

PROJECT MANUAL AND INVITATION TO BID

Wessagusset Beach Walk Project

**WESSAGUSSET/ GEORGE E LANE BEACH
WEYMOUTH, MA**

PROJECT NO. C18729.00

Construction Bid Documents
for

**ROCK REVETMENT, PEDESTRIAN BOARDWALK, BEACH
NOURISHMENT AND COASTAL BANK RESTORATION PROJECT**

~~April 24, 2024~~

~~Revised May 3, 2024~~

Revised May 13, 2024

OWNER

Town of Weymouth
Mayor Robert L. Hedlund
75 Middle Street
Weymouth, Massachusetts

ENGINEER

Coastal Engineering Co., Inc.
A Tighe & Bond Company

260 Cranberry Highway
Orleans, Massachusetts



LANDSCAPE ARCHITECT

Kyle Zick Landscape Architecture, Inc.

36 Bromfield Street, Suite 202
Boston, Massachusetts



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PART 1- BIDDING REQUIREMENTS

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SECTION 00 10 00 - INVITATION TO BID

Sealed bids for the Wessagusset Beach Walk Project located in Weymouth, MA. will be received via file upload until the time specified below at which time the bids will be publicly opened and read.

Bid Documents may be obtained electronically after **Wednesday, April 24th, 2024** from the Tighe & Bond website at: <https://www.tighebond.com/projects-out-to-bid/>. Prospective bidders must complete a one-time registration process on the website to receive log-in credentials. Bidders must log in to the web site to download bidding documents for the project and/or to upload a Bid. Bidders will be added to the “plan holders” or prospective bidders list upon downloading the bidding documents for the project.

Bids will be opened at a public video conference or at the Town of Weymouth Town Council Chambers on the 2nd floor of the Weymouth Town Hall on **Friday, May 31st, 2024, at 3 PM**. Each Bid must be accompanied by a bid security consisting of a BID BOND, CASH or CERTIFIED CHECK, issued by a responsible bank or trust company in the amount of 5% of the bid price. A pre-bid meeting will be held via a public video conference on **Wednesday May 8th, 2024, at 10:00 AM**. The municipality strongly suggests attendance at the pre-bid meeting.

A PERFORMANCE and PAYMENT BOND, in an amount equal to 100 percent of the total amount of the contract price with a surety company qualified to do business in the Commonwealth of Massachusetts will be required for the faithful performance of the contract, as well as a labor and materials bond in an amount equal to 100 percent of the total contract price.

All bids for this project are subject to applicable public bidding laws of Massachusetts, including, but not limited to G.L. c.30, §39M.

Attention is directed to the prevailing wage rates to be paid as determined by the Commissioner of Labor and Workforce Development and the weekly payroll record submittal requirements under the provisions of G.L. c.149, §§26 through 27D, inclusive.

Selection of the contractor will be based upon bidder qualifications, including evidence of past performance in similar projects, and bid price. The contract will be awarded to the bidder deemed by the AWARDING AUTHORITY to be the lowest responsible and eligible bidder.

The bidder agrees that its bid shall be good and may not be withdrawn for a period of 30 days, Saturdays, Sundays and legal holidays excluded, after the opening of the bids.

The Town reserves the right to waive any informality, to accept or reject, in whole or in part any or all bids, or take whatever other action may be deemed to be in the best interest of the Town.

Issued by: Weymouth Department of Asset Management

END OF SECTION

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SECTION 00 20 00 - INSTRUCTIONS TO BIDDERS

1. Receipt and Opening of Bids

Town of Weymouth Procurement Office, located at 75 Middle Street, Weymouth, Massachusetts, herein called the Owner, acting by and through its Commission, will receive sealed Bids for the project known as the Wessagusset Walk Project through Tighe & Bond.

General bids shall be addressed to the Town of Weymouth Department of Asset Management, 75 Middle Street, Weymouth, MA 02189 and endorsed as "BID FOR WESSAGUSSET WALK PROJECT". Bids will be received by the Town of Weymouth via the Tighe & Bond website until **3 p.m. on Friday, May 31st, 2024**, at which time the bids received will be opened and read aloud via during a public video conference. Bids shall be uploaded as electronic .pdf files to Tighe & Bond's website at <https://www.tighebond.com/projects-out-to-bid/>.

Questions concerning this bid shall be submitted in writing via email at rmcavanaugh@tighebond.com no later than the close of business on **Friday, May 17th, 2024**. 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 will not be considered. The bidder agrees that its bid shall be good and may not be withdrawn for a period of 30 days, Saturdays, Sundays, and legal holidays excluded, after the opening of bids.

A pre-bid meeting will be held via a public video conference on **Wednesday, May 8th, 2024**. All bidders are encouraged to visit the site prior to the pre-bid meeting. The municipality strongly urges attendance at the pre-bid meeting.

2. Location and Work to be Done

The Work consists of construction of a new revetment and significant landscaping and hardscaping work to create a public beach connection, and all work incidental thereto, in accordance with the Specifications and plans attached hereto.

Additional drawings showing details in accordance with which the Work is to be done may be furnished by addendum during the bidding period by the Owner or its Landscape Architect/Engineer, and shall then become a part of the Contract Documents.

The Contractor shall furnish all labor, services, materials, equipment, plant, machinery, apparatus, appliances, tools, supplies, and all other things necessary to do all work required for the completion of each item of the Work and as herein specified.

The Work to be done and paid for under any item shall not be limited to the exact extent mentioned or described but shall include all incidental work necessary or customarily done for the completion of that item.

3. Preparation of Bid

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 in a sealed envelope bearing on the outside the name of the bidder, his address, and endorsed with the name of the project as specified in Receipt and Opening of Bids, above. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed as specified in Receipt and Opening of Bids, above.

The bid should include the following documents:
Form of General Bid

4. Bid Opening Procedure

The following list of requirements shall apply to each filed bid. Bids not meeting all the requirements for timeliness and security will be rejected; bids not meeting signature and addenda requirements will be rejected prior to checking of bid amounts.

Bids shall be filed at the place and before the time specified in Receipt and Opening of Bids, above.

All addenda will be emailed to all prospective bidders. All bidders shall include with their bids the written acknowledgment form provided in Section 00 30 00, FORM OF GENERAL BID.

The total dollar amount of each bid will be read, and the three apparent lowest bids will be selected for further consideration. These three apparent low bids will be read aloud for the benefit of the other bidders and the bid opening procedure will be closed. All those present at the bid opening may examine all bids after the bid opening and after the reading of the three apparent low bids.

5. Modification

Any bidder may modify his/her bid by written communication at any time prior to the scheduled closing time for receipt of bids. Any telegraphic communication (i.e., email, facsimile or regular mail) must be received by the Owner prior to the closing time, and, provided further, the Owner must be satisfied that a written confirmation of the telegraphic modification over the signature of the bidder was mailed prior to the closing time. If written confirmation is not received within two days from the closing time, no consideration will be given to telegraphic communication.

The communication shall not reveal the bid price but shall provide the addition or subtraction or other modification so that the final prices or terms will not be known by the Owner until the sealed bid is opened.

6. Ability and Experience of Bidder

No award will be made to any bidder who cannot satisfy the Owner that he/she has sufficient ability and experience in this class of work and sufficient capital and financial wherewithal to enable him to prosecute and complete the work successfully within the time named. The Owner's decision or judgment on these matters will be final, conclusive, and binding.

The bidder should possess at least 10 years of experience and /or completed 4 projects in projects of similar size and scope in the State of Massachusetts. The bidder shall provide references to the Owner to review.

The Owner may make such investigations as it deems necessary, and the bidder shall furnish to the Owner, under oath if so required, all such information and data for this purpose as the Owner may request.

7. Conditions of Work

Each bidder must familiarize himself fully with 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/her contract. Insofar as possible the Contractor, in carrying out his/her work, must employ such methods or means as will not cause any interruption of or interference with the work of any other Contractor.

All work must be completed outside of the regulatory time requirements, and between Labor Day and Memorial Day.

8. Addenda and Interpretations

No interpretation of the meaning of the plans, specifications or other prebid documents will be made to any bidder orally. All information given to bidders other than by means of the plans, specifications, or by addenda, as described below, is given informally, and shall not be used as the basis of a claim against the Owner.

Every request for such interpretation should be emailed to Ryan Cavanaugh, Project Engineer with Tighe and Bond, at **RMcavanaugh@TigheBond.com** no later than the close of business on **Friday, May 17th, 2024**. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, when issued, will be emailed all prospective bidders (at the respective email address furnished by them for such purposes). Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under his bid as submitted. All addenda so issued shall become part of the Contract Documents.

9. Security for Faithful Performance

Simultaneously with his/her 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 and materials under this contract. The surety on such bond or bonds shall be a surety company qualified to do business under the laws of the Commonwealth and satisfactory to the Owner. The bonds shall remain in force for one year after final acceptance of the work by the Owner, unless the Owner, in writing, releases the Contractor from the obligation sooner.

10. Power of Attorney

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

11. Laws and Regulations

The bidder's attention is directed to the fact that all applicable State laws, municipal ordinances or bylaws, 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 written out in full.

12. 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 10 days after presentation thereof by the Owner, shall forfeit to the Owner, as liquidated damages for such failure or refusal, the security deposited with his/her bid, but the amount forfeited shall not exceed the difference between his/her bid price and the bid price of the next lowest responsible and eligible bidder. In case of death, disability, bona fide clerical or mechanical error of a substantial nature, or other similar unforeseen circumstances affecting the bidder, his/her bid deposit will be returned.

13. 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 document shall in no way relieve any bidder from any obligation in respect of his bid.

14. Information Not Guaranteed

All information given in the Contract Documents relating to subsurface and other conditions, natural phenomena, existing pipes, and other structures is from the best sources at present available to the Owner. All such information is furnished only for the information and convenience of bidders and is not guaranteed.

It is agreed and understood that the Owner does not warrant or guarantee that the subsurface or other conditions, natural phenomena, existing pipes, or other structures encountered during construction will be the same as those indicated in the Contract Documents. It is further agreed and understood that no bidder or Contractor shall use or be entitled to use any of the information made available to him or obtained in any

examination made by him in any manner as a basis of or grounds for any claim or demand against the Owner or the Architect/Engineer, arising from or by reason of any variance which may exist between the information made available and the actual subsurface or other structures actually encountered during the construction work, except as may otherwise be expressly provided for in the Contract Documents.

15. Bid Security

Each bid and sub-bid must be accompanied by bid security in the form of a certified check, a bid bond, cash, or a treasurer's or cashier's check, payable to the Owner, in the amount of five (5) percent of the value of the bid. Such security of general bidders will be returned to all except the three lowest responsible and eligible bidders within five days, Saturdays, Sundays, and legal holidays excluded, after the opening of bids, and the remaining securities will be returned promptly after the Owner and the accepted bidder have executed the Contract, or if no notice of intent to award has been presented to the selected contractor within 30 days, Saturdays, Sundays and holidays excluded, after the date of the opening of bids, upon demand of the bidder at any time thereafter.

16. Right to Reject Bid

The Owner reserves the right to waive any informalities in bids and to reject any and all bids, should the Owner deem it to be in the public interest to do so.

The Owner may also reject bids which in its sole judgment are either incomplete, conditional, obscure or not responsive or which contain additions not called for, erasures not properly initialed, alterations, or similar irregularities.

17. Time for Completion

The successful general bidder must agree to commence contract within ten (10) days of the date of the Notice to Proceed and to fully complete the project within the time limit stated below and in Section 00 30 00 - FORM OF GENERAL BID. Construction is anticipated to begin after Labor Day on **September 3rd, 2024**.

Substantial Completion for the revetment and boardwalk work is to be before **May 16th, 2025**. Substantial Completion for the coastal bank and landscaping work is to be before **May 31st, 2026**.

18. Comparison of Bids

Bids will be compared on the basis of prices set forth in the bid forms. In the event that there is a discrepancy between the lump sum or unit prices written in words and figures, the prices written in words will govern.

19. Award of Contract

The Contract will be awarded to "the lowest responsible and eligible bidder" pursuant to General Laws Chapter 30, Section 39M, as amended. Such a bidder shall possess the

skill, ability and integrity necessary for the faithful performance of the work, shall be able to furnish labor that can work in harmony with all other elements of labor employed, or to be employed, in the work, and shall otherwise comply with all applicable provisions of law. Contract award shall be subject to availability of an appropriation for funding.

20. Statutes Regulating Competitive Bidding

Any bid which does not comply with the provisions of Massachusetts General Laws Chapter 30, Section 39M, as amended, need not be accepted and the Owner may reject every such bid.

21. Wage Rates

Prevailing Wage Rates as determined by the Commissioner of the Department of Labor and Workforce Development under the provisions of Massachusetts General Laws, Chapter 149, Section 26 to 27G, as amended, apply to this project. This project is also federally funded and therefore subject to the Davis Bacon Prevailing Wage Rates as applicable under the Consolidated Appropriations Act, 2016.

The Contractor shall be responsible for determining and using the higher wage rates between the State and Federal Prevailing Wage Rates.

It is the responsibility of the bidder, before bid opening, to request any additional information on Prevailing Wage Rates for those tradespeople who may be employed for the proposed work under this contract.

22. Contractor Records

The Contractor shall comply with the provisions of Massachusetts General Laws, Chapter 30, Section 39R concerning Contractor records.

23. Insurance

The Contractor shall carry and continuously maintain until completion of the Contract, insurance as specified in the Agreement and in such form as shall protect him performing work covered by this Contract, and the Town of Weymouth Department of Planning & Community Development and its employees, agents and officials, from all claims an liability for damages for bodily injury, including accidental death, and for property damage, which may arise from operations under this Contract. The Town of Weymouth and Tighe & Bond Inc. shall be named as an additional insured. The Contractor covenants and agrees to hold the Town of Weymouth and its employees, agents and officials harmless from loss or damage due to claims for bodily injury or death and/or property damage arising from, or in connection with, operations under this Contract.

25. Project Manager

The Owner may utilize the services of a project manager, whose duties shall be as set forth in an Agreement for Project Manager Services.

26. Public Outreach

The Contractor, Project Manager, Owner, and Engineer will attend a public meeting in **June or July 2024** that will include addressing any concerns and questions the public and abutters may have relating to the construction and work being done as a part of this project.

END OF SECTION

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SECTION 00 30 00 - FORM OF GENERAL BID

Bid of _____ (hereinafter called "Bidder")*

() a corporation, organized and existing under the laws of the state of _____

() a partnership

() a joint venture

() an individual
doing business as _____

To the Town of Weymouth Department of Planning & Community Development, Massachusetts (hereinafter called "Owner").

A) The undersigned Bidder, in compliance with your invitation for bids for the project known as _____, having examined the plans and specifications and related documents and the site of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposed project including the availability of materials and labor, hereby proposes to furnish all labor, materials, and supplies, and to construct the project in accordance with the contract documents and the plans and specifications within the time set forth below, and at the prices stated below. These prices are to cover all expenses incurred in performing the work required under the contract documents, of which this bid is a part.

The Bidder hereby agrees to commence work on or before the date to be specified in written "Notice to Proceed" of the Owner, and to substantially complete the project by **May 16th, 2025**. The Bidder further agrees to pay as liquidated damages the sum of \$1,000 Dollars for each consecutive calendar day thereafter that the work is not complete as provided in the contract.

*Specify corporation, partnership or individual as applicable.

B) Bidder acknowledges receipt of and this bid includes the following addenda:

No. _____ Dated: _____

No. _____ Dated: _____

C) The Bidder agrees to perform the bid work described in the specifications and shown on the plans for the following itemized contract items. The items and values below are to be used for estimating purposes only.

WESSAGUSSET BEACH WALK - BID FORM

Item	Description	Quantity	Unit	Unit Cost	Total
1A	General Requirements	1	LS	\$ _____	\$ _____
1B	Mobilization/Demobilization	1	LS	\$ _____	\$ _____
1C	Temporary Rodent Control	1	LS	\$ _____	\$ _____
2A	Demolish Concrete Debris on Beach	2,600	SF	\$ _____	\$ _____
2B	Demolish Concrete Access Stairs	1	LS	\$ _____	\$ _____
2C	Sawcut and Demolish Concrete Pad and Sidewalk	725	SF	\$ _____	\$ _____
2D	Sawcut and Demolish Concrete Retaining Wall	440	LF	\$ _____	\$ _____
2E	Demolish Existing Cable Guard Rail	260	LF	\$ _____	\$ _____
3A	Clear and Grub Existing Vegetation	1	LS	\$ _____	\$ _____
3B	Protect Existing Trees	7	EA	\$ _____	\$ _____
3C	Tree Protection Fence	175	LF	\$ _____	\$ _____
3D	Planting Mix	1	LS	\$ _____	\$ _____
3E	Erosion Control Blanket and Live Staking	1	LS	\$ _____	\$ _____
3F	Plantings: Shrubs, Loam, and seed	1	LS	\$ _____	\$ _____
3G	Plantings: Grasses & Perennials	1	LS	\$ _____	\$ _____
3H	Conservation Seed Mix	1	LS	\$ _____	\$ _____
3I	Beach Grass Restoration	1	LS	\$ _____	\$ _____
3J	Beach Nourishment Sand	2,500	CY	\$ _____	\$ _____
3K	Dune Protection	1	LS	\$ _____	\$ _____
3L	Minor Site Grading	1	LS	\$ _____	\$ _____

WESSAGUSSET BEACH WALK - BID FORM

Item	Description	Quantity	Unit	Unit Cost	Total
3M	Environmental and Slope Stability Monitoring and Maintenance	1	LS	\$ _____	\$ _____
3N	Ordinary Borrow	20	CY	\$ _____	\$ _____
4A	Boardwalk: Rebuild Revetment	935	LF	\$ _____	\$ _____
4B	Boardwalk: New Stone for Revetment (5-6 Ton)	200	Ton	\$ _____	\$ _____
4B	Boardwalk: New Stone for Revetment (4-6 Ton)	200	Ton	\$ _____	\$ _____
4B	Boardwalk: New Stone for Revetment (2-3 Ton)	200	Ton	\$ _____	\$ _____
4B	Boardwalk: New Stone for Revetment (200 lb)	200	Ton	\$ _____	\$ _____
4C	Boardwalk: Precast Concrete Deck Units 7.5 feet long by 10 feet wide	136	EA	\$ _____	\$ _____
4D	Boardwalk: Cast-in-Place Concrete Sections	6	EA	\$ _____	\$ _____
4E	Cast-in-Place Concrete Ramp Retaining Wall.	1	LS	\$ _____	\$ _____
5A	Accessible Parking Space and Access Drive	1	LS	\$ _____	\$ _____
5B	Timber Beach Ramp	1	LS	\$ _____	\$ _____
6A	Boardwalk Drainage Swale	1,100	LF	\$ _____	\$ _____
6B	Riprap Drainage Swale	375	LF	\$ _____	\$ _____
6C	Remove and Replace Existing Outfall Headwall	4	EA	\$ _____	\$ _____
6D	Remove and Replace Existing Drainage Pipes	20	LF	\$ _____	\$ _____

WESSAGUSSET BEACH WALK - BID FORM

Item	Description	Quantity	Unit	Unit Cost	Total
7A	Granite Beach Access Stairs	1	LS	\$ _____	\$ _____
7B	Slope Stabilization Drainage System	1	LS	\$ _____	\$ _____
7C	Concrete Access Ramp and Aluminum Stairs	1	LS	\$ _____	\$ _____
8A	Demolish Existing Residential Access Stairs	10	EA	\$ _____	\$ _____
8B	Residential Access Stair #9 Regatta Rd.	1	LS	\$ _____	\$ _____
8C	Residential Access Stair #15 Regatta Rd.	1	LS	\$ _____	\$ _____
8D	Residential Access Stair #27 Regatta Rd.	1	LS	\$ _____	\$ _____
8E	Residential Access Stair #35 Regatta Rd.	1	LS	\$ _____	\$ _____
8F	Residential Access Stair #39/#45 Regatta Rd.	1	LS	\$ _____	\$ _____
8G	Residential Access Stair #53/#57 Regatta Rd.	1	LS	\$ _____	\$ _____
8H	Residential Access Stair #67/#73 Regatta Rd.	1	LS	\$ _____	\$ _____
8I	Residential Access Stair #77 Regatta Rd.	1	LS	\$ _____	\$ _____
8J	Residential Access Stair #85/#91 Regatta Rd.	1	LS	\$ _____	\$ _____
8K	Residential Access Stair #97#105 Regatta Rd.	1	LS	\$ _____	\$ _____
8L	Segmented Retaining Wall and Steps #97 Regatta Rd.	1	LS	\$ _____	\$ _____

WESSAGUSSET BEACH WALK - BID FORM

Item	Description	Quantity	Unit	Unit Cost	Total
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Total Bid Amount

(Amount in Figures): \$ _____

(Amount in Words): _____ **Dollars and** _____ **Cents**

The above unit prices shall include all labor, equipment, materials, bailing, shoring, removal, disposal, overhead, profit, and insurance to cover the finished work of the several kinds indicated in project Contract Documents.

The Bidder understands that all bids for this project are subject to the applicable bidding laws of the Commonwealth of Massachusetts, including General Laws Chapter 149 and Chapter 30, Section 39M, as amended.

The Bidder understands that the Owner reserves the right to reject any or all bids and to waive any informalities in the bidding.

The Bidder agrees that this bid shall be good and may not be withdrawn for a period of 30 days, Saturdays, Sundays and legal holidays excluded, after the opening of bids.

Within 10 days of receipt of the written notice of acceptance of this bid, the Bidder will execute the formal Agreement set forth in Section 00 50 00 - AGREEMENT.

Bid security is attached in the sum of five percent (5%) of the total bid in accordance with the conditions of Section 00 10 00 - INSTRUCTIONS TO BIDDERS. The bid security may become the property of the Owner in the event the contract and bond are not executed within the time set forth above.

The selected Contractor shall furnish a performance bond and a payment bond in an amount at least equal to one hundred percent (100%) of the contract price in accordance with Section 00 61 00 - PERFORMANCE BOND, Section 00 62 00 - PAYMENT BOND, and as stipulated in the contract.

The undersigned offers the following information as evidence of his qualifications to perform the work as bid upon according to all the requirements of the plans and specifications.

1. Have been in business under present name for ____ years.
2. The names and addresses of all persons interested in the bid (if made by a partnership or corporation) as principals, are as follows:

(attach supplementary list if necessary)

3. The bidder is requested to state below what work of a similar character to that included in the proposed contract he has done and give references that will enable the Owner to judge his experience, skill and business standing (add supplementary page(s) if necessary).

Completion Date	Project Name	Contract Amount	Design Engineer	Reference Name	Telephone No.
a.					
b.					
c.					
d.					
e.					
f.					

4. The bidder is requested to state below the anticipated subcontractors with contact information.

Subcontractor Name	Specialty	Telephone No.
--------------------	-----------	---------------

a. _____

b. _____

c. _____

d. _____

e. _____

f. _____

Bank reference _____
(Name)

(Bank)

(Address)

(Telephone No.)

Pursuant to G.L. c.62C, §49A, I certify hereby in writing, under penalties of perjury, that the within named Bidder/Contractor has complied with all laws of the commonwealth relating to taxes, reporting of employees and contractors, and withholding and remitting of child support.

The undersigned Bidder hereby certifies under penalties of perjury, as follows: (1) that he/she is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work; (2) that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and (3) that all employees to be employed in the work subject to this bid have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration.

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 undersigned bidder hereby certifies, under pains and penalties of perjury, that the foregoing bid is based upon the payment to laborers to be employed on the project of wages in an amount no less than the applicable prevailing wage rates established for the project by the Massachusetts Department of Labor and Workforce Development. The undersigned bidder agrees to indemnify the awarding authority for, from and against any loss, expense, damages, actions or claims, including any expense incurred in connection with any delay or stoppage of the project work arising out of or as a result of (1) the failure of the said bid to be based upon the payment of the said applicable prevailing wage rates or (2) the failure of the bidder, if selected as the contractor, to pay laborers employed on the project the said applicable prevailing wage rates.

Respectfully submitted:

Date: _____

By: _____
(Signature)

(Type Name of Bidder)

(Title)

(Business Address)

(City and State)

(Telephone Number)

END OF SECTION

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PART 2 - AGREEMENT

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SECTION 00 50 00 – FORM OF AGREEMENT

THIS FORM OF AGREEMENT made this _____ day of _____
in the year Two Thousand and _____, between _____,
with a usual place of business at _____,
hereinafter called the CONTRACTOR, and the Town of Weymouth, acting by and through its
duly authorized Mayor, with a usual place of business at 75 Middle Street, Weymouth, MA
02189 hereinafter called the TOWN.

The CONTRACTOR and the TOWN, for the consideration hereinafter named, agree as follows:

1. Scope of Work

The Contractor shall furnish all labor, materials, equipment, and insurance to perform all work required for the project known as the _____ Project, in strict accordance with the Contract Documents and all related Drawings and Specifications. The said Documents, Specifications, Drawings and any GENERAL and SUPPLEMENTARY CONDITIONS are incorporated herein by reference and are made a part of this Agreement.

2. Contract Price

The Owner shall pay the Contractor for the performance of this Agreement, subject to additions and deductions provided herein, in current funds, the sum of _____.

3. Commencement and Completion of Work and Liquidated Damages

It is agreed that time is of the essence of this Agreement. The Contractor shall commence and prosecute the work under this Agreement upon execution hereof and shall complete the work on or before May 16th, 2025.

- A. Definition of Term: The Term "Substantial completion" shall mean the date certified by the Owner when construction is sufficiently complete, in accordance with the Contract Documents, so the Owner may occupy the project, or designated portion(s) thereof, for the use for which it is intended.
- B. Time as Essential Condition: It is understood and agreed that the commencement of and substantial completion of the work are essential conditions of this Agreement. It is further agreed that time is of the essence for each and every portion of the Contract Documents wherein a definite and certain length of time is fixed for the performance of any act

whatsoever; and where under the Contract Documents any additional time is allowed for the completion of any work, the new time fixed by such extension shall be of the essence of this Agreement. It is understood and agreed that the times for the completion of the work are reasonable, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.

- C. Progress and Completion: Contractor shall commence work promptly upon execution of this Agreement and shall prosecute and complete the work regularly, diligently and uninterruptedly at such a rate of progress as will insure Substantial Completion within the stipulated number of calendar days.

- D. Liquidated Damages: It is expressly agreed between the Contractor and the Owner that the Contractor will be responsible for all damages which may arise due to the Contractor's failure to substantially complete the work within the above specified time. If the Contractor shall neglect, fail or refuse to complete the work within the specified number of days, or any extension thereof authorized by the Owner, Contractor agrees, as a part of the consideration for the execution of this Contract by the Owner, to pay the Owner the amount specified herein, not as a penalty, but as liquidated damages for such breach of contract as hereinafter set forth, for each and every calendar day, excluding Saturdays, Sundays and legal Holidays, that the Contractor shall be in default of Substantial completion after the date specified in the Agreement. Due to the impracticability and extreme difficulty of fixing and ascertaining the actual damages the Owner would in such event sustain, said amount is agreed to be the amount of damages which the Owner would sustain, and said amount shall be retained from time to time by the Owner from current periodic estimates. The amount of liquidated damages shall be \$1,000 per day.

4. Performance of the Work

- A. Direction of the Work: The Contractor shall supervise and direct the Work, using his best skills and attention which shall not be less than such state of skill and attention generally rendered by the contracting profession for projects similar to the Project in scope, difficulty and location. The Contractor shall maintain adequate supervisory personnel at the project site during the performance of the Work. He shall be solely responsible for all construction means, methods, techniques, site safety, sequences and procedures and for coordinating all portions of the Work under the Agreement.

B. Responsibility for the Work:

(1) The Contractor shall be responsible to the Owner for the acts and omissions of his employees, Subcontractors and their agents and employees, and other persons performing any of the Work under a contract with the Contractor. This obligation shall also extend to the presence on the Site of suppliers of materials or equipment, their employees, contractors, and agents engaged in the work.

- (2) The Contractor shall not be relieved from his obligations to perform the Work in accordance with the Contract Documents either by the activities or duties of the Owner in its administration of the Agreement, or by inspections, tests or approvals required or performed by persons other than the Contractor.
- C. Permits and Fees: Unless otherwise expressly provided, the Contractor shall secure and pay for all permits and fees, licenses and inspections necessary for the proper execution and completion of the Work which are customarily secured after execution of the Agreement and which are legally required at the time the bids are received, and the same shall at all times be the property of the Owner and shall be delivered to the Owner upon completion of the Project.
- D. Notices, Compliance With Laws:
- (1) The Contractor shall give all notices and comply with all federal, state and local laws, ordinances, rules, regulations and lawful orders of any public authority bearing on the performance of the Work. The Contractor shall provide the Owner with reproductions of all permits, licenses and receipts for any fees paid. The Owner represents that it has disclosed to the Contractor all orders and requirements known to the Owner of any public authority particular to this Agreement.
- (2) If the Contractor observes that any of the Contract Documents are at variance with applicable laws, statutes, codes and regulations in any respect, he shall promptly notify the Owner in writing, and any necessary changes shall be accomplished by appropriate modification.
- (3) If the Contractor performs any Work which he knows or should know is contrary to such laws, ordinances, rules and regulations, and without such notice to the Owner, he shall assume full responsibility therefor and shall bear all costs attributable thereto.
- (4) In the performance of the Work, the Contractor shall comply with all applicable federal, state and local laws and regulations including those relating to workplace and employee safety. The Contractor shall notify the Owner immediately of any conditions at the place of the work which violate said laws and regulations and shall take prompt action to correct and eliminate any such violations.
- E. Project Superintendent: The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site at all times during the progress of the Work. The superintendent shall represent the Contractor and all communications given to the superintendent shall be as binding as if given to the Contractor. Important communications shall be confirmed in writing. Other communications shall be so confirmed on written request in each case.
- F. Progress Schedule: The Contractor, immediately after being awarded the Contract, shall prepare and submit for the Owner's information an estimated progress schedule for the Work. The progress schedule shall be related to the entire Project to the extent required

by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

G. Drawings, Specifications and Submittals:

(1) The Contractor shall maintain at the site for the Owner one record copy of all Drawings, Specifications, Addenda, Change Orders and other Modifications, and "As-Built" Drawings and Specifications in good order and marked currently to record all changes made during construction, and approved Shop Drawings, Product Data and Samples. These shall be delivered to the Owner upon completion of the Work.

(2) By approving and submitting Shop Drawings, Product Data and Samples, the Contractor represents that he has determined and verified all materials, field measurements, and field construction criteria related thereto, or will do so, and that he has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

(3) The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Owner's approval of Shop Drawings, Product Data or Samples unless the Contractor has specifically informed the Owner in writing of such deviation at the time of submission and the Owner has given written approval to the specific deviation. The Contractor shall not be relieved from responsibility for errors or omissions in the Shop Drawings, Product Data or Samples by the Owner's approval thereof.

(4) The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data or Samples, to revisions other than those requested by the Owner on previous submittals.

(5) No portion of the Work requiring submission of a Shop Drawing, Product Data or Sample shall be commenced until the submittal has been approved by the Owner. All such portions of the Work shall be in accordance with approved submittals.

H. Protection of the Work and Owner's Property: The Contractor shall at all times safely guard the Owner's property from injury or loss in connection with this Agreement. He shall at all times safely guard and protect his own work, and that of adjacent property from damage. The Contractor shall replace or make good any such damage, loss or injury. The Contractor shall clean the work area and restore it to its original condition upon completion of the work.

I. Quality of the Work: The Contractor shall perform the work in a good, workmanlike manner. The Contractor hereby guarantees that the entire work constructed by him under the Agreement will meet fully all requirements thereof as to quality of workmanship and materials. The Contractor hereby agrees to make at his own expense any repairs or replacements made necessary by defects in materials or workmanship supplied to him that become evident within one (1) year after the date of the final payment, and to restore

to full compliance with the requirements set forth herein any part of the work constructed hereunder, which during said one (1) year period is found to be deficient with respect to any provisions of the Contract Documents. The Contractor also agrees to hold the Owner harmless from claims of any kind arising from damage due to said defects. The Contractor shall make all repairs and replacements promptly upon receipt of written orders for same from the Owner. If the Contractor fails to make the repairs and replacements promptly, the Owner may do the work and the Contractor shall be liable to the Owner for the cost thereof.

- J. Warranty: The Contractor guarantees to Owner that all materials incorporated into the work will be new unless otherwise specified or agreed. Prior to final payment, the Contractor shall deliver to the Owner all manufacturers' warranties, together with such endorsements or assignments as are necessary to ensure to the Owner the full rights and benefits of such warranties.

5. Affirmative Action/Equal Employment Opportunity

The Contractor is directed to comply with all applicable State Laws, Ordinances, Bylaws, and rules and regulations regarding affirmative action/equal employment opportunity requirements. Failure of the Contractor to comply with any such law, rule or regulation shall constitute grounds for the Owner to terminate the Agreement.

6. Site Information Not Guaranteed; Contractor's Investigation

All information given in the Contract Documents relating to subsurface and other conditions, natural phenomena, existing pipes, and other structures is from the best sources at present available to the Owner. All such information is furnished only for the information and convenience of the Contractor and is not guaranteed.

It is agreed and understood that the Owner does not warrant or guarantee that the subsurface or other conditions, natural phenomena, existing pipes, or other structures encountered during construction will be the same as those indicated in the Contract Documents.

Contractor has familiarized himself with the nature and extent of the Contract Documents, work, locality, and with all local conditions and federal, state, and local laws, rules, ordinances, and regulations that in any manner may affect costs, progress, or performance of the work. Contractor has made, or has caused to be made, examinations, investigations, and tests and studies of such reports and related data in addition to those referred to in the paragraph above as he deems necessary for the performance of the work at the Contract Price, within the Contract Time, and in accordance with the other Terms and Conditions of the Contract Documents; and no additional examinations, tests, investigations, reports, and similar data are or will be required by the Contractor for such purposes.

Contractor has correlated the results of all such observations, examinations, investigations, tests, reports, and data with the Contract Documents. Contractor has given the Owner written notice of all conflicts, errors, or discrepancies that he has discovered in the Contract Documents, and the resolution thereof by the Owner is acceptable to the Contractor.

It is further agreed and understood that the Contractor shall not use or be entitled to use any of the information made available to him or obtained in any examination made by him in any manner as a basis of or ground for any claim or demand against the Owner, arising from or by reason of any variance which may exist between the information made available and the actual subsurface conditions or other conditions or structures actually encountered during the construction work, except as may otherwise be expressly provided for in the Contract Documents.

7. Project Architect or Engineer

There is a project engineer who is Coastal Engineering a Tighe & Bond Company and a landscape architect who is Kyle Zick Landscape Architects (KZLA) for this project. Except as otherwise indicated in the Contract Documents, the Architect/Engineer shall be a representative of the Owner and the Contractor shall direct all communications, questions and comments on the work and the performance thereof to the Architect/Engineer. Except as otherwise provided, the Architect/Engineer shall have all the authority of the Owner set forth in the Contract Documents. In general, the Architect/Engineer shall have the authority to review the performance of the work, reject work which is defective or otherwise does not comply with the Contract Documents and to order the Contractor to remedy defective work and take such actions which are necessary to make the work conform to the Contract Documents.

8. Wage Rates

Prevailing Wage Rates as determined by the Commissioner of the Department of Labor and Workforce Development under the provisions of Massachusetts General Laws, Chapter 149, Section 26 to 27G, as amended, apply to this project. This project is also federally funded and therefore subject to the Davis Bacon Prevailing Wage Rates as applicable under the Consolidated Appropriations Act, 2016.

The Contractor shall be responsible for determining and using the higher wage rates between the State and Federal Prevailing Wage Rates.

It is the responsibility of the Contractor to provide the Town with certified payrolls and to comply with all requirements of the above-cited statutes.

The schedules of prevailing wage rates are included in Section 00 90 00 – Prevailing Wage Rates (State & Federal) of the Contract Documents.

9. Payments to the Contractor

24 APRIL 2024

00 50 00 - 6
FORM OF AGREEMENT

Within fifteen (15) days after receipt from the Contractor of a proper and satisfactory periodic estimate requesting payment of the amount due for the preceding month, the Owner shall have fifteen (15) days to make payment for:

- A. The work performed during the preceding month.
- B. The materials not incorporated in the Work but delivered and suitably stored at the site (or at some location agreed upon in writing) to which the Contractor has title, or to which a Subcontractor has title and has authorized the Contractor to transfer title to the Owner.
- C. Less the following retention items:
 - 1. A retention based on an estimate of the fair value of the Owner's claims against the Contractor.
 - 2. A retention for direct payments to Subcontractors, if any, based on demands for same in accordance with the provisions of Section 39F of Chapter 30 of the General Laws.
 - 3. A retention not exceeding five percent (5%) of the approved amount of the periodic payment.
- D. After the receipt of a periodic estimate requesting final payment and within sixty-five (65) days after the Contractor fully completes the Work, or substantially completes the Work so that the value of the Work remaining to be done is, on the estimate of the Owner, less than 1% of the original Contract Price, or substantially completes the Work and the Owner takes possession or occupancy, whichever occurs first, the Owner shall pay the Contractor the entire balance due on the Contract less:
 - 1. A retention based on an estimate of the fair value of the Owner's claims against the Contractor and of the cost of completing the incomplete and unsatisfactory items of work.
 - 2. A retention for direct payments to Subcontractors, if any, based on demands of same in accordance with the provisions of Section 39F of Chapter 30 of the General Laws, or based on the record of payments by the Contractor to the Subcontractors under this Contract if such record of payment indicates that the Contractor has not paid Subcontractors as provided in Section 39F of Chapter 30 of the General Laws.

If the Owner fails to make payment as herein provided, there shall be added to each such payment, daily interest at the rate of 3 percentage points above the rediscount rate than charged by the Federal Reserve Bank of Boston, commencing on the first day after said payment is due, and continuing until the payment is delivered or mailed to the Contractor; provided that no interest shall be due, in any event, on the amount of a periodic estimate for final payment until

fifteen (15) days after receipt of such a periodic estimate by the Owner as provided in the first paragraph of this Article. The Contractor agrees to pay to each subcontractor a portion of any such interest paid in accordance with the amount due each subcontractor.

The Owner may make changes in any periodic estimate submitted by the Contractor and the payment due on said periodic estimate shall be computed in accordance with the changes so made, and such changes and any requirements for a corrected periodic estimate shall not affect the due date for the periodic payment or the date for the commencement of interest charges on the amount of the periodic payment computed in accordance with the changes made, as provided herein; provided further, that the Owner may, within seven (7) days after receipt, return to the Contractor for correction, any periodic estimate which is not in acceptable form or which contains computations not arithmetically correct, and in that event, the date of receipt of such periodic estimate shall be the date of receipt of the corrected periodic estimate in proper form and with arithmetically correct computations. The date of receipt of a periodic estimate received on a Saturday shall be the first working day thereafter.

E. Changes in the Work: No changes in the work covered by the approved Contract Documents shall be made without prior written approval of the Owner. Charges or credits for the work covered by the approved change shall be determined by one or more, or a combination of the following methods:

- (a) Unit bid prices previously approved.
- (b) An agreed lump sum.
- (c) The actual cost of:
 - (1) Labor.
 - (2) Materials entering permanently into the work.
 - (3) The ownership or rental cost of construction equipment during the time of use on the extra work.
 - (4) Power and consumable supplies for the operation of power equipment.
 - (5) Wages to be paid.

To the cost under (c) there shall be added a fixed fee to be agreed upon but not to exceed fifteen percent (15%) of the actual cost of work. The fee shall be compensation to cover the cost of supervision, overhead, bond, profit and any other general expenses.

F. Claims for Additional Costs: If the Contractor wishes to make a claim for an increase in the Contract Sum, he shall give the Owner written notice thereof within twenty days after the occurrence of the event giving rise to such claim. This notice shall be given by the Contractor before proceeding to execute the Work, except in an emergency endangering

life or property. No such claim shall be valid unless so made. Any change in the Contract Sum resulting from such claim shall be authorized by Change Order.

The Contractor hereby agrees that the Contractor shall have no claim for damages of any kind against the Town on account of any delay in the commencement or performance of the work and/or any hindrance, delay or suspension of any portion of the work including, but not limited to, any claims or damages on account of having to perform out of sequence work, claims for damages on account of loss of production or other interference with the work whether such delay is caused by the Town or otherwise, except as and to the extent expressly provided under G.L. c.30, §39O in the case of written orders by the Town. The Contractor acknowledges that the Contractor's sole remedy for any such claim will be an extension of time as provided herein.

10. Final Payment, Effect

The acceptance of final payment by the Contractor shall constitute a waiver of all claims by the Contractor arising under the Agreement.

11. Contract Documents

The Contract Documents consist of the following, together with this Agreement:

Invitation to Bid
Instructions to Bidders
This Contract Form
Bid Form
Performance Bond
Labor & Materials Payment Bond
Non-Collusion Certificate
Tax Compliance Certificate
Clerk's Certificate of Corporate Vote
Certificate of Insurance
General Conditions
Supplementary General Conditions
General Requirements
Specifications and Addenda
Contract Drawings
Schedule of Prevailing Wages
W-9 Form
Local Orders of Conditions – SE 81-1213
Local Orders of Conditions – SE 81-1245
(TBD) USACE 404 & 408 Permit – NAE-2018-01520
MassDEP Chapter 91 Waterways License No. 15271
MassDEP 401 Water Quality Certificate – MassDEP #81-1213
Alpha Labs Sediment Analysis Report

If a conflict arises between any of the documents listed above, the order of precedence shall be that language contained in the document higher in the list shall prevail over any conflicting document lower in the list of documents.

12. Terms Required By Law

This Agreement shall be considered to include all terms required to be included in it by the Massachusetts General Laws, and all other laws, as though such terms were set forth in full herein.

13. Indemnification

The Contractor shall indemnify and hold harmless the Owner from and against any and all claims, damages, losses, and expenses, including attorney's fees, arising out of the performance of this Agreement when such claims, damages, losses, and expenses are caused, in whole or in part, by the acts, errors, or omissions of the Contractor or his employees, agents, subcontractors or representatives.

14. Insurance

The Contractor shall purchase and maintain such insurance as will protect both the Owner and the Contractor from claims which may arise under the Agreement, including operations performed for the named insured by independent contractors and general inspection thereof by the named insured. In addition, the Contractor shall require its subcontractors to maintain such insurance. Coverage shall be provided for:

- 1) claims under workers' or workmen's compensation, disability benefit and other applicable employee benefit acts;
- 2) claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;
- 3) claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;
- 4) claims for damages insured by usual personal injury liability coverage which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the Contractor, or (2) by any other person;
- 5) claims for damages, including damages to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom; and
- 6) 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.

- 7) claims involving contractual liability applicable to the Contractor's obligations under Article 13.

The limits of liability for coverage required under the preceding paragraph shall be as Specified in the Supplemental Conditions.

Except for Workmen's Compensation, all liability coverage shall name the Town of Weymouth and Tighe & Bond, Inc. as an additional insured and shall provide for 30 days prior written notice to the Town of any modification or termination of coverage provided thereby. The Contractor shall provide the Owner with appropriate certificate(s) of insurance evidencing compliance with this provision prior to the commencement of any work under this Agreement.

15. Notice

All notices required to be given hereunder shall be in writing and delivered to, or mailed first class to, the parties' respective addresses stated above. In the event that immediate notice is required, it may be given by telephone or facsimile, but shall, to the extent possible, be followed by notice in writing in the manner set forth above.

16. Termination

- A. Each party shall have the right to terminate this Agreement in the event of a failure of the other party to comply with the terms of the Agreement. Such termination shall be effective upon seven days' notice to the party in default and the failure within that time of said party to cure its default.
- B. The Owner shall have the right to terminate the Agreement without cause, upon ten (10) days' written notice to the Contractor. In the event that the Agreement is terminated pursuant to this subparagraph, the Contractor shall be reimbursed in accordance with the Contract Documents for all Work performed up to the termination date, and for all materials or equipment not incorporated in the Work, but delivered and suitably stored at the site. Payment for material or equipment stored at the site shall be conditioned upon submission by the Contractor of bills of sale or such other evidence as is satisfactory to Owner to establish the Owner's title to such material or equipment or otherwise protect the Owner's interests.

17. Miscellaneous

- A. Royalties and Patents: The Contractor shall pay all royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and shall save the Owner harmless from loss on account thereof, except that the Owner shall be responsible for all such loss when a particular design, process or the product of a particular manufacturer or manufacturers is specified; but if the Contractor believes or has reason to believe that the design, process or product specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the Owner, and thereafter the Owner insists on the use of the design, process or products specified.

- B. Assignment: The Contractor shall not assign or transfer any of its rights, duties or obligations under this Agreement without the written approval of the Owner.
- C. Governing Law: This Agreement shall be governed by and construed in accordance with the law of the Commonwealth of Massachusetts.
- D. By its signature hereon, the Contractor certifies, under the pains and penalties of perjury, that it has complied with all laws of the Commonwealth of Massachusetts relating to taxes, reporting of employees and contractors, and withholding and remitting child support.

AGREEMENT:

For the Contractor:
(NAME OF CONTRACTOR)

For the Town of Weymouth:

Signature of Authorized Signatory

Department Head / Contract Manager

Print Name & Title

Approved as to Form:

Address

Richard McLeod, Town Solicitor

Email Address

Approved as to Appropriation:

James Malary - CFO
XXXX FUNDING CODE XXXX

Approved:

Robert L. Hedlund – Mayor

DATED: _____

In accordance with G.L. c.44, Section 31C, this is to certify that an appropriation in the amount of this contract is available therefor and that the _____ has been authorized to execute the contract and approve all requisitions and change orders.

By _____
(Owner's Accountant)

(Name)

CERTIFICATE OF VOTE
(to be filed if Contractor is a Corporation)

I, _____, hereby certify that I am the duly qualified
(Secretary of the Corporation)

and acting Secretary of _____ and I further certify that a meeting of the

(Name of Corporation)

Directors of said Company, duly called and held on _____, at which

(Date of Meeting)

all Directors were present and voting, the following vote was unanimously passed:

VOTED: To authorize and empower

Anyone acting singly, to execute Forms of General Bid, Contracts or Bonds on behalf of the Corporation.

I further certify that the above vote is still in effect and has not been changed or modified in any respect.

By: _____

(Secretary of Corporation)

A True Copy:

Attest: _____

(Notary Public)

My Commission Expires: _____

(Date)

**CERTIFICATIONS REQUIRED BY LAW
FOR PUBLIC CONSTRUCTION CONTRACTS**

You must COMPLETE and SIGN the following certifications. You must also print, at the bottom of this page, the name of the contractor for whom these certifications are submitted.

TAX COMPLIANCE

Pursuant to Chapter 62C of the Massachusetts General Laws, Section 49A(b), I, the undersigned, authorized signatory for the below named contractor, do hereby certify under the pains and penalties of perjury that said contractor has complied with all laws of the Commonwealth of Massachusetts relating to taxes, reporting of employees and contractors, and withholding and remitting child support.

NON-COLLUSION

The undersigned certifies under the 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 subsection the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity.

PUBLIC CONTRACTOR DEBARMENT

The undersigned certifies under penalty of perjury that the below named contractor 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.

OSHA TRAINING

Pursuant to G.L. c. 30, §39S, the Contractor hereby certifies under penalties of perjury as follows:

- (1) Contractor is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work;
- (2) All employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and they shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and
- (3) All employees to be employed in the work subject to this contract have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration.

COMPLETE AND SIGN BELOW:

Authorized Person's Signature

Date

Print Name & Title of Signatory

Name of Contractor

PERFORMANCE BOND

CONTRACTOR *(name and address):*

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

OWNER *(name and address):*

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description *(name and location):*

BOND

Bond Number:

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

Amount:

Modifications to this Bond Form: None See Paragraph 16

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

CONTRACTOR AS PRINCIPAL

SURETY

Contractor's Name and Corporate Seal *(seal)*

Surety's Name and Corporate Seal *(seal)*

By: _____
Signature

By: _____
Signature *(attach power of attorney)*

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

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

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after:

3.1 The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;

3.2 The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

3.3 The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a

qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:

5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:

7.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

7.2 additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and

7.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.

9. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.

10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

11. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

14. Definitions

14.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

14.2 Construction Contract: The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

14.3 Contractor Default: Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

14.4 Owner Default: Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

14.5 Contract Documents: All the documents that comprise the agreement between the Owner and Contractor.

15. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

16. Modifications to this Bond are as follows:

PAYMENT BOND

CONTRACTOR *(name and address)*:

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

OWNER *(name and address)*:

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description *(name and location)*:

BOND

Bond Number:

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

Amount:

Modifications to this Bond Form: None See Paragraph 18

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

CONTRACTOR AS PRINCIPAL

SURETY

_____ *(seal)*
Contractor's Name and Corporate Seal

_____ *(seal)*
Surety's Name and Corporate Seal

By: _____
Signature

By: _____
Signature *(attach power of attorney)*

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

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

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

Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

13. Notice and Claims to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

16. Definitions

16.1 **Claim:** A written statement by the Claimant including at a minimum:

1. The name of the Claimant;
2. The name of the person for whom the labor was done, or materials or equipment furnished;
3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;
4. A brief description of the labor, materials, or equipment furnished;
5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
7. The total amount of previous payments received by the Claimant; and
8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.

16.2 **Claimant:** An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

16.3 **Construction Contract:** The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

16.4 **Owner Default:** Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

16.5 **Contract Documents:** All the documents that comprise the agreement between the Owner and Contractor.

17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

18. Modifications to this Bond are as follows:

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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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:*
 1. 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 well-known 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:
 - 1. 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 is responsible. Nothing in this Paragraph 5.06.J shall obligate 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 Documents prior to the submittal of the Bid or the final negotiation of the terms of 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 Price or 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 date 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, expeditors, 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;
 - l. 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.

SECTION 00 80 00

SUPPLEMENTARY CONDITIONS

PART 1 AMENDMENTS TO GENERAL CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract (EJCDC 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.

The terms used in these Supplementary Conditions have the meanings indicated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings indicated below, which are applicable to both the singular and plural thereof.

The address system used in the Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added thereto.

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

SC-1.01 Delete paragraph 1.01A.38 in its entirety and insert the following in its place:

1.01A.38. Specifications – Sections included under Division 1 through Division 16 of the Project Manual.

SC-1.01 Add the following language at the end of the first sentence of paragraph 1.01A.40:

or has been completed except for work having a contract price of less than one percent of the then adjusted total Contract Price.

ARTICLE 2 – PRELIMINARY MATTERS

SC-2.02 Delete paragraph 2.02A in its entirety.

ARTICLE 3 –DOCUMENTS: INTENT, REQUIREMENTS, REUSE

SC-3.01 Replace paragraph 3.01E with the following paragraph:

3.01E In the event of conflicts, inconsistencies or discrepancies among the Contract Documents, to the extent applicable, the better quality or greater quantity of work shall be provided without change to the Contract Price. In the event of such conflicts, inconsistencies or discrepancies which do not relate to the quality or quantity of work, the Contractor shall request clarifications or interpretations from the Engineer as provided herein.

SC-3.01 Add the following new paragraph immediately after paragraph 3.01E:

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

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

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

- 4.01A The Contract Times will commence to run on the date specified in the Notice to Proceed.

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

- SC-5.03 Add the following new paragraphs immediately after paragraph 5.03B.3:

- SC-5.04 Add the following new paragraph immediately after paragraph 5.04D.4:

- 5.04D.5 Adjustment resulting from subsurface or latent physical conditions will be in accordance with Massachusetts General Law Chapter 30, Section 39N referenced in Part II of the Supplementary Conditions.

- SC-5.06 Delete Paragraphs 5.06A and 5.06B in their entirety and insert the following:

- 5.06A. No reports or drawings related to Hazardous Environmental Conditions at the Site are known to the Owner.

- 5.06B. Not used.

ARTICLE 6 - BONDS AND INSURANCE

- SC-6.03 Add the following new paragraph immediately after paragraph 6.03B.3:

- 6.03B.4 Insurance certificate(s) shall also contain the following:

1. Confirmation that the General Liability policy covers only the Work under this Contract, with project specific limits.
2. Confirmation that automobile insurance covers all Scheduled, Hired and Non-Owned vehicles.
3. Names of all additional insurers as specified herein.

- SC-6.03 Add the words “and Paragraph 6.04” after the words “Paragraph 6.03” in Paragraph 6.03I.

SC 6.03 Add the following new paragraph immediately after Paragraph 6.03.J:
6.03.K The limits of liability for the insurance required by Paragraph 6.03 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:

1. Workers' Compensation, and related coverages under Paragraphs 6.03.A.1 and A.2 of the General Conditions:

State:	<u>Statutory</u>
Federal, if applicable (e.g., Longshoreman's):	<u>Statutory</u>

Employer's Liability:

Bodily injury, each accident	<u>Statutory</u>
Bodily injury by disease, each employee	<u>Statutory</u>
Bodily injury/disease aggregate	<u>Statutory</u>

2. Contractor's Commercial General Liability under Paragraphs 6.03.B and 6.03.C of the General Conditions:

General Aggregate	<u>\$3,000,00</u>
Each Occurrence (Bodily Injury and Property Damage)	<u>\$1,000,000</u>

3. Automobile Liability under Paragraph 6.03.D. of the General Conditions:

Bodily Injury:

Each person	<u>\$1,000,000</u>
Each accident	<u>\$1,000,000</u>

Property Damage:

Each accident	<u>\$1,000,000</u>
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4. Excess or Umbrella Liability:

Per Occurrence	<u>\$2,000,000</u>
General Aggregate	<u>\$2,000,000</u>

5. Contractor's Pollution Liability: _____

If box is checked, Contractor is not required to provide Contractor's Pollution Liability insurance under this Contract

6. Additional Insureds: In addition to Owner and Engineer, include as additional insureds the following: Town of Weymouth

7. Contractor's Professional Liability:	
Each Claim	<u>\$5,000,000</u>
Annual Aggregate	<u>\$5,000,000</u>

SC-6.04 Delete paragraph 6.04 in its entirety and insert the following in its place:

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

Bodily Injury	\$5,000,000	Each Occurrence
	\$5,000,000	Aggregate
Property Damage	\$5,000,000	Each Occurrence
	\$5,000,000	Aggregate

- A. Insurance coverage for the Contractor's Comprehensive General and Excess Liability policies and for the Owner's Protective Liability policy shall be written by one and the same insurance company to avoid the expense of duplicate and/or overlapping coverage and to facilitate and expedite the settlement of claims.
- B. The Owner's Protective Liability policy shall protect from claims which may arise from operations under the Contract, including operations performed for a named insured by independent contractors and general inspection or monitoring by a named insured. The policy also shall protect against Automobile Non-Ownership Liability in connection with the Contractor's operations under the Contract, whether such operations be by itself or by any Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable.

SC-6.05 Add the following new subparagraph after subparagraph 6.05.A.1:

6.05.A.1.a In addition to Owner, Contractor, and all Subcontractors, include as insureds the following:

- 1) Tighe & Bond (53 Southampton Rd, Westfield, MA 01085)

ARTICLE 7 - CONTRACTOR'S RESPONSIBILITIES

SC-7.02 Add the following new paragraph immediately after paragraph 7.02B.

7.02C 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-7.06 Add the following language at the end of paragraph 7.06O.2:

Contractor shall make payments to Subcontractors in accordance with Massachusetts General Law Chapter 30, Section 39F which is referenced in PART II of these Supplementary Conditions.

SC-7.06 Add the following language at the end of Paragraph 7.06L:

except as required otherwise by Massachusetts General Law Chapter 149, Section 44F.

SC-7.07 Delete paragraph 7.07B in its entirety and replace it with the following:

7.07B Not used.

SC-7.08 Delete the word "Owner" in the last sentence of Paragraph 7.08A and replace with the word "Contractor."

SC-7.08 Add the following new paragraph immediately after paragraph SC-7.08A:

7.08B The Owner has obtained the following permits and approvals for the Project. The Contractor is required to comply with the permit provisions. Copies of the permits are appended to this section.

- A. SE81-1213 Conservation Commission Order of Conditions
- B. SE81-1245 Conservation Commission Order of Conditions
- C. MassDEP Section 401 Water Quality Certification
- D. MassDEP Chapter 91 Waterways License No. 15271
- E. USACE 204 & 408 Authorization NAE-2018-01520

SC-7.10 Add the following new paragraph immediately after paragraph 7.10C.

7.10D Contractor shall comply with all applicable provisions of Chapter 30, Section 39R of the Massachusetts General Laws regarding Contractor's records.

SC-7.18 Add the following new paragraph immediately after paragraph 7.18.C.

7.18D If, through acts of neglect on the part 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 or arbitration if such other Contractor or Subcontractor will so settle. If

such other Contractor or Subcontractor shall assert any claim against Owner on account of any such damage alleged to have been sustained, Owner shall notify Contractor, who shall indemnify, defend, and save harmless Owner against any such claim.

ARTICLE 10 – ENGINEER’S STATUS DURING CONSTRUCTION

SC-10.03 Add the following new paragraphs immediately after Paragraph 10.03.A:

B. The Resident Project Representative (RPR) will be Owner's representative at the Site, will act as directed by and under the supervision of the Owner, and will confer with Owner and Engineer regarding RPR's actions.

1. RPR's dealings in matters pertaining to the Work in general shall be with the Owner, Engineer and Contractor. RPR's dealings with Subcontractors shall only be through or with the full knowledge and approval of Contractor.

C. The RPR shall not:

1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including “or-equal” items).
2. Exceed limitations of Engineer’s authority as set forth in the Contract Documents
3. Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers
4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of Contractor’s work
5. Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Engineer or Contractor
6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer
7. Accept Shop Drawing or Sample submittals from anyone other than Contractor
8. Authorize Owner to occupy the Project in whole or in part.

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

SC-11.04 Delete paragraph 11.04C.2.c in its entirety and insert the following in its place:

11.04C.2.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 paragraph 12.01C.2.a is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under paragraphs 11.01A.1 and 11.01A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of

five percent of the Cost of the Work, not including any Subcontractor's fee; 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;

SC-11.06 Insert the following sentence at the end of Paragraph 11.06.A.2:

If Engineer does not take action on the Change Proposal and neither Owner nor Contractor submit a letter to the other party indicating that the Change Proposal is deemed denied, then the Change Proposal shall be deemed denied after 60 days of Engineer's receipt of the Contractor's supporting data, thereby commencing the time for appeal of the denial under Article 12.

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

SC-13.01 Delete the word "superintendents," in the second sentence after the word "limitation," in paragraph 13.01B.1.

SC-13.01 Delete paragraph 13.01B.5.c in its entirety and replace with the following:

13.01B.5.c The fair rental and operating cost of all machinery and equipment used on the extra work for the period of such use. The fair rental and operating cost for all machinery and equipment shall be based upon the most recent edition of "Rental Rate Bluebook for Construction Equipment" (the "Bluebook"), published by Equipment Watch (equipmentwatch.com), or a similar publication approved by Engineer and adjusted for regional and age adjustments as specified in the "Bluebook." Rental periods corresponding to the overall period of use shall be used, except if a piece of equipment used on extra work is already on the job, or has previously been rented for a long period of time (months), then the long-term rental rate (monthly) shall be used in determining costs. The hourly rental rate for long-term rental equipment will be determined by the monthly rental rate divided by 176.

For the situation where equipment is on the job and available for use but cannot be used due to a delay or suspension of a portion or all of the Contract activities, a rental standby rate may be paid if the Contractor can conclusively demonstrate to the satisfaction of the Engineer that: (1) the equipment cannot be used elsewhere on the Project or demobilized and remobilized at a cost lower than the cost of standby time, (2) that the equipment cannot be put in use due to factors beyond the Contractor's control, and (3) the equipment on standby would have been used as part of the Work that is suspended or put on hold. The standby rate will be calculated as no more than 50% of the rental rate as listed in the "Bluebook" and adjusted for regional and age adjustments. Lesser standby rates may apply if the Owner or Engineer can demonstrate that the Contractor's standby cost is less than this rate. The standby rate will not include operating costs. A standby rate will not be paid for

equipment which is being employed for portions of the Work which are still underway. A standby rate will also not be paid for equipment which is readily demobilized including construction equipment categorized as “shop tools” or “miscellaneous” in the “Bluebook.” Standby rates for durations of less than four hours will not be considered.

SC-13.01 Insert in the first sentence after the word “architects,” the word “superintendents,” in paragraph 13.01C.1

SC-13.01 Add the following new paragraph immediately after paragraph 13.01C.5:

13.01C.6 Costs of or rental of small tools; costs of or rental of buildings.

SC-13.03 Delete Paragraph 13.03B in its entirety and replace it with the following:

13.03B Since subject to change upon determination of actual quantities, estimated quantities of items of Unit Price Work are not guaranteed and serve to facilitate comparison of Bids and to determine an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.

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

SC-14.02 Insert after the word “notice” the words “(minimum 24 hours)” in paragraph 14.02A.

SC-14.03 Delete paragraph 14.03B in its entirety and replace with the following:

14.03B *Engineer’s Authority:* At any time during the progress of the Work, Engineer shall have the authority to determine whether Work is defective, and reject defective Work, even though such work has been previously inspected and paid for.

SC-14.06 Add the following new paragraph immediately after paragraph 14.06A.

14.06B If Owner stops work under Paragraph 14.06, Contractor shall not be entitled to an extension of Contract Time nor to an increase in Contract Price.

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

SC-15.01 Insert the following sentence at the end of paragraph 15.01B.1:

The Certificate of Insurance for stored materials must list Tighe & Bond and the Town of Weymouth as additional insureds.

SC-15.01 Delete paragraph 15.01C.1 in its entirety and insert the following in its place:

- 15.01C.1 Progress Payments will be made in accordance with Massachusetts General Law Chapter 30, Section 39G, which is referenced in Part II of these Supplementary Conditions.
- SC-15.01 Delete paragraph 15.01D.1 in its entirety and insert the following in its place:
- 15.01D.1 Progress Payments will be made in accordance with Massachusetts General Law Chapter 30, Section 39G, which is referenced in Part II of these Supplementary Conditions.
- SC-15.03 Delete the second sentence in Paragraph 15.03A in its entirety.
- SC-15.03 Add the following new paragraph immediately after paragraph 15.03A:
- 15.03A.1 Substantial Completion shall be as defined in Chapter 30, Section 39G of the Massachusetts General Laws.
- SC-15.03 Delete paragraph 15.03C in its entirety and insert the following in its place:
- 15.03C If, after consultation with Owner, Engineer considers and the Owner agrees that the Work is substantially complete, Engineer will prepare and deliver to Contractor, in a form approved by Owner, a Certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be included with the certificate a list of items to be completed or corrected before final payment.
- SC-15.03 Delete the word “preliminary” from paragraph 15.03D.
- SC-15.03 Add the following new paragraph immediately after paragraph 15.03F:
- 15.03G. The procedure for Substantial Completion shall be in accordance with Chapter 30, Section 39G of the Massachusetts General Laws.
- SC-15.04 Add the following new paragraph immediately after paragraph 15.04A.3:
- 15.04A.4 Owner may at any time request Contractor in writing to permit Owner to take over operation of any part of the Work although it is not substantially complete. A copy of such request will be sent to Engineer, and within a reasonable time thereafter Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion and will prepare a list of the items remaining to be completed or corrected thereon before final payment. If Contractor does not object in writing to Owner and Engineer that such part of the Work is not ready for separate operation by Owner, Engineer will finalize the list of items to be completed or corrected and will deliver such lists to Owner and Contractor together with a written recommendation as to the division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, maintenance, utilities, insurance, warranties, and guarantees for that part of the Work which

will become binding upon Owner and Contractor at the time when Owner takes over such operation (unless they shall have otherwise agreed in writing and so informed Engineer). During such operation and prior to Substantial Completion of such part of the Work, Owner shall allow Contractor reasonable access to complete or correct items on said list and to complete other related Work.

Paragraph 15.04.A.4 shall be renumbered to 15.04.A.5

SC-15.06 Delete paragraph 15.06.D in its entirety and insert the following in its place:

D. *Payment Becomes Due:* Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, or other time period in accordance with applicable laws and regulations, 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.

ARTICLE 16 - SUSPENSION OF WORK AND TERMINATION

SC-16.01 Delete paragraph 16.01.A in its entirety and insert the following in its place:

16.01.A Owner may order, at any time and without cause, suspension of the Work in accordance with Massachusetts General Law Chapter 30, Section 39O, which is referenced in Part II of the Supplementary Conditions.

SC- 16.02 Add the following new paragraph immediately after paragraph 16.02.A.4:

16.02.A.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.

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

SC-17.01 Add the following paragraph after paragraph 17.01:

17.01 Venue
A. Any suit by either party arising under this Contract shall be brought only in the Superior Court in the county where the Project is located. The parties hereto waive any argument that this venue is improper or that the forum is inconvenient.

ARTICLE 18 - MISCELLANEOUS

SC-18.08 Add the following new paragraphs immediately after paragraph 18.08.

18.09 Wage Rates

- D. The requirements and provisions of all applicable laws and any amendments thereof or additions thereto as to the employment of labor, and to the schedule of minimum wage rates established in compliance with laws shall be a part of these Contract Documents. Copies of the wage schedules are included in Part II of these Supplementary Conditions. If 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. Such approved minimum rate shall be retroactive to the time of the initial employment of such person in such trade or occupation.
- E. The schedules of wages referred to above are minimum rates only, and Owner will not consider any claims for additional compensation made by Contractor because of payment by Contractor of any wage rate in excess of the applicable rate contained in these Contract Documents. All disputes in regard to the payment of wages in excess of those specified in the schedules shall be resolved by Contractor.
- F. Per MGL Chapter 149, Section 27, Contractor shall comply with annual updates to the prevailing wage schedule which shall be effective on the anniversary date of the execution of the Contract.
- G. The said schedules of wages shall continue to be the minimum rates to be paid during the life of this Agreement and a legible copy of said schedules shall be kept posted in a conspicuous place at the site of the work.
- H. Both Federal and State schedules of minimum wage rates are included in Part II of these Supplementary Conditions. Where rates differ, the higher rates shall apply as a minimum for that trade.

18.10 US EPA Phase II Storm Water Program

Comply with requirement of the US EPA Phase II Storm Water Program for Construction Activities Greater than 1 Acre.

18.11 American Iron and Steel

- A. The Contractor acknowledges to and for the benefit of the Owner and the Commonwealth of Massachusetts (the "State") that it understands the goods and services under this Agreement are being funded with monies made available by the Clean Water State Revolving Fund and/or Drinking Water State Revolving Fund that have statutory requirements commonly known as "American Iron and Steel;" that requires all of the iron and steel products used in the project to be produced in the United States ("American Iron and

Steel Requirement”) including iron and steel products provided by the Contractor pursuant to this Agreement. The Contractor hereby represents and warrants to and for the benefit of the Owner and the State that (a) the Contractor has reviewed and understands the American Iron and Steel Requirement, (b) all of the iron and steel products used in the project will be and/or have been produced in the United States in a manner that complies with the American Iron and Steel Requirement, unless a waiver of the requirement is approved, and (c) the Contractor will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the American Iron and Steel Requirement, as may be requested by the Owner or the State. Notwithstanding any other provisions of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the Owner or State to recover as damages against the Contractor any loss, expense, or cost (including without limitation attorney’s fees) incurred by the Owner or State resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the State or any damages owed to the State by the Owner). While the Contractor has no direct contractual privity with the State, as a lender to the Owner for the funding of its project, the Owner and the Contractor agree that the State is a third-party beneficiary and neither this paragraph (nor any other provision of this Agreement necessary to give this paragraph force or effect) shall be amended or waived without the prior written consent of the State.

- B. For the purpose of the American Iron and Steel requirement, an iron or steel product is one of the following made primarily of iron or steel (greater than 50% iron or steel, measured by cost):
 - Lined or unlined pipes or fittings
 - Manhole covers
 - Municipal castings (see below)
 - Hydrants
 - Tanks
 - Flanges
 - Pipe clamps and restraints
 - Valves
 - Structural steel (see below)
 - Construction materials (see below)
 - Reinforced precast concrete (see below)

- C. Production in the United States of the iron or steel products used in the project requires that all manufacturing processes, including application of coatings, must take place in the United States, with the exception of metallurgical processing involving refinement of steel additives. All manufacturing processes includes processes such as melting, refining, forming, rolling, drawing, finishing, fabricating and coating. Further, if a domestic iron and steel product is taken out of the US for any part of the manufacturing process, it becomes foreign source material. However, raw materials such as iron ore, limestone and iron and steel scrap are not covered by the AIS requirement, and the material(s), if any, being applied

as a coating are similarly not covered. Non-iron or steel components of an iron and steel product may come from non-US sources.

- D. Municipal castings are cast iron or steel infrastructure products that are melted and cast. Examples of municipal castings are:
- Access hatches
 - Ballast screen
 - Benches (iron or steel)
 - Bollards
 - Cast bases
 - Cast iron hinged hatches
 - Cast iron riser rings
 - Catch basin inlet
 - Cleanout/monument boxes
 - Construction covers and frames
 - Curb and corner guards
 - Curb openings
 - Detectable warning plates
 - Downspout shoes (boot, inlet)
 - Drainage grates, frames, and curb inlets
 - Inlets
 - Junction boxes
 - Lampposts
 - Manhole covers, rings and frames, risers
 - Meter boxes
 - Service boxes
 - Steel hinged hatches
 - Steel riser rings
 - Trash receptacles
 - Tree grates
 - Tree guards
 - Trench grates
 - Valve boxes, covers and risers
- E. Structural steel is rolled flanged shapes, having at least one dimension of their cross-section three inches or greater, which are used in the construction of bridges, buildings, ships, railroad rolling stock, and for numerous other constructional purposes. Such shapes are designated as wide-flange shapes, standard I-beams, channels, angles, tees and zees. Other shapes include H-piles, sheet piling, tie plates, cross ties, and those for other special purposes.
- F. Construction materials are those articles, materials, or supplies made primarily of iron and steel (greater than 50% iron or steel, measured by cost), that are permanently incorporated into the project, not including mechanical and/or electrical components, equipment and systems. This includes, but is not limited to, the following products: wire rod, bar, angles, concrete reinforcing bar, wire, wire cloth, wire rope and cables, tubing, framing, joists, trusses, fasteners (ie., nuts and bolts), welding rods,

decking, grating, railings, stairs, access ramps, fire escapes, ladders, wall panels, dome structures, roofing, ductwork, surface drains, cable hanging systems, manhole steps, fencing and fence tubing, guardrails, doors, and stationary screens.

- G. Mechanical and electrical components, equipment and systems are not considered construction materials. Mechanical equipment is typically that which has motorized parts and/or is powered by a motor. Electrical equipment is typically any machine powered by electricity and includes components that are part of the electrical distribution system. The following examples (including their appurtenances necessary for their intended use and operation) are not considered construction materials: pumps, motors, gear reducers, drives, electric/pneumatic/manual accessories used to operate valves, mixers, gates, motorized screens, blowers/aeration equipment, compressors, meters, sensors, controls and switches, SCADA, membrane bioreactor systems, membrane filtration systems, filters, clarifiers and clarifier mechanisms, rakes, grinders, disinfection systems, presses, conveyors, cranes, HVAC (excluding ductwork), water heaters, heat exchangers, generators, cabinetry and housings, lighting fixtures, electrical conduit, emergency life systems, metal office furniture, shelving, laboratory equipment, analytical instrumentation, and dewatering equipment.
- H. Reinforced precast concrete: the reinforcing bar and wire must be produced in the US and meet the same standards as for any other iron or steel product. Additionally, the casting of the concrete product must take place in the US. The cement and other raw materials used in concrete production are not required to be of domestic origin.
- I. The EPA has granted a national De Minimis waiver, which applies to incidental materials used in and incorporated into the project. Individual De Minimis items may not exceed 1% of the total cost of materials used in and incorporated into the project. De Minimis items cumulatively may comprise no more than 5% of the total cost of materials used in and incorporated into the project. To claim coverage under the De Minimis waiver, Contractor shall determine which items are to be covered under the waiver and submit relevant documentation such as invoices to confirm compliance with the De Minimis waiver requirements.
- J. Refer to Section 01330 for further information on documenting compliance with the American Iron and Steel requirement.

SC-19 Add Article 19 titled “FEDERAL REQUIREMENTS”

SC-19.01 Add the following language as Paragraph 19.01 with the title “Agency Not a Party”:

19.01.A This Contract is expected to be funded in part with funds provided by Agency. Neither Agency, nor any of its departments, entities, or employees is a party to this Contract.

SC 19.03 Add the following language after Article 19.02.B with the title “Conflict of Interest”:

19.03.A Contractor may not knowingly contract with a supplier or manufacturer if the individual or entity who prepared the plans and specifications has a corporate or financial affiliation with the supplier or manufacturer. Owner’s officers, employees, or agents shall not engage in the award or administration of this Contract if a conflict of interest, real or apparent, would be involved. Such a conflict would arise when: (i) the employee, officer or agent; (ii) any member of their immediate family; (iii) their partner or (iv) an organization that employs, or is about to employ, any of the above, has a financial interest in Contractor. Owner’s officers, employees, or agents shall neither solicit nor accept gratuities, favors or anything of monetary value from Contractor or subcontractors.

SC 19.05 Add the following language after Article 19.04.B with the title “Audit and Access to Records”:

19.05.A Owner, Agency, the Comptroller General of the United States, or any of their duly authorized representatives, shall have access to any books, documents, papers, and records of the Contractor which are pertinent to the Agreement, for the purpose of making audits, examinations, excerpts, and transcriptions. Engineer shall maintain all required records for three years after final payment is made and all other pending matters are closed.

SC 19.06 Add the following language after Article 19.05.A with the title “Small, Minority and Women’s Businesses”:

19.06.A If Contractor intends to let any subcontracts for a portion of the work, Contractor shall take affirmative steps to assure that small, minority and women’s businesses are used when possible as sources of supplies, equipment, construction, and services. Affirmative steps shall consist of: (1) including qualified small, minority and women’s businesses on solicitation lists; (2) assuring that small, minority and women’s businesses are solicited whenever they are potential sources; (3) dividing total requirements when economically feasible, into small tasks or quantities to permit maximum participation of small, minority, and women’s businesses; (4) establishing delivery schedules, where the requirements of the work permit, which will encourage participation by small, minority and women’s businesses; (5) using the services and assistance of the Small Business Administration and the Minority Business Development Agency of the U.S. Department of Commerce; (6) requiring each party to a subcontract to take the affirmative steps of this section; and (7) Contractor is encouraged to procure goods and services from labor surplus area firms.

SC 19.10 Add the following after Article 19.09 with the title “Equal Opportunity Requirements”:

19.10.A If this Contract exceeds \$10,000, Contractor shall comply with Executive Order 11246, "Equal Employment Opportunity," as amended by Executive Order 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity," and as supplemented by regulations at 41 CFR part 60, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor."

19.10.B Contractor's compliance with Executive Order 11246 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative active obligations required by the Standard Federal Equal Employment Opportunity Construction Contract Specifications, as set forth in 41 CFR Part 60-4 and its efforts to meet the goals established for the geographical area where the Contract is to be performed. The hours of minority and female employment and training must be substantially uniform throughout the length of the Contract, and in each trade, and Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting Contractor's goals shall be a violation of the Contract, the Executive Order, and the regulations in 41 CFR part 60-4. Compliance with the goals will be measured against the total work hours performed.

SC 19.11 Add the following after Article 19.10.C with the title "Restrictions on Lobbying":

19.11.A Contractor and each subcontractor shall comply with Restrictions on Lobbying (Public Law 101-121, Section 319) as supplemented by applicable Agency regulations. This Law applies to the recipients of contracts and subcontracts that exceed \$100,000 at any tier under a Federal loan that exceeds \$150,000 or a Federal grant that exceeds \$100,000. If applicable, Contractor must complete a certification form on lobbying activities related to a specific Federal loan or grant that is a funding source for this Contract. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. 1352. Each tier shall disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Certifications and disclosures are forwarded from tier to tier up to the Owner. Necessary certification and disclosure forms shall be provided by Owner.

SC 19.12 Add the following after Article 19.11.A with the title "Environmental Requirements":

When constructing a Project involving trenching and/or other related earth excavations, Contractor shall comply with the following environmental conditions:

- 19.12.A Wetlands –When disposing of excess, spoil, or other construction materials on public or private property, Contractor shall not fill in or otherwise convert wetlands.
- 19.12.B Floodplains –When disposing of excess, spoil, or other construction materials on public or private property, Contractor shall not fill in or otherwise convert 100-year floodplain areas (Standard Flood Hazard Area) delineated on the latest Federal Emergency Management Agency Floodplain Maps, or other appropriate maps, e.g., alluvial soils on NRCS Soil Survey Maps.
- 19.12.C Historic Preservation – Any excavation by Contractor that uncovers a historical or archaeological artifact or human remains shall be immediately reported to Owner and a representative of Agency. Construction shall be temporarily halted pending the notification process and further directions issued by Agency after consultation with the State Historic Preservation Officer (SHPO).
- 19.12.D Endangered Species – Contractor shall comply with the Endangered Species Act, which provides for the protection of endangered and/or threatened species and critical habitat. Should any evidence of the presence of endangered and/or threatened species or their critical habitat be brought to the attention of Contractor, Contractor will immediately report this evidence to Owner and a representative of Agency. Construction shall be temporarily halted pending the notification process and further directions issued by Agency after consultation with the U.S. Fish and Wildlife Service.

PART II – FEDERAL AND STATE GOVERNMENT PROVISIONS

Federal and State Government Provisions referenced or included herein, have been selected from those to which specific references have been made elsewhere in the Contract Documents. Each and every other provision of law or clause required by law to be inserted in this Contract shall be deemed to be also inserted herein in accordance with paragraph 3.01.F of the Supplementary Conditions.

1.0 FEDERAL GOVERNMENT PROVISIONS

- 1.1 Labor Standards Provisions for Federal and Federally Assisted Contracts
- 1.2 Federal Wage Rates
- 1.3 FmHA Compliance Statement
- 1.4 FmHA Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – Lower Tier Covered Transactions
- 1.5 FmHA Certification for Contracts, Grants and Loans
- 1.6 FmHA Supplemental General Conditions EOCD

2.0 COMMONWEALTH OF MASSACHUSETTS PROVISIONS

- 2.1 The Owner and Contractor agree that the following Commonwealth of Massachusetts Provisions apply to the work to be performed under this Contract and that these provisions supersede any conflicting provisions of this Contract.
- 2.4 520 CMR 14.00 Excavation Trench Safety
- 2.5 State Wage Rates
- 2.6 Massachusetts Construction Grants Policy Memoranda
- 2.7 Conservation Commission Order of Conditions
- 2.8 MassDEP Section 401 Water Quality Certification
- 2.9 MassDEP Chapter 91 Waterways License No. 15271
- 2.10 USACE 204 & 408 Authorization NAE-2018-01520

END OF SECTION

J:_Coastal\Accounting\DOC\C18700\C18729\SPECS\00\00 80 00.docx

ATTACHMENTS TO SUPPLEMENTARY CONDITIONS

**ATTACHMENT A
FEDERAL (DAVIS-BACON) WAGE RATES**

"General Decision Number: MA20240008 03/22/2024

Superseded General Decision Number: MA20230008

State: Massachusetts

Construction Types: Heavy (Heavy and Marine)

Counties: Barnstable, Bristol, Dukes, Essex, Middlesex, Nantucket, Norfolk, Plymouth and Suffolk Counties in Massachusetts.

HEAVY AND MARINE CONTRUCTION PROJECTS

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(1).

<p>If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:</p>	<ul style="list-style-type: none"> . Executive Order 14026 generally applies to the contract. . The contractor must pay all covered workers at least \$17.20 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2024.
<p>If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:</p>	<ul style="list-style-type: none"> . Executive Order 13658 generally applies to the contract. . The contractor must pay all covered workers at least \$12.90 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2024.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at <http://www.dol.gov/whd/govcontracts>.

Modification Number Publication Date

0	01/05/2024
1	01/19/2024
2	02/09/2024
3	03/01/2024
4	03/22/2024

BOIL0029-001 01/01/2021

	Rates	Fringes
BOILERMAKER.....	\$ 45.87	29.02

BRMA0001-011 02/01/2023

FOXBORO CHAPTER

BRISTOL (Attleboro, Berkley, Dighton, Mansfield, North Attleboro, Norton, Raynham, Rehoboth, Seekonk, Taunton); NORFOLK, (Bellingham, Canton, Dedham, Foxboro, Franklin, Norfolk, Norwood, Plainville, Sharon, Walpole, Westwood, Wrentham); and PLYMOUTH (Lakeville)

	Rates	Fringes
Bricklayer/Cement Mason.....	\$ 60.35	34.40

BRMA0001-012 02/01/2023

LOWELL CHAPTER

MIDDLESEX (Acton, Ashby, Ayer, Bedford, Billerica, Boxboro, Carlisle, Chemsford, Dracut, Dunstabale, Ft Devens, Groton, Littleton, Lowell, North Acton, Pepperell, Shirley, South Acton, Tewksbury, Townsend, Tyngsboro, West Acton, Westford, Wilmington)

	Rates	Fringes
BRICKLAYER.....	\$ 58.21	33.71

BRMA0001-013 08/01/2023

LOWELL CHAPTER

MIDDLESEX (Ashland, Framingham, Holliston, Hopkinton, Hudson, Maynard, Natick, Sherbvorn, Stow); and NORFOLK (Medfield, Medway, Millis)

	Rates	Fringes
BRICKLAYER.....	\$ 62.40	34.40

BRMA0003-001 08/01/2023

	Rates	Fringes
Marble & Tile Finisher.....	\$ 47.89	32.43
Marble, Tile & Terrazzo Workers.....	\$ 62.42	34.37
TERRAZZO FINISHER.....	\$ 61.34	34.21

BRMA0003-003 08/01/2023

BOSTON CHAPTER

MIDDLESEX (Arlington, Cambridge, Everett, Malden, Medford, Melrose, Somerville); NORFOLK (Brookline, Milton); and SUFFOLK

Rates Fringes

BRICKLAYER.....\$ 62.40 34.40

BRMA0003-011 08/01/2023

LYNN CHAPTER

ESSEX (Amesbury, Andover, Beverly, Boxford, Danvers, Essex, Georgetown, Gloucester, Groveland, Hamilton, Haverhill, Ipswich, Lawrence, Lynn, Lynnfield, Manchester, Marblehead, Merrimac, Methuen, Middleton, Nahant, Newbury, Newburyport, North Andover, Peabody, Rockport, Rowley, Salisbury, Salem, Saugus, Swampscott, Topsfield, Wakefield, Wenham, West Newbury); and MIDDLESEX (North Reading, Reading, Wakefield)

Rates Fringes

Bricklayer/Cement Mason.....\$ 62.40 34.40

BRMA0003-012 08/01/2023

Rates Fringes

BRICKLAYER

WALTHAM CHAPTER - MIDDLESEX (Belmont, Burlington, Concord, Lexington, Lincoln, Stoneham, Sudbury, Waltham, Watertown, Wayland, Weston, Winchester, Woburn).....\$ 62.40

34.40

BRMA0003-014 08/01/2023

QUINCY CHAPTER

PLYMOUTH COUNTY (Abington, Bridgewater, Brockton, Carver, Duxbury, East Bridgewater, Halifax, Hanover, Hanson, Hingham, Hull, Kingston, Marshfield, Middleboro, Norwell, Pembroke, Plymouth, Rockland, Scituate, West Bridgewater, Whitman)

Rates Fringes

Bricklayer/Cement Mason.....\$ 62.40 34.40

BRMA0003-025 08/01/2023

NEW BEDFORD CHAPTER

BARNSTABLE; BRISTOL (Acushnet, Dartmouth, Fairhaven, Fall River, Freetown, New Bedford, Somerset, Swansea, Westport); DUKES; NANTUCKET; PLYMOUTH (Marion, Mattapoisett, Rochester, Wareham)

Rates Fringes

Bricklayer/Cement Mason.....\$ 62.40 34.40

BRMA0003-033 08/01/2023

NEWTON CHAPTER
MIDDLESEX (Newton); NORFOLK (Dover, Needham, Wellesley)

Rates Fringes

Bricklayer, Plasterer.....\$ 62.40 34.40

CARP0056-001 08/01/2023

All of SUFFOLK COUNTY; and those areas of BARNSTABLE, BRISTOL, ESSEX, MIDDLESEX, NORFOLK, and PLYMOUTH COUNTIES situated INSIDE Boston Beltway (I-495) and North of Cape Cod Canal. ALL of DUKES and NANTUCKET COUNTIES

Rates Fringes

PILEDRIVERMAN.....\$ 53.11 35.10

CARP0056-002 08/01/2022

The areas of BARNSTABLE, BRISTOL, PLYMOUTH, and NORFOLK COUNTIES situated OUTSIDE Boston Beltway (I-495) and South of Cape Cod Canal

Rates Fringes

PILEDRIVERMAN.....\$ 48.34 34.10

CARP0056-003 08/01/2022

Those areas of ESSEX and MIDDLESEX COUNTIES situated OUTSIDE Boston Beltway (I-495)

Rates Fringes

PILEDRIVERMAN.....\$ 45.74 34.10

CARP0056-004 08/01/2022

Rates Fringes

DIVER TENDER.....\$ 52.15 34.10

DIVER.....\$ 68.70 35.57

* CARP0327-002 03/01/2024

MIDDLESEX (Belmont, Cambridge, Everett, Malden, Medford, Somerville); NORFOLK (Brookline, Dedham, Milton); AND SUFFOLK COUNTIES

Rates Fringes

CARPENTER.....\$ 57.20 31.04

* CARP0339-002 03/01/2024

BRISTOL (Attleborough, North Attleborough); ESSEX; MIDDLESEX (Except Belmont, Cambridge, Everett, Malden, Medford, Somerville); AND NORFOLK (Bellingham, Braintree, Canton, Cohasset, Foxboro, Franklin, Medfield, Medway, Millis, Needham, Norfolk, Norwood, Plainville, Quincy, Sharon, Walpole, Wellesley, Westwood, Weymouth, Wrentham) COUNTIES

	Rates	Fringes
CARPENTER.....	\$ 46.86	30.94

* CARP0346-001 03/01/2024		

NORFOLK (Braintree, Quincy, Cohasset, Weymouth, etc.) PLYMOUTH (Duxbury, Hanover, Hull, Hingham, Marshfield, Norwell, Pembroke Rockland, Scituate)

	Rates	Fringes
CARPENTER.....	\$ 46.86	30.94

CARP0624-002 09/01/2017		

DUKES; NANTUCKET

	Rates	Fringes
CARPENTER.....	\$ 46.43	28.35

CARP0624-006 09/01/2017		

BARNSTABLE; BRISTOL (Except Attleboro & North Attleboro); NORFOLK (Avon, Holbrook, Randolph, Stoughton); PLYMOUTH (Bridgewater, Kingston, Lakeville, Middleboro, Plymouth, S. Hanover, Whitman)

	Rates	Fringes
CARPENTER.....	\$ 39.28	27.90

CARP1121-001 01/01/2024		

SUFFOLK COUNTY

	Rates	Fringes
MILLWRIGHT.....	\$ 48.03	33.49

CARP1121-005 01/01/2024		

BARNSTABLE, BRISTOL, DUKES, ESSEX, MIDDLESEX, NANTUCKET, NORFOLK and PLYMOUTH COUNTIES

	Rates	Fringes
MILLWRIGHT.....	\$ 42.76	33.24

ELEC0096-001 09/03/2023		

MIDDLESEX (Ashby, Ashland, Ayer, Ft. Devens, Groton, Hopkinton, Hudson, Marlboro, Pepperell, Shirley, Stow, Townsend)

	Rates	Fringes
ELECTRICIAN.....	\$ 45.99	33.06
Teledata System Installer.....	\$ 34.49	31.44

ELEC0099-001 06/01/2021

BRISTOL (Attleboro, North Attleboro, Seekonk)

	Rates	Fringes
ELECTRICIAN.....	\$ 43.61	54.71%
Teledata System Installer.....	\$ 31.21	13.1%+14.93

* ELEC0103-002 03/01/2024

ESSEX (Amesbury, Andover, Boxford, Georgetown, Groveland, Haverhill, Lawrence, Merrimac, Methuen, Newbury, Newburyport, North Andover, Rowley, Salisbury, West Newbury); MIDDLESEX (Bedford, Billerica, Boxboro, Burlington, Carlisle, Chelmsford, Dracut, Dunstable littleton, Lowell, North Reading, Tewksbury, Tyngsboro, Westford, Wilmington)

	Rates	Fringes
ELECTRICIAN.....	\$ 61.86	36.14

* ELEC0103-004 03/01/2024

ESSEX (Beverly, Danvers, Essex, Gloucester, Hamilton, Ipswich, Manchester, Marblehead, Middleton, Peabody, Rockport, Salem, Topsfield, Wenham)

	Rates	Fringes
ELECTRICIAN.....	\$ 61.86	36.14

* ELEC0103-005 03/01/2024

ESSEX (Lynn, Lynnfield, Nahant, Saugus, Swampscott); MIDDLESEX (Acton, Arlington, Belmont, Cambridge, Concord, Everett, Framingham, Holliston, Lexington, Lincoln, Malden, Maynard, Medford, Melrose, Natick, Newton, Reading, Sherborn, Somerville, Stoneham, Sudbury, Wakefield, Waltham, Watertown, Wayland, Weston, Winchester, Woburn); NORFOLK (Bellingham, Braintree, Brookline, Canton, Cohasset, Dedham, Dover, Foxboro, Franklino, Medfield, Medway, Millis, Milton, Needham, Norfolk, Norwood, Quincy, Sharon, Walpole, Wellesley, Westwood, Weymouth, Wrentham); PLYMOUTH (Hingham and Hull);SUFFOLK

	Rates	Fringes
ELECTRICIAN.....	\$ 61.86	36.14

ELEC0104-001 08/29/2022

	Rates	Fringes
Line Construction:		
Cableman.....	\$ 53.06	28.49+A

Equipment Operator.....	\$ 45.10	25.20+A
Groundman.....	\$ 29.18	12.10+A
Lineman.....	\$ 53.06	28.49+A

A. PAID HOLIDAYS: New Year's Day; Memorial Day; Independence Day; Labor Day; Thanksgiving Day; Christmas Day and Columbus Day, provided the employee has been employed 5 working days prior to any one of the listed holidays.

 ELEC0223-002 09/01/2023

BARNSTABLE, BRISTOL (Except Attleboro, North Attleboro, Seekonk); DUKES; NANTUCKET; PLYMOUTH (Except Hingham and Hull Twps); NORFOLK (Avon, Halbrook, Randolph, Sloughton)

	Rates	Fringes
ELECTRICIAN.....	\$ 47.87	29.92

 ENGI0004-009 12/01/2023

	Rates	Fringes
Power equipment operators:		
Group 1.....	\$ 55.03	32.45
Group 2.....	\$ 54.43	32.45
Group 3.....	\$ 35.62	32.45
Group 4.....	\$ 43.96	32.45
Group 5.....	\$ 24.41	32.45
Group 6.....	\$ 29.86	32.45

HOURLY PREMIUM FOR BOOM LENGTHS (Including Jib):

Over 150 ft.	+2.18
Over 185 ft.	+3.84
Over 210 ft.	+5.39
Over 250 ft.	+8.16
Over 295 ft.	+11.29
Over 350 ft.	+13.14

FOOTNOTE FOR POWER EQUIPMENT OPERATORS:

A. PAID HOLIDAYS: New Year's Day, Washington's Birthday, Labor Day, Memorial Day, Independence Day, Patriot's Day, Columbus Day, Veteran's Day, Thanksgiving Day, Christmas Day

POWER EQUIPMENT OPERATORS CLASSIFICATIONS [HEAVY CONSTRUCTION]

GROUP 1: Power shovel; crane; truck crane; derrick; pile driver; trenching machine; mechanical hoist pavement breaker; cement concrete paver; dragline; hoisting engine; three drum machine; pumpcrete machine; loaders; shovel dozer; front end loader; mucking machine; shaft hoist; steam engine; backhoe; gradall; cable way; fork lift; cherry picker; boring machine; rotary drill; post hole hammer; post hole digger; asphalt plant on job site; concrete batching and/or mixing plant on job site; crusher plant on job site; paving concrete mixer; timber jack

GROUP 2: Sonic or vibratory hammer; grader; scraper; tandem scraper; bulldozer; tractor; mechanic - maintenance; York rake; mulching machine; paving screed machine; stationary steam boiler; paving concrete finishing machine; grout pump; portable steam boiler; portable steam generator; roller; spreader; asphalt paver; locomotives or machines

used in place thereof; tamper (self propelled or tractor-draw); cal tracks; ballast regulator;rail anchor machine; switch tamper; tire truck

GROUP 3: Pumps (1-3 grouped); compressor; welding machines (1-3 grouped); generator; sighting plant; heaters (power driven, 1- 5); syphon-pulsometer; concrete mixer; valves controlling permanent plant air steam, conveyor, wellpoint system (operating)

GROUP 4: Assitant engineer (fireman)

GROUP 5: Oiler (other than truck cranes and gradalls)

GROUP 6: Oiler (on truck cranes and gradalls)

IRON007-001 09/16/2023

AREA 1: BRISTOL (Easton); ESSEX (Beverly,Gloucester,Lynn, Lynnfield, Manchester,Marblehead, Nahant, Rockport, Salem, Saugus, Swampscott); MIDDLESEX (Arlington, Bedford, Belmont, Burlington, Cambridge, Carlisle, Concord, Dunstable, Everett, Framingham, Lexington, Lincoln, Malden, Maynard, Medford, Melrose, Natick, Newton, Reading, Sherborn, Somerville, Stoneham, Sudbury, Wakefield, Waltham, Watertown, Wayland, Weston, Winchester, Woburn); NORFOLK (Except Medway); PLYMOUTH (Abington, Bridgewater, Brocton, Duxbury, East Bridgewater, Halifax, Hanover, Hanson, Hingham, Hull, Kingston, Marshfield, Norwell, Pembroke, Plymouth, Plympton, Rockland, Scituate, West Bridgewater, Whitman); SUFFOLK

AREA 2: ESSEX (Amesbury, Andover, Boxford, Danvers, Essex, Georgetown, Hamilton, Haverhill, Ipswich, Lawrence, Merrimac, Methuen, Newbury, Newburyport, North Andover, Rowley, Salisbury, Topsfield, Wenham, West Newbury); MIDDLESEX (Action,Billerica, Chelmsford, Dracut, Groton, Groveland, Littleton, Lowell, Middleton, North Reading, Pepperell, Tewksbury, Tyngsboro, Westford, Wilinton)

	Rates	Fringes
IRONWORKER		
AREA 1.....	\$ 53.70	36.21
AREA 2.....	\$ 49.29	36.21

IRON007-010 09/16/2023

MIDDLESEX (Ashby, Ashland, Ayer, Boxboro, Holliston, Hopkinton, Hudson, Marlboro, Shirley, Stow, Townsend); NORFOLK (Medway)

	Rates	Fringes
IRONWORKER.....	\$ 53.40	36.21

IRON0037-002 09/16/2023

BARNSTABLE; BRISTOL (Acushnet, Attleboro, Berkley, Dartmouth, Dighton, Fairhaven, Fall River, Freetown, Mansfield, New Bedford, North Attleboro, Norton, Raynham, Rehoboth, Seekonk, Somerset, Swansea, Taunton, Westport); DUKES; NANTUCKET; NORFOLK (Billingham, Franklin, Plainville, Wrentham); PLYMOUTH (Lakeville, Marion, Mattapoisett, Middleboro, Rochester, Wareham)

	Rates	Fringes
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IRONWORKER.....\$ 40.00 32.58

LAB00022-006 12/01/2021

SUFFOLK COUNTY (Boston, Chelsea, Revere, Winthrop, Deer & Nut Islands); MIDDLESEX COUNTY (Arlington, Belmont, Burlington, Cambridge, Everett, Malden, Medford, Melrose, Reading, Somerville, Stoneham, Wakefield, Winchester, Winthrop and Woburn only); NORFOLK COUNTY (Brookline, Dedham, and Milton only)

Rates Fringes

Laborers:

GROUP 1.....	\$ 41.18	27.52
GROUP 2.....	\$ 41.43	27.52
GROUP 3.....	\$ 41.93	27.52
GROUP 4.....	\$ 42.18	27.52
GROUP 5.....	\$ 24.50	27.52
GROUP 6.....	\$ 43.18	27.52

LABORERS CLASSIFICATIONS

GROUP 1: Laborers; carpenter tenders; cement finisher tenders

GROUP 2: Asphalt raker; fence and guard rail erector; laser beam operator; mason tender; pipelayer; pneumatic drill operator; pneumatic tool operator; wagon drill operator

GROUP 3: Air track operator; block paver; rammer; curb setter

GROUP 4: Blaster; powderman

GROUP 5: Flagger

GROUP 6: Asbestos Abatement; Toxic and Hazardous Waste Laborers

LAB00022-012 12/01/2021

Counties of BARNSTABLE; BRISTOL; DUKES; ESSEX; NANTUCKET; PLYMOUTH; MIDDLESEX (With the exception of Arlington, Belmont, Burlington, Cambridge, Everett, Malden, Melrose, Reading, Somerville, Stoneham, Wakefield, Winchester, Winthrop and Woburn); NORFOLK (With the exception of Brookline, Dedham, and Milton)

Rates Fringes

Laborers:

GROUP 1.....	\$ 35.41	26.59
GROUP 2.....	\$ 35.66	26.59
GROUP 3.....	\$ 36.16	26.59
GROUP 4.....	\$ 36.41	26.59
GROUP 5.....	\$ 24.50	26.59
GROUP 6.....	\$ 37.41	26.59

LABORERS CLASSIFICATIONS

GROUP 1: Laborers; carpenter tenders; cement finisher tenders

GROUP 2: Asphalt raker; fence and guard rail erector; laser beam operator; mason tender; pipelayer; pneumatic drill operator; pneumatic tool operator; wagon drillperator

GROUP 3: Air track operator; block paver; rammer; curb setter; hydraulic & similar self powere drills

GROUP 4: Blaster; powderman

GROUP 5: Flagger

GROUP 6: Asbestos Abatement; Toxic and Hazardous Waste Laborers

LAB0022-013 12/01/2021

	Rates	Fringes
Laborers:		
(FREE AIR OPERATION):		
SHIELD DRIVEN AND LINER PLATE IN FREE AIR)		
GROUP 1.....	\$ 45.48	28.02
GROUP 2.....	\$ 45.48	28.02
(OPEN AIR CASSONS, UNDERPINNING AND TEST BORING INDUSTRIES):		
TEST BORING & WELL DRILLING		
Driller.....	\$ 42.58	27.67
Laborer.....	\$ 41.18	27.67
(OPEN AIR CASSONS, UNDERPINNING AND TEST BORING INDUSTRIES):		
OPEN AIR CASSON, UNDERPINNING WORK & BORING CREW		
Bottom man.....	\$ 42.33	27.67
Laborers; Top man.....	\$ 41.18	27.67
(TUNNELS, CAISSON & CYLINDER WORK IN COMPRESSED AIR)		
GROUP 1.....	\$ 42.93	28.02
GROUP 2.....	\$ 53.41	28.02
GROUP 3.....	\$ 53.41	28.02
GROUP 4.....	\$ 53.41	28.02
GROUP 5.....	\$ 53.41	28.02
GROUP 6.....	\$ 55.41	28.02
CLEANING CONCRETE AND CAULKING TUNNEL (Both New & Existing)		
GROUP 1.....	\$ 45.48	28.02
GROUP 2.....	\$ 45.48	28.02
ROCK SHAFT, CONCRETE LINING OF SAME AND TUNNEL IN FREE AIR		
GROUP 1.....	\$ 42.93	28.02
GROUP 2.....	\$ 45.48	28.02
GROUP 3.....	\$ 45.48	28.02
GROUP 4.....	\$ 45.48	28.02

GROUP 5.....\$ 47.48

28.02

LABORERS CLASSIFICATIONS for TUNNELS, CAISSON & CYLINDER WORK IN COMPRESSED AIR

GROUP 1: Powder watchman; Top man on iron bolt; change house attendant

GROUP 2: Brakeman; trackman; groutman; tunnel laborer; outside lock tender; lock tender; guage tender

GROUP 3: Motorman, miner

GROUP 4: Blaster

GROUP 5: Mucking machine operator

GROUP 6: Hazardous Waste work within the ""HOT"" zone. (A premium of two dollars \$2.00 per hour over the basic wage rate.

LABORERS CLASSIFICATIONS for (FREE AIR OPERATION): SHIELD DRIVEN AND LINER PLATE IN FREE AIR

GROUP 1: Miner; miner welder; conveyor operator; motorman; mucking machine operator; nozzle man; grout man-; pumps, shaft and tunnel steel and rodman; shield and erector arm operators, mole nipper, outside motorman, burner, TBM operator, safety miner; laborer topside; heading motormen; erecting operators; top signal men

GROUP 2: Brakeman; trackman

LABORERS CLASSIFICATIONS FOR CLEANING CONCRETE AND CAULKING TUNNEL (Both New & Existing)

GROUP 1: Concrete workers; strippers and form movers (wood & steel), cement finisher

GROUP 2: Form erector (wood & steel and all accessories)

LABORERS CLASSIFICATIONS for ROCK SHAFT, CONCRETE LINING OF SAME AND TUNNE IN FREE AIR

GROUP 1: Change house attendants

GROUP 2: Laborers, topside, bottom men (when heading is 50 ft. from shaft) and all other laborers

GROUP 3: Brakeman; trackman; tunnel laborers; shaft laborers

GROUP 4: Miner; cage tender; bellman

GROUP 5: Hazardous Waste work within the ""HOT"" zone. (A premium of two dollars \$2.00 per hour over the basic wage rate)

FOOTNOTE FOR LABORERS:

A. PAID HOLIDAYS: New Year's Day, Washington's Birthday, Patriot's Day, Memorial Day, Independence Day, Labor Day, Columbus Day, Veteran's Day, Thanksgiving Day, and Christmas Day

LAB01421-001 12/01/2023

WRECKING LABORERS:

	Rates	Fringes
Laborers: (Wrecking)		
Group 1.....	\$ 44.48	28.52
Group 2.....	\$ 45.23	28.52
Group 3.....	\$ 45.48	28.52
Group 4.....	\$ 40.48	28.52
Group 5.....	\$ 43.58	28.52
Group 6.....	\$ 44.48	28.52

Group 1: Adzeman, Wrecking Laborer.

Group 2: Burners, Jackhammers.

Group 3: Small Backhoes, Loaders on tracks, Bobcat Type Loaders, Hydraulic ""Brock"" Type Hammer Operators, Concrete Cutting Saws.

Group 4: Yardman (Salvage Yard Only).

Group 5: Yardman, Burners, Sawyers.

Group 6: Asbestos, Lead Paint, Toxic and Hazardous Waste.

PAIN0035-001 07/01/2019

BARNSTABLE BRISTOL; DUKES; ESSEX; NANTUCKET; PLYMOUTH
(Remainder of NORFOLK; MIDDLESEX AND SUFFOLK COUNTIES)

	Rates	Fringes
PAINTER		
NEW CONSTRUCTION:		
Bridge.....	\$ 50.36	30.25
Brush, Taper.....	\$ 39.86	30.25
Spray, Sandblast.....	\$ 41.26	30.25
REPAINT:		
Bridge.....	\$ 50.66	30.90
Brush, Taper.....	\$ 37.92	30.25
Spray, Sandblast.....	\$ 39.32	30.25

PAIN0035-015 07/01/2023

MIDDLESEX (Cambridge, Everett, Malden, Medford, Somerville)
SUFFOLK COUNTY (Boston, Chelsea) NORFOLK COUNTY (Brookline)

	Rates	Fringes
PAINTER		
NEW CONSTRUCTION:		
Brush, Taper.....	\$ 45.01	35.10
Spay, Sandblast.....	\$ 46.41	35.10
Spray, Sandblast.....	\$ 47.05	30.25
REPAINT:		
Bridge.....	\$ 55.51	35.10
Brush, Taper.....	\$ 43.07	35.10
Spray, Sandblast.....	\$ 44.47	35.10

PLAS0534-001 07/01/2023

ESSEX; MIDDLESEX; NORFOLK AND SUFFOLK COUNTY

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER...	\$ 48.19	39.37

* PLUM0004-001 03/01/2024

MIDDLESEX (Ashby, Ayer-West of Greenville branch of Boston and
Maine Railroad, Ft. Devens, Groton, Shirley, Townsend)

	Rates	Fringes
Plumbers and Pipefitters.....	\$ 53.95	28.42

* PLUM0012-001 03/03/2024

ESSEX (Ames, Andover, Beverly, Boxford, Byfield, Danvers,
Essex, Georgetown, Gloucester, Groveland, Hamilton, Haverhill,
Ipswich, Lawrence,Manchester, Marblehead, Merrimac, Methuem,
Middleton, Newbury, Newburyport, North Andover, Peabody,
Rockport, Rowley, Salem, Salisbury, Topsfieild, Wenham, West
Newbury)

	Rates	Fringes
PLUMBER.....	\$ 67.74	35.03

* PLUM0012-003 03/03/2024

ESSEX (Ames, Andover, Beverly, Boxford, Byfield, Danvers,
Essex, Georgetown, Gloucester, Groveland, Hamilton, Haverhill,
Ipswich, Lawrence, Manchester, Marblehead, Merrimac, Methuen,
Middleton, Newbury, Newburyport, North Andover, Peabody,
Rockport, Rowley, Salem, Salisbury, Topsfield, Wenham, West
Newbury)

	Rates	Fringes
Plumber, Pipefitter, Steamfitter.....	\$ 67.74	35.03

* PLUM0012-006 03/03/2024

ESSEX (Lynn, Lynnfield, Nahant, Saugus, and Swampscott);
MIDDLESEX (Acton, Arlington, Ashland, Ayer - except W. of
Greenville Branch of Boston & Maine RR, Bedford, Belmont,
Billerica, Boxboro, Burlington, Cambridge, Carlisle,
Chelmsford, Concord, Dracut, Dunstable, Everett, Framingham,
Hudson, Holliston, Hopkinton, Lexington, Lincoln, Littleton,
Lowell, Malden, Marlboro, Maynard, Medford, Melrose, Natick,
Newton, North Reading, Pepperell, Reading, Sherborn,
Somerville, Stoneham, Stow, Sudbury, Tewksbury, Tyngsboro,
Wakefield, Waltham, Watertown, Wayland, Westford, Wilmington,
Winchester, Woburn); NORFOLK (Bellingham, Braintree,
Brookline, Canton, Cohasset, Dedham, Dover, Foxboro, Franklin,
Medfield, Medway, Millis, Milton, Needham, Norfolk, Norwood,
Plainville, Quincy, Sharon, Walpole, Wellesley, Westwood,
Weymouth, Wrentham); PLYMOUTH (Hingham, Hull, Scituate);

SUFFOLK

	Rates	Fringes
PLUMBER.....	\$ 67.74	35.03

PLUM0051-005 09/01/2018

BARNSTABLE; BRISTOL; DUKES; NANTUCKET; NORFOLK (Avon, Holbrook, Randolph, Stoughton) PLYMOUTH(Remainder of County)

	Rates	Fringes
Plumbers and Pipefitters.....	\$ 42.04	29.91

PLUM0537-001 09/01/2023

MIDDLESEX (Arlington, Cambridge, Everett, Malden, Medford, Melrose, Reading, Wakefield, Winchester and Woburn); NORFOLK (Bellingham, Braintree, Brookline, Canton Cashasset, Dedham, Foxboro, Franklin, Millis, Milton, Sharon, Walpole, Westwood, and Wrentham); PLYMOUTH (Hingham, Hull, Scituate); ESSEX (Ames, Andover, Beverly, Boxford, Byfield, Danvers, Essex, Georgetown, Gloucester, Groveland, Hamilton, Haverhill, Ipswich, Lawrence, Lynn, Lynnfield, Manchester, Marblehead, Merrimac, Methuen, Middleton, Nahant, Newbury, Newburyport, North Andover, Peabody, Rockport, Rowley, Salem, Salisbury, Saugus, Swampscott, Topsfield, Wenham, West Newbury)

	Rates	Fringes
PIPEFITTER.....	\$ 63.48	36.67

TEAM0379-001 06/01/2023

	Rates	Fringes
Truck drivers:		
Group 1.....	\$ 38.78	31.86+a+b
Group 2.....	\$ 38.95	31.86+a+b
Group 3.....	\$ 39.02	31.86+a+b
Group 4.....	\$ 39.14	31.86+a+b
Group 5.....	\$ 39.24	31.86+a+b
Group 6.....	\$ 39.53	31.86+a+b
Group 7.....	\$ 39.82	31.86+a+b

POWER TRUCKS \$.25 DIFFERENTIAL BY AXLE
TUNNEL WORK (UNDERGROUND ONLY) \$.40 DIFFERENTIAL BY AXLE
HAZARDOUS MATERIALS (IN HOT ZONE ONLY) \$2.00 PREMIUM

TRUCK DRIVERS CLASSIFICATIONS

- Group 1: Station wagons; panel trucks; and pickup trucks
- Group 2: Two axle equipment; & forklift operator
- Group 3: Three axle equipment and tireman
- Group 4: Four and Five Axle equipment
- Group 5: Specialized earth moving equipment under 35 tons

other than conventional type trucks; low bed; vachual;
mechanics, paving restoration equipment

Group 6: Specialized earth moving equipment over 35 tons

Group 7: Trailers for earth moving equipment (double hookup)

FOOTNOTES:

A. PAID HOLIDAYS: New Year's Day, Washington's Birthday,
Memorial Day, Independence Day, Labor Day, Patriot's Day,
Columbus Day, Veteran's Day, Thanksgiving Day and Christmas
Day

B. PAID VACATION: Employees with 4 months to 1 year of
service receive 1/2 day's pay per month; 1 week vacation
for 1 - 5 years of service; 2 weeks vacation for 5 - 10
years of service; and 3 weeks vacation for more than 10
years of service

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

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

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

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

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

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

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour National Office because National Office has responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

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

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

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

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

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

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

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION"

**ATTACHMENT B
MASSACHUSETTS STATE WAGE RATES**



MAURA HEALEY
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 Weymouth
Contract Number: **City/Town:** WEYMOUTH
Description of Work: Coastal Bank Stabilization and Shoreline Boardwalk Construction Project.
Job Location: 20 River Street

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 annual update requirement is not applicable to 27F "rental of equipment" contracts. **The updated wage schedule must be provided to all contractors, including general and sub-contractors, working on the construction project.**
- 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 within 90 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 <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2023	\$40.05	\$14.41	\$18.67	\$0.00	\$73.13
	06/01/2024	\$41.05	\$14.41	\$18.67	\$0.00	\$74.13
	08/01/2024	\$41.05	\$14.91	\$18.67	\$0.00	\$74.63
	12/01/2024	\$41.05	\$14.91	\$20.17	\$0.00	\$76.13
	06/01/2025	\$42.05	\$14.91	\$20.17	\$0.00	\$77.13
	08/01/2025	\$42.05	\$15.41	\$20.17	\$0.00	\$77.63
	12/01/2025	\$42.05	\$15.41	\$21.78	\$0.00	\$79.24
	06/01/2026	\$43.05	\$15.41	\$21.78	\$0.00	\$80.24
	08/01/2026	\$43.05	\$15.91	\$21.78	\$0.00	\$80.74
	12/01/2026	\$43.05	\$15.91	\$23.52	\$0.00	\$82.48
(3 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2023	\$40.12	\$14.41	\$18.67	\$0.00	\$73.20
	06/01/2024	\$40.88	\$14.41	\$18.67	\$0.00	\$73.96
	08/01/2024	\$40.88	\$14.91	\$18.67	\$0.00	\$74.46
	12/01/2024	\$40.88	\$14.91	\$20.17	\$0.00	\$75.96
	06/01/2025	\$41.12	\$14.91	\$20.17	\$0.00	\$76.20
	08/01/2025	\$41.12	\$15.41	\$20.17	\$0.00	\$76.70
	12/01/2025	\$41.12	\$15.41	\$21.78	\$0.00	\$78.31
	06/01/2026	\$43.12	\$15.41	\$21.78	\$0.00	\$80.31
	08/01/2026	\$43.12	\$15.91	\$21.78	\$0.00	\$80.81
	12/01/2026	\$43.12	\$15.91	\$23.52	\$0.00	\$82.55
(4 & 5 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2023	\$40.24	\$14.41	\$18.67	\$0.00	\$73.32
	06/01/2024	\$41.24	\$14.41	\$18.67	\$0.00	\$74.32
	08/01/2024	\$41.24	\$14.91	\$18.67	\$0.00	\$74.82
	12/01/2024	\$41.24	\$14.91	\$20.17	\$0.00	\$76.32
	06/01/2025	\$42.24	\$14.91	\$20.17	\$0.00	\$77.32
	08/01/2025	\$42.24	\$15.41	\$20.17	\$0.00	\$77.82
	12/01/2025	\$42.24	\$15.41	\$21.78	\$0.00	\$79.43
	06/01/2026	\$43.24	\$15.41	\$21.78	\$0.00	\$80.43
	08/01/2026	\$43.24	\$15.91	\$21.78	\$0.00	\$80.93
	12/01/2026	\$43.24	\$15.91	\$23.52	\$0.00	\$82.67
ADS/SUBMERSIBLE PILOT <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2020	\$103.05	\$9.40	\$23.12	\$0.00	\$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2023	\$45.08	\$9.65	\$18.07	\$0.00	\$72.80
For apprentice rates see "Apprentice- LABORER"						
AIR TRACK OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 1 (HEAVY & HIGHWAY)</i>	12/01/2023	\$45.08	\$9.65	\$18.07	\$0.00	\$72.80
	06/01/2024	\$46.56	\$9.65	\$18.07	\$0.00	\$74.28
	12/01/2024	\$48.03	\$9.65	\$18.07	\$0.00	\$75.75
	06/01/2025	\$49.53	\$9.65	\$18.07	\$0.00	\$77.25
	12/01/2025	\$51.03	\$9.65	\$18.07	\$0.00	\$78.75
	06/01/2026	\$52.58	\$9.65	\$18.07	\$0.00	\$80.30
	12/01/2026	\$54.08	\$9.65	\$18.07	\$0.00	\$81.80
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
ASBESTOS REMOVER - PIPE / MECH. EQUIPT. <i>HEAT & FROST INSULATORS LOCAL 6 (BOSTON)</i>	12/01/2023	\$40.80	\$14.50	\$11.05	\$0.00	\$66.35
	06/01/2024	\$41.80	\$14.50	\$11.05	\$0.00	\$67.35
	12/01/2024	\$42.80	\$14.50	\$11.05	\$0.00	\$68.35
	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
ASPHALT RAKER <i>LABORERS - ZONE 1</i>	12/01/2023	\$44.58	\$9.65	\$18.07	\$0.00	\$72.30
For apprentice rates see "Apprentice- LABORER"						
ASPHALT RAKER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 1 (HEAVY & HIGHWAY)</i>	12/01/2023	\$44.58	\$9.65	\$18.07	\$0.00	\$72.30
	06/01/2024	\$46.06	\$9.65	\$18.07	\$0.00	\$73.78
	12/01/2024	\$47.53	\$9.65	\$18.07	\$0.00	\$75.25
	06/01/2025	\$49.03	\$9.65	\$18.07	\$0.00	\$76.75
	12/01/2025	\$50.53	\$9.65	\$18.07	\$0.00	\$78.25
	06/01/2026	\$52.08	\$9.65	\$18.07	\$0.00	\$79.80
	12/01/2026	\$53.58	\$9.65	\$18.07	\$0.00	\$81.30
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$55.03	\$15.00	\$16.40	\$0.00	\$86.43
	06/01/2024	\$56.33	\$15.00	\$16.40	\$0.00	\$87.73
	12/01/2024	\$57.78	\$15.00	\$16.40	\$0.00	\$89.18
	06/01/2025	\$59.08	\$15.00	\$16.40	\$0.00	\$90.48
	12/01/2025	\$60.53	\$15.00	\$16.40	\$0.00	\$91.93
	06/01/2026	\$61.83	\$15.00	\$16.40	\$0.00	\$93.23
	12/01/2026	\$63.28	\$15.00	\$16.40	\$0.00	\$94.68
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$55.03	\$15.00	\$16.40	\$0.00	\$86.43
	06/01/2024	\$56.33	\$15.00	\$16.40	\$0.00	\$87.73
	12/01/2024	\$57.78	\$15.00	\$16.40	\$0.00	\$89.18
	06/01/2025	\$59.08	\$15.00	\$16.40	\$0.00	\$90.48
	12/01/2025	\$60.53	\$15.00	\$16.40	\$0.00	\$91.93
	06/01/2026	\$61.83	\$15.00	\$16.40	\$0.00	\$93.23
	12/01/2026	\$63.28	\$15.00	\$16.40	\$0.00	\$94.68
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BARCO-TYPE JUMPING TAMPER <i>LABORERS - ZONE 1</i>	12/01/2023	\$44.58	\$9.65	\$18.07	\$0.00	\$72.30
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER <i>LABORERS - ZONE 1</i>	12/01/2023	\$45.08	\$9.65	\$18.07	\$0.00	\$72.80
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 1 (HEAVY & HIGHWAY)</i>	12/01/2023	\$45.08	\$9.65	\$18.07	\$0.00	\$72.80
	06/01/2024	\$46.56	\$9.65	\$18.07	\$0.00	\$74.28
	12/01/2024	\$48.03	\$9.65	\$18.07	\$0.00	\$75.75
	06/01/2025	\$49.53	\$9.65	\$18.07	\$0.00	\$77.25
	12/01/2025	\$51.03	\$9.65	\$18.07	\$0.00	\$78.75
	06/01/2026	\$52.58	\$9.65	\$18.07	\$0.00	\$80.30
	12/01/2026	\$54.08	\$9.65	\$18.07	\$0.00	\$81.80
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
BOILER MAKER <i>BOILERMAKERS LOCAL 29</i>	01/01/2024	\$48.12	\$7.07	\$20.60	\$0.00	\$75.79

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - BOILERMAKER - Local 29

Effective Date - 01/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	\$31.28	\$7.07	\$13.22	\$0.00	\$51.57
2	65	\$31.28	\$7.07	\$13.22	\$0.00	\$51.57
3	70	\$33.68	\$7.07	\$14.23	\$0.00	\$54.98
4	75	\$36.09	\$7.07	\$15.24	\$0.00	\$58.40
5	80	\$38.50	\$7.07	\$16.25	\$0.00	\$61.82
6	85	\$40.90	\$7.07	\$17.28	\$0.00	\$65.25
7	90	\$43.31	\$7.07	\$18.28	\$0.00	\$68.66
8	95	\$45.71	\$7.07	\$19.32	\$0.00	\$72.10

Notes:

Apprentice to Journeyworker Ratio:1:4

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING)	02/01/2024	\$62.40	\$11.49	\$23.59	\$0.00	\$97.48
BRICKLAYERS LOCAL 3 (QUINCY)	08/01/2024	\$64.50	\$11.49	\$23.59	\$0.00	\$99.58
	02/01/2025	\$65.80	\$11.49	\$23.59	\$0.00	\$100.88
	08/01/2025	\$67.95	\$11.49	\$23.59	\$0.00	\$103.03
	02/01/2026	\$69.30	\$11.49	\$23.59	\$0.00	\$104.38
	08/01/2026	\$71.50	\$11.49	\$23.59	\$0.00	\$106.58
	02/01/2027	\$72.90	\$11.49	\$23.59	\$0.00	\$107.98

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - BRICK/PLASTER/CEMENT MASON - Local 3 Quincy

Effective Date - 02/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$31.20	\$11.49	\$23.59	\$0.00	\$66.28
2	60	\$37.44	\$11.49	\$23.59	\$0.00	\$72.52
3	70	\$43.68	\$11.49	\$23.59	\$0.00	\$78.76
4	80	\$49.92	\$11.49	\$23.59	\$0.00	\$85.00
5	90	\$56.16	\$11.49	\$23.59	\$0.00	\$91.24

Effective Date - 08/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$32.25	\$11.49	\$23.59	\$0.00	\$67.33
2	60	\$38.70	\$11.49	\$23.59	\$0.00	\$73.78
3	70	\$45.15	\$11.49	\$23.59	\$0.00	\$80.23
4	80	\$51.60	\$11.49	\$23.59	\$0.00	\$86.68
5	90	\$58.05	\$11.49	\$23.59	\$0.00	\$93.13

Notes:

Apprentice to Journeyworker Ratio:1:5

BULLDOZER/GRADER/SCRAPER	12/01/2023	\$54.43	\$15.00	\$16.40	\$0.00	\$85.83
<i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2024	\$55.71	\$15.00	\$16.40	\$0.00	\$87.11
	12/01/2024	\$57.15	\$15.00	\$16.40	\$0.00	\$88.55
	06/01/2025	\$58.43	\$15.00	\$16.40	\$0.00	\$89.83
	12/01/2025	\$59.87	\$15.00	\$16.40	\$0.00	\$91.27
	06/01/2026	\$61.15	\$15.00	\$16.40	\$0.00	\$92.55
	12/01/2026	\$62.59	\$15.00	\$16.40	\$0.00	\$93.99

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

CAISSON & UNDERPINNING BOTTOM MAN	12/01/2023	\$45.48	\$9.65	\$18.22	\$0.00	\$73.35
<i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2024	\$46.96	\$9.65	\$18.22	\$0.00	\$74.83
	12/01/2024	\$48.43	\$9.65	\$18.22	\$0.00	\$76.30
	06/01/2025	\$49.93	\$9.65	\$18.22	\$0.00	\$77.80
	12/01/2025	\$51.43	\$9.65	\$18.22	\$0.00	\$79.30
	06/01/2026	\$52.98	\$9.65	\$18.22	\$0.00	\$80.85
	12/01/2026	\$54.48	\$9.65	\$18.22	\$0.00	\$82.35

For apprentice rates see "Apprentice- LABORER"

CAISSON & UNDERPINNING LABORER	12/01/2023	\$44.33	\$9.65	\$18.22	\$0.00	\$72.20
<i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2024	\$45.81	\$9.65	\$18.22	\$0.00	\$73.68
	12/01/2024	\$47.28	\$9.65	\$18.22	\$0.00	\$75.15
	06/01/2025	\$48.78	\$9.65	\$18.22	\$0.00	\$76.65
	12/01/2025	\$50.28	\$9.65	\$18.22	\$0.00	\$78.15
	06/01/2026	\$51.83	\$9.65	\$18.22	\$0.00	\$79.70
	12/01/2026	\$53.33	\$9.65	\$18.22	\$0.00	\$81.20

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CAISSON & UNDERPINNING TOP MAN <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2023	\$44.33	\$9.65	\$18.22	\$0.00	\$72.20
	06/01/2024	\$45.81	\$9.65	\$18.22	\$0.00	\$73.68
	12/01/2024	\$47.28	\$9.65	\$18.22	\$0.00	\$75.15
	06/01/2025	\$48.78	\$9.65	\$18.22	\$0.00	\$76.65
	12/01/2025	\$50.28	\$9.65	\$18.22	\$0.00	\$78.15
	06/01/2026	\$51.83	\$9.65	\$18.22	\$0.00	\$79.70
	12/01/2026	\$53.33	\$9.65	\$18.22	\$0.00	\$81.20
For apprentice rates see "Apprentice- LABORER"						
CARBIDE CORE DRILL OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2023	\$44.58	\$9.65	\$18.07	\$0.00	\$72.30
For apprentice rates see "Apprentice- LABORER"						
CARPENTER <i>CARPENTERS -ZONE 2 (Eastern Massachusetts)</i>	03/01/2024	\$47.12	\$9.83	\$19.97	\$0.00	\$76.92
	09/01/2024	\$48.37	\$9.83	\$19.97	\$0.00	\$78.17
	03/01/2025	\$49.62	\$9.83	\$19.97	\$0.00	\$79.42
	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 - 03/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$21.20	\$9.83	\$1.73	\$0.00	\$32.76
2	45	\$21.20	\$9.83	\$1.73	\$0.00	\$32.76
3	55	\$25.92	\$9.83	\$3.40	\$0.00	\$39.15
4	55	\$25.92	\$9.83	\$3.40	\$0.00	\$39.15
5	70	\$32.98	\$9.83	\$16.51	\$0.00	\$59.32
6	70	\$32.98	\$9.83	\$16.51	\$0.00	\$59.32
7	80	\$37.70	\$9.83	\$18.24	\$0.00	\$65.77
8	80	\$37.70	\$9.83	\$18.24	\$0.00	\$65.77

Effective Date - 09/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$21.77	\$9.83	\$1.73	\$0.00	\$33.33
2	45	\$21.77	\$9.83	\$1.73	\$0.00	\$33.33
3	55	\$26.60	\$9.83	\$3.40	\$0.00	\$39.83
4	55	\$26.60	\$9.83	\$3.40	\$0.00	\$39.83
5	70	\$33.86	\$9.83	\$16.51	\$0.00	\$60.20
6	70	\$33.86	\$9.83	\$16.51	\$0.00	\$60.20
7	80	\$38.70	\$9.83	\$18.24	\$0.00	\$66.77
8	80	\$38.70	\$9.83	\$18.24	\$0.00	\$66.77

Notes:

Apprentice to Journeyworker Ratio:1:5

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CARPENTER WOOD FRAME <i>CARPENTERS -ZONE 2 (Wood Frame)</i>	10/01/2023	\$30.61	\$7.02	\$6.47	\$0.00	\$44.10
	10/01/2024	\$31.91	\$7.02	\$6.47	\$0.00	\$45.40
	10/01/2025	\$33.21	\$7.02	\$6.47	\$0.00	\$46.70
	10/01/2026	\$34.51	\$7.02	\$6.47	\$0.00	\$48.00

All Aspects of New Wood Frame Work

Apprentice - CARPENTER (Wood Frame) - Zone 2

Effective Date - 10/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$15.31	\$7.02	\$0.00	\$0.00	\$22.33
2	50	\$15.31	\$7.02	\$0.00	\$0.00	\$22.33
3	55	\$16.84	\$7.02	\$2.00	\$0.00	\$25.86
4	55	\$16.84	\$7.02	\$2.00	\$0.00	\$25.86
5	70	\$21.43	\$7.02	\$6.47	\$0.00	\$34.92
6	70	\$21.43	\$7.02	\$6.47	\$0.00	\$34.92
7	80	\$24.49	\$7.02	\$6.47	\$0.00	\$37.98
8	80	\$24.49	\$7.02	\$6.47	\$0.00	\$37.98

Effective Date - 10/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$15.96	\$7.02	\$0.00	\$0.00	\$22.98
2	50	\$15.96	\$7.02	\$0.00	\$0.00	\$22.98
3	55	\$17.55	\$7.02	\$2.00	\$0.00	\$26.57
4	55	\$17.55	\$7.02	\$2.00	\$0.00	\$26.57
5	70	\$22.34	\$7.02	\$6.47	\$0.00	\$35.83
6	70	\$22.34	\$7.02	\$6.47	\$0.00	\$35.83
7	80	\$25.53	\$7.02	\$6.47	\$0.00	\$39.02
8	80	\$25.53	\$7.02	\$6.47	\$0.00	\$39.02

Notes:

Apprentice to Journeyworker Ratio:1:5

CEMENT MASONRY/PLASTERING <i>BRICKLAYERS LOCAL 3 (QUINCY)</i>	01/01/2024	\$49.33	\$13.00	\$23.57	\$1.30	\$87.20
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Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - CEMENT MASONRY/PLASTERING - Eastern Mass (Quincy)

Effective Date - 01/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.67	\$13.00	\$15.93	\$0.00	\$53.60
2	60	\$29.60	\$13.00	\$18.57	\$1.30	\$62.47
3	65	\$32.06	\$13.00	\$19.57	\$1.30	\$65.93
4	70	\$34.53	\$13.00	\$20.57	\$1.30	\$69.40
5	75	\$37.00	\$13.00	\$21.57	\$1.30	\$72.87
6	80	\$39.46	\$13.00	\$22.57	\$1.30	\$76.33
7	90	\$44.40	\$13.00	\$23.57	\$1.30	\$82.27

Notes:
Steps 3,4 are 500 hrs. All other steps are 1,000 hrs.

Apprentice to Journeyworker Ratio:1:3

CHAIN SAW OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2023	\$44.58	\$9.65	\$18.07	\$0.00	\$72.30
For apprentice rates see "Apprentice- LABORER"						

CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$56.13	\$15.00	\$16.40	\$0.00	\$87.53
	06/01/2024	\$57.45	\$15.00	\$16.40	\$0.00	\$88.85
	12/01/2024	\$58.93	\$15.00	\$16.40	\$0.00	\$90.33
	06/01/2025	\$60.26	\$15.00	\$16.40	\$0.00	\$91.66
	12/01/2025	\$61.73	\$15.00	\$16.40	\$0.00	\$93.13
	06/01/2026	\$63.06	\$15.00	\$16.40	\$0.00	\$94.46
	12/01/2026	\$64.54	\$15.00	\$16.40	\$0.00	\$95.94
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

COMPRESSOR OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$35.62	\$15.00	\$16.40	\$0.00	\$67.02
	06/01/2024	\$36.47	\$15.00	\$16.40	\$0.00	\$67.87
	12/01/2024	\$37.42	\$15.00	\$16.40	\$0.00	\$68.82
	06/01/2025	\$38.27	\$15.00	\$16.40	\$0.00	\$69.67
	12/01/2025	\$39.22	\$15.00	\$16.40	\$0.00	\$70.62
	06/01/2026	\$40.08	\$15.00	\$16.40	\$0.00	\$71.48
	12/01/2026	\$41.03	\$15.00	\$16.40	\$0.00	\$72.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

DELEADER (BRIDGE) <i>PAINTERS LOCAL 35 - ZONE 2</i>	01/01/2024	\$56.06	\$9.95	\$23.95	\$0.00	\$89.96
	07/01/2024	\$57.26	\$9.95	\$23.95	\$0.00	\$91.16
	01/01/2025	\$58.46	\$9.95	\$23.95	\$0.00	\$92.36

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DIRECTIONAL DRILL MACHINE OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$54.43	\$15.00	\$16.40	\$0.00	\$85.83
	06/01/2024	\$55.71	\$15.00	\$16.40	\$0.00	\$87.11
	12/01/2024	\$57.15	\$15.00	\$16.40	\$0.00	\$88.55
	06/01/2025	\$58.43	\$15.00	\$16.40	\$0.00	\$89.83
	12/01/2025	\$59.87	\$15.00	\$16.40	\$0.00	\$91.27
	06/01/2026	\$61.15	\$15.00	\$16.40	\$0.00	\$92.55
	12/01/2026	\$62.59	\$15.00	\$16.40	\$0.00	\$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DIVER <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2020	\$68.70	\$9.40	\$23.12	\$0.00	\$101.22
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2020	\$49.07	\$9.40	\$23.12	\$0.00	\$81.59
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2020	\$73.60	\$9.40	\$23.12	\$0.00	\$106.12
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER/SLURRY (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2020	\$103.05	\$9.40	\$23.12	\$0.00	\$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
DRAWBRIDGE OPERATOR (Construction) <i>DRAWBRIDGE - SEIU LOCAL 888</i>	07/01/2020	\$26.77	\$6.67	\$3.93	\$0.16	\$37.53
ELECTRICIAN <i>ELECTRICIANS LOCAL 103</i>	03/01/2024	\$61.86	\$13.00	\$22.21	\$0.00	\$97.07
	09/01/2024	\$63.78	\$13.00	\$22.26	\$0.00	\$99.04
	03/01/2025	\$64.98	\$13.00	\$22.30	\$0.00	\$100.28
	09/01/2025	\$66.89	\$13.00	\$22.36	\$0.00	\$102.25
	03/01/2026	\$68.09	\$13.00	\$22.39	\$0.00	\$103.48
	09/01/2026	\$70.00	\$13.00	\$22.45	\$0.00	\$105.45
	03/01/2027	\$71.19	\$13.00	\$22.49	\$0.00	\$106.68
	09/01/2027	\$73.11	\$13.00	\$22.54	\$0.00	\$108.65
	03/01/2028	\$74.31	\$13.00	\$22.58	\$0.00	\$109.89

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - ELECTRICIAN - Local 103

Effective Date - 03/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$24.74	\$13.00	\$0.74	\$0.00	\$38.48
2	40	\$24.74	\$13.00	\$0.74	\$0.00	\$38.48
3	45	\$27.84	\$13.00	\$16.67	\$0.00	\$57.51
4	45	\$27.84	\$13.00	\$16.67	\$0.00	\$57.51
5	50	\$30.93	\$13.00	\$17.17	\$0.00	\$61.10
6	55	\$34.02	\$13.00	\$17.67	\$0.00	\$64.69
7	60	\$37.12	\$13.00	\$18.17	\$0.00	\$68.29
8	65	\$40.21	\$13.00	\$18.68	\$0.00	\$71.89
9	70	\$43.30	\$13.00	\$19.18	\$0.00	\$75.48
10	75	\$46.40	\$13.00	\$19.69	\$0.00	\$79.09

Effective Date - 09/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$25.51	\$13.00	\$0.77	\$0.00	\$39.28
2	40	\$25.51	\$13.00	\$0.77	\$0.00	\$39.28
3	45	\$28.70	\$13.00	\$16.69	\$0.00	\$58.39
4	45	\$28.70	\$13.00	\$16.69	\$0.00	\$58.39
5	50	\$31.89	\$13.00	\$17.20	\$0.00	\$62.09
6	55	\$35.08	\$13.00	\$17.70	\$0.00	\$65.78
7	60	\$38.27	\$13.00	\$18.21	\$0.00	\$69.48
8	65	\$41.46	\$13.00	\$18.71	\$0.00	\$73.17
9	70	\$44.65	\$13.00	\$19.22	\$0.00	\$76.87
10	75	\$47.84	\$13.00	\$19.74	\$0.00	\$80.58

Notes :
App Prior 1/1/03; 30/35/40/45/50/55/65/70/75/80

Apprentice to Journeyworker Ratio:2:3***

ELEVATOR CONSTRUCTOR	01/01/2022	\$65.62	\$16.03	\$20.21	\$0.00	\$101.86
ELEVATOR CONSTRUCTORS LOCAL 4						

Apprentice - ELEVATOR CONSTRUCTOR - Local 4

Effective Date - 01/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total 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 mos.; Steps 3-5 are 1 year

Apprentice to Journeyworker Ratio:1:1

ELEVATOR CONSTRUCTOR HELPER <i>ELEVATOR CONSTRUCTORS LOCAL 4</i>	01/01/2022	\$45.93	\$16.03	\$20.21	\$0.00	\$82.17
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For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"

FENCE & GUARD RAIL ERECTOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 1 (HEAVY & HIGHWAY)</i>	12/01/2023	\$44.58	\$9.65	\$18.07	\$0.00	\$72.30
	06/01/2024	\$46.06	\$9.65	\$18.07	\$0.00	\$73.78
	12/01/2024	\$47.53	\$9.65	\$18.07	\$0.00	\$75.25
	06/01/2025	\$49.03	\$9.65	\$18.07	\$0.00	\$76.75
	12/01/2025	\$50.53	\$9.65	\$18.07	\$0.00	\$78.25
	06/01/2026	\$52.08	\$9.65	\$18.07	\$0.00	\$79.80
	12/01/2026	\$53.58	\$9.65	\$18.07	\$0.00	\$81.30

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"

FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	11/01/2023	\$50.30	\$14.50	\$16.15	\$0.00	\$80.95
	05/01/2024	\$51.54	\$14.50	\$16.15	\$0.00	\$82.19
	11/01/2024	\$52.83	\$14.50	\$16.15	\$0.00	\$83.48
	05/01/2025	\$54.27	\$14.50	\$16.15	\$0.00	\$84.92
	11/01/2025	\$55.56	\$14.50	\$16.15	\$0.00	\$86.21
	05/01/2026	\$57.00	\$14.50	\$16.15	\$0.00	\$87.65
	11/01/2026	\$58.29	\$14.50	\$16.15	\$0.00	\$88.94
	05/01/2027	\$59.72	\$14.50	\$16.15	\$0.00	\$90.37

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	11/01/2023	\$51.87	\$14.50	\$16.15	\$0.00	\$82.52
	05/01/2024	\$53.12	\$14.50	\$16.15	\$0.00	\$83.77
	11/01/2024	\$54.42	\$14.50	\$16.15	\$0.00	\$85.07
	05/01/2025	\$55.87	\$14.50	\$16.15	\$0.00	\$86.52
	11/01/2025	\$57.17	\$14.50	\$16.15	\$0.00	\$87.82
	05/01/2026	\$58.62	\$14.50	\$16.15	\$0.00	\$89.27
	11/01/2026	\$59.92	\$14.50	\$16.15	\$0.00	\$90.57
	05/01/2027	\$61.37	\$14.50	\$16.15	\$0.00	\$92.02

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	11/01/2023	\$24.93	\$14.50	\$16.15	\$0.00	\$55.58
	05/01/2024	\$25.66	\$14.50	\$16.15	\$0.00	\$56.31
	11/01/2024	\$26.42	\$14.50	\$16.15	\$0.00	\$57.07
	05/01/2025	\$27.27	\$14.50	\$16.15	\$0.00	\$57.92
	11/01/2025	\$28.03	\$14.50	\$16.15	\$0.00	\$58.68
	05/01/2026	\$28.88	\$14.50	\$16.15	\$0.00	\$59.53
	11/01/2026	\$29.64	\$14.50	\$16.15	\$0.00	\$60.29
	05/01/2027	\$30.49	\$14.50	\$16.15	\$0.00	\$61.14
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIRE ALARM INSTALLER <i>ELECTRICIANS LOCAL 103</i>	03/01/2024	\$61.86	\$13.00	\$22.21	\$0.00	\$97.07
	09/01/2024	\$63.78	\$13.00	\$22.26	\$0.00	\$99.04
	03/01/2025	\$64.98	\$13.00	\$22.30	\$0.00	\$100.28
	09/01/2025	\$66.89	\$13.00	\$22.36	\$0.00	\$102.25
	03/01/2026	\$68.09	\$13.00	\$22.39	\$0.00	\$103.48
	09/01/2026	\$70.00	\$13.00	\$22.45	\$0.00	\$105.45
	03/01/2027	\$71.19	\$13.00	\$22.49	\$0.00	\$106.68
	09/01/2027	\$73.11	\$13.00	\$22.54	\$0.00	\$108.65
	03/01/2028	\$74.31	\$13.00	\$22.58	\$0.00	\$109.89
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING <i>ELECTRICIANS LOCAL 103</i>	03/01/2024	\$49.49	\$13.00	\$20.19	\$0.00	\$82.68
	09/01/2024	\$51.02	\$13.00	\$20.24	\$0.00	\$84.26
	03/01/2025	\$51.98	\$13.00	\$20.27	\$0.00	\$85.25
	09/01/2025	\$53.51	\$13.00	\$20.32	\$0.00	\$86.83
	03/01/2026	\$54.47	\$13.00	\$20.34	\$0.00	\$87.81
	09/01/2026	\$56.00	\$13.00	\$20.39	\$0.00	\$89.39
	03/01/2027	\$56.95	\$13.00	\$20.42	\$0.00	\$90.37
	09/01/2027	\$58.49	\$13.00	\$20.46	\$0.00	\$91.95
03/01/2028	\$59.45	\$13.00	\$20.49	\$0.00	\$92.94	
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						
FIREMAN (ASST. ENGINEER) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$44.47	\$15.00	\$16.40	\$0.00	\$75.87
	06/01/2024	\$45.53	\$15.00	\$16.40	\$0.00	\$76.93
	12/01/2024	\$46.71	\$15.00	\$16.40	\$0.00	\$78.11
	06/01/2025	\$47.77	\$15.00	\$16.40	\$0.00	\$79.17
	12/01/2025	\$48.94	\$15.00	\$16.40	\$0.00	\$80.34
	06/01/2026	\$50.00	\$15.00	\$16.40	\$0.00	\$81.40
	12/01/2026	\$51.18	\$15.00	\$16.40	\$0.00	\$82.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FLAGGER & SIGNALER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 1 (HEAVY & HIGHWAY)</i>	12/01/2023	\$25.48	\$9.65	\$18.07	\$0.00	\$53.20
	06/01/2024	\$26.51	\$9.65	\$18.07	\$0.00	\$54.23
	12/01/2024	\$26.51	\$9.65	\$18.07	\$0.00	\$54.23
	06/01/2025	\$27.59	\$9.65	\$18.07	\$0.00	\$55.31
	12/01/2025	\$27.59	\$9.65	\$18.07	\$0.00	\$55.31
	06/01/2026	\$28.71	\$9.65	\$18.07	\$0.00	\$56.43
	12/01/2026	\$28.71	\$9.65	\$18.07	\$0.00	\$56.43
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FLOORCOVERER	03/01/2024	\$54.73	\$8.83	\$20.27	\$0.00	\$83.83
<i>FLOORCOVERERS LOCAL 2168 ZONE I</i>	09/01/2024	\$56.23	\$8.83	\$20.27	\$0.00	\$85.33
	03/01/2025	\$57.73	\$8.83	\$20.27	\$0.00	\$86.83
	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

Apprentice - FLOORCOVERER - Local 2168 Zone I

Effective Date - 03/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$24.63	\$8.83	\$1.76	\$0.00	\$35.22
2	45	\$24.63	\$8.83	\$1.76	\$0.00	\$35.22
3	55	\$30.10	\$8.83	\$3.52	\$0.00	\$42.45
4	55	\$30.10	\$8.83	\$3.52	\$0.00	\$42.45
5	70	\$38.31	\$8.83	\$16.75	\$0.00	\$63.89
6	70	\$38.31	\$8.83	\$16.75	\$0.00	\$63.89
7	80	\$43.78	\$8.83	\$18.51	\$0.00	\$71.12
8	80	\$43.78	\$8.83	\$18.51	\$0.00	\$71.12

Effective Date - 09/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$25.30	\$8.83	\$1.76	\$0.00	\$35.89
2	45	\$25.30	\$8.83	\$1.76	\$0.00	\$35.89
3	55	\$30.93	\$8.83	\$3.52	\$0.00	\$43.28
4	55	\$30.93	\$8.83	\$3.52	\$0.00	\$43.28
5	70	\$39.36	\$8.83	\$16.75	\$0.00	\$64.94
6	70	\$39.36	\$8.83	\$16.75	\$0.00	\$64.94
7	80	\$44.98	\$8.83	\$18.51	\$0.00	\$72.32
8	80	\$44.98	\$8.83	\$18.51	\$0.00	\$72.32

Notes: Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

FORK LIFT/CHERRY PICKER	12/01/2023	\$55.03	\$15.00	\$16.40	\$0.00	\$86.43
<i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2024	\$56.33	\$15.00	\$16.40	\$0.00	\$87.73
	12/01/2024	\$57.78	\$15.00	\$16.40	\$0.00	\$89.18
	06/01/2025	\$59.08	\$15.00	\$16.40	\$0.00	\$90.48
	12/01/2025	\$60.53	\$15.00	\$16.40	\$0.00	\$91.93
	06/01/2026	\$61.83	\$15.00	\$16.40	\$0.00	\$93.23
	12/01/2026	\$63.28	\$15.00	\$16.40	\$0.00	\$94.68

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
GENERATOR/LIGHTING PLANT/HEATERS <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$35.62	\$15.00	\$16.40	\$0.00	\$67.02
	06/01/2024	\$36.47	\$15.00	\$16.40	\$0.00	\$67.87
	12/01/2024	\$37.42	\$15.00	\$16.40	\$0.00	\$68.82
	06/01/2025	\$38.27	\$15.00	\$16.40	\$0.00	\$69.67
	12/01/2025	\$39.22	\$15.00	\$16.40	\$0.00	\$70.62
	06/01/2026	\$40.08	\$15.00	\$16.40	\$0.00	\$71.48
	12/01/2026	\$41.03	\$15.00	\$16.40	\$0.00	\$72.43

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS) <i>GLAZIERS LOCAL 35 (ZONE 2)</i>	01/01/2024	\$45.56	\$9.95	\$23.95	\$0.00	\$79.46
	07/01/2024	\$46.76	\$9.95	\$23.95	\$0.00	\$80.66
	01/01/2025	\$47.96	\$9.95	\$23.95	\$0.00	\$81.86

Apprentice - GLAZIER - Local 35 Zone 2

Effective Date - 01/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.78	\$9.95	\$0.00	\$0.00	\$32.73
2	55	\$25.06	\$9.95	\$6.66	\$0.00	\$41.67
3	60	\$27.34	\$9.95	\$7.26	\$0.00	\$44.55
4	65	\$29.61	\$9.95	\$7.87	\$0.00	\$47.43
5	70	\$31.89	\$9.95	\$20.32	\$0.00	\$62.16
6	75	\$34.17	\$9.95	\$20.93	\$0.00	\$65.05
7	80	\$36.45	\$9.95	\$21.53	\$0.00	\$67.93
8	90	\$41.00	\$9.95	\$22.74	\$0.00	\$73.69

Effective Date - 07/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.38	\$9.95	\$0.00	\$0.00	\$33.33
2	55	\$25.72	\$9.95	\$6.66	\$0.00	\$42.33
3	60	\$28.06	\$9.95	\$7.26	\$0.00	\$45.27
4	65	\$30.39	\$9.95	\$7.87	\$0.00	\$48.21
5	70	\$32.73	\$9.95	\$20.32	\$0.00	\$63.00
6	75	\$35.07	\$9.95	\$20.93	\$0.00	\$65.95
7	80	\$37.41	\$9.95	\$21.53	\$0.00	\$68.89
8	90	\$42.08	\$9.95	\$22.74	\$0.00	\$74.77

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

HOISTING ENGINEER/CRANES/GRADALLS <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$55.03	\$15.00	\$16.40	\$0.00	\$86.43
	06/01/2024	\$56.33	\$15.00	\$16.40	\$0.00	\$87.73
	12/01/2024	\$57.78	\$15.00	\$16.40	\$0.00	\$89.18
	06/01/2025	\$59.08	\$15.00	\$16.40	\$0.00	\$90.48
	12/01/2025	\$60.53	\$15.00	\$16.40	\$0.00	\$91.93
	06/01/2026	\$61.83	\$15.00	\$16.40	\$0.00	\$93.23
	12/01/2026	\$63.28	\$15.00	\$16.40	\$0.00	\$94.68

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - OPERATING ENGINEERS - Local 4

Effective Date - 12/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$30.27	\$15.00	\$0.00	\$0.00	\$45.27
2	60	\$33.02	\$15.00	\$16.40	\$0.00	\$64.42
3	65	\$35.77	\$15.00	\$16.40	\$0.00	\$67.17
4	70	\$38.52	\$15.00	\$16.40	\$0.00	\$69.92
5	75	\$41.27	\$15.00	\$16.40	\$0.00	\$72.67
6	80	\$44.02	\$15.00	\$16.40	\$0.00	\$75.42
7	85	\$46.78	\$15.00	\$16.40	\$0.00	\$78.18
8	90	\$49.53	\$15.00	\$16.40	\$0.00	\$80.93

Effective Date - 06/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$30.98	\$15.00	\$0.00	\$0.00	\$45.98
2	60	\$33.80	\$15.00	\$16.40	\$0.00	\$65.20
3	65	\$36.61	\$15.00	\$16.40	\$0.00	\$68.01
4	70	\$39.43	\$15.00	\$16.40	\$0.00	\$70.83
5	75	\$42.25	\$15.00	\$16.40	\$0.00	\$73.65
6	80	\$45.06	\$15.00	\$16.40	\$0.00	\$76.46
7	85	\$47.88	\$15.00	\$16.40	\$0.00	\$79.28
8	90	\$50.70	\$15.00	\$16.40	\$0.00	\$82.10

Notes:

Apprentice to Journeyworker Ratio:1:6

HVAC (DUCTWORK) SHEETMETAL WORKERS LOCAL 17 - A	02/01/2024	\$57.22	\$14.59	\$27.50	\$2.98	\$102.29
	08/01/2024	\$58.97	\$14.59	\$27.50	\$2.98	\$104.04
	02/01/2025	\$60.72	\$14.59	\$27.50	\$2.98	\$105.79
	08/01/2025	\$62.57	\$14.59	\$27.50	\$2.98	\$107.64
	02/01/2026	\$64.52	\$14.59	\$27.50	\$2.98	\$109.59

For apprentice rates see "Apprentice- SHEET METAL WORKER"

HVAC (ELECTRICAL CONTROLS) ELECTRICIANS LOCAL 103	03/01/2024	\$61.86	\$13.00	\$22.21	\$0.00	\$97.07
	09/01/2024	\$63.78	\$13.00	\$22.26	\$0.00	\$99.04
	03/01/2025	\$64.98	\$13.00	\$22.30	\$0.00	\$100.28
	09/01/2025	\$66.89	\$13.00	\$22.36	\$0.00	\$102.25
	03/01/2026	\$68.09	\$13.00	\$22.39	\$0.00	\$103.48
	09/01/2026	\$70.00	\$13.00	\$22.45	\$0.00	\$105.45
	03/01/2027	\$71.19	\$13.00	\$22.49	\$0.00	\$106.68
	09/01/2027	\$73.11	\$13.00	\$22.54	\$0.00	\$108.65
	03/01/2028	\$74.31	\$13.00	\$22.58	\$0.00	\$109.89

For apprentice rates see "Apprentice- ELECTRICIAN"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HVAC (TESTING AND BALANCING - AIR) <i>SHEETMETAL WORKERS LOCAL 17 - A</i>	02/01/2024	\$57.22	\$14.59	\$27.50	\$2.98	\$102.29
	08/01/2024	\$58.97	\$14.59	\$27.50	\$2.98	\$104.04
	02/01/2025	\$60.72	\$14.59	\$27.50	\$2.98	\$105.79
	08/01/2025	\$62.57	\$14.59	\$27.50	\$2.98	\$107.64
	02/01/2026	\$64.52	\$14.59	\$27.50	\$2.98	\$109.59
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (TESTING AND BALANCING -WATER) <i>PIPEFITTERS LOCAL 537</i>	03/01/2024	\$65.28	\$12.70	\$21.80	\$0.00	\$99.78
	09/01/2024	\$67.08	\$12.70	\$21.80	\$0.00	\$101.58
	03/01/2025	\$68.88	\$12.70	\$21.80	\$0.00	\$103.38
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HVAC MECHANIC <i>PIPEFITTERS LOCAL 537</i>	03/01/2024	\$65.28	\$12.70	\$21.80	\$0.00	\$99.78
	09/01/2024	\$67.08	\$12.70	\$21.80	\$0.00	\$101.58
	03/01/2025	\$68.88	\$12.70	\$21.80	\$0.00	\$103.38
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HYDRAULIC DRILLS <i>LABORERS - ZONE 1</i>	12/01/2023	\$45.08	\$9.65	\$18.07	\$0.00	\$72.80
For apprentice rates see "Apprentice- LABORER"						
HYDRAULIC DRILLS (HEAVY & HIGHWAY) <i>LABORERS - ZONE 1 (HEAVY & HIGHWAY)</i>	12/01/2023	\$45.08	\$9.65	\$18.07	\$0.00	\$72.80
	06/01/2024	\$46.56	\$9.65	\$18.07	\$0.00	\$74.28
	12/01/2024	\$48.03	\$9.65	\$18.07	\$0.00	\$75.75
	06/01/2025	\$49.53	\$9.65	\$18.07	\$0.00	\$77.25
	12/01/2025	\$51.03	\$9.65	\$18.07	\$0.00	\$78.75
	06/01/2026	\$52.58	\$9.65	\$18.07	\$0.00	\$80.30
	12/01/2026	\$54.08	\$9.65	\$18.07	\$0.00	\$81.80
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
INSULATOR (PIPES & TANKS) <i>HEAT & FROST INSULATORS LOCAL 6 (BOSTON)</i>	09/01/2023	\$53.50	\$14.75	\$19.61	\$0.00	\$87.86
	09/01/2024	\$56.92	\$14.75	\$19.61	\$0.00	\$91.28
	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

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Boston

Effective Date - 09/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$26.75	\$14.75	\$14.32	\$0.00	\$55.82
2	60	\$32.10	\$14.75	\$15.37	\$0.00	\$62.22
3	70	\$37.45	\$14.75	\$16.43	\$0.00	\$68.63
4	80	\$42.80	\$14.75	\$17.49	\$0.00	\$75.04

Effective Date - 09/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental 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

Notes:

Steps are 1 year

Apprentice to Journeyworker Ratio:1:4

IRONWORKER/WELDER IRONWORKERS LOCAL 7 (BOSTON AREA)	03/16/2024	\$53.97	\$8.35	\$26.70	\$0.00	\$89.02
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Apprentice - IRONWORKER - Local 7 Boston

Effective Date - 03/16/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$32.38	\$8.35	\$26.70	\$0.00	\$67.43
2	70	\$37.78	\$8.35	\$26.70	\$0.00	\$72.83
3	75	\$40.48	\$8.35	\$26.70	\$0.00	\$75.53
4	80	\$43.18	\$8.35	\$26.70	\$0.00	\$78.23
5	85	\$45.87	\$8.35	\$26.70	\$0.00	\$80.92
6	90	\$48.57	\$8.35	\$26.70	\$0.00	\$83.62

Notes:

Apprentice to Journeyworker Ratio:1:4

JACKHAMMER & PAVING BREAKER OPERATOR LABORERS - ZONE 1	12/01/2023	\$44.58	\$9.65	\$18.07	\$0.00	\$72.30
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For apprentice rates see "Apprentice- LABORER"

LABORER LABORERS - ZONE 1	12/01/2023	\$44.33	\$9.65	\$18.07	\$0.00	\$72.05
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Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - LABORER - Zone 1

Effective Date - 12/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$26.60	\$9.65	\$18.07	\$0.00	\$54.32
2	70	\$31.03	\$9.65	\$18.07	\$0.00	\$58.75
3	80	\$35.46	\$9.65	\$18.07	\$0.00	\$63.18
4	90	\$39.90	\$9.65	\$18.07	\$0.00	\$67.62

Notes:

Apprentice to Journeyworker Ratio:1:5

LABORER (HEAVY & HIGHWAY)	12/01/2023	\$44.33	\$9.65	\$18.07	\$0.00	\$72.05
LABORERS - ZONE 1 (HEAVY & HIGHWAY)	06/01/2024	\$45.81	\$9.65	\$18.07	\$0.00	\$73.53
	12/01/2024	\$47.28	\$9.65	\$18.07	\$0.00	\$75.00
	06/01/2025	\$48.78	\$9.65	\$18.07	\$0.00	\$76.50
	12/01/2025	\$50.28	\$9.65	\$18.07	\$0.00	\$78.00
	06/01/2026	\$51.83	\$9.65	\$18.07	\$0.00	\$79.55
	12/01/2026	\$53.33	\$9.65	\$18.07	\$0.00	\$81.05

Apprentice - LABORER (Heavy & Highway) - Zone 1

Effective Date - 12/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$26.60	\$9.65	\$18.07	\$0.00	\$54.32
2	70	\$31.03	\$9.65	\$18.07	\$0.00	\$58.75
3	80	\$35.46	\$9.65	\$18.07	\$0.00	\$63.18
4	90	\$39.90	\$9.65	\$18.07	\$0.00	\$67.62

Effective Date - 06/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$27.49	\$9.65	\$18.07	\$0.00	\$55.21
2	70	\$32.07	\$9.65	\$18.07	\$0.00	\$59.79
3	80	\$36.65	\$9.65	\$18.07	\$0.00	\$64.37
4	90	\$41.23	\$9.65	\$18.07	\$0.00	\$68.95

Notes:

Apprentice to Journeyworker Ratio:1:5

LABORER: CARPENTER TENDER	12/01/2023	\$44.33	\$9.65	\$18.07	\$0.00	\$72.05
LABORERS - ZONE 1						

For apprentice rates see "Apprentice- LABORER"

LABORER: CEMENT FINISHER TENDER	12/01/2023	\$44.33	\$9.65	\$18.07	\$0.00	\$72.05
LABORERS - ZONE 1						

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER <i>LABORERS - ZONE 1</i>	12/01/2023	\$44.48	\$9.65	\$18.07	\$0.00	\$72.20
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER <i>LABORERS - ZONE 1</i>	06/01/2023	\$43.83	\$9.40	\$17.82	\$0.00	\$71.05
	06/01/2024	\$44.58	\$9.65	\$18.07	\$0.00	\$72.30
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 1 (HEAVY & HIGHWAY)</i>	12/01/2023	\$44.58	\$9.65	\$18.07	\$0.00	\$72.30
	06/01/2024	\$46.06	\$9.65	\$18.07	\$0.00	\$73.78
	12/01/2024	\$47.53	\$9.65	\$18.07	\$0.00	\$75.25
	06/01/2025	\$49.03	\$9.65	\$18.07	\$0.00	\$76.75
	12/01/2025	\$50.53	\$9.65	\$18.07	\$0.00	\$78.25
	06/01/2026	\$52.08	\$9.65	\$18.07	\$0.00	\$79.80
	12/01/2026	\$53.58	\$9.65	\$18.07	\$0.00	\$81.30
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
LABORER: MULTI-TRADE TENDER <i>LABORERS - ZONE 1</i>	12/01/2023	\$44.33	\$9.65	\$18.07	\$0.00	\$72.05
For apprentice rates see "Apprentice- LABORER"						
LABORER: TREE REMOVER <i>LABORERS - ZONE 1</i>	12/01/2023	\$44.33	\$9.65	\$18.07	\$0.00	\$72.05
This classification applies to the removal of standing trees, and the trimming and removal of branches and limbs when related to public works construction or site clearance incidental to construction . For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2023	\$44.58	\$9.65	\$18.07	\$0.00	\$72.30
For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 1 (HEAVY & HIGHWAY)</i>	12/01/2023	\$44.58	\$9.65	\$18.07	\$0.00	\$72.30
	06/01/2024	\$46.06	\$9.65	\$18.07	\$0.00	\$73.78
	12/01/2024	\$47.53	\$9.65	\$18.07	\$0.00	\$75.25
	06/01/2025	\$49.03	\$9.65	\$18.07	\$0.00	\$76.75
	12/01/2025	\$50.53	\$9.65	\$18.07	\$0.00	\$78.25
	06/01/2026	\$52.08	\$9.65	\$18.07	\$0.00	\$79.80
	12/01/2026	\$53.58	\$9.65	\$18.07	\$0.00	\$81.30
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
MARBLE & TILE FINISHERS <i>BRICKLAYERS LOCAL 3 - MARBLE & TILE</i>	02/01/2024	\$47.89	\$11.49	\$21.37	\$0.00	\$80.75
	08/01/2024	\$49.57	\$11.49	\$21.37	\$0.00	\$82.43
	02/01/2025	\$50.61	\$11.49	\$21.37	\$0.00	\$83.47
	08/01/2025	\$52.33	\$11.49	\$21.37	\$0.00	\$85.19
	02/01/2026	\$53.41	\$11.49	\$21.37	\$0.00	\$86.27
	08/01/2026	\$55.17	\$11.49	\$21.37	\$0.00	\$88.03
	02/01/2027	\$56.29	\$11.49	\$21.37	\$0.00	\$89.15

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - MARBLE & TILE FINISHER - Local 3 Marble & Tile

Effective Date - 02/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.95	\$11.49	\$21.37	\$0.00	\$56.81
2	60	\$28.73	\$11.49	\$21.37	\$0.00	\$61.59
3	70	\$33.52	\$11.49	\$21.37	\$0.00	\$66.38
4	80	\$38.31	\$11.49	\$21.37	\$0.00	\$71.17
5	90	\$43.10	\$11.49	\$21.37	\$0.00	\$75.96

Effective Date - 08/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.79	\$11.49	\$21.37	\$0.00	\$57.65
2	60	\$29.74	\$11.49	\$21.37	\$0.00	\$62.60
3	70	\$34.70	\$11.49	\$21.37	\$0.00	\$67.56
4	80	\$39.66	\$11.49	\$21.37	\$0.00	\$72.52
5	90	\$44.61	\$11.49	\$21.37	\$0.00	\$77.47

Notes:

Apprentice to Journeyworker Ratio:1:3

MARBLE MASONS, TILELAYERS & TERRAZZO MECH	02/01/2024	\$62.42	\$11.49	\$23.56	\$0.00	\$97.47
BRICKLAYERS LOCAL 3 - MARBLE & TILE	08/01/2024	\$64.52	\$11.49	\$23.56	\$0.00	\$99.57
	02/01/2025	\$65.82	\$11.49	\$23.56	\$0.00	\$100.87
	08/01/2025	\$67.97	\$11.49	\$23.56	\$0.00	\$103.02
	02/01/2026	\$69.32	\$11.49	\$23.56	\$0.00	\$104.37
	08/01/2026	\$71.52	\$11.49	\$23.56	\$0.00	\$106.57
	02/01/2027	\$72.92	\$11.49	\$23.56	\$0.00	\$107.97

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - MARBLE-TILE-TERRAZZO MECHANIC - Local 3 Marble & Tile

Effective Date - 02/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$31.21	\$11.49	\$23.56	\$0.00	\$66.26
2	60	\$37.45	\$11.49	\$23.56	\$0.00	\$72.50
3	70	\$43.69	\$11.49	\$23.56	\$0.00	\$78.74
4	80	\$49.94	\$11.49	\$23.56	\$0.00	\$84.99
5	90	\$56.18	\$11.49	\$23.56	\$0.00	\$91.23

Effective Date - 08/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$32.26	\$11.49	\$23.56	\$0.00	\$67.31
2	60	\$38.71	\$11.49	\$23.56	\$0.00	\$73.76
3	70	\$45.16	\$11.49	\$23.56	\$0.00	\$80.21
4	80	\$51.62	\$11.49	\$23.56	\$0.00	\$86.67
5	90	\$58.07	\$11.49	\$23.56	\$0.00	\$93.12

Notes:

Apprentice to Journeyworker Ratio:1:5

MECH. SWEEPER OPERATOR (ON CONST. SITES) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$54.43	\$15.00	\$16.40	\$0.00	\$85.83
	06/01/2024	\$55.71	\$15.00	\$16.40	\$0.00	\$87.11
	12/01/2024	\$57.15	\$15.00	\$16.40	\$0.00	\$88.55
	06/01/2025	\$58.43	\$15.00	\$16.40	\$0.00	\$89.83
	12/01/2025	\$59.87	\$15.00	\$16.40	\$0.00	\$91.27
	06/01/2026	\$61.15	\$15.00	\$16.40	\$0.00	\$92.55
	12/01/2026	\$62.59	\$15.00	\$16.40	\$0.00	\$93.99

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

MECHANICS MAINTENANCE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$54.43	\$15.00	\$16.40	\$0.00	\$85.83
	06/01/2024	\$55.71	\$15.00	\$16.40	\$0.00	\$87.11
	12/01/2024	\$57.15	\$15.00	\$16.40	\$0.00	\$88.55
	06/01/2025	\$58.43	\$15.00	\$16.40	\$0.00	\$89.83
	12/01/2025	\$59.87	\$15.00	\$16.40	\$0.00	\$91.27
	06/01/2026	\$61.15	\$15.00	\$16.40	\$0.00	\$92.55
	12/01/2026	\$62.59	\$15.00	\$16.40	\$0.00	\$93.99

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

MILLWRIGHT (Zone 1) <i>MILLWRIGHTS LOCAL 1121 - Zone 1</i>	01/01/2024	\$48.03	\$10.08	\$21.72	\$0.00	\$79.83
	01/06/2025	\$50.53	\$10.08	\$21.72	\$0.00	\$82.33
	01/05/2026	\$53.03	\$10.08	\$21.72	\$0.00	\$84.83

Apprentice - MILLWRIGHT - Local 1121 Zone 1

Effective Date - 01/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$26.42	\$10.08	\$5.64	\$0.00	\$42.14
2	65	\$31.22	\$10.08	\$6.66	\$0.00	\$47.96
3	75	\$36.02	\$10.08	\$19.16	\$0.00	\$65.26
4	85	\$40.83	\$10.08	\$20.18	\$0.00	\$71.09

Effective Date - 01/06/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$27.79	\$10.08	\$5.64	\$0.00	\$43.51
2	65	\$32.84	\$10.08	\$6.66	\$0.00	\$49.58
3	75	\$37.90	\$10.08	\$19.16	\$0.00	\$67.14
4	85	\$42.95	\$10.08	\$20.18	\$0.00	\$73.21

Notes: Step 1&2 Appr. indentured after 1/6/2020 receive no pension, but do receive annuity. (Step 1 \$5.72, Step 2 \$6.66)
Steps are 2,000 hours

Apprentice to Journeyworker Ratio:1:4

MORTAR MIXER <i>LABORERS - ZONE 1</i>	12/01/2023	\$44.58	\$9.65	\$18.07	\$0.00	\$72.30
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For apprentice rates see "Apprentice- LABORER"

OILER (OTHER THAN TRUCK CRANES,GRADALLS) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$24.41	\$15.00	\$16.40	\$0.00	\$55.81
	06/01/2024	\$25.01	\$15.00	\$16.40	\$0.00	\$56.41
	12/01/2024	\$25.67	\$15.00	\$16.40	\$0.00	\$57.07
	06/01/2025	\$26.27	\$15.00	\$16.40	\$0.00	\$57.67
	12/01/2025	\$26.93	\$15.00	\$16.40	\$0.00	\$58.33
	06/01/2026	\$27.52	\$15.00	\$16.40	\$0.00	\$58.92
	12/01/2026	\$28.19	\$15.00	\$16.40	\$0.00	\$59.59

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

OILER (TRUCK CRANES, GRADALLS) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$29.86	\$15.00	\$16.40	\$0.00	\$61.26
	06/01/2024	\$30.58	\$15.00	\$16.40	\$0.00	\$61.98
	12/01/2024	\$31.38	\$15.00	\$16.40	\$0.00	\$62.78
	06/01/2025	\$32.10	\$15.00	\$16.40	\$0.00	\$63.50
	12/01/2025	\$32.90	\$15.00	\$16.40	\$0.00	\$64.30
	06/01/2026	\$33.62	\$15.00	\$16.40	\$0.00	\$65.02
	12/01/2026	\$34.42	\$15.00	\$16.40	\$0.00	\$65.82

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

OTHER POWER DRIVEN EQUIPMENT - CLASS II <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$54.43	\$15.00	\$16.40	\$0.00	\$85.83
	06/01/2024	\$55.71	\$15.00	\$16.40	\$0.00	\$87.11
	12/01/2024	\$57.15	\$15.00	\$16.40	\$0.00	\$88.55
	06/01/2025	\$58.43	\$15.00	\$16.40	\$0.00	\$89.83
	12/01/2025	\$59.87	\$15.00	\$16.40	\$0.00	\$91.27
	06/01/2026	\$61.15	\$15.00	\$16.40	\$0.00	\$92.55
	12/01/2026	\$62.59	\$15.00	\$16.40	\$0.00	\$93.99

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PAINTER (BRIDGES/TANKS) <i>PAINTERS LOCAL 35 - ZONE 2</i>	01/01/2024	\$56.06	\$9.95	\$23.95	\$0.00	\$89.96
	07/01/2024	\$57.26	\$9.95	\$23.95	\$0.00	\$91.16
	01/01/2025	\$58.46	\$9.95	\$23.95	\$0.00	\$92.36

Apprentice - PAINTER Local 35 - BRIDGES/TANKS

Effective Date - 01/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$28.03	\$9.95	\$0.00	\$0.00	\$37.98
2	55	\$30.83	\$9.95	\$6.66	\$0.00	\$47.44
3	60	\$33.64	\$9.95	\$7.26	\$0.00	\$50.85
4	65	\$36.44	\$9.95	\$7.87	\$0.00	\$54.26
5	70	\$39.24	\$9.95	\$20.32	\$0.00	\$69.51
6	75	\$42.05	\$9.95	\$20.93	\$0.00	\$72.93
7	80	\$44.85	\$9.95	\$21.53	\$0.00	\$76.33
8	90	\$50.45	\$9.95	\$22.74	\$0.00	\$83.14

Effective Date - 07/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$28.63	\$9.95	\$0.00	\$0.00	\$38.58
2	55	\$31.49	\$9.95	\$6.66	\$0.00	\$48.10
3	60	\$34.36	\$9.95	\$7.26	\$0.00	\$51.57
4	65	\$37.22	\$9.95	\$7.87	\$0.00	\$55.04
5	70	\$40.08	\$9.95	\$20.32	\$0.00	\$70.35
6	75	\$42.95	\$9.95	\$20.93	\$0.00	\$73.83
7	80	\$45.81	\$9.95	\$21.53	\$0.00	\$77.29
8	90	\$51.53	\$9.95	\$22.74	\$0.00	\$84.22

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, NEW) *	01/01/2024	\$46.96	\$9.95	\$23.95	\$0.00	\$80.86
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. <i>PAINTERS LOCAL 35 - ZONE 2</i>	07/01/2024	\$48.16	\$9.95	\$23.95	\$0.00	\$82.06
	01/01/2025	\$49.36	\$9.95	\$23.95	\$0.00	\$83.26

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER Local 35 Zone 2 - Spray/Sandblast - New

Effective Date - 01/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.48	\$9.95	\$0.00	\$0.00	\$33.43
2	55	\$25.83	\$9.95	\$6.66	\$0.00	\$42.44
3	60	\$28.18	\$9.95	\$7.26	\$0.00	\$45.39
4	65	\$30.52	\$9.95	\$7.87	\$0.00	\$48.34
5	70	\$32.87	\$9.95	\$20.32	\$0.00	\$63.14
6	75	\$35.22	\$9.95	\$20.93	\$0.00	\$66.10
7	80	\$37.57	\$9.95	\$21.53	\$0.00	\$69.05
8	90	\$42.26	\$9.95	\$22.74	\$0.00	\$74.95

Effective Date - 07/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.08	\$9.95	\$0.00	\$0.00	\$34.03
2	55	\$26.49	\$9.95	\$6.66	\$0.00	\$43.10
3	60	\$28.90	\$9.95	\$7.26	\$0.00	\$46.11
4	65	\$31.30	\$9.95	\$7.87	\$0.00	\$49.12
5	70	\$33.71	\$9.95	\$20.32	\$0.00	\$63.98
6	75	\$36.12	\$9.95	\$20.93	\$0.00	\$67.00
7	80	\$38.53	\$9.95	\$21.53	\$0.00	\$70.01
8	90	\$43.34	\$9.95	\$22.74	\$0.00	\$76.03

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, REPAINT)	01/01/2024	\$45.02	\$9.95	\$23.95	\$0.00	\$78.92
PAINTERS LOCAL 35 - ZONE 2	07/01/2024	\$46.22	\$9.95	\$23.95	\$0.00	\$80.12
	01/01/2025	\$47.42	\$9.95	\$23.95	\$0.00	\$81.32

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER Local 35 Zone 2 - Spray/Sandblast - Repaint

Effective Date - 01/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.51	\$9.95	\$0.00	\$0.00	\$32.46
2	55	\$24.76	\$9.95	\$6.66	\$0.00	\$41.37
3	60	\$27.01	\$9.95	\$7.26	\$0.00	\$44.22
4	65	\$29.26	\$9.95	\$7.87	\$0.00	\$47.08
5	70	\$31.51	\$9.95	\$20.32	\$0.00	\$61.78
6	75	\$33.77	\$9.95	\$20.93	\$0.00	\$64.65
7	80	\$36.02	\$9.95	\$21.53	\$0.00	\$67.50
8	90	\$40.52	\$9.95	\$22.74	\$0.00	\$73.21

Effective Date - 07/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.11	\$9.95	\$0.00	\$0.00	\$33.06
2	55	\$25.42	\$9.95	\$6.66	\$0.00	\$42.03
3	60	\$27.73	\$9.95	\$7.26	\$0.00	\$44.94
4	65	\$30.04	\$9.95	\$7.87	\$0.00	\$47.86
5	70	\$32.35	\$9.95	\$20.32	\$0.00	\$62.62
6	75	\$34.67	\$9.95	\$20.93	\$0.00	\$65.55
7	80	\$36.98	\$9.95	\$21.53	\$0.00	\$68.46
8	90	\$41.60	\$9.95	\$22.74	\$0.00	\$74.29

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, NEW) *	01/01/2024	\$45.56	\$9.95	\$23.95	\$0.00	\$79.46
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 2	07/01/2024	\$46.76	\$9.95	\$23.95	\$0.00	\$80.66
	01/01/2025	\$47.96	\$9.95	\$23.95	\$0.00	\$81.86

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER - Local 35 Zone 2 - BRUSH NEW

Effective Date - 01/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.78	\$9.95	\$0.00	\$0.00	\$32.73
2	55	\$25.06	\$9.95	\$6.66	\$0.00	\$41.67
3	60	\$27.34	\$9.95	\$7.26	\$0.00	\$44.55
4	65	\$29.61	\$9.95	\$7.87	\$0.00	\$47.43
5	70	\$31.89	\$9.95	\$20.32	\$0.00	\$62.16
6	75	\$34.17	\$9.95	\$20.93	\$0.00	\$65.05
7	80	\$36.45	\$9.95	\$21.53	\$0.00	\$67.93
8	90	\$41.00	\$9.95	\$22.74	\$0.00	\$73.69

Effective Date - 07/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.38	\$9.95	\$0.00	\$0.00	\$33.33
2	55	\$25.72	\$9.95	\$6.66	\$0.00	\$42.33
3	60	\$28.06	\$9.95	\$7.26	\$0.00	\$45.27
4	65	\$30.39	\$9.95	\$7.87	\$0.00	\$48.21
5	70	\$32.73	\$9.95	\$20.32	\$0.00	\$63.00
6	75	\$35.07	\$9.95	\$20.93	\$0.00	\$65.95
7	80	\$37.41	\$9.95	\$21.53	\$0.00	\$68.89
8	90	\$42.08	\$9.95	\$22.74	\$0.00	\$74.77

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, REPAINT)	01/01/2024	\$43.62	\$9.95	\$23.95	\$0.00	\$77.52
PAINTERS LOCAL 35 - ZONE 2	07/01/2024	\$44.82	\$9.95	\$23.95	\$0.00	\$78.72
	01/01/2025	\$46.02	\$9.95	\$23.95	\$0.00	\$79.92

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER Local 35 Zone 2 - BRUSH REPAINT

Effective Date - 01/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.81	\$9.95	\$0.00	\$0.00	\$31.76
2	55	\$23.99	\$9.95	\$6.66	\$0.00	\$40.60
3	60	\$26.17	\$9.95	\$7.26	\$0.00	\$43.38
4	65	\$28.35	\$9.95	\$7.87	\$0.00	\$46.17
5	70	\$30.53	\$9.95	\$20.32	\$0.00	\$60.80
6	75	\$32.72	\$9.95	\$20.93	\$0.00	\$63.60
7	80	\$34.90	\$9.95	\$21.53	\$0.00	\$66.38
8	90	\$39.26	\$9.95	\$22.74	\$0.00	\$71.95

Effective Date - 07/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.41	\$9.95	\$0.00	\$0.00	\$32.36
2	55	\$24.65	\$9.95	\$6.66	\$0.00	\$41.26
3	60	\$26.89	\$9.95	\$7.26	\$0.00	\$44.10
4	65	\$29.13	\$9.95	\$7.87	\$0.00	\$46.95
5	70	\$31.37	\$9.95	\$20.32	\$0.00	\$61.64
6	75	\$33.62	\$9.95	\$20.93	\$0.00	\$64.50
7	80	\$35.86	\$9.95	\$21.53	\$0.00	\$67.34
8	90	\$40.34	\$9.95	\$22.74	\$0.00	\$73.03

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER TRAFFIC MARKINGS (HEAVY/HIGHWAY)	12/01/2023	\$44.33	\$9.65	\$18.07	\$0.00	\$72.05
<i>LABORERS - ZONE 1 (HEAVY & HIGHWAY)</i>	06/01/2024	\$45.81	\$9.65	\$18.07	\$0.00	\$73.53
	12/01/2024	\$47.28	\$9.65	\$18.07	\$0.00	\$75.00
	06/01/2025	\$48.78	\$9.65	\$18.07	\$0.00	\$76.50
	12/01/2025	\$50.28	\$9.65	\$18.07	\$0.00	\$78.00
	06/01/2026	\$51.83	\$9.65	\$18.07	\$0.00	\$79.55
	12/01/2026	\$53.33	\$9.65	\$18.07	\$0.00	\$81.05

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)

PANEL & PICKUP TRUCKS DRIVER	12/01/2023	\$39.88	\$14.41	\$18.67	\$0.00	\$72.96
<i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	06/01/2024	\$40.88	\$14.41	\$18.67	\$0.00	\$73.96
	08/01/2024	\$40.88	\$14.91	\$18.67	\$0.00	\$74.46
	12/01/2024	\$40.88	\$14.91	\$20.17	\$0.00	\$75.96
	06/01/2025	\$41.88	\$14.91	\$20.17	\$0.00	\$76.96
	08/01/2025	\$41.88	\$15.41	\$20.17	\$0.00	\$77.46
	12/01/2025	\$41.88	\$15.41	\$21.78	\$0.00	\$79.07
	06/01/2026	\$42.88	\$15.41	\$21.78	\$0.00	\$80.07
	08/01/2026	\$42.88	\$15.91	\$21.78	\$0.00	\$80.57
	12/01/2026	\$42.88	\$15.91	\$23.52	\$0.00	\$82.31

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) <i>PILE DRIVER LOCAL 56 (ZONE 1)</i> For apprentice rates see "Apprentice- PILE DRIVER"	08/01/2020	\$49.07	\$9.40	\$23.12	\$0.00	\$81.59
PILE DRIVER <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2020	\$49.07	\$9.40	\$23.12	\$0.00	\$81.59

Apprentice - PILE DRIVER - Local 56 Zone 1

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.54	\$9.40	\$23.12	\$0.00	\$57.06
2	60	\$29.44	\$9.40	\$23.12	\$0.00	\$61.96
3	70	\$34.35	\$9.40	\$23.12	\$0.00	\$66.87
4	75	\$36.80	\$9.40	\$23.12	\$0.00	\$69.32
5	80	\$39.26	\$9.40	\$23.12	\$0.00	\$71.78
6	80	\$39.26	\$9.40	\$23.12	\$0.00	\$71.78
7	90	\$44.16	\$9.40	\$23.12	\$0.00	\$76.68
8	90	\$44.16	\$9.40	\$23.12	\$0.00	\$76.68

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
Step 1&2 \$34.01/ 3&4 \$41.46/ 5&6 \$62.80/ 7&8 \$69.25

Apprentice to Journeyworker Ratio:1:5

PIPEFITTER & STEAMFITTER <i>PIPEFITTERS LOCAL 537</i>	03/01/2024	\$65.28	\$12.70	\$21.80	\$0.00	\$99.78
	09/01/2024	\$67.08	\$12.70	\$21.80	\$0.00	\$101.58
	03/01/2025	\$68.88	\$12.70	\$21.80	\$0.00	\$103.38

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PIPEFITTER - Local 537

Effective Date - 03/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$26.11	\$12.70	\$9.05	\$0.00	\$47.86
2	45	\$29.38	\$12.70	\$21.80	\$0.00	\$63.88
3	60	\$39.17	\$12.70	\$21.80	\$0.00	\$73.67
4	70	\$45.70	\$12.70	\$21.80	\$0.00	\$80.20
5	80	\$52.22	\$12.70	\$21.80	\$0.00	\$86.72

Effective Date - 09/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$26.83	\$12.70	\$9.05	\$0.00	\$48.58
2	45	\$30.19	\$12.70	\$21.80	\$0.00	\$64.69
3	60	\$40.25	\$12.70	\$21.80	\$0.00	\$74.75
4	70	\$46.96	\$12.70	\$21.80	\$0.00	\$81.46
5	80	\$53.66	\$12.70	\$21.80	\$0.00	\$88.16

Notes:

** 1:3; 3:15; 1:10 thereafter / Steps are 1 yr.
 Refrig/AC Mechanic **1:1;1:2;2:4;3:6;4:8;5:10;6:12;7:14;8:17;9:20;10:23(Max)

Apprentice to Journeyworker Ratio:**

PIPELAYER LABORERS - ZONE 1	12/01/2023	\$44.58	\$9.65	\$18.07	\$0.00	\$72.30
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For apprentice rates see "Apprentice- LABORER"

PIPELAYER (HEAVY & HIGHWAY) LABORERS - ZONE 1 (HEAVY & HIGHWAY)	12/01/2023	\$44.58	\$9.65	\$18.07	\$0.00	\$72.30
	06/01/2024	\$46.06	\$9.65	\$18.07	\$0.00	\$73.78
	12/01/2024	\$47.53	\$9.65	\$18.07	\$0.00	\$75.25
	06/01/2025	\$49.03	\$9.65	\$18.07	\$0.00	\$76.75
	12/01/2025	\$50.53	\$9.65	\$18.07	\$0.00	\$78.25
	06/01/2026	\$52.08	\$9.65	\$18.07	\$0.00	\$79.80
	12/01/2026	\$53.58	\$9.65	\$18.07	\$0.00	\$81.30

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"

PLUMBERS & GASFITTERS PLUMBERS & GASFITTERS LOCAL 12	03/03/2024	\$67.74	\$14.32	\$19.11	\$0.00	\$101.17
	09/01/2024	\$69.54	\$14.32	\$19.11	\$0.00	\$102.97
	03/02/2025	\$71.34	\$14.32	\$19.11	\$0.00	\$104.77

Apprentice - PLUMBER/GASFITTER - Local 12

Effective Date - 03/03/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$23.71	\$14.32	\$6.88	\$0.00	\$44.91
2	40	\$27.10	\$14.32	\$7.82	\$0.00	\$49.24
3	55	\$37.26	\$14.32	\$10.65	\$0.00	\$62.23
4	65	\$44.03	\$14.32	\$12.53	\$0.00	\$70.88
5	75	\$50.81	\$14.32	\$14.41	\$0.00	\$79.54

Effective Date - 09/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$24.34	\$14.32	\$6.88	\$0.00	\$45.54
2	40	\$27.82	\$14.32	\$7.82	\$0.00	\$49.96
3	55	\$38.25	\$14.32	\$10.65	\$0.00	\$63.22
4	65	\$45.20	\$14.32	\$12.53	\$0.00	\$72.05
5	75	\$52.16	\$14.32	\$14.41	\$0.00	\$80.89

Notes:
 ** 1:2; 2:6; 3:10; 4:14; 5:19/Steps are 1 yr
 Step4 with lic\$69.00, Step5 with lic\$76.87

Apprentice to Journeyworker Ratio:**

PNEUMATIC CONTROLS (TEMP.) <i>PIPEFITTERS LOCAL 537</i>	03/01/2024	\$65.28	\$12.70	\$21.80	\$0.00	\$99.78
	09/01/2024	\$67.08	\$12.70	\$21.80	\$0.00	\$101.58
	03/01/2025	\$68.88	\$12.70	\$21.80	\$0.00	\$103.38

For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"

PNEUMATIC DRILL/TOOL OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2023	\$44.58	\$9.65	\$18.07	\$0.00	\$72.30
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For apprentice rates see "Apprentice- LABORER"

PNEUMATIC DRILL/TOOL OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 1 (HEAVY & HIGHWAY)</i>	12/01/2023	\$44.58	\$9.65	\$18.07	\$0.00	\$72.30
	06/01/2024	\$46.06	\$9.65	\$18.07	\$0.00	\$73.78
	12/01/2024	\$47.53	\$9.65	\$18.07	\$0.00	\$75.25
	06/01/2025	\$49.03	\$9.65	\$18.07	\$0.00	\$76.75
	12/01/2025	\$50.53	\$9.65	\$18.07	\$0.00	\$78.25
	06/01/2026	\$52.08	\$9.65	\$18.07	\$0.00	\$79.80
	12/01/2026	\$53.58	\$9.65	\$18.07	\$0.00	\$81.30

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"

POWDERMAN & BLASTER <i>LABORERS - ZONE 1</i>	12/01/2023	\$45.33	\$9.65	\$18.07	\$0.00	\$73.05
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For apprentice rates see "Apprentice- LABORER"

POWDERMAN & BLASTER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 1 (HEAVY & HIGHWAY)</i>	12/01/2023	\$45.33	\$9.65	\$18.07	\$0.00	\$73.05
	06/01/2024	\$46.81	\$9.65	\$18.07	\$0.00	\$74.53
	12/01/2024	\$48.28	\$9.65	\$18.07	\$0.00	\$76.00
	06/01/2025	\$49.78	\$9.65	\$18.07	\$0.00	\$77.50
	12/01/2025	\$51.28	\$9.65	\$18.07	\$0.00	\$79.00
	06/01/2026	\$52.83	\$9.65	\$18.07	\$0.00	\$80.55
	12/01/2026	\$54.33	\$9.65	\$18.07	\$0.00	\$82.05

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
POWER SHOVEL/DERRICK/TRENCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$55.03	\$15.00	\$16.40	\$0.00	\$86.43
	06/01/2024	\$56.33	\$15.00	\$16.40	\$0.00	\$87.73
	12/01/2024	\$57.78	\$15.00	\$16.40	\$0.00	\$89.18
	06/01/2025	\$59.08	\$15.00	\$16.40	\$0.00	\$90.48
	12/01/2025	\$60.53	\$15.00	\$16.40	\$0.00	\$91.93
	06/01/2026	\$61.83	\$15.00	\$16.40	\$0.00	\$93.23
	12/01/2026	\$63.28	\$15.00	\$16.40	\$0.00	\$94.68
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (CONCRETE) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$54.43	\$15.00	\$16.40	\$0.00	\$85.83
	06/01/2024	\$55.71	\$15.00	\$16.40	\$0.00	\$87.11
	12/01/2024	\$57.15	\$15.00	\$16.40	\$0.00	\$88.55
	06/01/2025	\$58.43	\$15.00	\$16.40	\$0.00	\$89.83
	12/01/2025	\$59.87	\$15.00	\$16.40	\$0.00	\$91.27
	06/01/2026	\$61.15	\$15.00	\$16.40	\$0.00	\$92.55
	12/01/2026	\$62.59	\$15.00	\$16.40	\$0.00	\$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$35.62	\$15.00	\$16.40	\$0.00	\$67.02
	06/01/2024	\$36.47	\$15.00	\$16.40	\$0.00	\$67.87
	12/01/2024	\$37.42	\$15.00	\$16.40	\$0.00	\$68.82
	06/01/2025	\$38.27	\$15.00	\$16.40	\$0.00	\$69.67
	12/01/2025	\$39.22	\$15.00	\$16.40	\$0.00	\$70.62
	06/01/2026	\$40.08	\$15.00	\$16.40	\$0.00	\$71.48
	12/01/2026	\$41.03	\$15.00	\$16.40	\$0.00	\$72.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY-MIX CONCRETE DRIVER <i>TEAMSTERS 653 - Southeastern Concrete (Weymouth)</i>	08/01/2023	\$25.00	\$13.91	\$6.90	\$0.00	\$45.81
RECLAIMERS <i>OPERATING ENGINEERS LOCAL 4</i>						
	12/01/2023	\$54.43	\$15.00	\$16.40	\$0.00	\$85.83
	06/01/2024	\$55.71	\$15.00	\$16.40	\$0.00	\$87.11
	12/01/2024	\$57.15	\$15.00	\$16.40	\$0.00	\$88.55
	06/01/2025	\$58.43	\$15.00	\$16.40	\$0.00	\$89.83
	12/01/2025	\$59.87	\$15.00	\$16.40	\$0.00	\$91.27
	06/01/2026	\$61.15	\$15.00	\$16.40	\$0.00	\$92.55
	12/01/2026	\$62.59	\$15.00	\$16.40	\$0.00	\$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
RIDE-ON MOTORIZED BUGGY OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2023	\$44.58	\$9.65	\$18.07	\$0.00	\$72.30
For apprentice rates see "Apprentice- LABORER"						
ROLLER/SPREADER/MULCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$54.43	\$15.00	\$16.40	\$0.00	\$85.83
	06/01/2024	\$55.71	\$15.00	\$16.40	\$0.00	\$87.11
	12/01/2024	\$57.15	\$15.00	\$16.40	\$0.00	\$88.55
	06/01/2025	\$58.43	\$15.00	\$16.40	\$0.00	\$89.83
	12/01/2025	\$59.87	\$15.00	\$16.40	\$0.00	\$91.27
	06/01/2026	\$61.15	\$15.00	\$16.40	\$0.00	\$92.55
	12/01/2026	\$62.59	\$15.00	\$16.40	\$0.00	\$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
ROOFER (Inc.Roofer Waterproofing &Roofer Damproofg) ROOFERS LOCAL 33	02/01/2024	\$50.03	\$12.78	\$21.45	\$0.00	\$84.26
	08/01/2024	\$51.53	\$12.78	\$21.45	\$0.00	\$85.76
	02/01/2025	\$52.78	\$12.78	\$21.45	\$0.00	\$87.01
	08/01/2025	\$54.28	\$12.78	\$21.45	\$0.00	\$88.51
	02/01/2026	\$55.53	\$12.78	\$21.45	\$0.00	\$89.76

Apprentice - ROOFER - Local 33

Effective Date - 02/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.02	\$12.78	\$6.21	\$0.00	\$44.01
2	60	\$30.02	\$12.78	\$21.45	\$0.00	\$64.25
3	65	\$32.52	\$12.78	\$21.45	\$0.00	\$66.75
4	75	\$37.52	\$12.78	\$21.45	\$0.00	\$71.75
5	85	\$42.53	\$12.78	\$21.45	\$0.00	\$76.76

Effective Date - 08/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.77	\$12.78	\$6.21	\$0.00	\$44.76
2	60	\$30.92	\$12.78	\$21.45	\$0.00	\$65.15
3	65	\$33.49	\$12.78	\$21.45	\$0.00	\$67.72
4	75	\$38.65	\$12.78	\$21.45	\$0.00	\$72.88
5	85	\$43.80	\$12.78	\$21.45	\$0.00	\$78.03

Notes: ** 1:5, 2:6-10, the 1:10; Reroofing: 1:4, then 1:1
 Step 1 is 2000 hrs.; Steps 2-5 are 1000 hrs.
 (Hot Pitch Mechanics' receive \$1.00 hr. above ROOFER)

Apprentice to Journeyworker Ratio:**

ROOFER SLATE / TILE / PRECAST CONCRETE ROOFERS LOCAL 33	02/01/2024	\$50.28	\$12.78	\$21.45	\$0.00	\$84.51
	08/01/2024	\$51.78	\$12.78	\$21.45	\$0.00	\$86.01
	02/01/2025	\$53.03	\$12.78	\$21.45	\$0.00	\$87.26
	08/01/2025	\$54.53	\$12.78	\$21.45	\$0.00	\$88.76
	02/01/2026	\$55.78	\$12.78	\$21.45	\$0.00	\$90.01

For apprentice rates see "Apprentice- ROOFER"

SHEETMETAL WORKER SHEETMETAL WORKERS LOCAL 17 - A	02/01/2024	\$57.22	\$14.59	\$27.50	\$2.98	\$102.29
	08/01/2024	\$58.97	\$14.59	\$27.50	\$2.98	\$104.04
	02/01/2025	\$60.72	\$14.59	\$27.50	\$2.98	\$105.79
	08/01/2025	\$62.57	\$14.59	\$27.50	\$2.98	\$107.64
	02/01/2026	\$64.52	\$14.59	\$27.50	\$2.98	\$109.59

Apprentice - SHEET METAL WORKER - Local 17-A

Effective Date - 02/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	42	\$24.03	\$14.59	\$6.13	\$0.00	\$44.75
2	42	\$24.03	\$14.59	\$6.13	\$0.00	\$44.75
3	47	\$26.89	\$14.59	\$12.11	\$1.61	\$55.20
4	47	\$26.89	\$14.59	\$12.11	\$1.61	\$55.20
5	52	\$29.75	\$14.59	\$13.09	\$1.72	\$59.15
6	52	\$29.75	\$14.59	\$13.34	\$1.73	\$59.41
7	60	\$34.33	\$14.59	\$14.75	\$1.91	\$65.58
8	65	\$37.19	\$14.59	\$15.73	\$2.03	\$69.54
9	75	\$42.92	\$14.59	\$17.69	\$2.26	\$77.46
10	85	\$48.64	\$14.59	\$19.15	\$2.47	\$84.85

Effective Date - 08/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	42	\$24.77	\$14.59	\$6.13	\$0.00	\$45.49
2	42	\$24.77	\$14.59	\$6.13	\$0.00	\$45.49
3	47	\$27.72	\$14.59	\$12.11	\$1.63	\$56.05
4	47	\$27.72	\$14.59	\$12.11	\$1.63	\$56.05
5	52	\$30.66	\$14.59	\$13.09	\$1.75	\$60.09
6	52	\$30.66	\$14.59	\$13.34	\$1.76	\$60.35
7	60	\$35.38	\$14.59	\$14.75	\$1.94	\$66.66
8	65	\$38.33	\$14.59	\$15.73	\$2.06	\$70.71
9	75	\$44.23	\$14.59	\$17.69	\$2.30	\$78.81
10	85	\$50.12	\$14.59	\$19.15	\$2.52	\$86.38

Notes:
Steps are 6 mos.

Apprentice to Journeyworker Ratio:1:4

SPECIALIZED EARTH MOVING EQUIP < 35 TONS	12/01/2023	\$40.34	\$14.41	\$18.67	\$0.00	\$73.42
TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	06/01/2024	\$41.34	\$14.41	\$18.67	\$0.00	\$74.42
	08/01/2024	\$41.34	\$14.91	\$18.67	\$0.00	\$74.92
	12/01/2024	\$41.34	\$14.91	\$20.17	\$0.00	\$76.42
	06/01/2025	\$42.34	\$14.91	\$20.17	\$0.00	\$77.42
	08/01/2025	\$42.34	\$15.41	\$20.17	\$0.00	\$77.92
	12/01/2025	\$42.34	\$15.41	\$21.78	\$0.00	\$79.53
	06/01/2026	\$43.34	\$15.41	\$21.78	\$0.00	\$80.53
	08/01/2026	\$43.34	\$15.91	\$21.78	\$0.00	\$81.03
	12/01/2026	\$43.34	\$15.91	\$23.52	\$0.00	\$82.77

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SPECIALIZED EARTH MOVING EQUIP > 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2023	\$40.63	\$14.41	\$18.67	\$0.00	\$73.71
	06/01/2024	\$41.63	\$14.41	\$18.67	\$0.00	\$74.71
	08/01/2024	\$41.63	\$14.91	\$18.67	\$0.00	\$75.21
	12/01/2024	\$41.63	\$14.91	\$20.17	\$0.00	\$76.71
	06/01/2025	\$42.63	\$14.91	\$20.17	\$0.00	\$77.71
	08/01/2025	\$42.63	\$15.41	\$20.17	\$0.00	\$78.21
	12/01/2025	\$42.63	\$15.41	\$21.78	\$0.00	\$79.82
	06/01/2026	\$43.63	\$15.41	\$21.78	\$0.00	\$80.82
	08/01/2026	\$43.63	\$15.91	\$21.78	\$0.00	\$81.32
	12/01/2026	\$43.63	\$15.91	\$23.52	\$0.00	\$83.06
SPRINKLER FITTER <i>SPRINKLER FITTERS LOCAL 550 - (Section A) Zone 1</i>	03/01/2024	\$69.75	\$10.90	\$23.20	\$0.00	\$103.85
	10/01/2024	\$71.55	\$10.90	\$23.20	\$0.00	\$105.65
	03/01/2025	\$73.35	\$10.90	\$23.20	\$0.00	\$107.45

Apprentice - SPRINKLER FITTER - Local 550 (Section A) Zone 1

Effective Date - 03/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$24.41	\$10.90	\$12.80	\$0.00	\$48.11
2	40	\$27.90	\$10.90	\$13.60	\$0.00	\$52.40
3	45	\$31.39	\$10.90	\$14.40	\$0.00	\$56.69
4	50	\$34.88	\$10.90	\$15.20	\$0.00	\$60.98
5	55	\$38.36	\$10.90	\$16.00	\$0.00	\$65.26
6	60	\$41.85	\$10.90	\$16.80	\$0.00	\$69.55
7	65	\$45.34	\$10.90	\$17.60	\$0.00	\$73.84
8	70	\$48.83	\$10.90	\$18.40	\$0.00	\$78.13
9	75	\$52.31	\$10.90	\$19.20	\$0.00	\$82.41
10	80	\$55.80	\$10.90	\$20.00	\$0.00	\$86.70

Effective Date - 10/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$25.04	\$10.90	\$12.80	\$0.00	\$48.74
2	40	\$28.62	\$10.90	\$13.60	\$0.00	\$53.12
3	45	\$32.20	\$10.90	\$14.40	\$0.00	\$57.50
4	50	\$35.78	\$10.90	\$15.20	\$0.00	\$61.88
5	55	\$39.35	\$10.90	\$16.00	\$0.00	\$66.25
6	60	\$42.93	\$10.90	\$16.80	\$0.00	\$70.63
7	65	\$46.51	\$10.90	\$17.60	\$0.00	\$75.01
8	70	\$50.09	\$10.90	\$18.40	\$0.00	\$79.39
9	75	\$53.66	\$10.90	\$19.20	\$0.00	\$83.76
10	80	\$57.24	\$10.90	\$20.00	\$0.00	\$88.14

Notes: Apprentice entered prior 9/30/10:
40/45/50/55/60/65/70/75/80/85
Steps are 850 hours

Apprentice to Journeyworker Ratio:1:3

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
STEAM BOILER OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$54.43	\$15.00	\$16.40	\$0.00	\$85.83
	06/01/2024	\$55.71	\$15.00	\$16.40	\$0.00	\$87.11
	12/01/2024	\$57.15	\$15.00	\$16.40	\$0.00	\$88.55
	06/01/2025	\$58.43	\$15.00	\$16.40	\$0.00	\$89.83
	12/01/2025	\$59.87	\$15.00	\$16.40	\$0.00	\$91.27
	06/01/2026	\$61.15	\$15.00	\$16.40	\$0.00	\$92.55
	12/01/2026	\$62.59	\$15.00	\$16.40	\$0.00	\$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$54.43	\$15.00	\$16.40	\$0.00	\$85.83
	06/01/2024	\$55.71	\$15.00	\$16.40	\$0.00	\$87.11
	12/01/2024	\$57.15	\$15.00	\$16.40	\$0.00	\$88.55
	06/01/2025	\$58.43	\$15.00	\$16.40	\$0.00	\$89.83
	12/01/2025	\$59.87	\$15.00	\$16.40	\$0.00	\$91.27
	06/01/2026	\$61.15	\$15.00	\$16.40	\$0.00	\$92.55
	12/01/2026	\$62.59	\$15.00	\$16.40	\$0.00	\$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TELECOMMUNICATION TECHNICIAN <i>ELECTRICIANS LOCAL 103</i>	03/01/2024	\$49.49	\$13.00	\$20.19	\$0.00	\$82.68
	09/01/2024	\$51.02	\$13.00	\$20.24	\$0.00	\$84.26
	03/01/2025	\$51.98	\$13.00	\$20.27	\$0.00	\$85.25
	09/01/2025	\$53.51	\$13.00	\$20.32	\$0.00	\$86.83
	03/01/2026	\$54.47	\$13.00	\$20.34	\$0.00	\$87.81
	09/01/2026	\$56.00	\$13.00	\$20.39	\$0.00	\$89.39
	03/01/2027	\$56.95	\$13.00	\$20.42	\$0.00	\$90.37
	09/01/2027	\$58.49	\$13.00	\$20.46	\$0.00	\$91.95
	03/01/2028	\$59.45	\$13.00	\$20.49	\$0.00	\$92.94

Apprentice - TELECOMMUNICATION TECHNICIAN - Local 103

Effective Date - 03/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$22.27	\$13.00	\$0.67	\$0.00	\$35.94
2	45	\$22.27	\$13.00	\$0.67	\$0.00	\$35.94
3	50	\$24.75	\$13.00	\$16.16	\$0.00	\$53.91
4	50	\$24.75	\$13.00	\$16.16	\$0.00	\$53.91
5	55	\$27.22	\$13.00	\$16.57	\$0.00	\$56.79
6	60	\$29.69	\$13.00	\$16.97	\$0.00	\$59.66
7	65	\$32.17	\$13.00	\$17.38	\$0.00	\$62.55
8	70	\$34.64	\$13.00	\$17.78	\$0.00	\$65.42
9	75	\$37.12	\$13.00	\$18.18	\$0.00	\$68.30
10	80	\$39.59	\$13.00	\$18.58	\$0.00	\$71.17

Effective Date - 09/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$22.96	\$13.00	\$0.69	\$0.00	\$36.65
2	45	\$22.96	\$13.00	\$0.69	\$0.00	\$36.65
3	50	\$25.51	\$13.00	\$16.16	\$0.00	\$54.67
4	50	\$25.51	\$13.00	\$16.16	\$0.00	\$54.67
5	55	\$28.06	\$13.00	\$16.57	\$0.00	\$57.63
6	60	\$30.61	\$13.00	\$16.97	\$0.00	\$60.58
7	65	\$33.16	\$13.00	\$17.38	\$0.00	\$63.54
8	70	\$35.71	\$13.00	\$17.78	\$0.00	\$66.49
9	75	\$38.27	\$13.00	\$18.18	\$0.00	\$69.45
10	80	\$40.82	\$13.00	\$18.58	\$0.00	\$72.40

Notes:

Apprentice to Journeyworker Ratio:1:1

TERRAZZO FINISHERS	02/01/2024	\$61.34	\$11.49	\$23.59	\$0.00	\$96.42
BRICKLAYERS LOCAL 3 - MARBLE & TILE	08/01/2024	\$63.44	\$11.49	\$23.59	\$0.00	\$98.52
	02/01/2025	\$64.74	\$11.49	\$23.59	\$0.00	\$99.82
	08/01/2025	\$66.89	\$11.49	\$23.59	\$0.00	\$101.97
	02/01/2026	\$68.24	\$11.49	\$23.59	\$0.00	\$103.32
	08/01/2026	\$70.44	\$11.49	\$23.59	\$0.00	\$105.52
	02/01/2027	\$71.84	\$11.49	\$23.59	\$0.00	\$106.92

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - TERRAZZO FINISHER - Local 3 Marble & Tile

Effective Date - 02/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$30.67	\$11.49	\$23.59	\$0.00	\$65.75
2	60	\$36.80	\$11.49	\$23.59	\$0.00	\$71.88
3	70	\$42.94	\$11.49	\$23.59	\$0.00	\$78.02
4	80	\$49.07	\$11.49	\$23.59	\$0.00	\$84.15
5	90	\$55.21	\$11.49	\$23.59	\$0.00	\$90.29

Effective Date - 08/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$31.72	\$11.49	\$23.59	\$0.00	\$66.80
2	60	\$38.06	\$11.49	\$23.59	\$0.00	\$73.14
3	70	\$44.41	\$11.49	\$23.59	\$0.00	\$79.49
4	80	\$50.75	\$11.49	\$23.59	\$0.00	\$85.83
5	90	\$57.10	\$11.49	\$23.59	\$0.00	\$92.18

Notes:

Apprentice to Journeyworker Ratio:1:3

TEST BORING DRILLER <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2023	\$48.33	\$9.65	\$18.22	\$0.00	\$76.20
	06/01/2024	\$49.81	\$9.65	\$18.22	\$0.00	\$77.68
	12/01/2024	\$51.28	\$9.65	\$18.22	\$0.00	\$79.15
	06/01/2025	\$52.78	\$9.65	\$18.22	\$0.00	\$80.65
	12/01/2025	\$54.28	\$9.65	\$18.22	\$0.00	\$82.15
	06/01/2026	\$55.83	\$9.65	\$18.22	\$0.00	\$83.70
	12/01/2026	\$57.33	\$9.65	\$18.22	\$0.00	\$85.20

For apprentice rates see "Apprentice- LABORER"

TEST BORING DRILLER HELPER <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2023	\$44.45	\$9.65	\$18.22	\$0.00	\$72.32
	06/01/2024	\$45.93	\$9.65	\$18.22	\$0.00	\$73.80
	12/01/2024	\$47.40	\$9.65	\$18.22	\$0.00	\$75.27
	06/01/2025	\$48.90	\$9.65	\$18.22	\$0.00	\$76.77
	12/01/2025	\$50.40	\$9.65	\$18.22	\$0.00	\$78.27
	06/01/2026	\$51.95	\$9.65	\$18.22	\$0.00	\$79.82
	12/01/2026	\$53.45	\$9.65	\$18.22	\$0.00	\$81.32

For apprentice rates see "Apprentice- LABORER"

TEST BORING LABORER <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2023	\$44.33	\$9.65	\$18.22	\$0.00	\$72.20
	06/01/2024	\$45.81	\$9.65	\$18.22	\$0.00	\$73.68
	12/01/2024	\$47.28	\$9.65	\$18.22	\$0.00	\$75.15
	06/01/2025	\$48.78	\$9.65	\$18.22	\$0.00	\$76.65
	12/01/2025	\$50.28	\$9.65	\$18.22	\$0.00	\$78.15
	06/01/2026	\$51.83	\$9.65	\$18.22	\$0.00	\$79.70
	12/01/2026	\$53.33	\$9.65	\$18.22	\$0.00	\$81.20

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TRACTORS/PORTABLE STEAM GENERATORS <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$54.43	\$15.00	\$16.40	\$0.00	\$85.83
	06/01/2024	\$55.71	\$15.00	\$16.40	\$0.00	\$87.11
	12/01/2024	\$57.15	\$15.00	\$16.40	\$0.00	\$88.55
	06/01/2025	\$58.43	\$15.00	\$16.40	\$0.00	\$89.83
	12/01/2025	\$59.87	\$15.00	\$16.40	\$0.00	\$91.27
	06/01/2026	\$61.15	\$15.00	\$16.40	\$0.00	\$92.55
	12/01/2026	\$62.59	\$15.00	\$16.40	\$0.00	\$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TRAILERS FOR EARTH MOVING EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2023	\$40.92	\$14.41	\$18.67	\$0.00	\$74.00
	06/01/2024	\$41.92	\$14.41	\$18.67	\$0.00	\$75.00
	08/01/2024	\$41.92	\$14.91	\$18.67	\$0.00	\$75.50
	12/01/2024	\$41.92	\$14.91	\$20.17	\$0.00	\$77.00
	06/01/2025	\$42.92	\$14.91	\$20.17	\$0.00	\$78.00
	08/01/2025	\$42.92	\$15.41	\$20.17	\$0.00	\$78.50
	12/01/2025	\$42.92	\$15.41	\$21.78	\$0.00	\$80.11
	06/01/2026	\$43.92	\$15.41	\$21.78	\$0.00	\$81.11
	08/01/2026	\$43.92	\$15.91	\$21.78	\$0.00	\$81.61
	12/01/2026	\$43.92	\$15.91	\$23.52	\$0.00	\$83.35
TUNNEL WORK - COMPRESSED AIR <i>LABORERS (COMPRESSED AIR)</i>	12/01/2023	\$56.56	\$9.65	\$18.67	\$0.00	\$84.88
	06/01/2024	\$58.04	\$9.65	\$18.67	\$0.00	\$86.36
	12/01/2024	\$59.51	\$9.65	\$18.67	\$0.00	\$87.83
	06/01/2025	\$61.01	\$9.65	\$18.67	\$0.00	\$89.33
	12/01/2025	\$62.51	\$9.65	\$18.67	\$0.00	\$90.83
	06/01/2026	\$64.06	\$9.65	\$18.67	\$0.00	\$92.38
	12/01/2026	\$65.56	\$9.65	\$18.67	\$0.00	\$93.88
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) <i>LABORERS (COMPRESSED AIR)</i>	12/01/2023	\$58.56	\$9.65	\$18.67	\$0.00	\$86.88
	06/01/2024	\$60.04	\$9.65	\$18.67	\$0.00	\$88.36
	12/01/2024	\$61.51	\$9.65	\$18.67	\$0.00	\$89.83
	06/01/2025	\$63.01	\$9.65	\$18.67	\$0.00	\$91.33
	12/01/2025	\$64.51	\$9.65	\$18.67	\$0.00	\$92.83
	06/01/2026	\$66.06	\$9.65	\$18.67	\$0.00	\$94.38
	12/01/2026	\$67.56	\$9.65	\$18.67	\$0.00	\$95.88
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR <i>LABORERS (FREE AIR TUNNEL)</i>	12/01/2023	\$48.63	\$9.65	\$18.67	\$0.00	\$76.95
	06/01/2024	\$50.11	\$9.65	\$18.67	\$0.00	\$78.43
	12/01/2024	\$51.58	\$9.65	\$18.67	\$0.00	\$79.90
	06/01/2025	\$53.08	\$9.65	\$18.67	\$0.00	\$81.40
	12/01/2025	\$54.58	\$9.65	\$18.67	\$0.00	\$82.90
	06/01/2026	\$56.13	\$9.65	\$18.67	\$0.00	\$84.45
	12/01/2026	\$57.63	\$9.65	\$18.67	\$0.00	\$85.95
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TUNNEL WORK - FREE AIR (HAZ. WASTE) <i>LABORERS (FREE AIR TUNNEL)</i>	12/01/2023	\$50.63	\$9.65	\$18.67	\$0.00	\$78.95
	06/01/2024	\$52.11	\$9.65	\$18.67	\$0.00	\$80.43
	12/01/2024	\$53.58	\$9.65	\$18.67	\$0.00	\$81.90
	06/01/2025	\$55.08	\$9.65	\$18.67	\$0.00	\$83.40
	12/01/2025	\$56.58	\$9.65	\$18.67	\$0.00	\$84.90
	06/01/2026	\$58.13	\$9.65	\$18.67	\$0.00	\$86.45
	12/01/2026	\$59.63	\$9.65	\$18.67	\$0.00	\$87.95
For apprentice rates see "Apprentice- LABORER"						
VAC-HAUL <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2023	\$40.34	\$14.41	\$18.67	\$0.00	\$73.42
	06/01/2024	\$41.34	\$14.41	\$18.67	\$0.00	\$74.42
	08/01/2024	\$41.34	\$14.91	\$18.67	\$0.00	\$74.92
	12/01/2024	\$41.34	\$14.91	\$20.17	\$0.00	\$76.42
	06/01/2025	\$42.34	\$14.91	\$20.17	\$0.00	\$77.42
	08/01/2025	\$42.34	\$15.41	\$20.17	\$0.00	\$77.92
	12/01/2025	\$42.34	\$15.41	\$21.78	\$0.00	\$79.53
	06/01/2026	\$43.34	\$15.41	\$21.78	\$0.00	\$80.53
	08/01/2026	\$43.34	\$15.91	\$21.78	\$0.00	\$81.03
	12/01/2026	\$43.34	\$15.91	\$23.52	\$0.00	\$82.77
WAGON DRILL OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2023	\$44.58	\$9.65	\$18.07	\$0.00	\$72.30
For apprentice rates see "Apprentice- LABORER"						
WAGON DRILL OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 1 (HEAVY & HIGHWAY)</i>	12/01/2023	\$44.58	\$9.65	\$18.07	\$0.00	\$72.30
	06/01/2024	\$46.06	\$9.65	\$18.07	\$0.00	\$73.78
	12/01/2024	\$47.53	\$9.65	\$18.07	\$0.00	\$75.25
	06/01/2025	\$49.03	\$9.65	\$18.07	\$0.00	\$76.75
	12/01/2025	\$50.53	\$9.65	\$18.07	\$0.00	\$78.25
	06/01/2026	\$52.08	\$9.65	\$18.07	\$0.00	\$79.80
12/01/2026	\$53.58	\$9.65	\$18.07	\$0.00	\$81.30	
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
WASTE WATER PUMP OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$55.03	\$15.00	\$16.40	\$0.00	\$86.43
	06/01/2024	\$56.33	\$15.00	\$16.40	\$0.00	\$87.73
	12/01/2024	\$57.78	\$15.00	\$16.40	\$0.00	\$89.18
	06/01/2025	\$59.08	\$15.00	\$16.40	\$0.00	\$90.48
	12/01/2025	\$60.53	\$15.00	\$16.40	\$0.00	\$91.93
	06/01/2026	\$61.83	\$15.00	\$16.40	\$0.00	\$93.23
12/01/2026	\$63.28	\$15.00	\$16.40	\$0.00	\$94.68	
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
WATER METER INSTALLER <i>PLUMBERS & GASFITTERS LOCAL 12</i>	03/03/2024	\$67.74	\$14.32	\$19.11	\$0.00	\$101.17
	09/01/2024	\$69.54	\$14.32	\$19.11	\$0.00	\$102.97
	03/02/2025	\$71.34	\$14.32	\$19.11	\$0.00	\$104.77
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						

Additional Apprentices Information:

Minimum wage rates for apprentices employed on public works projects are listed above as a percentage of the pre-determined hourly wage rate established by the Commissioner under the provisions of the M.G.L. c. 149, ss. 26-27D. Apprentices ratios are established by the Division of Apprenticeship Training pursuant to M.G.L. c. 23, ss. 11E-11L.

All apprentices must be registered with the Division of Apprenticeship Training in accordance with M.G.L. c. 23, ss. 11E-11L.

All steps are six months (1000 hours.)

Ratios are expressed in allowable number of apprentices to journeymen or fraction thereof, unless otherwise specified.

** Multiple ratios are listed in the comment field.

*** APP to JM; 1:1, 2:2, 2:3, 3:4, 4:4, 4:5, 4:6, 5:7, 6:7, 6:8, 6:9, 7:10, 8:10, 8:11, 8:12, 9:13, 10:13, 10:14, etc.

**** APP to JM; 1:1, 1:2, 2:3, 2:4, 3:5, 4:6, 4:7, 5:8, 6:9, 6:10, 7:11, 8:12, 8:13, 9:14, 10:15, 10:16, etc.

00 91 00
MBE & WBE PROGRAM REQUIREMENTS

MINORITY BUSINESS ENTERPRISE PROGRAMS (MBE)
WOMEN BUSINESS ENTERPRISE PROGRAMS (WBE)

CONTRACT COMPLIANCE REQUIREMENTS

GENERAL

The Town of Weymouth has put into effect a Town-Wide Minority Business Enterprise (MBE) and Women's Business Enterprise (WBE) Program. **To comply with the requirements of these programs, the apparent low bidder must submit to the Awarding Authority, the appropriate MBE/WBE forms within 5 working days after the receipt of bids.** The Awarding Authority, at their discretion, may grant an extension of time to submit these documents, if deemed to be appropriate and in the public interest to do so. Letters of Intent are not required for subcontractors, however, filed sub bidders who are SOMWBA Certified shall be listed on the Participation Schedule. Submit the completed Participation Schedule and Letters of Intent to:

Town of Weymouth
75 Middle Street
Weymouth, Massachusetts 02189
781-335-2000

Failure to submit the required Participation Schedule and Letters of Intent or failure to meet the percentage of participation stated or failure to produce acceptable evidence of unsuccessful attempts at compliance will result in rejection of the bid. The bidder will be ineligible for contract award unless the Awarding Authority has granted a waiver or extension of time. Requests for such a waiver or extension must be made to the Awarding Authority by 4:30 PM on the fifth (5th) working day following the general bid opening. In cases of such failure, the next lowest eligible bidder shall be notified or given five (5) working days to submit the Participation Schedule and Letters of Intent.

The Bidders must submit, prior to, and as a condition of contract approval, signed subcontracts with all subcontractors or a purchase order or invoice from material suppliers or manufacturers listed on the Participation Schedule unless waivers are granted.

Filed sub bidders are not required to submit a Participation Schedule. They may, at their option, if they are a SOMWBA Certified Enterprise, submit a Letter of Intent with their bid. If a filed subcontractor intends to sub-sub work to a SOMWBA Certified Enterprise, and the general contractor wishes for the subcontract to be credited towards participation for this contract, a Participation Schedule and Letter of Intent is required.

PROCEDURE

The Town of Weymouth's MBE/WBE requirements are as follows:

1. Secure a copy of the State Office of Minority and Women Business Assistance (SOMWBA) Certified Minority and Women Directory. The Town of Weymouth will accept only MBE and WBE firms approved by SOMWBA. Copies of the directory are available from SOMWBA, 100 Cambridge Street, 13th Floor, Boston, Massachusetts 02202; or you may purchase the directory at the State House Book Store.
2. Attempt to develop a bid that includes a goal of not less than ten percent (10%) of the total bid price to be spent on Minority Business Enterprises and a goal of not less than five percent (5%) of the total bid price to be spent on Women Business Enterprises. These goals are met by subcontracting work to, or purchasing materials from, one or more SOMWBA approved Minority Business and Women Business Enterprises.
3. To make the attempt to secure at least ten percent (10%) Minority Business Participation and at least five percent (5%) Women Business Participation, the general contractor should contact as many of the subcontractors of services/supplies in the SOMWBA Directory as

- necessary, and should keep a record of each firm contacted; and all other information called for under Special Provisions for Participation by Minority and Women Business Enterprise.
4. If you are successful in securing at least ten percent (10%) or more Minority Business Participation and at least five percent (5%) or more Women Business Participation, you must:
 - A. Complete and submit Schedule for Participation by Minorities and Women Business Enterprise.
 - B. Have each participating Minority/ Women Owned Business complete a Letter of Intent to participate.
 5. If, after contacting all the SOMWBA approved firms in the trades or materials categories you are not able to secure at least ten percent (10%) Minority Business Participation and five percent (5%) Women Business Participation, then you must:
 - A. Complete and submit Contractor Request for an Extension.
 - B. Complete and submit Information on Unsuccessful MBE/WBE Contact.
 6. Prior to awarding a contract, Items 1 and 2 must be completed to reflect the ten percent (10%) and five percent (5%) respectively, unless the contractor can support why they cannot comply with the established requirements.

**SPECIAL PROVISIONS
FOR PARTICIPATION BY
MINORITY AND WOMEN BUSINESS ENTERPRISES**

I. PERCENTAGE PARTICIPATION

Under this contract the percentage goal of the work required to be performed by the Minority and Women Businesses shall be a goal of not less than the following percentages of the total contract price:

- Minority Contractor – Ten Percent (10%) Women Contractor – Five Percent (5%)

II. DEFINITIONS

For the purposes of this Special Provision, the following terms are defined:

- A. Minority – Refers to persons who are citizens or lawful permanent residents of the United States and whose origins are in any of the following racial or ethnic groups: Black, Cape Verdean, Central/South American, Native American or Asian.
- B. Women – Self explanatory.
- C. Contractor – Refers to any business who contracts or subcontracts construction, demolition, renovation or maintenance work in the various classifications customarily used in public work and is acting in this capacity under the subject contract.
- D. Minority and Women Contractors – Refers to any contractor determined by the State Office of Minority and Women Business Assistance (SOMWBA) to be at least fifty-one percent (51%) owned and controlled by minority persons or women as appropriate, hereinafter referred to as MBE/WBE.
 - In the case of any business organization other than a joint venture, the business shall be considered a MBE/WBE only if it is independently owned and operated and if minority persons or women have at least fifty-one percent (51%) beneficial ownership

and control of the business including, where applicable, to the particular form of business organization, at least fifty-one percent (51%) of each of the following:

Participation in management of the enterprise includes;

- (a) Unrestricted voting rights;
- (b) Unrestricted and unencumbered ownership including the right to partake of all the benefits attached to ownership.

- If a corporation has more than one class of stockholders, the ownership requirements must be met as to each class of stock. The existence of any agreements, options rights of conversion or other restraints on the existing distribution or ownership and control, which may be exercised within three years and which, if executed, could reduce minority/women ownership or control to less than fifty-one percent (51%), shall establish that the existing business enterprise does not qualify as an MBE/WBE.
- E. Joint Ventures - A joint venture between a certified MBE/WBE and a non-certified MBE/WBE shall be certified by SOMWBA as a MBE/WBE if the certified MBE/WBE has at least fifty-one percent (51%) control over the management and receipt of profits of the project bid upon.
- A joint venture between a certified MBE/WBE subcontractor and a non MBE/WBE subcontractor, in which the MBE/WBE does not exercise more than fifty-one percent (51%) control over management and profits, shall be entitled to MBE/WBE credit equal to that portion of the MBE/WBE's participation in the joint venture. For example, if the MBE participates in twenty percent (20%) of the work, the contractor is entitled to twenty percent (20%) credit.
 - Whenever a general bid is filed jointly with a certified MBE/WBE participant in the joint venture and the MBE/WBE does not exercise more than fifty-one percent (51%) control over management and profits, that joint venture shall be entitled to MBE/WBE credit equal to that portion of the MBE/WBE's participation in the joint venture. For example, if the MBE participates in twenty percent (20%) of the work, the contractor is entitled to twenty percent (20%) credit.
 - Whenever a joint venture with a certified MBE/WBE participant files a general bid or sub bid, and requests credit as an MBE/WBE, the bid must be accompanied by the pre bid joint venture agreement for that project. SOMWBA certified joint ventures should submit a copy of SOMWBA certification.
- F. Material Supplier – Refers to a vendor certified by SOMWBA as a MBE/WBE engaged in sales to the construction industry from an established place of business or source of supply, which either;
- (a) Manufactures goods from raw materials or substantially alters them before resale, entitling the general contractor to MBE/WBE credit for the full amount of the purchase order; or
 - (b) Maintains a storage facility for materials utilized in the work, entitling the general contractor to MBE/WBE credit for ten percent (10%) of the purchase order.
- G. Perform – Refers to doing work by a contractor by its own organization either under the prime contract or a subcontract approved by the Commission.
- H. Percent of Total Price – The percentage of work a MBE/WBE participates in of the entire contract should represent the same percentage of money of the entire contract that the MBE/WBE is entitled.

- III. DETERMINATION OF MBE/WBE CONTRACTORS BY THE STATE OFFICE OF MINORITY AND WOMEN BUSINESS ASSISTANCE (SOMWBA)
- Any contractor or subcontractor, sub-sub contractor or materials supplier may apply to SOMWBA for MBE/WBE status. Applications shall be made on a form provided by SOMWBA entitled SOMWBA MINORITY AND WOMEN BUSINESS APPLICATION.
 - SOMWBA will prepare, publish and update from time to time a list of MBE/WBE's for the purpose of providing a reference source to assist any contractor in meeting the requirements of this Special Provision. Contractors shall seek assurances from their proposed subcontractor and materials supplier that it meets the SOMWBA requirements for designation as a MBE/WBE.
 - In meeting the requirements of this Special Provision, contractors are not limited to the list referred to in sub section IIIB. In seeking out and negotiating with MBE/WBE's and determining which item of work shall be subcontracted to MBE/WBE contractors but said subcontractors must be SOMWBA certified prior to the award of a contract.
 - Contractors shall exercise their own judgement in selecting any subcontractor to perform any portion of the work.
- IV. REQUIREMENTS FOR CONTRACT AWARD
- The general contractor shall submit Item I and Item II under Schedule for Participation by Women and Minority Business Enterprise with a Letter of Intent. A separate Letter of Intent shall be signed by each MBE/WBE proposed to be used by the contractor. The Letter of Intent includes, among other things, the contract items that the MBE/WBE is proposing to perform and the prices that the MBE/WBE proposes to charge for the work.
 - Item I and Item II under Schedule for Participation by Women and Minority Business Enterprise shall list those MBE/WBE's with whom the contractor intends to subcontract, identifying the total price to be paid to each MBE/WBE as taken from each Letter of Intent.
 - For all prospective MBE/WBE's not included in the SOMWBA list of MBE/WBE's referred to in subsection III, the contractor shall submit the SOMWBA Minority and Women Certification Application.
 - If, after contacting all the SOMWBA approved firms in the trades or materials categories a contractor is unable to secure at least ten percent (10%) Minority Business Participation and at least five percent (5%) Women Business Participation; the contractor must complete the following:
 - (a) Contractor Request for an Extension
 - (b) Information on Unsuccessful MBE/WBE Contact
 - A ten (10) day extension will subsequently be granted in writing by the town for the purposes of completing the MBE/WBE goals established by the town as identified in section I.
- V. COMPLIANCE
- If the Participation Schedule or any of the Letters of Intent are materially incomplete, the Awarding Authority shall rescind its vote of award, treat the bid informal as to substance and reject the bid. If the Participation Schedule or any of the Letters of Intent are incomplete in other respects, the Awarding Authority may waive the informalities upon the satisfactory completion of the required information by the contractor and the MBE/WBE as applicable.

- If the Awarding Authority finds that the percentage of the MBE/WBE participation submitted by the contractor on his Participation Schedule does not meet the percentage requirements in Section I and the contractor has not or cannot otherwise comply with the requirement, the Awarding Authority shall rescind its vote of award and find such contractor not eligible for award of the contract.
- The Awarding Authority has the right to approve or not approve all subcontractors.
- The contractor shall not perform or subcontract to any other contractor, any work designated for the named MBE/WBE on the Schedule submitted by the contractor under Section V without the approval of the Town of Weymouth.
- A contractor's compliance with the percentage requirement identified in Section I shall continue to be determined by reference to the required percentage of the total contract price as stated in Section I even though the total of actual contract payments may be greater or less than the bid price.
- A contractor who has complied with their schedule submitted under Section IV, except for approved underruns, deletions or other changes affecting performance of the items of work listed in the Schedule shall be considered to have met their obligations under this Special Provision.
- Any change or substitution of the officers or stockholders in the MBE/WBE organization that reduces the minority/women ownership or control to less than the requisite percentage will immediately rescind the MBE/WBE designation. Compliance with this Special Provision obligation will be considered terminated immediately upon notification that the MBE/WBE designation has been rescinded. The contractor shall then proceed in accordance with Section V.
- The contractor shall notify the Town of Weymouth and SOMWBA of any evident facts indicating that he will be unable to comply with Section I.
- If the contractor desires to comply with Section I but for reasons beyond their control cannot subcontract work to MBE/WBE in accordance with the Participation Schedule submitted by the contractor under Section IV, the reasons for their inability to comply with their own Schedule may be submitted to the Town of Weymouth and SOMWBA identifying the new proposed revisions to the Schedule identifying how the obligations under Section I will be met. If approved by the Town of Weymouth, the new revised Participation Schedule shall govern the contractor's performance schedule in meeting the Town of Weymouth's obligations under this Special Provision.

VI. SANCTIONS

- If the contractor does not comply with the terms of this Special Provision, the Awarding Authority may:
 - (a) Suspend any payment for the work that should have been performed by a MBE/WBE pursuant to the schedule or;
 - (b) Require specific performance of the contractor's obligation under Section I by requiring the contractor to subcontract with a MBE/WBE for any contract or specialty item at the contract price established for that item in the Participation Schedule submitted by the contractor.
- To the extent that the contractor has not complied with the terms of this Special Provision, the Awarding Authority may retain an amount determined by multiplying the total bid price of the contract by the percentage in Section I, less any amount paid to

MBE/WBE's for work performed under the contract and any payments already suspended under Section VI.

- In addition, or as an alternative, to the remedies under Section VI, the Awarding Authority may suspend, terminate or cancel this contract, in whole or in part, or may call upon the contractor's surety to perform all terms and conditions of the contract, unless the contractor is able to demonstrate his compliance with the terms of this Special Provision, and further deny to the contractor the right to participate in any future contracts awarded by the Awarding Authority or a period of up to three (3) years.
- In any proceeding involving the imposition of sanctions by the Awarding Authority, no sanctions should be imposed if the Awarding Authority finds that the contractor has taken every possible measure to comply with the Special Provision or that some other justifiable reason exists for waiving the Special Provision in whole, or in part.
- The contractor shall provide such information as is necessary in the judgement of the Awarding Authority to ascertain its compliance with the terms of this Special Provision.

VI. HEARINGS AND APPEAL

- No sanctions under Section IV shall be imposed by the Awarding Authority except in an adjudicator proceeding that may be appealed under the provisions of Chapter 30A of the Massachusetts General Laws.
- A contractor shall have the right to request suspension of any sanctions imposed under Section VI upon a showing that he is in compliance with this Special Provision.

**SCHEDULE FOR PARTICIPATION BY
 MINORITY BUSINES ENTERPRISE AND WOMEN BUSINESS ENTERPRISE**

Note: Participation of a Minority or Women owned enterprise should be counted in only one category and computed accordingly.

ITEM I
 Minority Business Enterprise Participation (MBE)

Name and Address of MBE	Nature of Participation	Dollar Value of Participation
1.		
2.		
3.		
//////////////////////////////////// ////////////////////////////////////	//////////////////////////////////// ////////////////////////////////////	//////////////////////////////////// ////////////////////////////////////
<u>Total MBE Commitment</u> (dollars)	//////////////////////////////////// ////////////////////////////////////	\$
<u>Total MBE Commitment</u> (percentage)	//////////////////////////////////// ////////////////////////////////////	%
//////////////////////////////////// ////////////////////////////////////	//////////////////////////////////// ////////////////////////////////////	//////////////////////////////////// ////////////////////////////////////
<u>Total Bid Price</u>	//////////////////////////////////// ////////////////////////////////////	\$

ITEM II
Women Business Enterprise Participation (WBE)

Name and Address of WBE	Nature of Participation	Dollar Value of Participation
1.		
2.		
3.		
//////////////////////////////////// ////////////////////////////////////	//////////////////////////////////// ////////////////////////////////////	//////////////////////////////////// ////////////////////////////////////
<u>Total</u> WBE Commitment (dollars)	//////////////////////////////////// ////////////////////////////////////	\$
<u>Total</u> WBE Commitment (percentage)	//////////////////////////////////// ////////////////////////////////////	%
//////////////////////////////////// ////////////////////////////////////	//////////////////////////////////// ////////////////////////////////////	//////////////////////////////////// ////////////////////////////////////
<u>Total</u> Bid Price	//////////////////////////////////// ////////////////////////////////////	\$

**SCHEDULE FOR PARTICIPATION BY
MINORITY BUSINES ENTERPRISE AND WOMEN BUSINESS ENTERPRISE
Page 2**

The General Bidder agrees that once they have been awarded the contract, they will comply with the ten percent (10%) Minority Business Participation (MBE) and five percent (5%) Women Business Participation (WBE). Breach of this commitment constitutes a breach of the contract.

Date _____

Name of General Bidder _____

Signature _____

Name and Title _____

Business Address _____

City/Town and State _____

Business Phone _____

Business FAX _____

LETTER OF INTENT BY
MINORITY BUSINESS ENTERPRISE AND WOMEN BUSINESS ENTERPRISE

Note: This page is to be completed by the MBE's and WBE's submitted by the General Bidder.

My company intends to perform work as:

- _____ an individual
- _____ a corporation
- _____ a partnership
- _____ a joint venture with _____
- _____ other (please explain) _____

My company has been certified by SOMWBA and it has not changed its minority/women ownership, control or management without notifying SOMWBA within thirty (30) days of such change.

My company understands that if your company is awarded the contract, your company intends to enter into an agreement with my company to perform the activity described below for the prices indicated. My company also understands that your company, as General Bidder, will make substitutions only as allowed by Section V of the Special Provisions.

MBE/WBE PARTICIPATION

Name of MBE/WBE	Quantity	Unit Price	Amount
1.		\$ per	\$
2.		\$ per	\$
3.		\$ per	\$
4.		\$ per	\$
Total Amount	//////////////////////////////////// ////////////////////////////////////	//////////////////////////////////// ////////////////////////////////////	\$

Date _____

Name of MBE/WBE _____

Signature _____

Name and Title _____

Business Address _____

City/Town and State _____

Business Phone/FAX _____

**CONTRACTOR REQUEST FOR AN EXTENSION
MINORITY BUSINES ENTERPRISE AND WOMEN BUSINESS ENTERPRISE**

The below signed general bidder certifies that it made a good faith effort to develop the required ten percent (10%) Minority and five percent (5%) Women Business Enterprise Participation in this contract but was able to develop only _____ percent.

The below signed general bidder further certifies that it contracted the firms listed below from the State Office of Minority and Women Business Assistance (SOMWBA) Directory and that said contacts were bona fide efforts to develop the required contract but were unsuccessful due to circumstances beyond the control of the general bidder. The information given on the following pages about each contact is accurate and complete.

MBE/WBE 's contacted:

24 APRIL 2024

1.	11.
2.	12.
3.	13.
4.	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

The below signed general bidder therefore requests that the Town of Weymouth grant an extension of ten (10) working days in order to provide the general bidder an opportunity to secure the required percentage of MBE/WBE Participation.

Date _____

Name of General Bidder _____

Signature _____

Name and Title _____

Business Address _____

City/Town and State _____

Business Phone/FAX _____

**INFORMATION ON UNSUCCESSFUL MBE/WBE CONTACT
MINORITY BUSINESS ENTERPRISE AND WOMEN BUSINESS ENTERPRISE**

Note: Additional copies of this form shall be prepared by the general bidder in the quantity necessary for each MBE/WBE listed on the previous page.

1. Name of MBE/WBE contacted _____

2. Address of MBE/WBE contacted _____

3. Telephone of MBE/WBE contacted _____

5. Date of initial contact _____

- (a) _____ by telephone
- (b) _____ in person
- (c) _____ by mail

6. Sub-Contract work offered to MBE/WBE _____

7. Result of contact (Please check appropriate answer.)

- (a) _____ MBE/WBE declined job
- (b) _____ MBE/WBE offered to do job at price of \$_____, which was determined to be too high
- (c) _____ MBE/WBE offered to do job at price of \$_____, which was satisfactory, however, MBE/WBE was judged by our company to be unqualified for the job
- (d) _____ other

8. Name and title of MBE/WBE officer who can verify the above _____

It is certified herewith by the below-signed general bidder that the above information is accurate and complete.

Date _____

Name of General Bidder _____

Signature _____

Name and Title _____

Business Address _____

City/Town and State _____

Business Phone/FAX _____

PART 3 - PROJECT SPECIFICATIONS

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SECTION 01 00 00 - GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT, GENERAL CONDITIONS, and SUPPLEMENTARY CONDITIONS and all Sections within Division 1 Section 01 00 00 - GENERAL REQUIREMENTS, which are hereby made a part of this Section of the Specifications.

1.2 PROJECT REQUIREMENTS

- A. Project Identification: Wessagusset Walk Project, Wessagusset/George E Lane Beach, Weymouth, Massachusetts.
- B. The work shall be completed between the Tuesday after Labor Day 2024 and the Friday before Memorial Day 2025.
- C. Prior to the commencement of work a neighborhood meeting will be held by the Town and attended by the contractor.
- D. Particular Project Requirements:
 - 1. Occupancy of Adjacent Facilities: The project involves utility, curbing, slab and retaining wall work in the Wessagusset Road Right of Way, and the Wessagusset Road roadway shall remain open to traffic throughout the entire construction project. However, the portion of the Wessagusset Road sidewalk included within the project Limit of Work may be closed to public access during portions of construction period as needed to ensure public safety during neighboring construction activities.
 - 2. Disturbance of Adjacent Structures: Care shall be taken to not disturb adjacent structures and property including the existing retaining wall portions to remain, sidewalk & curb, utility poles, drainage grates, stockade fence, dwellings, pools, timber decks, and patios related to Wessagusset Road and the properties along Regatta Road. Some of these structures adjacent to the bank are observed to be in various states of disrepair and will require special care during the construction period so as not to cause further damage to them.
 - 3. This project is located in an environmentally sensitive area that is regulated by the Weymouth Conservation Commission and the Massachusetts Department of Environmental Protection. Attached in the Appendix is a copy of the two (2) Order of Conditions issued by the Commission for this project. The Order of Conditions #81-1213 for the revetment, and the Order of Conditions #81-2145 for the landscaping and plantings. The contractor shall familiarize themselves with and abide by all of the conditions in this Order for the duration of the project including time of year work restrictions. The contractor shall prepare and post at the site the required DEP File # sign prior to the start of any construction activities.
 - 4. The contractor shall install and maintain temporary security fencing along the perimeter of the site to prevent non-authorized access to the site for the entire construction period.

5. The contractor shall install and maintain a temporary project sign along Wessagusset Beach. The language of the sign will be provided by the Town.
 6. Environmental and Slope Monitoring and Maintenance: The Contractor shall be responsible for monitoring and maintaining the stability of the slope and the viability of the plants during the duration of construction and two years from the date of substantial completion. The monitoring would include but is not limited to regular site visits to observe site conditions for bank stability and erosion. The monitoring will also include spring and fall reporting to the Town summarizing the status of the slope, activities, and maintenance needs. The maintenance would include a guarantee of the plants, invasive species management to be conducted in accordance with the plans prepared by KZLA and maintaining the stability of the slope as needed.
 7. The Contractor shall be responsible for and repair any slope failures, or other stability issues along the slope, as well as damage to the adjacent slopes, structures, or other facilities.
 8. Contractor shall note that the existing steep coastal bank above the beach is only marginally stable. Much of the work of this contract includes actions (e.g., temporary cuts at toe and on slope, vegetation removal, exposure of unreinforced toe to wave action, etc.) That could potentially destabilize portions of the slope. Contractor shall take all care necessary to protect and reinforce the coastal bank against failure; including, but not limited to:
 - a. Preparation of an OSHA-compliant support of excavation plan for all phases of the project.
 - b. Preventing any significant surcharges along the top of slope.
 - c. Controlling run-on and run-off.
 - d. Protecting exposed slopes with suitable erosion control measures
 - e. Phasing the work to limit the length of bank exposed to destabilizing toe cuts at any one time.
 - f. Phasing the work with respect to the tides to protect the exposed toe.
 - g. Phasing the work to complete the buttressing lower slope work before initiating work on the slope above the boardwalk.
- E. Project Requirements for Temporary Utilities and Facilities:
1. Utility Costs: The Contractor shall meter and pay for the cost of utility services consumed, including electricity, water, gas and temporary heat.
 2. Temporary Offices: A separate field office trailer for the Engineer and the Owner's Representative is required for the winter months.
 3. Toilet Facilities: The Contractor shall provide and maintain temporary toilets on the site for the duration of the construction project.
 4. Staging and Access Areas: A proposed staging and access plan is included with the plan set to show the recommended staging and access areas. Other plans shall be subject to Town approval, including

any access via the waterway.

- F. Permits and Fees: Apply for, obtain, and pay for permits, fees, and utility company back charges required to perform the work. Submit copies to Engineer.
- G. Codes: Comply with applicable codes and regulations of authorities having jurisdiction. Submit copies of inspection reports, notices, and similar communications to Engineer.
- H. Dimensions: Verify dimensions indicated on drawings with field dimensions before fabrication or ordering of materials. Do not scale drawings.
- I. Existing Conditions: Notify Engineer of existing conditions differing from those indicated on the drawings.
- J. Contractor's Conduct on Premises: The Contractor and their employees shall behave in a respectful, courteous, and safe manner. Abusive, harassing, and lewd behavior is prohibited. Music playing is prohibited. Alcohol, tobacco, and drug use is prohibited.
 - 1. Comply with the Owner's security requirements.

1.3 SPECIFICATION INFORMATION

- A. These specifications are a specialized form of technical writing edited from master specifications and contain deviations from traditional writing formats. Capitalization, underlining and bold print is only used to assist the reader in finding information and no other meaning is implied.
- B. Except where specifically indicated otherwise, the subject of all imperative statements is the Contractor.
- C. Sections are generally numbered in conformance with Construction Specifications Institute Masterformat System. Numbering sequence is not consecutive. Refer to the Table of Contents for names and numbers of sections included in this Project.
- D. Pages are numbered separately for each section. Each section is noted with "End of Section" to indicate the last page of a section.

1.4 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's/Engineer's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's/Engineer's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect/Engineer. Other terms including "requested," "authorized," "selected," "approved," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.5 INDUSTRY STANDARDS

- A. Referenced standards are part of the Contract Documents and have the same force and effect as if bound with these specifications.
- B. Except where specifically indicated otherwise, comply with the current standard in effect as of the date of the Owner/Contractor Agreement. Obtain copies of industry standards directly from the publisher.
- C. The titles of industry standard organizations are commonly abbreviated; full titles may be found in Encyclopedia of Associations or consult Engineer.

1.6 CODES AND REGULATIONS

- A. Comply with all applicable codes, ordinances, regulations, and requirements of authorities having jurisdiction.
- B. Submit copies of all permits, licenses, certifications, inspection reports, releases, notices, judgments, and communications from authorities having jurisdiction to the Engineer.

1.7 PROGRESS SCHEDULE

- A. Provide a comprehensive bar chart schedule showing all major and critical minor portions of the work, sequence of work and duration of each activity. Update and reissue regularly, but not less than monthly. Schedule should include phasing of work required for slope stability.

1.8 SCHEDULE OF VALUES

- A. Prepare Schedule of Values to coordinate with application for payment breakdown. Submit at least 10 days before the first payment application. Update and reissue regularly, but not less than monthly.

1.9 PAYMENT REQUESTS

- A. Provide three copies of each request on completely filled out copies of AIA G702 and continuation sheet G703. Substantiate requests with complete documentation; include change orders to date. Provide partial lien waivers for work in progress and full lien waivers for completed work.
- B. Record Drawing Certification: Certify as a part of each application for payment that the project record documents are current at the time of application is submitted. The Contractor shall require such drawings to be current as a condition of approving any payment to the trade Contractor and Subcontractor.
- C. Before first payment application, provide the following:

1. List of subcontractors, suppliers and fabricators.
 2. Schedule of values.
 3. Progress schedule.
 4. Submittal schedule keyed to project schedule.
 5. List of Contractor's key project personnel.
 6. Copies of permits and other communications from authorities.
 7. Contractor's certificate of insurance.
 8. Performance and payment bonds if required.
 9. Unit price schedule.
- D. Before final payment application, provide and complete the following:
1. Complete closeout requirements.
 2. Complete punch list items.
 3. Settle all claims.
 4. Transmit record documents to Engineer.
 5. Prove that all taxes, fees and similar obligations have been paid.
 6. Remove temporary facilities and surplus materials.
 7. Clean the work.
 8. Submit consent of surety, if any, for final payment.

1.10 PROCEDURES AND CONTROLS

- A. Project Meetings: Arrange for and attend meetings with the Architect/Engineer and such other persons as the Engineer requests to have present. The Contractor shall be represented by a principal, project manager, general superintendent, or other authorized main office representative, as well as by the Contractor's field superintendent. An authorized representative of any subcontractor or sub-subcontractor shall attend such meetings if the representative's presence is requested by the Engineer. Such representatives shall be empowered to make binding commitments on all matters to be discussed at such meetings, including costs, payments, change orders, time schedules and manpower. Any notices required under the Contract may be served on such representatives. Written reports of meeting minutes shall be prepared by the Engineer and distributed by the Engineer to attendees, the Contractor, and Owner within three business days.
1. Pre-Construction Conference: Attendance by Engineer, Contractor, major subcontractors, and Conservation Agent. Agenda shall include: Protection of wetland resource areas, quality of workmanship, coordination, interpretations, job schedule, submittals, approvals, requisition procedures, testing, protection of construction, cold weather procedures, and construction waste management.
 2. Subcontractors. Agenda shall include as applicable: Review of construction details, bulkhead repairs and improvements, cleaning, and cold weather procedures.
 3. Progress Meetings: Hold regularly before preparation of payment requests and additional meetings as requested by the Engineer. Attendance by Engineer, Contractor, and others as determined by Contractor. Agenda shall include work in progress and payment

- requests.
4. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction, as specified. Preinstallation Conferences may be part of Progress Meeting agenda. Attendance by Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow. Agenda shall include a review of the progress of other construction activities and preparations for the particular activity under consideration.
- B. Emergency Contacts: Furnish the Owner and Engineer, in writing, the names and telephone numbers of individuals to be contacted in the event of an out-of-hours emergency at the building site. Post a similar list readily visible from the outside of the field office or a location acceptable to the Engineer.
 - C. Layout: Furnish layout work and be responsible for all lines, elevations, and measurements of the proposed facilities, grading, utilities, and other work executed under the contract. Retain a registered land surveyor, acceptable to the Engineer, to initially establish exterior lines and required elevations of all structures to be erected on the site.
 - D. Field Measurements: Verify measurements at the site prior to ordering materials or commencing work. No extra charge or compensation will be allowed because of differences between actual dimensions and measurements indicated on the Drawings. Differences which may be found shall be submitted to the Engineer for decision before proceeding with the work.
 - E. Field Measurements for Fixed Equipment: Dimensions for fixed equipment to be supplied under this Contract or separate contracts shall be determined by field measurements taken jointly by the Contractor and the equipment supplier involved. A record of the field measurements shall be kept until time of substantial completion of the project, or until the equipment has been fully installed and accepted by the Owner, whichever is later. Responsibility for fixed equipment fabricated accurately to field measurements for proper fit and operation shall be that of the Contractor. Contractor shall pay all costs involved in correcting any misfitting fixed equipment as fabricated.
 - F. Project Limit Line: The boundaries of the site do not limit the responsibility of the Contractor to perform the work in its entirety. Make utility connections as indicated.
 - G. Matching: Where matching is indicated, the Architect/Engineer shall be the sole and final judge of what is an acceptable match. Mockups and sample submissions are required.
 - H. Observation: Notify the Engineer and authorities having jurisdiction at least thirty-six hours in advance of concealing any work.
 - I. Utilities: Prior to interrupting utilities, services, or facilities, notify the utility owner and the Owner and obtain their written approval a minimum 48 hours in advance.
 - J. Clean-Up: Frequently clean-up all waste, remove from site regularly, and legally dispose of off- site.
 - K. Installer's Acceptance of Conditions: All installers shall inspect substrates and conditions under which work is to be executed and shall report in writing to the Contractor all conditions detrimental to the proper execution and completion of

the work. Do not proceed with work until unsatisfactory conditions are corrected. Beginning work means installer accepts previous work and conditions.

- L. Coordination: The Contractor shall be fully responsible for coordinating all trades, coordinating construction sequences and schedules, and coordinating the actual installed location and interface of all work.
- M. Request For Interpretation (RFIs):
 - 1. Procedure: Immediately on discovery of the need for interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, prepare and submit an RFI in the form specified.
 - a. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
 - 2. Content of the RFI: Include a detailed, legible description of item needing interpretation.
 - 3. Engineer's Action: Engineer will review each RFI, determine action required, and return it. Allow three working days for Engineer's response for each RFI. RFIs received after 1:00 p.m. will be considered as received the following working day.
 - 4. The following RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for coordination information already indicated in the Contract Documents.
 - d. Requests for adjustments in the Contract Time or the Contract Sum.
 - e. Requests for interpretation of Engineer's actions on submittals.
 - f. Incomplete RFIs or RFIs with numerous errors.
- N. Existing Articles of Unusual Value: If during demolition, excavation, or disposal work articles of unusual value or of historical or archaeological significance are encountered, the ownership of such articles is retained by the Owner, and information regarding their discovery shall be immediately furnished to the Engineer. If the nature of the article is such that work cannot proceed without danger of damage, work in the area shall be immediately discontinued until the Engineer has determined the proper procedure to be followed. Delays in time thereby shall be a condition for which the time of the Contract may be extended. Costs incurred after discovery in the salvaging of such articles shall be borne by the Owner.

1.11 SUBMITTALS

- A. Required Submittals: Submit shop drawings, product data, initial selection samples, verification samples, calculations, coordination drawings, schedules, and all other submittals as specified in individual specification sections.
- B. Submittal Schedule: Within 30 days after award of contract and before first application for payment, prepare list of submittals in chronological sequence showing all submittals and proposed date first due at Engineer's office and proposed date due to be returned to Contractor. Note relevant specification section number.

- C. Contractor's Preparation of Submittals: Modify and customize all submittals to show interface with adjacent work and attachment to building. Identify each submittal with name of project, date, Contractor's name, subcontractor's name, manufacturer's name, submittal name, relevant specification section numbers, and Submittal Schedule reference number. Stamp and sign each submittal to show the Contractor's review and approval of each submittal before delivery to Engineer's office; unstamped and unsigned submittals will be returned without action by the Engineer. Leave 4" x 6" open space for Engineer's "action" stamp.
1. Electronic Submittals: Provide a copy of all submittals in electronic format to the Engineer. Engineer will return a file of reviewed submittal in electronic format to the Contractor for distribution to subcontractors, suppliers, fabricators, governing authorities, and others as necessary for proper performance of the Work. Unless otherwise amenable to the Engineer, additional hard copies of submittals will not be reviewed by the Engineer (or Consultant) and will not be returned to the Contractor.
 2. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
 3. Name file with submittal number or other unique identifier, including revision identifier.
 4. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Engineer and Construction Manager.
 5. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Engineer.
- D. Product Data: Provide manufacturer's preprinted literature including, without limitation, manufacturer's standard printed description of product, materials and construction, recommendations for application and use, certification of compliance with standards, instructions for installation, and special coordination requirements. Collect data into one submittal for each unit of work or system; mark each copy to show which choices and options are applicable to project.
1. Installer Copy: Verify that the Installer has a current copy of the relevant product data, including installation instructions, before permitting installation to begin.
- E. Shop Drawings: Provide accurately prepared, large scale and detailed shop drawings prepared specifically for this project. Show adjacent conditions and related work. Show accurate field dimensions and clearly note field conditions. Identify materials and products in the work shown. Note special coordination required.
1. After Engineer's action, follow specified distribution procedure.
- F. Samples: Provide units identical with final materials and products to be installed in the work. Where indicated, prepare samples to match Engineer's sample. Label each sample with description, source, generic name or manufacturer's name and model number. Engineer will review samples for confirmation of visual design intent, color, pattern, texture, and type only; Engineer will not test samples for compliance with other Contract requirements which shall remain the exclusive responsibility of the Contractor.

1. Initial Selection Samples Submittal Quantities: For initial selection purposes, submit 1 set of samples showing the complete range of colors and finishes available.
 2. Verification Samples Submittal Quantities: For verification of an initial selection, submit 3 sets of samples; one set will be returned to Contractor to be maintained at project site for quality control comparisons.
- G. Timing of Submittals: Submit submittals in a timely fashion to allow at least 10 business days for each office's review and handling. This means that submittals which have to be reviewed by the Engineer and one of their consultants require at least 20 business days for review and handling. Add ten business days for each additional consultant who must review a submission.
- H. Engineer's Action on Submittals: Engineer will review submittals, stamp with "action stamp", mark action, and return to Contractor. Engineer will review submittals only for conformance with the design concept of the project. The Contractor is responsible for confirming compliance with other Contract requirements, including without limitation, performance requirements, field dimensions, fabrication methods, means, methods, techniques, sequences and procedures of construction, coordination with other work. The Engineer's review and approval of submittals shall be held to the limitations stated in the Owner/Engineer Agreement and the Conditions of the Contract. In no case shall approval or acceptance by the Engineer be interpreted as a release of Contractor of their responsibilities to fulfill all of the requirements of the Contract Documents.
1. Required Resubmittal: Unless submittal is noted "reviewed" or "reviewed except as noted, resubmission not required," make corrections or changes to original and resubmit to Engineer.
 2. Distribution: When submittal is noted "reviewed" or "reviewed as noted, resubmittal not required," make prints or copies and distribute to Owner, Subcontractors involved, and to all other parties requiring information from the submittal for performance or coordination of related work.

1.12 WARRANTIES

- A. Warranties Required: Refer to individual specification sections for specific product warranty requirements.
- B. Procurement: Where a warranty is required, do not purchase or subcontract for materials or work until it has been determined that parties required to countersign warranties are willing to do so.
- C. Warranty Forms: Submit written warranty to Owner through Engineer for approval prior to execution. Furnish two copies of executed warranty to Owner for their records; furnish two additional conformed copies where required for maintenance manual.
- D. Work Covered: Contractor shall remove and replace other work of project which has been damaged as a result of failure of warranted work or equipment, or which must be removed and replaced to provide access to work under warranty. Unless otherwise specified, warranty shall cover full cost of replacement or repair, and shall not be pro-rated on basis of useful service life.
- E. Warranty Extensions: Work repaired or replaced under warranty shall be warranted until the original warranty expiration date or for ninety days whichever is later in time.

- F. Warranty Effective Starting Date: Guarantee period for all work, material and equipment shall begin on the date of substantial completion of the Project, not when subcontractor has completed their work nor when equipment is turned on. In addition to the one year guarantees for the entire work covered by these Contract Documents, refer to the various sections of the specifications for extended guarantee or maintenance requirements for various material and equipment.

1.13 TEMPORARY FACILITIES AND UTILITIES

- A. Scope of Temporary Work: This article is not intended to limit the scope of temporary work required under the Contract. Provide all temporary facilities and utilities needed.
- B. Permits and Fees: Obtain and pay for all permits, fees and charges related to temporary work.
- C. Codes and Authorities Having Jurisdiction for Temporary Facilities and Utilities: Comply with all requirements of authorities having jurisdiction, codes, utility companies, OSHA, and industry standards including, but not limited to the following:
 - 1. NFPA 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations.
 - 2. ANSI-A10 Series, Safety Requirements for Construction and Demolition.
 - 3. NECA National Joint Guideline NJG-6, Temporary Job Utilities and Services.
 - 4. Electrical Service: NEMA, NECA, and UL.
- D. Field Offices: Provide Contractor's field offices as needed. Keep current copies of all Contract Documents and project paperwork neatly on file at jobsite. Permit Engineer's unrestricted use of Contractor's field office facilities including copiers, telephones, plan tables, and other equipment. Furnish, maintain, and pay for light, power, phone, fax, and other field office services.
- E. Shops and Sheds: At Contractor's option, provide shops and sheds for Contractor's use as needed. Locate shops and sheds where acceptable to Owner and authorities having jurisdiction. Prior to completion of construction, temporary storage facilities and surplus stored materials shall be removed from the site.
- F. Temporary Heat: Provide temporary heat as needed to protect the work and create a suitable work environment. Provide temporary heat to protect the exterior construction against injury or damage resulting from cold temperature and dampness, to heat materials, and to maintain the minimum temperatures specified herein and in individual specification sections. Do not use heaters which would interfere with curing of mortar and grout or damage any materials.
- G. Pumping and Drainage: Protect excavations, trenches, buildings and materials from rainwater, ground water, backup or leakage of sewers, drains and other piping, and from water of any other origin. Promptly remove any accumulation of water. Provide and operate all pumps, piping and other equipment necessary for pumping, drainage and protection from water.
- H. Equipment and Tools: Provide all equipment including, but not limited to, hoists, lifts, scaffolding, machines, tools and the like, as needed for execution

of the work. Provide safe access to all parts of the work.

- I. Temporary Enclosures: Provide temporary enclosures to maintain proper temperatures and to prevent weather damage. Always maintain legal means of egress.
- J. Snow and Ice: Remove all snow and ice which interferes with work or safety.
- K. Streets, Walks and Grounds: Maintain public and private roads and walks clear of debris caused by construction operations. Repair all damage caused to streets, drives, curbs, sidewalks, fences, poles and similar items where disturbed or damaged by construction and leave them in as good condition after completion of the work as before operations started.
- L. Protection: Protect nearby property and the public from construction activities. Provide and maintain barricades, warning signs and lights, railings, walkways and similar items. Immediately repair damaged property to its condition before being damaged.
- M. Public Services: Provide temporary public services such as, street lighting, night lighting, sidewalks, covered passages, signs, signals and the like, as requested by authorities having jurisdiction.
- N. Construction Fencing: Provide construction fencing and barriers as applicable to the project and as required by code to protect personnel, the public, and to control access.
- O. Security: Secure site against unauthorized entry at all times. Provide secure, locked temporary enclosures. Protect the work at all times. Provide watchman service, if necessary, to protect the work.
- P. Signs: Erect project identification signs in compliance with details to be provided by Engineer. Signs shall be minimum 4' x 8' exterior grade plywood and shall contain the names of the project, Owner, Engineer, major Consultants, Contractor, and major financing institution. Except for safety and warning signs, no other signs are permitted. Location as acceptable to the Engineer.
- Q. Fire Prevention: Take every precaution to prevent fire. Provide and maintain in good operating condition suitable and adequate fire protection equipment and services, and comply with recommendations regarding fire protection made by the representative of the fire insurance company carrying insurance on the Work or by the local fire chief or fire marshal. The area within the site limits shall be kept orderly and clean, and all combustible rubbish shall be promptly removed from the site.
- R. Egress: Maintain safe and legal means of egress at all times.

1.14 PRODUCTS AND SUBSTITUTIONS

- A. Specified Products: In all cases in which a manufacturer's name, trade name or other proprietary designation is used in connection with materials or articles to be furnished under this Contract, whether or not the phrase "or equal" is used after such name, the Contractor shall provide the product of the named manufacturers without substitution, unless a written request for a substitution has been submitted by the Contractor and approved in writing by the Engineer.
- B. Deviations from Detailed Requirements: If the Contractor proposes to use material which, while suitable for the intended use, deviates in any way from the detailed requirements of the Contract Documents, the Contractor shall inform the Engineer in writing of the nature of such deviations at the time the

materials is submitted for approval and shall request written approval of the deviation from the requirements of the Contract Documents.

- C. Approval of Substitutions: In requesting approval of deviations or substitutions, the Contractor shall provide evidence, including, but not limited to manufacturer's data, leading to a reasonable certainty that the proposed substitution or deviation will provide a quality of result at least equal to that attainable if the detailed requirements of the Contract Documents were strictly followed. If, in the opinion of the Engineer, the evidence presented by the Contractor does not provide a sufficient basis for such reasonable certainty, the Engineer may reject such substitution or deviation without further investigation.
- D. Intent of Contract Documents: The Contract Documents are intended to produce a facility of consistent character and quality of design. All components of the facility including visible items of mechanical and electrical equipment have been selected to have a coordinated design in relation to the overall appearance of the project. The Engineer shall judge the design and appearance of proposed substitutes on the basis of the suitability in relation to the overall design of the Project, as well as for their intrinsic merits. The Engineer will not approve as equal to materials specified proposed substitutes which in the Engineer's opinion, would be out of character, obtrusive, or otherwise inconsistent with the character or quality of design of the Project. In order to permit coordinated design of color and finishes the Contractor shall furnish the substituted material in any color, finish texture, or pattern which would have been available from the manufacturer originally specified, at no additional cost to the Owner.
- E. Additional Costs or Impact: Any additional cost, or any loss or damage arising from the substitution of any material or any method for those originally specified shall be borne by the contractor, notwithstanding approval or acceptance of such substitution by the Owner or the Engineer, unless such substitution was made at the written request or direction of the Owner and the Engineer. Any decrease in the cost of the substitution shall be returned to the Owner.
- F. Manufacturers: To the greatest degree possible, provide primary materials and products from one manufacturer for each type or kind. Provide secondary materials as recommended by manufacturers of primary materials.
- G. Substitution Requests: Refer to Division 1 Section 01 62 00 - SUBSTITUTION REQUEST FORM. Submit 3 copies. Identify product to be replaced by substitute by reference to specification sections and drawing numbers. Provide Contractor's certification and evidence to prove compliance with Contract Document requirements as acceptable to Engineer.
- H. Substitution Conditions: Substitution requests will be returned without action unless one of the following conditions is satisfied. The Contractor shall state which of the following conditions applies to the requested substitution:
 - 1. Request is due to an "or equal" clause.
 - 2. Specified material or product cannot be coordinated with other work.
 - 3. Specified material or product is not acceptable to authorities having jurisdiction.
 - 4. Substantial advantage is offered Owner in terms of cost, time, or other valuable consideration.

5. Specified material or product is not available.
- I. Invalid Substitutions: Contractor's submittal and Engineer's acceptance of shop drawings, samples, product data or other submittal is not a valid request for, nor an approval of a substitution unless the Contractor presents the information when first submitted as a Request for Substitution.
- J. Compatibility of Materials Used in the Work:
 1. Ensure complete compatibility between materials.
 2. Compatibility shall include adhesion, erosion, solubility, differential thermal response, and galvanic action.
 3. Provide evidence of compatibility.
 4. Provide custom testing where evidence is not available.
 5. Where materials are not compatible, provide necessary isolation or transition materials and provide details of same.
 6. Correct defects resulting from incompatibility including de-construction and re- construction of assemblies – whether materials are part of a submittal and substitution process or not.
 7. Proposed substitutions may be rejected where compatibility information is not provided; or where compatibility is not adequately addressed, according to the Engineer's judgment; or where incompatible materials would negatively impact the project's success.

1.15 DELIVERY, STORAGE AND HANDLING

- A. Manufacturer's Instructions: Strictly comply with manufacturer's instructions and recommendations and prevent damage, deterioration, and loss, including theft. Minimize long- term storage at the site. Maintain environmental conditions, temperature, ventilation, and humidity within range permitted by manufacturers of materials and products used.

1.16 RECORD DOCUMENTS

- A. General: Keep record documents neatly and accurately. Record information as the work progresses and deliver to Engineer at time of final acceptance. Include in record documents all field changes made, all relevant dimensions, and all relevant details of the work. Keep record documents up to date with all field orders and change orders clearly indicated.
- B. Drawings: Keep four separate sets of blackline prints at the site,. Neatly and accurately note all deviations from the Contract Documents and the exact actual location of the work as installed. Marked-up and colored prints will be used as a guide to determine the progress of the work installed. Requisitions for payment will not be approved until the record documents are accurate and up-to-date.
 1. Record data to an accuracy of plus or minus 1 inch and determine and record the invert elevation of all drain lines.
 2. At completion of the work, submit one complete set of marked-up prints for review. After acceptance, these marked-up prints shall be used in the preparation of the record drawings.
 3. Engineer shall furnish Contractor with AutoCAD files for originals of the Contract Drawings. Make modifications to these files as shown on the marked-up prints. Remove superseded data to show the completed

- installation.
4. Deliver the completed AutoCAD record drawings, in the same version as Contract Drawings, properly titled and dated to the Engineer. Indicate preparer of record drawings. These record drawings shall become the property of the Owner.
- C. Specifications: Maintain one clean copy of complete specifications [including addenda, modifications, and bulletins with changes, substitutions, and selected options clearly noted. Circle or otherwise clearly indicate which manufacturer and products are actually used.
- D. Operating and Maintenance Manuals: Manuals shall be submitted which contain the following:
1. Description of the system provided.
 2. Handling, storage, and installation instructions.
 3. Detailed description of the function of each principal component of the systems or equipment.
 4. Operating procedures, including prestart up, startup, normal operation, emergency shutdown, normal shutdown, and troubleshooting.
 5. Maintenance procedures including lubrication requirements, intervals between lubrication, preventative and repair procedures, and complete spare parts list with cross reference to original equipment manufacturer's part numbers.
 6. Control and alarm features including schematic of control systems, control loop electric ladder diagrams, controller operating set points, settings for alarms and shutdown systems, pump curves and fan curves.
 7. Safety and environmental considerations.
- E. Copies of Operating and Maintenance Manuals: Three copies of the manuals shall be provided within sufficient time to allow for training of Owner's personnel. Submit one copy of the manuals to the Engineer for review no later than 90 calendar days prior to substantial completion, or building turn over, whichever comes first. Submit the remaining two copies within 15 days after first review set is returned to contractor. Progress payment may be withheld if this requirement is not met.
- F. Additional Requirements for Operating and Maintenance Manuals: The requirements for manuals applies to each packaged and field-fabricated operating system. The manuals shall be provided in three-ring side binders with durable plastic covers. The manuals shall contain a detailed table of contents and have tab dividers for major sections and special equipment.

1.17 PROJECT CLOSE OUT

- A. Complete the following prior to Substantial Completion:
1. Provide Contractor's Punch List of incomplete items stating reason for incompleteness and value of incompleteness.
 2. Advise Owner of insurance change over requirements.
 3. Submit all warranties, maintenance contracts, final certificates, and similar documents.
 4. Obtain Certificate of Occupancy and similar releases which permit the Owner's full and unrestricted use of the areas claimed "Substantially

- Complete".
5. Submit record documents.
 6. Deliver maintenance stocks of materials where specified.
 7. Complete startup of all systems and instruct Owner's personnel in proper operation and routine maintenance of systems and equipment.
 8. Complete clean up and restoration of damaged finishes.
 9. Remove all temporary facilities and utilities that are no longer needed.
 10. Request Engineer's inspection for Substantial Completion.
- B. Engineer will either issue a Certificate of Substantial Completion or notify Contractor of work which must be performed prior to issue of certificate.
- C. Complete the following prior to Final Acceptance and payment:
1. Obtain Certificate of Substantial Completion.
 2. Submit final application for payment, showing final accounting of changes in the work.
 3. Provide final releases and lien waivers not previously submitted.
 4. Submit certified copy of final punch list stating that Contractor has completed or corrected each item.
 5. Submit final meter readings, record of stored fuel and similar information, if necessary.
 6. Submit Consent of Surety for final payment.
 7. Submit evidence of Contractor's continuing insurance coverage (if required by Contract Documents).

1.18 FINAL CLEANING AND REPAIR

- A. Clean Up: Immediately prior to the Engineer's inspection for Substantial Completion, the Contractor shall completely clean the premises and clean and prepare the completed work in order for it to be used for its intended purpose in accordance with the Contract Documents. Such work shall include, but not be limited to the following:
1. Clean any sediment accumulated in catch basins.
 2. Street sweep sediment from paved surfaces.
 3. Restore all adjacent property to pre-construction or better condition.
- B. Repairs: Repair and touch-up all damaged and deteriorated products and surfaces.

PART 2 - PRODUCTS [Not Used]

PART 3 - EXECUTION [Not Used]

END OF SECTION

SECTION 01 10 00 – SUMMARY OF WORK

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes the following:
 - 1. Work covered by the contract documents.
 - 2. Work phases.
 - 3. Work under other contracts
 - 4. Use of premises.
 - 5. Owner’s occupancy requirements.
 - 6. Specification formats and conventions.
 - 7. Compliance with local regulations and ordinance
 - a. The federal permits have been applied for or a renewal was requested. The permits are under review; however, the previous permits are attached in the appendix for a reference. All these permit conditions will be enforceable during construction.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification: Wessagusset Walk
 - 1. Project Location: Wessagusset Beach/ George E Lane Beach, Weymouth, MA.
- B. Owner: Town of Weymouth, 75 Middle Street, Weymouth, MA 02189
 - 1. Owner's Representative: Robert J. Luongo, Director of Planning and Community Development
- C. Architect/Engineers:
 - 1. Tighe & Bond Company – Civil/Structural Engineers
 - 2. Kyle Zick Landscape Architects – Landscape Architects
 - 3. Crawford Land Management – Landscape Consultants
- D. The work on the Revetment, Concrete Boardwalk, Public Access Stairs, Beach Ramp, and other structures shall be completed between the Tuesday after Labor Day and the Friday before Memorial Day. The work on the be substantially completed before Memorial Day 2025.
- E. The work pertaining to the Coastal Bank and Vegetation Management shall be substantially completed after a final inspection coordinated by the Town or Engineer. This final inspection shall begin the two (2) year monitoring and maintenance guarantee for the stability/erosion of the bank and the plantings.
- F. Prior to the commencement of work a neighborhood meeting will be held by the Town and attended by the contractor.
- G. The work in this contract includes but is not limited to the following
 - 1. Remove and dispose of debris along the beach area.
 - 2. Reconstruct the revetment along the beach.
 - 3. Construction of concrete boardwalk between beaches above revetment.

4. Removal and reconstruction of the public access stairs and granite stairs.
5. Construction of accessible drop off area.
6. Vegetation management and restoration plantings along coastal bank.
7. Construction of drainage system along bank and concrete boardwalk.
8. Removal and reconstruction of the access stairs along the bank.
9. Beach nourishment.

H. Project will be constructed under a single prime contract.

1.3 USE OF PREMISES

- A. General: Contractor shall have full use of premises for construction operations, including use of Project site, during construction period. Contractor's use of premises is limited only by Owner's right to perform work or to retain other contractors on portions of Project.
- B. Use of Site: Use of premises is limited to work areas within the Contract limits indicated. Do not disturb portions of Project site beyond the areas in which the Work is indicated.
 1. Limits: Confine construction operations to site locus including beach front areas and street side sidewalk fronting the property up to two feet beyond the street curb line, and between adjacent property boundary lines as indicated on plan.
 2. Owner Access: Allow for Owner and agents to access site as needed.
 3. Regatta Road Roadway and Sidewalk: The contractor shall keep Regatta Road open to traffic at all times during the project construction period. The existing sidewalk along the entire length of the project site will be closed to public access for the duration of the construction period. The contractor shall provide police details as required to maintain uninterrupted traffic flow on Regatta Road during the project construction period.
 4. The contractor may use the entire project site for a staging and storage area during the project construction period.

1.4 SUBMITTALS:

- A. The contractor shall submit a phasing plan, staging and storage plan, traffic control plan, and a general means and methodology prior to construction starting. A recommended traffic control plan and staging plan are shown on sheet V-103.

PART 2 – PRODUCTS

1.1 PRODUCT SOURCING

- A. Per FEMA requirements, all products used within or on the project must be American Sourced Goods.

PART 3 - EXECUTION [Not Used]

END OF SECTION

Was SECTION 01 20 00 - MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 ADMINISTRATIVE SUBMITTALS

- A. Application for Payment: Suitable to Owner and as specified herein.
- B. Final Application for Payment: As specified herein.

1.2 APPLICATION FOR PAYMENT

- A. Use separate, detailed Application for Payment Form suitable to Owner for each payment application.
- B. Preparation:
 - 1. List each Change Order and Written Amendment executed prior to date of submission as a separate line item.
 - 2. Submit three (3) copies of Application for Payment Form, and such supporting data as may be requested by Owner. Deduct 5 percent retainage unless otherwise agreed to between Owner and Contractor.

1.3 MEASUREMENT - GENERAL

- A. Units of measure shown on the Bid Form shall be as follows unless specified otherwise.

<u>Item</u>	<u>Method of Measurement</u>
CY	Cubic Yard, Field Measurement by Owner/Engineer.
DAY	Day, Field Measurement by Owner/Engineer.
EA	Each, Field Measurement by Owner/Engineer.
LF	Linear Foot, Field Measurement by Owner/Engineer (measured from the cutoff elevation to the tip for piles).
SF	Square Foot, Field Measurement by Owner/Engineer.
SY	Square Yard, Field Measurement by Owner/Engineer.
LS	Unit is one, no measurement will be made.
TON	Ton, Based on Certified Trip Tickets.

1.4 PAYMENT

- A. General: Progress payment requests shall be submitted monthly.
- B. Payment for Lump Sum Work covers all Work necessary to furnish, install, and/or complete the following items in accordance with the plans and specifications:

Bid Item No.	Description
1A.	<p>General Requirements: Project management; submittals; construction meetings; coordination for telephone; electric, water, sanitary sewer, and gas company requirements; bonds and insurance requirements; downtime due to weather conditions; debris control; traffic control; site security (e.g., temporary fencing); construction phasing; survey as required; permit requirements; temporary parking area, and closeout documents.</p> <p>As part of this Bid Item, the Contractor shall be responsible for preparing hand annotated As-Built Drawings that reflect the revisions/changes made in the field. These drawings shall be utilized by the Owner/Engineer at the end of the project to prepare the Project Record Drawings. Progress payments to the Contractor by the Owner shall be contingent upon the daily preparation and maintenance of these drawings as determined by regular inspections by the Owner/Engineer.</p> <p>Payment for this Bid Item shall be 35% of the Lump Sum Bid price in the first month with the remainder of the payment (65%) being equally divided among the remaining months in the contract time.</p> <p>Payment for this Bid Item shall be considered full compensation for all labor, materials, off-site disposal, and other fees, equipment, supervision, and supplies required for the work.</p>
1B.	<p>Mobilization: Move in all personnel, equipment, and materials; and setup and install temporary trailer(s) and utilities as required.</p>
1C.	<p>Temporary Rodent Control: The Contractor is required to provide rodent control for the duration of the construction period until the substantial completion date for both the Coastal Bank and the Boardwalk and Revetment. The rodent control shall be completed by a licensed rodent exterminator.</p>
2B.	<p>Demolish Concrete Access Stairs: Demolish, remove, and dispose of existing concrete access stairs and access ramp. The limits and extents of the demolition are shown on the drawings. The materials are to be disposed of offsite.</p>
3A.	<p>Clear and Grub Existing Vegetation: Clear and grub all of the existing vegetation and invasive species, within the invasive management areas as shown on the drawings. All invasive species must be disposed of properly, and in accordance with the specifications.</p>
3D.	<p>Planting Mix: Furnish and install planting mix to support the plantings as noted on the drawings.</p>
3E.	<p>Erosion Control Blanket and Live Staking: Furnish, install, and maintain an erosion control blanket on all newly created slopes that are equal to or steeper than a 3:1 slope but less than a 2:1 slope.</p>
3F.	<p>Plantings: Shrubs, Loam, and Seed: Furnish, plant, and maintain all necessary loam, seed and shrubs as shown on the drawings.</p>

Bid Item No.	Description
3G.	<u>Plantings: Grasses & Perennials:</u> Furnish, plant, and maintain perennials as shown on the drawings.
3H.	<u>Conservation Seed Mix:</u> Furnish and install seed mix to support the plantings as noted on the drawings.
3I.	<u>Beach Grass Restoration:</u> Plant, protect, and maintain new beach grass in the areas shown on the drawings.
3K.	<u>Dune Protection:</u> Furnish, install, and maintain fencing to surround and protect the existing Coastal Dune on the project site as outlined in the Waterfront and Landscaping Plans.
3L.	<u>Minor Site Grading:</u> Grade the site to the proposed grades shown on the drawings. The minor site grading includes all required grading or touch up grading outside of the major slope grading.
3M.	<p><u>Environmental and Slope Stability Monitoring and Maintenance:</u> The work being done on the Coastal Bank is extensive and requires both clearing of the vegetation and replanting. These activities will decrease stability of the Coastal Bank Slope. Following the substantial completion date for vegetation the Contractor shall Monitor and Maintain the vegetation and stability of the slope for a period of two years.</p> <p>The Contractor shall be responsible for monitoring and maintaining the slope and the plants throughout the duration of construction and two years from the date of substantial completion. The monitoring will include but is not limited to regular site visits to observe site conditions for bank stability and erosion. The monitoring will also include spring and fall reporting to the Town summarizing the status of the slope, activities, and maintenance needs. The maintenance will include a guarantee of the plants, invasive species management to be conducted in accordance with the plans prepared by KZLA and maintaining the stability of the slope as needed.</p>
4E.	<u>Boardwalk: Cast-in-Place Concrete Ramp Retaining Wall:</u> Furnish, and install all necessary concrete, formwork, and reinforcing steel, excavate, and backfill the bank to construct the retaining wall as shown on the drawings.
5A.	<u>Accessible Parking Space and Access Drive:</u> Furnish and install all labor and items necessary to pour a concrete slab on top of the existing ramp areas, and layout an accessible parking space and drop off area including all appropriate signage, and line painting per the drawings and specifications.
5B.	<u>Timber Beach Ramp:</u> Furnish and install all labor and items necessary to construct the timber beach access ramp as shown on the drawings and specifications including but not limited to fourteen (14) class B driven piles, the timber pile caps, timber stringers, decking, and associated handrails.
6C.	<u>Remove and Replace Headwall:</u> Furnish and install all labor and items necessary to demolish the existing storm drain outfall pipe

Bid Item No.	Description
	headwall and install a new concrete headwall per the drawings and specifications.
7B.	<u>Slope Stabilization Drainage:</u> Furnish and install all necessary items and materials to construct the coarse stone, HDPE and perforated pipe drainage swales with manholes along the newly graded slope, connect to the swale at the boardwalk, and tie into the existing drainage swales as shown of the drawings.
7C.	<u>Concrete Access Ramp:</u> Furnish and install all necessary items to install the cast-in-place concrete access ramp and stairs, coarse stone sub-base, handrails, cast-in-place concrete landing, prefabricated aluminum stairs, and helical pile foundations.

- C. Payment for unit price items covers all Work necessary to furnish, install, and/or complete the items as noted in the bid form per the drawings and specifications. The quantities in the bid form are for estimating purposes only and payment will be based on the actual quantity of the measured item.

Bid Item No.	Description
2A.	<u>Demolish Concrete Debris on Beach:</u> Demolish, remove, and dispose of remaining bathhouse foundations, concrete pad, and general concrete debris along the beach. The limits and extents of the demolition are shown on the drawings. The materials are to be disposed of offsite.
2C.	<u>Demolish Concrete Pad and Saw Cutting of Sidewalk:</u> Demolish, remove, and dispose of the existing boat ramp pad and saw cut, remove, and dispose of the adjacent sidewalk pavement on the western side of the project site. The limits and extents of the demolition are shown on the drawings. The materials are to be disposed of offsite.
2D.	<u>Demolish and Sawcut of Concrete Retaining Wall:</u> Demolish, remove, and dispose of the existing concrete retaining wall between the beach and Wessagussett road. Sawcut the wall as noted on the drawings. The limits and extents of the demolition are shown on the drawings. The materials are to be disposed of offsite.
2E.	<u>Demolish Existing Cable Guard Rail:</u> Demolish, remove, and dispose of the existing concrete post and cable guard rail along Wessagussett road. The limits and extents of the demolition are shown on the drawings. The materials are to be disposed of offsite.
3B.	<u>Protect Existing Trees:</u> Protect the existing trees as called out on the drawings. Protecting the trees includes maintaining the soil around the tree, fertilization, and pruning as appropriate.
3C.	<u>Tree Protection Fence:</u> Furnish, install, and maintain a fence deemed suitable by the owner, engineer, or landscape architect, around the base of the protected trees that will adequately protect the specified trees for the duration of the project.

Bid Item No.	Description
3J.	Beach Nourishment Sand: Furnish and place beach nourishment sand in the area shown on the drawings to match the proposed grade. The nourishment sand shall be grain size compatible with the existing sand beach.
3N.	Ordinary Borrow: Furnish, delivery, and install all Ordinary Borrow material for re-grading or fill required to construct the project.
4A/4B.	<p>Boardwalk: Revetment: Reconstruct revetment including moving and setting aside the existing stones, removing and replacing the filter fabric, adding a crushed stone base, the addition and grading of the slope and new stones to complete the revetment, as well as all excavation, grading, filter fabric, and crushed stone to create the base for the concrete boardwalk. The limits and extent of the work are shown on the drawings.</p> <p>It should be noted that the estimate for reusable stone should be based off of what is visible. There is no estimated quantity related to the existing stone.</p>
4C.	Boardwalk: Precast Concrete Deck Units: Furnish and install all necessary precast concrete deck units. The deck units include all associated concrete and rebar required to construct the units, the installation and tensioning of the post-tensioned strands that run through the decking units.
4D.	Boardwalk: Cast-in-Place Concrete Sections: Furnish and install all necessary concrete, formwork, and reinforcing steel to construct the cast-in-place concrete deck sections including the bump outs, and access ramp stair landings. The limits and extents are shown on the drawings.
6A.	Boardwalk Drainage Swale: Furnish and install required materials and excavate and backfill to match the proposed grades. The materials include coarse stone and filter fabric for swale running parallel to the entire boardwalk.
6B.	Riprap Drainage Swale: Furnish and install riprap stones, coarse stone, catch basin, and filter fabric base, excavate, and grade the swale to match the proposed grade as shown on the drawings.
6C.	Remove and Replace Existing Outfall Headwall: Demolish, remove, and dispose of the existing concrete outfall headwall. All materials to be disposed of off-site. Furnish and install all necessary concrete, formwork, and reinforcing steel to construct the proposed headwall as shown on the drawing.
6D.	Remove and Replace Existing Drainage Pipes: Demolish, remove, and dispose of the ends of the drainage outfall pipes when installing the headwalls.
7A.	Granite Beach Access Stairs: Reuse the existing granite blocks on site, and pour new concrete substructure and walls to construct granite stairs to access the beach. Furnish and install materials including filter fabric, precast concrete blocks, and coarse stone base.

Bid Item No.	Description
7C.	<u>Concrete Access Ramp and Aluminum Stairs:</u> Furnish and install the concrete, formwork, reinforcing steel, handrails, cast-in-place retaining wall, helical pile foundations, and prefabricated aluminum stairs to construct the walkway, ramp, concrete steps, concrete landings, and stairs for public access to the beach.
8A.	<u>Demolish Existing Residential Access Stairs:</u> Demolish, remove, and dispose of the ten (10) existing residential access stairs.
8B.	<u>Residential Access Stair #9 Regatta Rd.:</u> Furnish and install all materials and provide all labor and equipment necessary to construct the pre-fabricated aluminum access stairs, including helical pile foundations, aluminum framing and treads, and the seasonally removable section.
8C.	<u>Residential Access Stair #15 Regatta Rd.:</u> Furnish and install all materials and provide all labor and equipment necessary to construct the pre-fabricated aluminum access stairs, including helical pile foundations, aluminum framing and treads, and the seasonally removable section.
8D.	<u>Residential Access Stair #27 Regatta Rd.:</u> Furnish and install all materials and provide all labor and equipment necessary to construct the pre-fabricated aluminum access stairs, including helical pile foundations, aluminum framing and treads, and the seasonally removable section.
8E.	<u>Residential Access Stair #35 Regatta Rd.:</u> Furnish and install all materials and provide all labor and equipment necessary to construct the pre-fabricated aluminum access stairs, including helical pile foundations, aluminum framing and treads, and the seasonally removable section.
8F.	<u>Residential Access Stair #39/#45 Regatta Rd.:</u> Furnish and install all materials and provide all labor and equipment necessary to construct the pre-fabricated aluminum access stairs, including helical pile foundations, aluminum framing and treads, and the seasonally removable section.
8G.	<u>Residential Access Stair #53/#57 Regatta Rd.:</u> Furnish and install all materials and provide all labor and equipment necessary to construct the pre-fabricated aluminum access stairs, including helical pile foundations, aluminum framing and treads, and the seasonally removable section.
8H.	<u>Residential Access Stair #67/#73 Regatta Rd.:</u> Furnish and install all materials and provide all labor and equipment necessary to construct the pre-fabricated aluminum access stairs, including helical pile foundations, aluminum framing and treads, and the seasonally removable section.
8I.	<u>Residential Access Stair #77 Regatta Rd.:</u> Furnish and install all materials and provide all labor and equipment necessary to construct the pre-fabricated aluminum access stairs, including helical pile foundations, aluminum framing and treads, and the seasonally removable section.

Bid Item No.	Description
8J.	Residential Access Stair #85/#91 Regatta Rd.: Furnish and install all materials and provide all labor and equipment necessary to construct the pre-fabricated aluminum access stairs, including helical pile foundations, aluminum framing and treads, and the seasonally removable section.
8K.	Residential Access Stair #97#105 Regatta Rd.: Furnish and install all materials and provide all labor and equipment necessary to construct the pre-fabricated aluminum access stairs, including helical pile foundations, aluminum framing and treads, and the seasonally removable section.
8L.	Retaining Wall and Steps #97 Regatta Rd.: Demolish, remove, and dispose of the existing timber retaining wall along the property. Furnish and install all the materials necessary to construct a new segmented retaining wall and stairs.

- D. Payment for equipment, materials and labor for items not included on the Bid or described in Article PAYMENT, herein, shall be considered incidental and no separate payment will be made.

1.5 NONPAYMENT FOR REJECTED OR UNUSED ITEMS

- A. Payment will not be made for the following:
 1. Demolishing, Loading, Hauling, and disposing of rejected material.
 2. Quantities of material wasted or disposed of in a manner not called for under the Contract Documents.
 3. Rejected loads of material, including material rejected after Contractor has placed it.
 4. Material not unloaded from transporting vehicle.
 5. Defective Work not accepted by the Owner/Engineer.
 6. Material remaining on hand after completion of Work.

1.6 PARTIAL PAYMENT FOR STORED MATERIALS AND EQUIPMENT.

- A. Final Payment: Shall be made only for materials incorporated into the Work in the Contract; no partial payments shall be made for equipment or materials delivered to the site but not used, unless otherwise agreed to be the Owner.

1.7 FINAL APPLICATION FOR PAYMENT

- A. Reference the Owner’s Contract, and as may otherwise be required in the Plans and Technical Specifications.
- B. Prior to submitting the final application, make acceptable delivery of required documents.

PART 2 - PRODUCTS [Not Used]

PART 3 - EXECUTION [Not Used]

END OF SECTION

SECTION 01 29 00 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Unless otherwise required by Massachusetts General Law, this Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

1.2 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Work Schedule
 - 1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including Application for Payment forms with Continuation Sheets, and Contractor's Construction Schedule.
 - 2. Submit the Schedule of Values to Engineer at earliest possible date but no later than two weeks before the date scheduled for submittal of initial Applications for Payment.
 - 3. Sub-schedules: Where the Work is separated into phases requiring separately phased payments, provide sub-schedules showing values correlated with each phase of payment.
- B. Retain paragraph and subparagraphs below. Revise to suit Project. If desired, include a sample schedule of values at end of Section.
- C. Format and Content: Use the Project Manual table of contents and appropriate Division of Labor as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.
 - 1. Identification: Include the following Project identification on the Schedule of Values:
 - a. Project name and location.
 - b. Name of Owner and Engineer.
 - c. Engineer's project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
 - 2. Submit draft of EJCDC Document C-620 (AIA Document G703 Continuation Sheets) or similar form acceptable to the Engineer.
 - 3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.
 - 4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
 - 5. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - 6. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

7. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
 - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.
8. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.3 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by Engineer and paid for by Owner.
 1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Times: Progress payments shall be submitted to Owner by the 20th of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.
- D. Payment Application Forms: Use of EJCDC Document C-620 (AIA Document G703 Continuation Sheets) or similar form acceptable to the Engineer for Applications for Payment.
- E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Engineer will return incomplete applications without action.
 1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
 2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- F. Transmittal: Submit three (3) signed and notarized original copies of each Application for Payment to Owner by a method ensuring receipt within agreed submittal date. One copy shall include waivers of lien and similar attachments if required.
 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from every entity who is lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
 1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit final or full waivers.
 3. Owner reserves the right to designate which entities involved in the

- Work must submit waivers.
4. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.
- H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. Schedule of Values.
 3. Contractor's Construction Schedule (preliminary if not final).
 4. Submittals Schedule (preliminary if not final).
 5. List of Contractor's staff assignments.
 6. List of Contractor's principal consultants.
 7. Copies of building permits.
 8. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 9. Initial progress report.
 10. Report of preconstruction conference.
 11. Certificates of insurance and insurance policies.
- I. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- J. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following in a form approved by the Engineer:
1. Evidence of completion of Project closeout requirements.
 2. Contractor's Affidavit of Payment of Debts and Claims.
 3. Contractor's Affidavit of Release of Liens.
 4. Consent of Surety to Final Payment.
 5. Evidence that claims have been settled.
 6. Final, liquidated damages settlement statement.

PART 2 - PRODUCTS [Not Used]

PART 3 - EXECUTION [Not Used]

END OF SECTION

SECTION 01 32 00 – CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Contractor's Construction Schedule.
 - 2. Submittals Schedule.
 - 3. Daily construction reports.
 - 4. Field condition reports.
- B. See Division 1 Section 01 29 00 – PAYMENT PROCEDURES for submitting the Schedule of Values.
- C. See Division 1 Section 01 32 33 – PHOTO DOCUMENTATION for submitting construction photographs.

1.2 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
 - 1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.
- B. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.
- C. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- D. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.
- E. Major Area: a significant construction element.

1.3 SUBMITTALS

- A. Submittals Schedule: Submit electronic copies of schedule in suitable portable document file (file) format. Arrange the following information in a tabular format:
 - 1. Scheduled date for first submittal.
 - 2. Specification Section number and title.
 - 3. Submittal category (action or informational).
 - 4. Name of subcontractor.
 - 5. Description of the Work covered.
 - 6. Scheduled date for final release or approval.
- B. Preliminary Network Diagram: Submit copies, large enough to show entire network for entire construction period. Show logic ties for activities.

- C. Contractor's Construction Schedule: Submit copies of initial schedule, large enough to show entire schedule for entire construction period.
 - 1. Submit an electronic copy of schedule, using software indicated, through web-based project portal, or other suitable electronic format, labeled to comply with requirements for submittals. Include type of schedule (Initial or Updated) and date on label.
 - D. Weekly Construction Reports: Submit copies of construction progress reports at weekly intervals, or as otherwise agreed to by the Owner and Engineer.
 - E. Field Condition Reports: Submit at time of discovery of differing conditions.
- 1.4 COORDINATION
- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
 - B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from parties involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 – PRODUCTS

2.1 SUBMITTALS SCHEDULE

- A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.
 - 1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
 - 2. Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from date established for commencement of the Work to date of Final Completion.
 - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- B. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:
 - 1. Revise the first subparagraph below to suit Project. Long activity durations provide less detail and, therefore, less information with which to manage a project. As an alternative to specifying activity duration, indicate minimum and maximum number of activities, which will result in a similar effect.
 - 2. Activity Duration: Define activities so no activity is longer than thirty (30) days, unless specifically allowed by Engineer.

3. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
 4. Submittal Review Time: Include review and resubmittal times indicated in Division 1 Section 01 33 00 – SUBMITTAL PROCEDURES in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
 5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion and allow time for Engineer's administrative procedures necessary for certification of Substantial Completion.
- C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule and show how the sequence of the Work is affected.
1. Phasing: Arrange list of activities on schedule by phase.
 2. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
 3. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Required phasing of the coastal bank work.
 - b. Permit conditions.
 - c. Coordination with existing construction.
 - d. Limitations of continued occupancies.
 - e. Uninterruptible services.
 - f. Partial occupancy before Substantial Completion.
 - g. Use of premises restrictions.
 - h. Provisions for future construction.
 - i. Seasonal variations.
 - j. Environmental control.
 4. Work Stages: Indicate important stages of construction for each major portion of the Work.
- D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.
- E. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragnets to demonstrate the effect of the proposed change on the overall project schedule.

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

- A. General: Prepare network diagrams using AON (activity-on-node) format.
- B. Preliminary Network Diagram: Submit diagram within two weeks of date established for Notice of Award. Outline significant construction activities for the first sixty (60) days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated

activities.

- C. CPM Schedule: Prepare Contractor's Construction Schedule using a computerized time-scaled CPM network analysis diagram for the Work.
 - 1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than thirty (30) days after date established for Notice to Proceed.
 - a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Engineer's approval of the schedule.
 - 2. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
 - 3. Use "one workday" as the unit of time. Include list of nonworking days and holidays incorporated into the schedule.
- D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the preliminary network diagram, prepare a skeleton network to identify probable critical paths.
 - 1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
 - a. Preparation and processing of submittals.
 - b. Mobilization and demobilization.
 - c. Purchase of materials.
 - d. Delivery.
 - e. Fabrication.
 - f. Utility interruptions.
 - g. Installation.
 - h. Work by Owner that may affect or be affected by Contractor's activities.
 - i. Testing and commissioning.
 - 2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
 - 3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
 - 4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
 - a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.
- E. Initial Issue of Schedule: Prepare initial network diagram from a list of straight "early start-total float" sort. Identify critical activities. Prepare tabulated reports showing the following:
 - 1. Contractor or subcontractor and the Work or activity.

2. Description of activity.
 3. Principal events of activity.
 4. Immediately preceding and succeeding activities.
 5. Early and late start dates.
 6. Early and late finish dates.
 7. Activity duration in workdays.
 8. Total float or slack time.
 9. Average size of workforce.
- F. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
1. Identification of activities that have changed.
 2. Changes in early and late start dates.
 3. Changes in early and late finish dates.
 4. Changes in activity durations in workdays.
 5. Changes in the critical path.
 6. Changes in total float or slack time.
 7. Changes in the Contract Time.

2.4 REPORTS

- A. Weekly Construction Reports: Prepare a weekly construction report recording the following information concerning events at Project site:
1. List of subcontractors at Project site.
 2. Equipment at Project site.
 3. Material deliveries.
 4. High and low temperatures and general weather conditions.
 5. Accidents.
 6. Stoppages, delays, shortages, and losses.
 7. Meter readings and similar recordings.
 8. Orders and requests of authorities having jurisdiction.
 9. Services connected and disconnected.
 10. Equipment or system tests and startups.
- B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a request for interpretation. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

PART 3 – EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 3. As the Work progresses, indicate Actual Completion percentage for each activity.
- B. Distribution: Distribute copies of approved schedule to Owner, Engineer, Architect, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
1. Post copies in Project meeting rooms and temporary field offices.
 2. When revisions are made, distribute updated schedules to the same parties and post them in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION

SECTION 01 32 33 – PHOTO DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for the following:
 - 1. Preconstruction photographs.
 - 2. Periodic construction photographs.
- B. See Division 1 Section 01 77 00 – CLOSE OUT PROCEDURES for submitting digital photographic media as Project Record Documents at Project closeout.

1.2 SUBMITTALS

- A. Key Plan: Submit key plan of Project site and with notation of vantage points marked for location and direction of each photograph. Indicate elevation or story of construction. Include same label information as corresponding set of photographs.
- B. Construction Photographs: Maintain catalog of digital photographs of work progress for submission to Owner as work progresses.
 - 1. Identification: provide label or other suitable file catalog of digital photographs with the following information:
 - a. Name of Project.
 - b. Name and address of photographer.
 - c. Name of Contractor.
 - d. Date photograph was taken if not date stamped by camera.
 - e. Description of vantage point, indicating location, direction (by compass point) or other suitable descriptor
 - f. Unique sequential identifier.
 - 2. Digital Images: Submit a complete set of digital image electronic files on flash drive or portable hard drive acceptable to Owner. Identify electronic media with date photographs were taken. Submit images that have same aspect ratio as the sensor, uncropped.

1.3 USAGE RIGHTS

- A. Obtain and transfer copyright usage rights from photographer to Owner for unlimited reproduction of photographic documentation.

PART 2 - PRODUCTS

2.1 PHOTOGRAPHIC MEDIA

- A. Photographic Film: 35 mm, medium speed (ISO 100-200).
- B. Digital Images: Provide images in uncompressed TIFF format, produced by a digital camera with minimum sensor size of 4.0 megapixels, and at an image resolution of not less than 1600 by 1200 pixels.

PART 3 – EXECUTION

3.1 CONSTRUCTION PHOTOGRAPHS

- A. Photographer: Engage a qualified commercial photographer to take construction photographs upon completion of work.
- B. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.
 - 1. Maintain key plan with each set of construction photographs that identifies each photographic location.
- C. Film Images:
 - 1. Date Stamp: Unless otherwise indicated, date and time stamp each photograph as it is being taken so stamp is integral to photograph.
 - 2. Field Office Prints: Retain one set of prints of progress photographs in the field office at Project site, available at all times for reference. Identify photographs same as for those submitted to Engineer.
- D. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
 - 1. Date and Time: Include date and time in filename for each image.
 - 2. Field Office Images: Maintain one set of images on flash drive in the field office at Project site, available at all times for reference. Identify images same as for those submitted to Engineer.
- E. Preconstruction Photographs: Before commencement of work, take a sufficient number of photographs of Project site and surrounding properties, including adjacent properties affected by the work, and any existing items that are to remain during construction, from different vantage points, as directed by Engineer.
 - 1. Flag construction limits before taking construction photographs.
 - 2. Take plenty of photographs to show existing conditions adjacent to property before starting the Work.
 - 3. Take detailed photographs of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.
- F. Periodic Construction Photographs: Take a sufficient number of photographs regularly during each work week, with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.
- G. Additional Photographs: Engineer may issue requests for additional photographs, in addition to periodic photographs specified.
 - 1. In emergency situations, take additional photographs within 24 hours of request.
 - 2. Circumstances that could require additional photographs include, but are not limited to, the following:
 - a. Special events planned at Project site.

- b. Immediate follow-up when on-site events result in construction damage or losses.
- c. Photographs to be taken at fabrication locations away from Project site.
- d. Substantial Completion of a major phase or component of the Work.
- e. Extra record photographs at time of final acceptance.
- f. Owner's request for special publicity photographs.

END OF SECTION

SECTION 01 33 00 – SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. See Division 1 Section 01 32 33 - PHOTO DOCUMENTATION for submitting digital photographs.
- C. See Division 1 Section 01 40 00 - QUALITY REQUIREMENTS for submitting test and inspection reports and any mockup requirements.
- D. See Division 1 Section 01 77 00 - CLOSEOUT PROCEDURES for submitting warranties.

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information that requires Engineer's responsive action.
- B. Informational Submittals: Written information that does not require Engineer's responsive action. Submittals may be rejected for not complying with requirements.

1.3 SUBMITTAL PROCEDURES

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- B. Submittals Schedule: Comply with project requirements for list of submittals and time requirements for scheduled performance of related construction activities.
- C. Processing Time: Allow sufficient time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 - 1. Initial Review: Allow ten (10) working days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
 - 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.

3. Resubmittal Review: Allow five (5) additional working days for review of each resubmittal.
- D. Identification: Place a permanent label or title block on each submittal for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
 2. Provide adequate space on label or beside title block to record Contractor's review and approval markings and action taken by Engineer.
 3. Include the following information on label for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name and address of Contractor.
 - d. Name and address of subcontractor.
 - e. Name and address of supplier.
 - f. Name of manufacturer.
 - g. Submittal number or other unique identifier, including revision identifier.
 - Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 06 10 00.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 06 10 00.01.A).
 - h. Number and title of appropriate Specification Section.
 - i. Drawing number and detail references, as appropriate.
 - j. Location(s) where product is to be installed, as appropriate.
 - k. Other necessary identification.
- E. Deviations: Highlight, encircle, or otherwise specifically identify deviations from the Contract Documents on submittals.
- F. Additional Copies: Unless additional copies are required for final submittal, and unless Engineer observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
1. Additional copies submitted for maintenance manuals will not be marked with action taken and will be returned.
- G. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal in suitable electronic form.
- H. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
1. Note date and content of previous submittal.
 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 3. Resubmit submittals until they are marked as approved by the reviewing party.

- I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- J. Use for Construction: Use only final submittals with mark indicating "Approved".

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 - 1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Include the following information, as applicable:
 - a. Manufacturer's written recommendations.
 - b. Manufacturer's product specifications.
 - c. Manufacturer's installation instructions.
 - d. Manufacturer's catalog cuts.
 - e. Wiring diagrams showing factory-installed wiring.
 - f. Printed performance curves.
 - g. Operational range diagrams.
 - h. Compliance with specified referenced standards.
 - i. Testing by recognized testing agency.
 - 4. Number of Copies: Submit copies in suitable electronic format of Product Data, unless otherwise indicated. Engineer will return copies in similar format.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
 - 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Dimensions.
 - b. Identification of products.
 - c. Fabrication and installation drawings.
 - d. Roughing-in and setting diagrams.
 - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
 - f. Shop work manufacturing instructions.

- g. Templates and patterns.
 - h. Schedules.
 - i. Notation of coordination requirements.
 - j. Notation of dimensions established by field measurement.
 - k. Relationship to adjoining construction clearly indicated.
 - l. Seal and signature of professional engineer if specified.
 - m. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 24 by 36 inches.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
- 1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 - 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of appropriate Specification Section.
 - 3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - 4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit three (3) full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Engineer will return submittal with options selected.
 - 5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - a. Number of Samples: Submit three (3) sets of Samples. Mark up and retain one returned Sample set as a Project Record Sample.
- E. Product Schedule or List: As required in individual Specification Sections,

prepare a written summary indicating types of products required for the Work and their intended location.

- F. Submittals Schedule: Comply with requirements specified in Division 1 Section 01 32 00 - CONSTRUCTION SCHEDULE.
- G. Application for Payment: Comply with requirements specified in Division 1 Section 01 29 00 - PAYMENT PROCEDURES.
- H. Schedule of Values: Comply with requirements specified in Division 1 Section 01 29 00 - PAYMENT PROCEDURES.
- I. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design.
- J. Material Safety Data Sheets (MSDSs): Submit information necessary to show compliance with material safety requirements, which will be the limit of the Engineer's review.

2.2 INFORMATIONAL SUBMITTALS

- A. General: Prepare and submit Informational Submittals required by other Specification Sections.
 - 1. Number of Copies: Submit copies in suitable electronic format of each submittal, unless otherwise indicated.
 - 2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - 3. Test and Inspection Reports: Comply with requirements specified in Division 1 Section 01 40 00 - QUALITY REQUIREMENTS.
- B. Coordination Drawings: Comply with requirements specified in Division 1 Section 01 31 00 – PROJECT MANAGEMENT AND COORDINATION.
- C. Contractor's Construction Schedule: Comply with requirements specified in Division 1 Section 01 32 00 – CONSTRUCTION SCHEDULE.
- D. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of Engineers and owners, and other information specified.
- E. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.
- F. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- G. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- H. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

- I. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- J. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- K. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- L. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.
- M. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- N. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- O. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- P. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.
- Q. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer.
- R. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:
 - 1. Statement on condition of substrates and their acceptability for installation of product.
 - 2. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 - 3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
- S. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

- T. Construction Photographs and/or Videotapes: Comply with requirements specified in Division 1 Section 01 32 32 – PHOTOGRAPHIC DOCUMENTATION.
- U. Material Safety Data Sheets (MSDSs): Submit information directly to Owner; do not submit to Engineer, except as required in "Action Submittals" Article.

2.3 DELEGATED DESIGN

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Engineer.
- B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit copies of a statement, signed and sealed by the responsible design professional in Massachusetts, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
 - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer.
- B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ENGINEER'S ACTION

- A. General: Engineer will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: Engineer will review each submittal, make marks to indicate corrections or modifications required, and return it. Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:
 - 1. On advice of counsel, select appropriate terms for action stamp and insert term and explanation of each action taken in subparagraph below. See Evaluations.
 - 2. Approved
 - 3. Approved as Noted
 - 4. Revise/Resubmit

- 5. Rejected
- C. Informational Submittals: Engineer will review each submittal and will not return it, or will return it if it does not comply with requirements. Engineer will forward each submittal to appropriate party.
- D. Partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.
- E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION

SECTION 01 40 00 – QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 2. Requirements for Contractor to provide quality-assurance and -control services required by Engineer, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
- C. See Divisions 2 through 33 Sections for specific test and inspection requirements.

1.2 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Engineer.
- C. Mockups: Full-size, physical assemblies that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples.
 - 1. Coordinate assemblies which required mockups based on approved materials.
 - 2. Approved mockups establish the standard by which the Work will be judged.
- D. Preconstruction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.
- E. Product Testing: Tests and inspections that are performed by an NDT, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.
- F. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.
- G. Field Quality-Control Testing: Tests and inspections that are performed on-site

for installation of the Work and for completed Work.

- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 - 1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.
- J. Experienced: When used with an entity, "experienced" means having successfully completed a minimum of five (5) years previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.3 CONFLICTING REQUIREMENTS

- A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Engineer for a decision before proceeding.
- B. 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 requirements. Refer uncertainties to Engineer for a decision before proceeding.

1.4 SUBMITTALS

- A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- B. Reports: Prepare and submit certified written reports that include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.
 - 7. Identification of product and Specification Section.
 - 8. Complete test or inspection data.
 - 9. Test and inspection results and an interpretation of test results.
 - 10. Record of temperature and weather conditions at time of sample taking

and testing and inspecting.

11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 12. Name and signature of laboratory inspector.
 13. Recommendations on retesting and/or follow up inspections.
- C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.5 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- E. Professional Engineer Qualifications: A registered professional engineer who is legally licensed to practice in the Commonwealth of Massachusetts and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or products that are similar to those indicated for this Project in material, design, and extent.
- F. Specialists: Certain sections of the Specifications require that specific construction activities be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
 1. Requirement for specialists shall not supersede building codes and regulations governing the Work.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

- H. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
 - 1. Build mockups in location and of size indicated or as directed.
 - 2. Notify Owner and Engineer five (5) days in advance of dates and times when mockups will be constructed.
 - 3. Demonstrate the proposed range of aesthetic effects and workmanship.
 - 4. Obtain Engineer's approval of mockups before starting work, fabrication, or construction.
 - 5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - 6. Demolish and remove mockups when directed, unless otherwise indicated.
- J. Laboratory Mockups: Comply with requirements of preconstruction testing and those specified in individual Sections in Divisions 2 through 33.

1.6 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
 - 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
 - 2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 - 1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 - 2. Notify testing agencies at least twenty-four (24) hours in advance of time when Work that requires testing or inspecting will be performed.
 - 3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 - 4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.

5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 1 Section 01 33 00 - SUBMITTAL PROCEDURES.
- D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- E. Testing Agency Responsibilities: Cooperate with Engineer and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Engineer and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 6. Do not perform any duties of Contractor.
- F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 - PRODUCTS [Not Used]

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
 - 2. Comply with the Contract Document requirements for Division 1 Section 01 73 29 - CUTTING AND PATCHING.
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

SECTION 01 42 00 – REFERENCES

PART 1 - GENERAL

1.1 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Engineer's action on Contractor's submittals, applications, and requests, "approved" is limited to Engineer's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Engineer. Other terms including "requested," "authorized," "selected," "approved," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.2 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless 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 standards in effect as of date of the Contract Documents, unless otherwise indicated.
- C. Copies of Standards: Each entity engaged in construction on Project should 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, obtain copies directly from publication source.
- D. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale Research's "Encyclopedia of

Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."

- E. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

AA	Aluminum Association, Inc. (The)
AAMA	American Architectural Manufacturers Association
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute/ACI International
ACPA	American Concrete Pipe Association
AEIC	Association of Edison Illuminating Companies, Inc. (The)
AFPA	American Forest & Paper Association (See AF&PA)
AF&PA	American Forest & Paper Association
AGA	American Gas Association
AGC	Associated General Contractors of America (The)
AHA	American Hardboard Association
AI	Asphalt Institute
AIA	American Institute of Architects (The)
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
ALCA	Associated Landscape Contractors of America
ALSC	American Lumber Standard Committee, Incorporated
ANSI	American National Standards Institute
AOSA	Association of Official Seed Analysts
APA	APA - The Engineered Wood Association
APA	Architectural Precast Association

API	American Petroleum Institute
ASCA	Architectural Spray Coaters Association
ASCE	American Society of Civil Engineers
ASME	ASME International (The American Society of Mechanical Engineers International)
ASSE	American Society of Sanitary Engineering
ASTM	ASTM International (American Society for Testing and Materials International)
AWI	Architectural Woodwork Institute
AWPA	American Wood-Preservers' Association
AWS	American Welding Society
AWWA	American Water Works Association
BIA	Brick Industry Association (The)
CCFSS	Center for Cold-Formed Steel Structures
CDA	Copper Development Association Inc.
CGA	Compressed Gas Association
CISPI	Cast Iron Soil Pipe Institute
CLFMI	Chain Link Fence Manufacturers Institute
CPPA	Corrugated Polyethylene Pipe Association
CRSI	Concrete Reinforcing Steel Institute
CSI	Construction Specifications Institute (The)
EIA	Electronic Industries Alliance
EJCDC	Engineers Joint Contract Documents Committee
EJMA	Expansion Joint Manufacturers Association, Inc.
FCI	Fluid Controls Institute
FM	Factory Mutual System (See FMG)
FMG	FM Global

(Formerly: FM - Factory Mutual System)

FSC	Forest Stewardship Council
GRI	Geosynthetic Research Institute
ICRI	International Concrete Repair Institute, Inc.
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers, Inc. (The)
IESNA	Illuminating Engineering Society of North America
ITS	Intertek Testing Services
NACE	NACE International (National Association of Corrosion Engineers International)
NAMI	National Accreditation and Management Institute, Inc.
NBGQA	National Building Granite Quarries Association, Inc.
NCMA	National Concrete Masonry Association
NCPI	National Clay Pipe Institute
NCTA	National Cable & Telecommunications Association
NEBB	National Environmental Balancing Bureau
NECA	National Electrical Contractors Association
NeLMA	Northeastern Lumber Manufacturers' Association
NEMA	National Electrical Manufacturers Association
NETA	InterNational Electrical Testing Association
NLGA	National Lumber Grades Authority
NRMCA	National Ready Mixed Concrete Association
NSF	NSF International (National Sanitation Foundation International)
NSSGA	National Stone, Sand & Gravel Association
PCI	Precast/Prestressed Concrete Institute
PDI	Plumbing & Drainage Institute

PGI	PVC Geomembrane Institute
RCSC	Research Council on Structural Connections
SAE	SAE International
SPIB	Southern Pine Inspection Bureau (The)
SSPC	SSPC: The Society for Protective Coatings
SWRI	Sealant, Waterproofing, & Restoration Institute
TMS	The Masonry Society
TPI	Turfgrass Producers International
UL	Underwriters Laboratories Inc.
UNI	Uni-Bell PVC Pipe Association
WASTECH	Waste Equipment Technology Association
WCLIB	West Coast Lumber Inspection Bureau
WWPA	Western Wood Products Association

- F. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

BOCA	BOCA International, Inc.
BBRS	Bureau of Building Regulations and Standards
CABO	Council of American Building Officials (See ICC)
IAPMO	International Association of Plumbing and Mechanical Officials (The)
ICBO	International Conference of Building Officials
ICBO	ICBO Evaluation Service, Inc.
ICC	International Code Council, Inc. (Formerly: CABO - Council of American Building Officials)

- G. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

CE	Army Corps of Engineers
CPSC	Consumer Product Safety Commission
DOC	Department of Commerce
EPA	Environmental Protection Agency
GSA	General Services Administration
NCHRP	National Cooperative Highway Research Program (See TRB)
NIST	National Institute of Standards and Technology
OSHA	Occupational Safety & Health Administration
SD	State Department
TRB	Transportation Research Board
USDA	Department of Agriculture
USPS	Postal Service

H. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

CZM	Coastal Zone Management
DEP	Department of Environmental Protection
MEPA	Massachusetts Environmental Policy Act

PART 2 - PRODUCTS [Not Used]

PART 3 - EXECUTION [Not Used]

END OF SECTION

SECTION 01 50 00 – TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. See Division 1 Section 01 70 00 - EXECUTION REQUIREMENTS for progress cleaning requirements.
- C. See Divisions 2 through 33 Sections for temporary heat, ventilation, and humidity requirements for products in those Sections.

1.2 DEFINITIONS

- A. Temporary Enclosure: Temporary insulated and weathertight enclosure to facilitate appropriate temperature control in protected work area; exterior weather protection in controlled work area.

1.3 USE CHARGES

- A. General: Cost or use charges for temporary facilities shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to Owner's work forces, Engineer, testing agencies, and authorities having jurisdiction.
- B. Water Service: All water connections will need to be coordinated with the Town. Contractor shall provide connections and extensions of services as required for construction operations.
- C. Electric Power Service: All electrical connections will need to be coordinated with the Town. Contractor shall provide connections and extensions of services as required for construction operations.

1.4 SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, NFPA, UL and other standards reference in Division 26 for temporary and permanent electric service.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.6 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.
- B. The Town can provide temporary staging areas, prior to mobilization if required.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Pavement: Comply with Division 31 for pavement materials
- B. Temporary Chain-Link Fencing: Minimum 2-inch, 0.148-inch- thick, galvanized steel, chain-link fabric fencing; minimum six (6) feet high with galvanized steel pipe posts; minimum 2-3/8-inch OD line posts and 2-7/8-inch OD corner and pull posts, with 1-5/8-inch OD top rails. Provide concrete or suitable galvanized steel bases for supporting posts.
- C. Wood Enclosure Fence: Plywood, six (6) feet high, framed with four 2-by-4-inch rails, with preservative-treated wood posts spaced not more than 8 feet apart.
- D. Lumber and Plywood: Comply with requirements in Division 6 Section 06 10 00 - CARPENTRY.

2.2 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
- B. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. Temporary heating equipment: Provide vented, self-contained, liquid-propane-gas or fuel-oil space heaters with individual thermostatic control.
 - 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 - 2. Heating Units: Listed and labeled for type of fuel being consumed, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
 - 1. Arrange with utility company, Owner, and existing users for time when

service can be interrupted, if necessary, to make connections for temporary services.

- B. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.
- C. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- D. Heating: Provide temporary heating required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- E. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- F. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
 - 1. Install electric power service, unless otherwise indicated in Division 26.
- G. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
 - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
- H. Electronic Communication Service: Provide temporary electronic communication service, including electronic mail in field office.

3.3 SUPPORT FACILITIES INSTALLATION

- A. Temporary Roads and Paved Areas: Locate temporary roads and paved areas within construction limits as needed to access site.
 - 1. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust.
- B. Traffic Controls: Comply with requirements of authorities having jurisdiction.
 - 1. Protect existing site improvements to remain including curbs, pavement, and utilities.
 - 2. Maintain access for fire-fighting equipment and access to fire hydrants.
- C. Parking: Provide temporary off-street parking areas for construction personnel.
- D. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
 - 1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties nor endanger permanent Work or

temporary facilities.

2. Remove snow and ice as required to minimize accumulations.
- E. Project Identification and Temporary Signs: Provide Project identification and other signs as required in the Order of Conditions or as otherwise directed by Engineer. Install signs were indicated to inform public and individuals seeking entrance to Project. Unauthorized signs are not permitted.
1. Provide temporary, directional signs for construction personnel and visitors.
 2. Maintain and touchup signs so they are legible at all times.
- F. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with Division 1 Section 01 70 00 - EXECUTION REQUIREMENTS for progress cleaning requirements.
- G. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Environmental Protection: Conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
1. Refer to Order(s) of Conditions and DEP license for environmental regulatory compliance requirements.
- B. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.
- C. Stormwater Control: Comply with authorities having jurisdiction. Provide barriers in and around excavations to prevent flooding by runoff of stormwater from heavy rains.
- D. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- E. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Obtain extended warranty for Owner. Perform control operations lawfully, using environmentally safe materials.
- F. Site Enclosure Fence: Furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.

- G. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- H. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Termination and Removal: Remove temporary facilities when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion.

END OF SECTION

SECTION 01 50 72 - TEMPORARY RODENT CONTROL

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes

1. Provide temporary rodent control for areas of construction by a licensed rodent exterminator in accordance with this Section.

1.2 PRICE AND PAYMENT PROCEDURES

- A. Measurement and payment requirements: per Division 01 General Requirements.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordination, sequencing, and scheduling: per Division 01 General Requirements.

1.4 SUBMITTALS

- A. Submit in accordance with Division 01 General Requirements.

1. Name, contact information, and license information for rodent exterminator to be retained for the duration of the Project.
2. Pre-construction inspection notification.
3. Rodent control plan showing number and location of bait stations, property information where bait stations will be located, and any additional actions to be taken to prevent or mitigate rodent activity and presence, including identification of pesticides to be used as well as manufacturer instructions, warnings, and safety data sheets (SDS).
4. Create template and complete property owner permission forms for all properties included in rodent control plan. Form should include at a minimum a summary of rodent control activities and bait stations to be included on the property, schedule for rodent control activities, property owner information, and signature of property owner and date.
5. Records of property owner(s) who declined permission to implement rodent control activities.
6. Licensed rodent exterminator's logbook including a diagram with locations of all bait stations, SDS for pesticides being used, and rodent exterminator's license and insurance information. Logbook must be available for inspection upon request by the Owner's Health Department and Inspectional Services.

7. Rodent control reports within seven (7) days after each treatment that document, at a minimum, the locations of treatments, percentage of bait consumed, and any rebaiting or rodent control related activities.

1.5 QUALITY ASSURANCE

- A. Provide in accordance with Division 01 General Requirements.
- B. Qualifications of rodent exterminator: per Division 01 General Requirements and as follows.
 1. Licensed and insured in the state where the Project is located.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

- A. Ensure that the rodent exterminator complies with the following.
 1. Perform a pre-construction baiting and a maintenance baiting program extending for duration of construction activities.
 2. Respond to changes in rodent populations and rodent related complaints associated with the construction activities in addition to rodent control guidelines and measures determined.
 3. Follow minimum steps specified in order to control and/or eliminate the rodent population and perform these steps per street or Work area for Work on multiple non-contiguous streets or Work areas. These steps are provided as guidelines only and do not supersede the judgement and measures deemed necessary by rodent exterminator.
 4. Coordinate with Owner's Health Department and Inspectional Services.

3.2 SITE INSPECTION

- A. 45 days prior to commencement of Work, notify public and private property owners within 300 feet of construction activities of investigations two (2) days ahead of investigation.
- B. Inspect public and private areas within 300 feet of construction activities. Investigate signs of rodent activity as a basis for the rodent control plan.
- C. In preparation for providing rodent control for public and private premises impacted by related rodent activity within a 300-foot radius of Project limits:

1. Obtain written permission, via the property owner permission form identified in Section 1.04 above, from public and private property owners where bait will be placed, or for other rodent control activities.
2. Identify property owners who declined permission to implement rodent control activities on their property and reason for declining permission if known. Submit records to the Quincy Health Department and Inspectional Services.

3.3 FIRST SERVICE - PRE-CONSTRUCTION

- A. Provide rodent control for any premises, public and private, impacted by related rodent activity within a 300-foot radius of Project limits per the approved rodent control plan.
- B. Perform sub-surface baiting treatment to sewer and drain lines within a 300-foot radius of construction activities. Make pesticide applications with bait formulations labeled for use in sewers and drains.

3.4 SECOND SERVICE FOLLOW UP / PRE-CONSTRUCTION

- A. Seven (7) to ten (10) days after First Service, re-inspect public and private areas within a 300-foot radius of construction activities. Re-treat active locations.
- B. Perform sub-surface treatment. Rebait / re-treat active sewer and drain lines treated during First Service.

3.5 THIRD SERVICE FOLLOW UP / PRE-CONSTRUCTION

- A. Ten (10) to 14 days after Second Service, re-inspect public and private areas within a 300-foot radius of construction activities. Re-treat active locations.
- B. Perform sub-surface treatment. Rebait / re-treat active sewer and drain lines.

3.6 PERIODIC SERVICE / MAINTENANCE DURING CONSTRUCTION

- A. Every two (2) weeks after Third Service, re-inspect public and private areas within a 300-foot radius of construction activities. Re-treat active locations.
- B. Perform sub-surface treatment. Rebait / re-treat active sewer and drain lines.

3.7 FINAL SERVICE / POST CONSTRUCTION

- A. Twenty (20) days after Substantial Completion, rodent exterminator shall retrieve all baits, traps, pesticides and other materials and equipment deployed for rodent control from public and private areas and sewer and drain lines.
- B. Notify Owner Health Department and Inspectional Services upon completion of final service.

END OF SECTION

SECTION 01 55 00

TRAFFIC REGULATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Traffic requirements
 - 2. Traffic officers

1.2 PAYMENT PROCEDURES

- 1. Refer to Section 01 29 00, Measurement and Payment for procedures relating to payment for the Work.
- 2. Schedule, document and pay for traffic officers if they are required. Contractor will be reimbursed for payment of traffic officers only after invoices have been paid.
- 3. Owner will deduct from monies due Contractor for the following abnormal and unreasonable expenses:
 - a. Contractor caused delays in the prosecution of work that result in hiring traffic officers for more hours than would have been required during normal prosecution of work.
 - b. Reconstruction and/or reinstallation of any portions of the work, as a result of improper initial installation or defective material, for which traffic officers are required.
 - c. Traffic officers required at a site where Contractor is not working or outside of Contractor's standard work day as a result of obstructions to traffic that remain in the traveled way.
 - d. All other incidents resulting from Contractor's operations requiring traffic officers that would not normally be encountered during the progress of a well-organized project employing proper construction methods.
 - e. When traffic officers are requested for the convenience of Contractor and are not otherwise considered necessary to the work.

1.3 REFERENCES

- A. Manual of Uniform Traffic Control Devices, U.S. Department of Transportation
- B. MassDOT Standard Specifications, latest revision

1.4 TRAFFIC REQUIREMENTS

- A. Adhere to all applicable Weymouth ordinances that relate to traffic control. Coordinate and meet with Town authorities to review applicable requirements and

develop a traffic control plan consistent with referenced documents for approval by the Town authorities.

- B. Arrange construction activity so that all streets shall remain open to at least one-way traffic during periods of actual work, and to unimpeded, two-way traffic during all other periods.
- C. Provide a traffic control plan to Engineer for approval showing traffic control signs, barrels, cones, traffic officers, including detour signs, meeting the approval of Engineer, Owner and local Police Departments in accordance with the Manual of Uniform Traffic Control Devices.
- D. Determine the location of each day's work and implement the approved traffic control plan. If the plan requires the use of traffic officers, notify the Police Department.
- E. Contractor shall have no claim of delay if he does not notify the Police Department of his scheduled location in time to arrange for traffic officers.
- F. Hand deliver written notice to individual houses affected by driveway and side road closings or detours a minimum 24 hours in advance. A recommended parking area outside the work limits shall be included in the notice.

1.5 TRAFFIC OFFICERS

- A. Uniformed traffic officers shall be required at locations deemed necessary by Owner, working in conjunction with local Police and Fire Departments, for the protection of the public.
- B. The Police Chief or his representative, in consultation with Owner's representative, will determine the number of officers required for the work.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

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SECTION 01 58 20

PROJECT IDENTIFICATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Informational Signs
- B. Related Requirements
 - 1. Section 01 33 00 - Submittal Procedures
 - 2. Section 01 55 00 – Traffic Regulation

1.2 SUBMITTALS

- A. Action Submittals
 - 1. Information on paints to be used for items under this section.
 - 2. Layout of each sign.

1.3 QUALITY ASSURANCE

- A. Finishes and painting shall resist weathering and fading for scheduled construction period.

1.4 MAINTENANCE

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

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Informational Signs
 - 1. Provide six painted signs with painted lettering, or standard products:
 - a. Size of signs and lettering: To meet Federal Highway Administration “Standard Alphabets for Highway Signs.”
 - b. Colors: As required by regulatory agencies, otherwise uniform colors throughout Project.
 - c. Furnish, erect, and maintain job instruction signs, including "DANGER," "KEEP OFF," as may be required to conduct the Work safely. Such signs shall be clean, maintained in good condition, and promptly removed when they have served their purpose.
 - 2. Erect at construction locations to provide required information.

B. Traffic Control Signs

1. Traffic control signs shall be as specified in Section 01 55 00 and as indicated on the Drawings.

2.2 MATERIALS

A. Sign Materials

1. Structure and Framing: May be new or used, wood or metal, 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:
 - a. Thickness: As required by standards to span framing members, to provide even, smooth surface without waves or buckles.
3. Wrought Hardware: Galvanized.
4. Paint:
 - a. Apply a coat of white alkyd primer wood oil to entire woodwork of sign.
 - b. Apply 2 coats of white exterior latex paint to sign including framework.

- B. Sign layout shall be approved by the Owner prior to fabrication.

PART 3 EXECUTION

3.1 PREPARATION

A. Project Identification Sign

1. Paint exposed surface of supports, framing and surface material; one coat of primer and one coat of exterior white paint.
2. Paint graphics in styles, sizes, and colors selected.
3. Sign to be minimum of 48 inches by 96 inches.

3.2 ERECTION

A. Project Identification Sign

1. Erect Project signs at locations approved by the Owner in the vicinity of the Bay Avenue.
2. Maintain in good condition until completion of the Project.
 - a. Remove sign, framing, supports and foundations at completion of the Project.

END OF SECTION

SECTION 01 60 00 – PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.
- B. See Division 1 Section 01 77 00 - CLOSEOUT PROCEDURES for submitting warranties for Contract closeout.
- C. See Divisions 2 through 33 Sections for specific requirements for warranties on products and installations specified to be warranted.

1.2 DEFINITIONS

- A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process, or were indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
- C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

1.3 SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

- a. Statement indicating why specified material or product cannot be provided.
 - b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
 - g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
 - i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
 - j. Cost information, including a proposal of change, if any, in the Contract Sum.
 - k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
 - l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
2. Engineer's Action: If necessary, Engineer will request additional information or documentation for evaluation within seven (7) days of receipt of a request for substitution. Engineer will notify Contractor of acceptance or rejection of proposed substitution within fourteen (14) days of receipt of request.
- a. Form of Approval: As specified in Division 1 Section 01 33 00 - SUBMITTAL PROCEDURES.

- B. Comparable Product Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Engineer's Action: If necessary, Engineer will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Engineer will notify Contractor of approval or rejection of proposed comparable product request within fourteen (14) days of receipt of request.
 - a. Form of Approval: As specified in Division 1 Section 01 33 00 - SUBMITTAL PROCEDURES.
- C. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 1 Section 01 33 00 – SUBMITTAL PROCEDURES. Show compliance with requirements.

1.4 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
 - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 - 4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
- C. Storage:
 - 1. Store products to allow for inspection and measurement of quantity or counting of units.
 - 2. Store materials in a manner that will not endanger the Work.
 - 3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
 - 4. Store cementitious products and materials on elevated platforms.

5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.

1.6 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
 1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.
 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 2. Refer to Divisions 2 through 33 Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Division 1 Section 01 77 00 - CLOSEOUT PROCEDURES.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.
 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 4. Where products are accompanied by the term "as selected," or "match sample," Engineer or Owner will make selection.
 5. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.

- B. Product Selection Procedures:
1. Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
 2. Product Options: Where Specifications indicate that sizes, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide the specified product or system. Comply with provisions in Part 2 "Product Substitutions" Article for consideration of an unnamed product or system.
 3. Basis-of-Design Product: Where Specifications name a product and include a list of manufacturers, provide the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named.
 4. Visual Matching Specification: Where Specifications require matching an established Sample, select a product that complies with requirements and matches the selected sample.
 - a. If no product available within specified category matches and complies with other specified requirements, comply with provisions in Part 2 "Product Substitutions" Article for proposal of product.
 5. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product that complies with other specified requirements.
 - a. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that does not include premium items.
 - b. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 PRODUCT SUBSTITUTIONS

- A. Timing: Engineer will consider requests for substitution if received thirty (30) days from the Notice of Award. Requests received after that time may be considered or rejected at the discretion of Engineer.
- B. Conditions: Engineer will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Engineer will return requests without action, except to record noncompliance with these requirements:

1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
2. Requested substitution does not require extensive revisions to the Contract Documents.
3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
4. Substitution request is fully documented and properly submitted.
5. Requested substitution will not adversely affect Contractor's Construction Schedule.
6. Requested substitution has received necessary approvals of authorities having jurisdiction.
7. Requested substitution is compatible with other portions of the Work.
8. Requested substitution has been coordinated with other portions of the Work.
9. Requested substitution provides specified warranty.

PART 3 - EXECUTION [Not Used]

END OF SECTION

SECTION 01 70 00 – EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. General installation of products.
 - 4. Progress cleaning.
 - 5. Starting and adjusting.
 - 6. Protection of installed construction.
 - 7. Correction of the Work.
- B. See Division 1 Section 01 77 00 – CLOSE OUT PROCEDURES for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.2 SUBMITTALS

- A. Certificates: Submit certificate signed by registered land surveyor certifying that location and elevation of improvements comply with requirements.
- B. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for any hazardous waste disposal.

1.3 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in the Commonwealth of Massachusetts and who is experienced in providing land-surveying services of the kind indicated.

PART 2 - PRODUCTS [Not Used]

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
 - 1. Before construction, verify the location and points of connection of utility services.
- B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction affecting the Work.
 - 1. Before construction, verify the location and invert elevation of sanitary

sewer, storm sewer, and water-service piping, and underground electrical services.

2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a Request for Information (RFI) to Engineer for processing. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents, if required.

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.
- B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.
 1. Establish benchmarks and control points to set lines and levels as needed to locate each element of Project.
 2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 3. Inform installers of lines and levels to which they must comply.
 4. Check the location, level and plumb, of every major element as the Work progresses.
 5. Notify Engineer when deviations from required lines exceed allowable tolerances.
 6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.
- D. Construction Lines and Levels: Locate and lay out control lines and levels for structures, foundations, post grids, and deck levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or

more locations.

- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

3.4 FIELD ENGINEERING

- A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
- B. Benchmarks: Establish and maintain a minimum of two (2) permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
 - 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.

3.5 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- G. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 - 2. Allow for movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves,

concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

- H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 2. Do not hold materials for more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F.
 - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 - 1. Remove liquid spills promptly.
 - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of

the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.7 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

3.8 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 1 Section 01 73 29 - CUTTING AND PATCHING.
 - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION

SECTION 01 73 29 – CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes procedural requirements for cutting and patching.
- B. See Divisions 2 through 33 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

1.2 SUBMITTALS

- A. Cutting and Patching Proposal: Submit a proposal describing procedures before the time cutting and patching will be performed. Include the following information:
 - 1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
 - 2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes significant visual elements.
 - 3. Products: List products to be used and firms or entities that will perform the Work.
 - 4. Dates: Indicate when cutting and patching will be performed.
 - 5. Utility Services and Mechanical/Electrical Systems: List services/systems that cutting and patching procedures will disturb or affect. List services/systems that will be relocated and those that will be temporarily out of service.
 - 6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
 - 7. Engineer's Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive the right to later require removal and replacement of unsatisfactory work.

1.3 QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
- B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
- C. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
- D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch

construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

1.4 WARRANTY

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

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
 - 1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
 - 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.

3.3 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Masonry]: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 4. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.
 - 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 - 6. Proceed with patching after construction operations requiring cutting are complete.
- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.
 - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
 - 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
- D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, and similar materials.

END OF SECTION

SECTION 01 77 00 – CLOSE OUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Inspection procedures.
 - 2. Warranties.
 - 3. Final cleaning.
- B. See Division 1 Section 01 29 00 - PAYMENT PROCEDURES for requirements for Applications for Payment for Substantial and Final Completion.
- C. See Division 1 Section 01 32 33 - PHOTO DOCUMENTATION for submitting Final Completion construction photographs and negatives.
- D. See Division 1 Section 01 78 10 - PROJECT RECORD DOCUMENTS for submitting Record Drawings, Record Specifications, and Record Product Data.
- E. See Divisions 2 through 33 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.2 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
 - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
 - 2. Advise Owner of pending insurance changeover requirements.
 - 3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities.
 - 5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs, damage or settlement surveys, property surveys, and similar final record information.
 - 6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
 - 7. Complete startup testing of systems.
 - 8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 - 9. Complete final cleaning requirements, including touchups.
 - 10. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

- B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
 - 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 - 2. Results of completed inspection will form the basis of requirements for Final Completion.

1.3 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
 - 1. Submit a final Application for Payment according to Division 1 Section 01 29 00 - PAYMENT PROCEDURES.
 - 2. Submit certified copy of Engineer's Substantial Completion inspection list of items to be completed or corrected (punch list). The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 - 3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 - 4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
 - 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.4 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Preparation: Submit list of incomplete items (punch list). Include name and identification of each area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1.5 WARRANTIES

- A. Submittal Time: Submit written warranties on request of Engineer for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
- B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
 - 1. Bind warranties and bonds in heavy-duty, 3-ring, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.

2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation.
 3. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 4. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
- C. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep boardwalk and paved areas broom clean. Remove spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Clean exposed exterior and interior hard-surface finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces.
 - f. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
 - g. Replace parts subject to unusual operating conditions.
 - h. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those

noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

- i. Leave Project clean and ready for occupancy.
- B. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION

SECTION 01 78 10 – PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
- B. See Divisions 2 through 33 Sections for specific requirements for Project Record Documents of the Work in those Sections.

1.2 SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit one complete set of marked-up Record Drawings in portable document format (pdf).
- B. Record Specifications: Submit one set of marked up Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit summary list and data sheets of each Product installed.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Plans: Maintain one full set of blue- or black-line white prints of the Contract Drawings and Shop Drawings on site at all times.
 - 1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
 - 2. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
 - 3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 - 4. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

- B. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
 - 1. Record Prints: Organize Record Prints and newly prepared Record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 - 2. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Owner
 - e. Name of Architect/Engineer.
 - f. Name of Contractor.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 - 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 - 4. Note related Change Orders and Record Product Data where applicable.

2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 - 3. Note related Change Orders and Record Drawings where applicable.

2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.
- B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Engineer's reference during normal working hours.

END OF SECTION

SECTION 02 30 00

TEMPORARY EARTH RETAINING SYSTEMS AND COFFERDAMS

PART 1 GENERAL

1.1 WORK INCLUDED

- A. The work covered in this section includes the installation, maintenance, and removal of temporary earth retaining systems and cofferdams as required.

1.2 RESPONSIBILITY

- A. Temporary earth retaining systems and cofferdams shall be of sufficient strength to safely sustain all loads from the sides of the excavations together with all water pressure and reasonable surcharge.
 - 1. Types and/or limits shown on the Drawings are for information only and the Contractor shall be responsible for the final selection, layout, and design of the temporary earth retaining and cofferdam systems required to perform the work.
 - 2. The Contractor shall, at all times, be entirely responsible for the adequacy of temporary earth retaining and cofferdam systems used to permit the satisfactory and safe installation and construction of the work.
 - 3. The Contractor shall, at all times, provide adequate protection against damage to all existing utilities, structures and completed portions of the work, and shall prevent injury to persons

1.3 SUBMITTALS

- A. Temporary Earth Retaining Systems and Cofferdam Drawings:
 - 1. At least twenty-one (21) calendar days prior to the start of installation submit for review by the Engineer:
 - a. Drawings
 - b. Sections
 - c. Details and other pertinent information
 - 2. The data shown shall include:
 - a. An overall time schedule for construction.
 - b. A description of the anticipated sequence of construction.
 - c. Complete details of methods, equipment and materials proposed to be used at each work location.
 - d. Any other pertinent data required for review by the Engineer.
- B. Design Computations:
 - 1. The Contractor shall also submit complete computations for the design of the temporary earth retaining systems and cofferdams proposed to be installed. The

design shall be in accordance with sound engineering practice and modern accepted principles of soil mechanics. It shall include the effects of all surcharge which may be reasonably anticipated.

2. The minimum factor of safety for temporary earth retaining systems and cofferdams shall be 1.5. This includes but is not limited to rotational stability and piping/heave.
3. All drawings and computations shall be made and sealed by a registered Professional Engineer licensed to practice in the Commonwealth of Massachusetts.

C. Submittal Review by Engineer:

1. The design and layout will be reviewed by the Engineer as to type and suitability, providing that the arrangements presented by the Contractor are satisfactory, but such review will not relieve the Contractor of the sole responsibility for the adequacy of the systems nor shall it be construed as a guarantee that the Contractor's proposed equipment, materials, and methods will be adequate for the work required at the locations of and for the work required by this contract.

PART 2 PRODUCTS

2.1 PILES

- A. The shapes, sizes, and lengths of piles to be utilized are at the Contractor's discretion, unless otherwise shown on the Drawings. Piles shall be satisfactory to withstand all driving and construction stresses.

2.2 SHEETING

- A. The shapes, sizes, and lengths of sheet piles to be utilized are at the Contractor's discretion, unless otherwise shown on the Drawings. Sheet piles shall be satisfactory to withstand all driving and construction stresses.

2.3 WATER-INFLATED DAMS

- A. The shapes, sizes and lengths of water-inflated dams to be utilized are at the Contractor's discretion, unless otherwise shown on the Drawings. Water inflated dams shall be satisfactory for the intended purpose.

2.4 PORT-A-DAMS

- A. The shapes, sizes and lengths of Port-A-Dams to be utilized are at the Contractor's discretion unless otherwise shown on the Drawings. Port-A-Dams shall be satisfactory for the intended purpose.

2.5 SANDBAGS

- A. Sandbags, if utilized to construct temporary cofferdams, shall be 35-inch x 35-inch x 38-inch jumbo sandbags suitable for reuse and constructed to maintain their shape after filling. Completely fill sandbags with well graded sand suitable for the intended application. The in-situ unit weight of the sand fill shall be 111 pcf (min) for a total bag weight of 3,000 pounds (min).

2.6 PLASTIC LINER

- A. Plastic liner shall be 10 mil polyethylene liner (min). Overlap liner a minimum of 4 feet at all seams and secure with standard sandbags.

2.7 SUPPORTS

- A. Bracing and other supports whether of steel, timber, or other materials shall be of the strength and dimensions necessary to satisfactorily withstand the loads to which they will be subjected. All bracing and other supports shall be free from any defects which might impair this strength.

2.8 OTHER MATERIALS

- A. The Contractor may propose other suitable materials to construct the cofferdams including but not limited to plastic lined concrete block enclosures and shall provide all hardware and fastenings necessary for the satisfactory installation of all cofferdams.

PART 3 EXECUTION

3.1 GENERAL

- A. The Contractor shall take all precautions necessary to prevent lateral or inward movement of material along the sides or the bottoms of excavations.
 - 1. It is expressly understood and agreed that whenever temporary earth retaining systems and cofferdams are used, it shall not relieve the Contractor of the sole responsibility for any damages or injury due to the installation or failure of the systems or the settling of the backfill, utilities, or of the adjacent ground, structures, utilities, or other work

3.2 INSTALLATION

- A. Where temporary earth retaining systems and cofferdams are used, they shall be installed ahead of all excavation operations.
 - 1. Install to maintain sufficient restraint of the adjacent soil and to prevent movement, excessive inflow of water, and intrusion of soils into or instability of the bottom of the excavations.
 - 2. If voids occur, they shall be filled immediately with selected materials from the earth excavation to the satisfaction of the Engineer.

3.3 OBSTRUCTIONS DURING DRIVING

- A. Where obstructions are encountered that result in a sudden, unexpected increase in penetration resistance and deviation from acceptable tolerances, the Contractor may be required to perform one of the following options.
 - 1. Removal of the obstruction.
 - 2. Extraction, repositioning, and re-driving.
 - 3. Addition of extra piling.

- B. Pursue the course of action selected by the Engineer. If, in the Engineer's opinion, the obstruction could not have been reasonably anticipated by the Contractor, work done under this Section, will be considered for payment as a Change Order.

3.4 INSPECTION

- A. The Contractor shall provide inspection prior to and during its operations of all existing utilities, structures and other facilities which might be disturbed by temporary earth retaining and cofferdam system installation.
 - 1. The Contractor shall monitor and control its construction operations to prevent damage to the existing adjacent utilities, structures, and completed portions of the work.

3.5 REMOVAL

- A. Temporary earth retaining systems and cofferdams shall be removed when backfilling is done, and removal shall be conducted in such a manner so as to avoid any damage to the permanent structure or to other members of the systems. Impact loading on the permanent structure or on members of the systems will not be allowed.
- B. During backfilling, temporary support elements shall not be removed until alternative support is available, such as substituted struts, backfill, or ability of the temporary earth retaining and cofferdam system to act as a cantilever without detrimental deflection. All voids left by removal of said systems shall be immediately filled.
- C. All temporary earth retaining systems and cofferdams shall be removed at completion unless otherwise shown on the Drawings

END OF SECTION

SECTION 02 31 50

EXCAVATION, BACKFILL, AND COMPACTION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Excavation, backfill, and compaction for boardwalk, revetment, retaining walls and other structures
 - 2. Excavation, backfill and compaction for subsurface utilities
 - 3. Earth retention systems
- B. Related Sections
 - 1. Section 02 30 00 – Temporary Earth Retaining Systems and Cofferdams
 - 2. Section 02 32 00 - Borrow Materials
 - 3. Section 02 40 00 - Dewatering, Control, and Diversion of Water
 - 4. Section 35 31 19 - Stone Revetment

1.2 REFERENCES

- A. ASTM D1557-07 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³))
- B. Federal Register 40 CFR Part 122, United State Environmental Protection Agency (USEPA) Administered Permit Programs (National Pollution Discharge Elimination System or NPDES), Storm Water Discharge
- C. ASTM D1556-07 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
- D. ASTM D2487-06e1 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
- E. ASTM D6938-08a - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
- F. 29 CFR Part 1926 Subpart P - OSHA Excavation Regulations 1926.650 through 1926.652 including Appendices A through F
- G. 520 CMR 14.00 Excavation and Trench Safety
- H. Commonwealth of Massachusetts Highway Department “Standard Specifications for Highways and Bridges,” 1988 Edition as amended
- I. Manual on Uniform Traffic Control Devices for Streets and Highways, U.S. Department of Transportation, Federal Highway Administration, latest edition

1.3 DEFINITIONS

- A. Benching - A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.
- B. Earth Retention Systems - Any structural system, such as sheeting and bracing or cofferdams, designed to retain in-situ soils in place and prevent the collapse of the sides of an excavation in order to protect employees and adjacent structures.
- C. Excavation - Any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.
- D. Protective System - A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include earth retention systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.
- E. Registered Professional Engineer - A person who is registered as a professional engineer in the state where the work is to be performed. However, a professional engineer, registered in any state is deemed to be a "registered professional engineer" within the meaning of this standard when approving designs for "manufactured protective systems" or "tabulated data" to be used in interstate commerce.
- F. Licensed Site Professional - A person who is registered by the Commonwealth of Massachusetts to render Hazardous Waste Site Cleanup Activity Opinions.
- G. Shield System - A structure that is designed to withstand the forces imposed on it by a cave-in and thereby protects employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either pre-manufactured or job-built in accordance with 29 CFR 1926.652(c)(3) or (c)(4). Shields used in trenches are usually referred to as "trench boxes" or "trench shields."
- H. Sloping - A method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.
- I. Trench - A narrow excavation (in relation to its length) made below the surface of the ground, of at least three feet in depth. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 m).

1.4 SUBMITTALS

- A. Performance data for the compaction equipment to be utilized
- B. Construction methods that will be utilized for the removal of rock
- C. Modified Proctor Test (ASTM D1557) results and soil classification (ASTM D2487) for all proposed backfill materials at the frequency specified below:

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

1.5 QUALITY ASSURANCE

- A. All Excavation, Trenching, and related Earth Retention Systems shall comply with the requirements of OSHA excavation safety standards (29 CFR Part 1926 Subpart P), 520 CMR 14.00, and other State and local requirements. Where conflict between OSHA and State regulations exists, the more stringent requirements shall apply.

1.6 PROJECT CONDITIONS

- A. Notify Dig Safe and obtain Dig Safe identification numbers.
- B. Notify utility owners in reasonable advance of the work and request the utility owner to stake out on the ground surface the underground facilities and structures. Notify the Engineer in writing of any refusal or failure to stake out such underground utilities after reasonable notice.

- C. Make explorations and Excavations to determine the location of existing underground structures, pipes, house connection services, and other underground facilities in accordance with Paragraph 3.2.D of this Section.
- D. In accordance with 520 CMR 14.00, no person shall, except in an emergency, make an excavation in any public way, public property, or privately owned land until a permit is obtained from the appropriate designated permitting authority. For this project, the permit should be obtained from necessary regulatory agencies or authorities.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

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

2.2 CONTROLLED DENSITY FILL

- A. Controlled density fill shall be flowable, excavatable and shall require no vibration for placement. Compressive strength at 28 days shall be 30 to 80 psi and the slump shall be 10 to 12 inches.

PART 3 EXECUTION

3.1 PREPARATION

- A. Public Safety and Convenience
 - 1. Adhere to the requirements of 520 CMR 14.00 for all excavation work.
 - 2. Take precautions for preventing injuries to persons or damage to property in or about the Work.
 - 3. Provide safe access for the Owner and Engineer at site during construction.

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

3.2 CONSTRUCTION

A. Earth Retention Systems

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

B. Excavation

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

- a. Excavated material not required or not suitable for backfill shall be removed from the site and disposed of in accordance with local, State and Federal laws and regulations.
 - b. Perform grading to prevent surface water from flowing into the excavation.
 - c. Pile excavated material in a manner that will endanger neither the safety of personnel in the excavation nor the Work itself. Avoid obstructing sidewalks and driveways.
 - d. Hydrants under pressure, valve pit covers, valve boxes, manholes, curb stop boxes, fire and police call boxes, or other utility controls shall be left unobstructed and accessible until the Work is completed.
6. Grade or create berms or swales to direct surface water from excavations to appropriate structures designed to accommodate storm water. If no structures exist, direct water to areas that minimize impacts to adjacent structures and properties.
- C. Backfill and Compaction
1. Unless otherwise specified or indicated on the Drawings, use satisfactory material removed during excavation for backfilling trenches. The Engineer may require stockpiling, drying, blending and reuse of materials from sources on the Project.
 2. Spread and compact the material promptly after it has been deposited. When, in the Engineer's judgment, equipment is inadequate to spread and compact the material properly, reduce the rate of placing of the fill or employ additional equipment.
 3. Prior to backfilling or placement of structures, excavated subgrades shall be proof compacted with either 10 passes of a 10-ton vibratory drum roller for open excavations or 6 passes of a large, reversible, walk behind vibratory compactor capable of exerting a minimum force of 2,000 pounds in trench or pit excavations. Soft or weak spots shall be over-excavated and replaced with compacted Granular Fill or compacted Crushed Stone wrapped in a non-woven geotextile, as directed by the Owner or their representative. If proof compaction will prove detrimental to the subgrade due to the presence of groundwater, static rolling may be allowed at the discretion of the Engineer or Owner.
 4. Soil bearing surfaces shall be protected against freezing and the elements before and after concrete placement. If construction is performed during freezing weather, structures shall be backfilled as soon as possible after they are constructed. Insulating blankets or other means shall be used for protection against freezing at the discretion of the Engineer or Owner.
 5. When excavated material is specified for backfill and there is an insufficient amount of this material at a particular location on the Project due to rejection of a portion thereof, consideration will be given to the use of excess material from one portion of the Project to make up the deficiency existing on other portions of the Project.

- a. Use borrow material if there is no excess of excavated material available at other portions of the Project.
6. Backfilling and compaction methods shall attain 95% of maximum dry density at optimum moisture content as determined in accordance with ASTM D1557.
7. Do not place stone or rock fragment larger than six inches in greatest dimension in the backfill.
8. Maximum loose lift height for backfilling existing or borrow material shall be 12 inches, unless satisfactory compaction is demonstrated otherwise to the Engineer through field-testing. In no case shall loose lift height for backfilling exceed 3 feet.
9. Where excavation is made through permanent pavements, curbs, paved driveways, or paved sidewalks, or where such structures are undercut by the excavation, place the entire backfill to sub-grade with granular materials and compact in 6 inch layers, unless satisfactory compaction is demonstrated otherwise to the Engineer through field-testing. Use approved mechanical tampers for the full depth of the trench. If required, sprinkle the backfill material with water before tamping so as to improve compaction. Any trenches improperly backfilled, or where settlement occurs, shall be reopened to the depth required to correct the problem, and shall then be refilled and properly compacted with the surface restored to required grade at no additional expense.
10. The Contractor shall not place backfill against or on structures until they have attained sufficient strengths to support the loads to which they will be subjected, without distortion, cracking, or other damage. As soon as possible after the structures are adequate, they shall be backfilled with suitable backfill material.
11. Place and compact backfill around manholes, vaults, pumping stations, gate boxes or other structures in six inch layers unless satisfactory compaction is demonstrated otherwise to the Engineer through field-testing, from a point one foot over the pipe. Exercise care to protect and prevent damage to the structures.
12. Conduct operations so as to prevent at all times the accumulation of water, ice and snow in excavations or in the vicinity of excavated areas so as to prevent water from interfering with the progress or quality of the work.
13. Exercise care to ensure that water does not collect in the bell or collar holes to sufficient depth to wet the bell or collar of pipes waiting to be jointed.
14. Take precautions to protect new work from flooding during storms or from other causes. Control the grading in the areas surrounding all excavations so that the surface of the ground will be properly sloped to prevent water from running into the excavated area. Where required, provide temporary ditches for drainage. Upon completion of the work, all areas shall be restored to original condition.
15. Brace or otherwise protect pipelines and structures not stable against uplift during construction.

16. Install erosion/sedimentation controls for velocity dissipation at point discharges onto non-paved surfaces.

3.3 PROTECTION

A. Protection of Existing Structures

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

B. Accommodation of Traffic

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

C. Erosion and Sedimentation Control

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

END OF SECTION

SECTION 02 32 00

BORROW MATERIALS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Gravel Borrow
2. Processed Gravel Borrow for Pavement Sub-base
3. Granular Fill
4. Sand Borrow
5. Stone Borrow
6. Ordinary Borrow
7. Beach Nourishment

B. Related Sections

1. Section 02315 - Excavation, Backfill, Compaction, and Dewatering
2. Section 02 40 00 - Dewatering, Control, and Diversion of Water

1.2 REFERENCES

- A. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
- B. ASTM C117 - Standard Test Method for Materials Finer than 75 μm (No. 200) Sieve in Mineral Aggregates by Washing
- C. ASTM D422 - Standard Test Method for Particle-Size Analysis of Soils (including Hydrometer analysis for silts and clays)
- D. ASTM D4318 - Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils
- E. ASTM D5084 - Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials using a Flexible Wall Permeameter (Falling Head Permeability Test)
- F. AASHTO - Standard Specification for Transportation Materials and Methods of Sampling and Testing, 1986 Edition as amended
- G. Commonwealth of Massachusetts Highway Department "Standard Specification for Highways and Bridges," 1988 Edition as amended

1.3 SUBMITTALS

WESSAGUSSET BEACH WALK

- A. Representative Samples of borrow materials taken from the source. Tag, label, and package the Samples as requested by Engineer. Provide access to the borrow site for field evaluation and inspection.
- B. Provide sieve analysis (ASTM C136) and permeability analysis (ASTM D2434) from certified soils testing laboratory for all borrow materials. Take and test a sample, at no additional cost to the Owner for each 1,500 c.y. of borrow material placed.

1.4 QUALITY ASSURANCE

- A. No borrow shall be placed prior to the approval of Samples by the Engineer.

1.5 PROJECT/SITE CONDITIONS

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

PART 2 PRODUCTS

2.1 GRAVEL BORROW

- A. Gravel Borrow shall consist of inert material that is hard, durable stone and coarse sand, free from loam and clay, surface coatings, and deleterious materials. The coarse aggregate shall have a percentage of wear, by the Los Angeles Abrasion Test, of not more than 50.

Gradation requirements for Gravel Borrow shall be determined by AASHTO-T11 and T27 and shall conform to the following:

Sieve	Percent Passing
½ inch	50 – 85
No. 4	40 – 75
No. 50	8 – 28
No. 200	0 - 10

Maximum size of stone in Gravel Borrow shall be 2 inches.

2.2 PROCESSED GRAVEL BORROW FOR PAVEMENT SUBBASE

- A. The compacted Processed Gravel Borrow to be used for gravel access roads and pavement subbase, or other area where a firm, free-draining subgrade is needed shall consist of inert material that is hard, durable stone and coarse sand, free from loam and clay, surface coatings and deleterious materials. The coarse aggregate shall have a percentage of wear, by the Los Angeles Abrasion Test, of not more than 50.

- B. Gradation requirements shall conform to the following:

Sieve	Percent Passing
3"	100
1 ½"	70 – 100
¾"	50 – 85
No. 4	30 – 60
No. 200	0 - 10

- C. Stockpile the processed materials in such a manner to minimize segregation of particle sizes. All processed gravel shall come from approved stockpiles.

2.3 GRANULAR FILL

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

- B. Gradation requirements for Granular Fill shall conform to the following:

Sieve Size	Percent by Weight Passing Through	
	Minimum	Maximum
2/3rds loose lift thickness	100	--
No. 10	30	95
No. 40	10	70
No. 200	0	15

2.4 SAND BORROW

- A. Sand Borrow material shall be supplied from an off-site borrow area approved by the Engineer. Testing of the off-site Sand Borrow shall be at the Contractor’s expense.
- B. Sand Borrow shall consist of clean, inert, hard, durable grains of quartz or other hard, durable, rock, free from loam or clay, surface coatings and deleterious materials. The allowable amount of material passing a No. 200 sieve as determined by ASTM-C117 shall not exceed 10% by weight.
1. Sand Borrow for Beach Nourishment should be grain size compatible with the beach.
- C. Material shall consist of a clean, non-plastic, granular material conforming to the requirements of a SW, SP or SM under the Unified Soil Classification System (USCS) (ASTM D2487).

WESSAGUSSET BEACH WALK

- D. The material shall have the characteristics that when placed and compacted, the soil particles will bind together so as to form a solid, stable surface capable of supporting rubber-tired vehicular traffic during wet weather periods as well as extended dry weather periods. The borrow material shall not contain fines to the extent that the surface layer becomes “greasy” when wet.
- E. The material shall not contain stones larger than 3/8 inch in diameter.
- F. Material consisting of frozen clogs, ice and snow will be rejected.
- G. All sand borrow material to be used shall be subject to approval by Engineer, and Engineer reserves the right to reject any borrow material from the job that does not meet the above requirements.

2.5 STONE BORROW

A. Crushed Stone Borrow

- 1. Crushed stone borrow shall consist of one of the following materials:
 - a. Durable crushed rock consisting of the angular fragments obtained by breaking and crushing solid or shattered natural rock, and free from a detrimental quantity of thin, flat, elongated or other objectionable pieces. A detrimental quantity will be considered as any amount in excess of 15% of the total weight. Thin stones shall be considered to be such stones whose average width exceeds 4 times their average thickness. Elongated stones shall be considered to be stones whose average length exceeds 4 times their average width.
 - b. Durable crushed gravel stone obtained by artificial crushing of gravel boulders or fieldstone with a minimum diameter before crushing of 8 inches.
- 2. The crushed stone shall be free from clay, loam, or deleterious material and not more than 1.0% of satisfactory material passing a No. 200 sieve will be allowed to adhere to the crushed stone.
- 3. The crushed stone shall have a maximum percentage of wear as determined by the Los Angeles Abrasion Test (AASHTO-T-96) as follows:
 - a. For Class 1 Bit. Conc. 30%**
 - b. For Cement Concrete Aggregate 45%***
 - c. Crushed Stone for Subbase 45%

**Crushed stone for this use shall consist of crushed or shattered natural rock only. Crushed gravel stone will not be permitted.

***Except for 5000 psi or greater cement concrete and prestressed concrete which shall be 30%.
- 4. The crushed stone shall conform to the grading requirements shown in the following grading Table.

Sieve Size	Percent by Weight Passing Through	
	Minimum	Maximum
1 ½" Crushed Stone		
2"	100	--
1 ½"	95	100
1"	35	70
¾"	0	25
¾" Crushed Stone		
1"	100	--
¾"	90	100
½"	10	50
3/8"	0	20
No. 4	0	5

B. Dense Graded Stone Borrow

- The crushed stone used for backfill shall be a dense graded mixture and conform to the following gradation requirements.

Sieve Size (Square Openings)	Percent by Weight Passing Through	
	Minimum	Maximum
5/8"	100	100
½"	85	100
3/8"	15	45
#4	0	15
#8	0	5

C. Washed Rounded Stone (Peastone)

- All stone shall be clean material substantially free from any foreign and deleterious material such that not more than 1% passes the #200 sieve. The maximum particle size shall be 5/8".
- Washed rounded stone shall conform to the following gradation requirements:

Percent Passing Through by Weight

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Sieve Size	Minimum	Maximum
5/8 "	100	-
1/2"	85	100
3/8"	15	45
No.4	0	15
No.8	0	5

2.6 ORDINARY BORROW

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

2.7 BEACH NOURISHMENT

- A. Beach Nourishment Material should be compatible the physical characteristics of the existing beach. The grain size analysis and sieve results are located within the Alpha Labs Report.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Prior to the placement of borrow material, site preparation shall be completed as required by the Contract Documents and approved by the Engineer.
- B. Ensure that all materials are properly stockpiled on site to prevent contamination by other materials.
- C. Place borrow material over the entire area in uniform lifts and compact in accordance with Section 02315.
- D. Utilize on-site soils prior to using off-site borrow provided on-site soils meet the requirements of the specifications.
- E. Utilize gravel borrow in all locations where a surface treatment has not been specified but requires a firm finish surface.
- F. Processed gravel for pavement subbase is intended to provide a stable foundation for driveways, sidewalk and roadway repair where a gravel base has been specified.
- G. Borrow shall be used as a replacement for unsuitable materials where poor soil conditions are encountered during the progress of the work, where approved by the Engineer. Borrow type will be determined by the Engineer. Borrow material used as a replacement for unsuitable soil is not intended to be an aid to dewatering.

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- H. Shape borrow used for pipe foundation material so that it supports the pipe properly and will not damage the pipe, bells, collars, or the pipe fittings.
- I. Place all borrow to keep it free of other materials and to prevent segregation.
- J. Maintain and repair all eroded areas during the life of this contract at no additional cost to the Owner.

END OF SECTION

SECTION 02 40 00

DEWATERING, CONTROL, AND DIVERSION OF WATER

PART 1 GENERAL

1.1 WORK INCLUDED

- A. Work covered under this section consists of the Dewatering, Control, and Diversion of Water as required to perform the work.

1.2 SUBMITTALS

- A. At least twenty-one (21) calendar days prior to the start of Construction, submit a Dewatering, Control, and Diversion of Water Plan for review by the Engineer that includes the following.

1. Describe how dewatering, control, and diversion of water shall be accomplished.
2. Provide Plans, Sections, and Details showing the type and location of flow diversion pipes/channels, dewatering sumps/wells, electrical services, discharge hoses, and pre-treatment and sedimentation controls for each anticipated phase of the project.
3. Provide the estimated average and peak dewatering rates, in gallons per minute (gpm), for each anticipated phase of the project, including Supporting Calculations.
4. Provide details and methods for providing back-up power and emergency procedures for maintaining continuous, uninterrupted dewatering operations as required.
5. Provide manufacturer's literature and/or cut-sheets for proposed pumps, sump/well casing and screen, filter pack, pre-treatment equipment, sedimentation controls, and other pertinent items.
6. Provide an overall schedule for dewatering, control, and diversion of water.

The Water Control Plan shall be coordinated with the requirements of other specification sections as required. All submittals shall be received and approved by the Engineer prior to ordering materials and starting work.

The Water Control Plan will be reviewed by the Engineer as to type and suitability, providing that the arrangements presented by the Contractor are satisfactory, but such review will not relieve the Contractor of the sole responsibility for the adequacy of the system nor shall it be construed as a guarantee that the Contractor's proposed equipment, materials, and water control methods will be adequate for the work required at the locations of and for the work required by this contract.

1.3 QUALIFICATIONS

- A. Dewatering Contractor: Minimum of 5 years of past experience with similar soil and groundwater conditions on at least 3 projects completed within the same time period.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

- A. The Contractor shall provide all materials and equipment including, but not limited to pipe, fittings, valves, pumps, tools, fuel, and other appurtenances in suitable and adequate quantities as required to control water.

PART 3 EXECUTION

3.1 SURFACE DRAINAGE

- A. The Contractor shall intercept and divert surface drainage away from the work sites by the use of dikes, curb walls, ditches, sumps or other means. The Contractor shall design surface drainage systems so that they do not cause erosion on or off the site. Surface runoff shall be controlled to prevent entry of water into excavations. The Contractor shall remove drainage systems when no longer needed.

3.2 WATER CONTROL IN EXCAVATIONS

- A. The Contractor shall use water control methods, which are appropriate to the ground conditions, the construction operations, and the requirements of these Contract Documents. The methods shall involve the removal of water within the excavation and may involve the removal of water outside the excavation or construction of facilities to control water movement into the excavation.
- B. Water control measures shall minimize adverse effects of elevated or reduced water pressure on the work, the surrounding ground, and adjacent facilities and structures. The water control measures shall be designed and operated so as to prevent the removal of in-situ materials or loosening or softening of in-situ materials within the excavation. The Contractor shall control groundwater and surface water such that construction operations will be performed without adverse effects of water, and to prevent hydrostatic uplift pressures until construction has been completed.
- C. Water shall be controlled and maintained 1 foot below the lowest working elevation during periods when the sub-grade is being compacted, when earth materials are being placed, when geotextiles, geo-grids, grout, and/or concrete (except tremie concrete) are being placed, and at such other times as is necessary for the safe execution of the work. If the Contractor encounters large amounts of water entering the excavation, immediate action shall be taken to control the water inflow. A large amount of inflow requiring control shall be defined as that which adversely affects the performance of the work or has the potential of causing loss or damage to adjacent property or structures
- D. Construction activities shall be schedule for periods when flows are anticipated to be at a minimum. If there is flowing water during construction, flow shall be diverted around the work site in a stable manner using methods approved by the engineer. A temporary pump around system shall be used as necessary to move water around the work site. Any pump around system(s) shall not be left unattended.
- E. Dewatering of the work area shall be conducted in a manner that limits discharge of turbid water into the resource areas to prevent any damage to the established ecosystem. Turbid discharge shall be directed to a filter bag.

3.3 PROPERTY LOSSES FROM REMOVAL OR DISTURBANCE OF GROUNDWATER

- A. Any structure, including but not limited to buildings, bridges, streets, and utilities that become unstable or vulnerable to settlement due to removal or disturbance of groundwater will be supported immediately by the Contractor. Support shall include but not be limited to bracing, underpinning, or compaction grouting.
- B. All loss or damage arising from removal or disturbance of groundwater, including but not limited to claims for subsidence and the loss of structure support, that may occur in the prosecution of the work shall be sustained and borne by the Contractor.
- C. If the Contractor needs to correct the damage resulting from his operations, the Owner may, 30 days after notifying the Contractor in writing, proceed to repair, rebuild or otherwise restore such damaged property as may be deemed necessary, and the cost thereof shall be deducted from compensation which may be or become due the Contractor under this Contract.

END OF SECTION

SECTION 02 41 00 – SITE DEMOLITION

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Work Includes:

1. Demolition and removal of selected site elements as required for new work. Refer to the Drawings for additional requirements.
2. Removal and legal disposal of demolished materials off site. Except those items specifically designated to be relocated, reused, or turned over to the facility, all existing removed materials, items, trash, and debris shall become property of the Contractor and shall be completely removed from the site and legally disposed of at her/his expense. Salvage value belongs to the Contractor. On-site sale of materials is not permitted.
3. Demolition and removal work shall properly prepare for alteration work and new construction to be provided under the Contract.
4. Scheduling and sequencing operations without interruption to utilities serving occupied areas. If interruption is required, obtain written permission from the utility company and the Owner. Provide temporary services as necessary to serve occupied and usable facilities when permanent utilities must be interrupted, or schedule interruption when the least amount of inconvenience will result.

B. Related Work: The following items are not included in this Section and are specified under the designated Sections:

1. Division 1 Section 01 00 00 General Requirements for temporary facilities and controls, for maintenance of access, for cleaning during construction, and for dust and noise control.
2. Division 31 Section 02 31 50 – Excavation, Backfill, and Compaction:
 - a. Excavating and backfilling for removal of existing pavement, sub-surface utility structures and lines, appurtenances, and other elements indicated on the Drawings.

1.2 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and reinstalled.
- B. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated. Protect from weather until reinstallation.
- C. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed or removed and reinstalled.

1.3 MATERIALS OWNERSHIP

- A. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques, antiques, and other items of interest or value to Owner that may be encountered during selective demolition remain property of the Owner as applicable. Carefully remove each item or object in a manner to prevent damage and deliver promptly to a location

acceptable to the Owner.

1.4 SUBMITTALS

- A. Schedule of Selective Demolition Activities: Indicate the following:
 - 1. Detailed sequence of selective demolition and removal work, with early and late starting and finishing dates for each activity. Ensure Owner's on-site operations are uninterrupted if applicable.
 - 2. Interruption of utility services. Indicate how long utility services will be interrupted.
 - 3. Coordination for shutoff, capping, and continuation of utility services.
 - 4. Locations of proposed dust- and noise-control temporary partitions and means of egress, including for other occupants affected by selective demolition operations.
 - 5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
 - 6. Means of protection for items to remain and items in path of waste removal from building.
- B. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged, and turned over to the Owner.
- C. Pre-demolition Photos and Videotapes: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by selective demolition operations or construction activities. Comply with Division 01 requirements. Submit before Work begins.
- D. Landfill Records: Provide trip tickets (receipts) indicating receipt and acceptance of any hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.5 QUALITY ASSURANCE

- A. Examination of Existing Conditions: The Contractor shall examine the Contract Drawings for demolition and removal requirements and provisions for new work. Verify all existing conditions and dimensions before commencing work. The Contractor shall visit the site and examine the existing conditions as he finds them and shall inform himself of the character, extent and type of demolition and removal work to be performed. Submit any questions regarding the extent and character of the demolition and removal work in the manner and within the time period established for receipt of such questions during the bidding period.
- B. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.
- C. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.
- D. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- E. Standards: Comply with ANSI A10.6 and NFPA 241.
- F. Pre-demolition Conference: Conduct conference at Project site to comply with requirements in DIVISION 01 - General Requirements, Project Meetings. Review methods and procedures related to selective demolition including, but

not limited to, the following:

1. Inspect and discuss condition of construction to be selectively demolished.
2. Review structural load limitations of existing structure.
3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
5. Review areas where existing construction is to remain and requires protection.

1.6 WARRANTY

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

PART 2 - PRODUCTS

2.1 SALVAGING

- A. Salvaged for Reinstallation: Materials indicated on the Drawings or designated in the field by the Owner to be salvaged and reinstalled shall be carefully removed and stored at a location acceptable to the Engineer/Engineer and Owner. Materials to be salvaged include, but are not limited to the following:
 1. Existing granite steps.
 2. Riprap Revetment.
 3. Existing curbing along Regatta Road.
 4. As directed by Engineer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. Inventory and record the condition of items to be removed and reinstalled.
- D. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and electrical systems serving areas to be selectively demolished.
 1. Arrange to shut off indicated utilities with utility companies and Owner.
 2. If services/systems are required to be removed, relocated, or abandoned,

before proceeding with selective demolition provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.

3. Cut off pipe or conduit in the Regatta Road Right of Way and on the project site. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.
4. Prior to commencing cutting work in existing surfaces, take all precautionary measures to assure that electrical services to the particular area have been made inactive. Coordinate with Plumbing and Electrical subcontractors. Only licensed tradesmen of that particular trade shall disconnect and cap existing plumbing and electrical items that are to be removed, abandoned and/or relocated.
5. If, during the process of cutting work, existing utility lines are encountered which are not indicated on the Drawings, regardless of their condition, immediately report such items to the Engineer. Do not proceed with work in such areas until instructions are issued by the Engineer. Continue work in other areas.

3.3 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 1. Comply with requirements for access and protection specified in DIVISION 01 - GENERAL REQUIREMENTS, Temporary Facilities and Controls.
 2. Maintain adequate passage to and from all exits at all times. Before any work is done which significantly alters access or egress patterns, consult with the Engineer and obtain approval of code required egress. Under no condition block or interfere with the free flow of people at legally required exits, or in any way alter the required condition of such exits.
- B. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
 1. Strengthen or add new supports when required during progress of selective demolition.
 2. Remove temporary shoring, bracing and structural supports when no longer required.
 3. Post warning signs and place barricades as applicable during placement and removal of temporary shoring.
- C. Conduct demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain. Ensure safe passage of people around demolition area(s).
 1. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction. Provide temporary barricades as required to limit access to demolition areas.
 2. Protect existing site improvements, appurtenances, and landscaping to

remain.

- D. Drain, purge, or otherwise remove, collect, and dispose of chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with demolition operations.

3.4 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically.
2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering, and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
5. Maintain adequate ventilation when using cutting torches.
6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
7. Remove upper portions of existing buried timber bulkhead components located behind the existing bulkhead at the site to the extent necessary to allow construction of the proposed facilities.
8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
9. Dispose of demolished items and materials promptly.

- B. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

- C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by the Owner, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective

demolition operations are complete.

- D. Items for Re-use and Preservation of Existing Surfaces to Remain:
 - 1. The Contractor shall inspect closely each item specifically designated to be relocated, reused, or turned over to the Owner prior to its removal, and immediately report damages and defects to the Engineer and the Owner. The Contractor shall be responsible for any subsequent damage to the same other than latent defects not readily apparent from close inspection, and shall bear responsibility for its repair or same replacement as directed by the Engineer, to the satisfaction of the Owner.
 - 2. Unless special surface preparation is specified under other Specification Sections, leave existing surfaces that are to remain in a condition suitable to receive new materials and/or finishes.

3.5 PROTECTION OF PUBLIC AND PROPERTY

- A. Provide all measures required by federal, state and municipal laws, regulations, and ordinances for the protection of surrounding property, the public, workmen, and Owner's employees during all demolition and removal operations. Measures are to be taken, but not limited to installation of sidewalks, sheds, barricades, fences, warning lights and signs, trash chutes and temporary lighting.
- B. Protect all walks, roads, streets, curbs, pavements, trees, and plantings on and off premises, and bear all costs for correcting such damage as directed by the Engineer, and to the satisfaction of the Owner.
- C. Demolition shall be performed in such a manner that will ensure the safety of adjacent property. Protect adjacent property from damage and protect persons occupying adjacent property from injuries which might occur from falling debris or other cause and so as not to cause interference with the use of other portions of the building, of adjacent buildings or the free access and safe passage to and from the same.
- D. Every precaution shall be taken to protect against movement or settlement of the building, of adjacent buildings, sidewalks, roads, streets, curbs, and pavements. Provide and place at the Contractor's own expense, all necessary bracing and shoring in connection with demolition and removal work.
- E. Remove portions of structures with care by using tools and methods that will not transfer heavy shocks to existing and adjacent building structures, both internal and external of the particular work area.
- F. Provide and maintain in proper condition, suitable fire resistive dust barriers around areas where interior demolition and removal work is in progress. Dust barriers shall prevent dust migration to adjacent areas. Remove dust barriers upon completion of major demolition and removal in the particular work area.

3.6 DISCOVERY OF HAZARDOUS MATERIALS

- A. If hazardous materials, such as chemicals, asbestos-containing materials, or other hazardous materials are discovered during the course of the work, cease work in affected area only and immediately notify the Engineer and the Owner of such discovery. Do not proceed with work in such areas until instructions are issued by the Engineer. Continue work in other areas.
- B. If unmarked containers are discovered during the course of the work, cease work in the affected area only and immediately notify the Engineer and the Owner of

such discovery. Do not proceed with work in such areas until instructions are issued by the Engineer. Take immediate precautions to prohibit endangering the containers' integrity. Continue work in other areas.

3.7 CUTTING

- A. Perform all cutting of existing surfaces in a manner which will ensure a minimal difference between the cut area and new materials when patched. Use extreme care when cutting existing surfaces containing concealed utility lines which are indicated to remain and bear full responsibility for repairing or replacement of all such utilities that are accidentally damaged.
- B. Provide a flush saw cut edge where pavement, curb and concrete removals abut new construction work or existing surfaces to remain undisturbed.

3.8 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Comply with the following:
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- B. Burning: Do not burn demolished materials.

3.9 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Premises shall be left in a clean condition and ready to accept alteration work and new construction.

END OF SECTION

SECTION 02 41 13 – SITE PREPARATION

PART 1 – GENERAL PROVISIONS

1.1 DESCRIPTION OF WORK

- A. Provide all labor, materials, equipment, and services necessary to complete the work of this Section as specified herein, as shown on the drawings, or both. The Contractor shall coordinate site preparation and demolition activities for each phase of construction. Refer to the site phasing plan, civil drawings and other drawings showing the phased work.
- B. The work of this Section includes, but is not limited to, the following:
 - 1. Staking layout, limits of work and extent of grading.
 - 2. Saw cutting existing pavement.
 - 3. Removing bituminous concrete pavement.
 - 4. Removing curbing.
 - 5. Clearing and grubbing.
 - 6. Temporary protection of adjacent public and private property.
 - 7. Net removal of a portion of existing soils from the site to create space for addition of agricultural soils required for the proposed plantings.

1.2 RELATED WORK

- A. Carefully examine all of the Contract Documents for requirements that affect the work of this Section. Other specification sections that directly relate to the work of this Section include, but are not limited to, the following:
 - 1. Division 1 Section 01 50 00 – Temporary Facilities and Controls
 - 2. Division 2 Section 02 41 00 – Site Demolition
 - 3. Division 31 Section 02 31 50 – Excavation, Backfill, and Compaction

1.3 PROJECT CONDITIONS

- A. It is hereby understood that the Contractor has carefully examined the site and all conditions affecting work under this Section. No claim for additional cost will be allowed because of lack of full knowledge of existing conditions.
- B. Preparation and Workmanship: Except as otherwise specified, site preparation, demolition work and clean-up shall be the work of the Contractor. Any item of work not specifically designed to be accomplished by a particular subcontractor shall be considered work of the Contractor.
- C. Traffic: Conduct site clearing and demolition operations to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. With the exception of the existing sidewalk located along the project frontage, do not close or obstruct streets, walks or other occupied or used facilities without permission from authorities having jurisdiction.
- D. Protection of Existing Improvements: Provide protection necessary to prevent damage to existing paving, services and all other improvements indicated to remain in place. Locate and identify existing underground utilities within project limit lines. Provide adequate means of protection of all utilities to remain. The Contractor shall contact “Dig-Safe” at 1-888-344-7233 prior to beginning any

excavation work. The Contractor shall be solely responsible for locating all underground utilities prior to the commencement of work. Locations of existing utilities on the site plans are not warranted to show all existing utilities under or above ground. Existing utilities indicated on the site plans are shown only for the convenience of the Owner's representatives.

1. Protect improvements and surfacing on Owner's property.
 2. Restore improvements damaged during construction to their original condition, as acceptable to the Owner and any agencies having jurisdiction.
- E. Dust and Pollution Control: Provide dust control for dust generated by the work of this project. Dampen surface as required or use other approved method. Comply with pollution control requirements of the governing authority.
- F. Salvageable Improvements: Carefully remove items indicated to be salvaged or reused, and store at the site for future use. Protect such items from accidental damage, vandalism and theft. Bench Marks: Locate, protect and maintain bench marks, monuments, control points and project engineering reference points.
- G. Regulatory controls: All work within this Section must comply with the requirements of all authorities having jurisdiction.
- H. Coastal Bank Stability: All work within this section and the Landscape architects Plans should include ensuring the Coastal Bank is stable at all times during the project.
- I. Contractor shall note that the existing steep coastal bank above the beach is only marginally stable. Much of the work of this contract includes actions (e.g., temporary cuts at toe and on slope, vegetation removal, exposure of unreinforced toe to wave action, etc.) That could potentially destabilize portions of the slope. Contractor shall take all care necessary to protect and reinforce the coastal bank against failure; including, but not limited to:
1. Preparation of an OSHA-compliant support of excavation plan for all phases of the project.
 2. Preventing any significant surcharges along the top of slope.
 3. Controlling run-on and run-off.
 4. Protecting exposed slopes with suitable erosion control measures.
 5. Phasing the work to limit the length of bank exposed to destabilizing toe cuts at any one time.
 6. Phasing the work with respect to the tides to protect the exposed toe.
 7. Phasing the work to complete the buttressing lower slope work before initiating work on the slope above the boardwalk.
- J. Neighborhood Conditions: Best practices should be implemented to minimize the impact to the residents along Regatta Road. No demolition waste, trees, or other greenery should be compiled or stored in the yards of the residents along Regatta Road and adjacent to the Coastal Bank.
- K. Subsurface conditions: Refer to Section 02 31 50 – Excavation, Backfill, and Compaction

PART 2 - PRODUCTS [None]

PART 3 - EXECUTION

3.1 SITE ENGINEERING/LAYOUT

- A. Prior to the start of clearing and excavation operations, lay out and stake the proposed improvements, paved areas, limits of cut and fill and work limit lines for the Engineer's review. The contractor shall retain the services of a Registered Land Surveyor to stake the proposed work as shown on the project plans.
- B. Promptly upon completion of layout work, and before any clearing or other construction work is begun, the Contractor shall arrange a conference on the site with the Engineer to inspect and verify the limits of work areas staked out.

3.2 BITUMINOUS CONCRETE

- A. Remove and legally dispose of all bituminous concrete paving indicated on the Drawings to be removed and all other paving required to be removed in order to construct the Project.
- B. Saw cut existing bituminous paving at all locations where pavement to be removed meets existing pavement to remain and where new pavement meets existing pavement to remain.
- C. Sawcuts shall be made with sharp tools and blades to provide a clean, straight, and vertical cut line. Use carbide or other type blade intended for that purpose.

3.3 ABOVE AND BELOW GRADE IMPROVEMENTS

- A. Remove and legally dispose of all existing above and below grade improvements necessary to permit construction of the Project including but not limited to existing buried timber bulkhead components, pipes, tanks, concrete slabs, castings, curbing, walls, fencing, signage and any and all other improvements inside or outside the contract limits. Remove walls and other obstructions to a depth of at least 2 feet below finished grades and as required to construct the subsurface improvements of this project.
- B. Abandonment, relocation, partial removal or complete removal of certain existing underground and above ground utilities including, but not limited to pipes, tanks, castings, conduits, electrical wiring and poles shall be performed as indicated on the Drawings.

3.4 DISPOSAL OF WASTE MATERIALS

- A. Removal from Owner's property: Remove all waste materials from Owner's property in timely and responsible manner and legally dispose of off-site. Accumulation is not permitted. Maintain disposal routes clear, clean and free of debris. Dumping and / or burning of material on site will not be permitted.

3.5 CLEAN UP

- A. Keep pavements and areas adjacent to and leading from the site, clean and free of mud, dirt and debris.
- B. At completion of the work of this Section, remove materials generated by site clearing. Do not spill or disperse debris on the site. Leave the site in a safe and clean condition acceptable to the Architect.

SECTION 02 45 70

HELICAL PILES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. This work shall consist of helical piles designed, furnished, installed, and tested in accordance with these specifications and as shown on the Contract Drawings.

2. Helical Pile Brackets

B. Related Sections

1. Section 06130 – Wood Pedestrian Boardwalk and Platform

1.2 REFERENCES

A. Massachusetts State Building Code, Current Edition

B. International Building Code, 2015 Edition

C. ASTM A36 Standard Specification for Carbon Structural Steel

D. ASTM A53 Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless

E. ASTM A153 Zinc Coating (Hot Dip) on Iron and Steel Hardware

F. ASTM A572 Standard Specification for High-Strength Low-Allow Columbium-Vanadium Structural Steel

G. ASTM D1143 Standard Test Methods for Deep Foundations Under Static Axial Compressive Load

H. ASTM D3689 Standard Test Methods for Deep Foundations Under Static Axial Tensile Load

I. ASTM D3966 Standard Test Methods for Deep Foundations Under Lateral Load

J. AWS D1.1 Structural Welding Code – Steel

1.3 DEFINITIONS

A. Contractor - The person/firm responsible for performing the helical pile work.

B. Coupling - Central steel shaft connection to the extension shaft.

C. Coupling Bolts - High-strength, structural steel fasteners used to connect helical pile segments together.

D. Helical Extension - Helical pile foundation component installed immediately following the lead or starter section. This component consists of one or more helix plates welded to a central shaft. Its function is to increase bearing area.

- E. Helix Plate - Generally this is a round steel plate formed into a ramped spiral. The helical shape provides the means to install the helical pile, plus transfers load to the soil in end bearing.
- F. Helical Pile - A bearing type foundation element consisting of a lead or starter section, helical extension (if required), plain extension section(s), and a steel cap plate.
- G. Installation Torque (T) - The resistance generated by a helical pile when installed into the soil. The installation resistance is a function of the soil type, and the size and shape of the various components of the helical pile.
- H. Lead Section - The first helical pile foundation component installed into the soil, consisting of single or multiple helix plates welded to a central steel shaft.
- I. Plain Extension - Central steel shaft segment without helix plates. It is installed following the installation of the lead section or helical extension (if used). Plain extensions are used to extend the helix plates beyond the specified minimum depth and into competent load bearing stratum.
- J. Safety Factor - The ratio of the ultimate capacity to the working or design load used for the design of the pile or structural element of the pile.

1.4 SUBMITTALS

A. Qualifications

1. Submit a list containing at least five projects on which the pile contractor has installed helical piles similar in size and complexity to this project within the past 5 years. A brief description of each project and a reference shall be included for each project listed. As a minimum, the reference shall include an individual's name, company name and address, and current phone number.
2. The helical pile work shall be performed under the direction of the Contractor's Design Engineer. The Design Engineer shall have a minimum of 5 years of experience designing and directing the installation of helical piles, and shall be a licensed Massachusetts Professional Engineer. Equipment operators and on-site supervisors shall have a minimum of 1 year of experience installing helical piles with the pile contractor's organization, and a minimum of 5 years of experience installing helical piles. Prior to the start of work, the Contractor shall submit a list identifying the engineer, rig operators, and on-site supervisors who will be assigned to the project. The list shall contain a summary of each individual's experience.
3. The Engineer will approve or reject the pile contractor's qualifications and staff within 10 working days after receipt of the complete submittal. Work shall not be started on any piling nor any materials ordered until approval of the pile contractor's qualifications is given. The Engineer may suspend the pile work if the pile contractor substitutes unqualified personnel for approved personnel; the Contractor shall be fully liable for additional costs resulting from the suspension of work and no adjustment in contract time resulting from the suspension of work will be allowed.

- B. Submit a detailed narrative describing the pile installation method proposed and encompassing all aspects of the pile installation operation.

- C. Submit working drawings and a design submission describing the helical piles proposed for use. The working drawings and design submission, stamped/sealed by the Design Engineer, shall be submitted 30 calendar days prior to the desired commencement of the pile installation. The working drawings and design submission shall include the following:
1. Pile design calculations stamped/sealed by a Massachusetts Professional Engineer, and properly coordinated with shop drawings. Calculations shall include:
 - a. A written summary report which describes the overall helical pile design.
 - b. Applicable code requirements and design references.
 - c. Design criteria including soil shear strengths, unit weights, and bearing capacity factors values for each stratum.
 - d. References for and/or calculations for soil unit weights, friction angles, and soil lateral resistance.
 2. A drawing showing the location and orientation of each helical pile and cross bracing. The locations of the pile to timber pile cap connections shall not be altered from what is shown on the design plans. Pile locations shall not interfere with any existing site features, including but not limited to structures, roadways, utilities, and equipment. A pile schedule providing:
 - a. Pile number.
 - b. Pile design load.
 - c. Pile batter as required; and
 - d. Type and size of pile.
 3. Installation means and methods to ensure that loads are transferred to the bearing stratum. The submittal shall include general notes for constructing the helical piles, including construction sequencing and other special construction requirements.
 4. Pile to concrete pile cap connection details.
 5. Pile to stair column connection details.
 6. Fabricated bracing to pile connection details (if required).
 7. The Engineer will acknowledge and respond to the Contractor's working drawings and design submission within 15 working days after receipt of the submission.
- D. Submit mill test reports for the helical piles, including pipe thicknesses, dimensions, and steel type.
- E. Submit mill test reports for the bracing and bracing brackets.
- F. Submit calibration data for each test jack and pressure gauge. The calibration tests shall have been performed by an independent testing laboratory and test shall have

been performed within 60 calendar days of the date submitted. Testing shall not commence until the Engineer has acknowledged receipt of satisfactory submittals for the jack and pressure gauge calibration.

- G. Submit within 30 calendar days after completion of the helical pile work a report containing:
 - 1. As-built drawings showing the surveyed locations of the piles, the pile lengths, and surveyed pile tip elevations.
 - 2. Detailed pile installation records for each pile including embedment depth of pile in the bearing stratum, helical pile type and configuration, installation equipment, type of torque indicator used, installation torque at one-foot intervals for the final 10 feet of installation, obstructions, plumbness, and variance from designed pile location and elevation.
 - 3. Pile test results and graphs.
- H. Manufacturer's literature including technical and performance specifications of the pile installation equipment. Submit copies of calibration reports for each torque indicator or torque motor. The calibration tests shall have been performed within 45 days of the date submitted. The calibration reports shall include the name of the testing agency, the serial number of the device calibrated, a description of the calibration testing equipment, the calibration date, and calibration results.

1.5 DESIGN CRITERIA

- A. Helical piles shall be designed in accordance with the Massachusetts State Building Code and meet the following requirements:
 - 1. Minimum vertical and lateral service loads:
 - 1) Compression: the greater 10 kips or the dead load of the stairs, per the stair designer, plus 6 kips.
 - 2) Tension: 1 kip (per pile)
 - 3) Lateral: 500 lbs (per pile)
 - 4) As otherwise required by the stairway designer/manufacturer.
 - 2. The allowable axial design load in compression shall be determined as $0.5 P_u$, where P_u is the least value of:
 - a. The sum of the areas of the helical bearing plates multiplied by the ultimate bearing capacity of the soil or rock comprising the bearing stratum.
 - b. The ultimate capacity as determined from well-documented correlations with installation torque.
 - c. The ultimate capacity as determined from load tests.
 - d. The ultimate capacity of the pile shaft.
 - e. The ultimate axial capacity of pile shaft couplings.

- f. The sum of the ultimate axial capacity of helical bearing plates.
- 3. The allowable uplift capacity of a single helical pile shall be determined by an approved method of analysis based on a minimum factor of safety of 3.0, unless load tests are conducted, in which case the minimum factor of safety shall be 2.0.
- 4. The allowable lateral load capacity of a single helical pile or group thereof shall be determined by an approved method of analysis or by lateral load test. The allowable load shall be half of the load which produces a gross lateral movement of 1 inch.
 - a. The design shall not rely upon lateral resistance in the top 2 feet of soil.
- 5. The allowable working load on the helical piles shall not exceed the lesser of $0.6F_y$ or $0.5F_u$, where F_y is the specified minimum yield stress of steel and F_u is the specified minimum tensile stress of the steel.
- 6. The design submittal shall provide the minimum effective installation torque for each size and capacity pile.
- 7. The design shall consider the effects of adfreeze on helical piles that are in the frost zone. The design shall demonstrate that the helical piles in the frost zone have adequate resistance to prevent uplift from adfreezing.
- 8. The minimum pile tip depth shall be at least 10 feet below finished grade. Where predrilling or excavation is performed to remove obstructions prior to pile installation, the piles shall be installed to a sufficient depth such that all helices bear within undisturbed soils.

1.6 ALLOWABLE TOLERANCES

- A. Centerline of helical pile shall be not more than 2.0 inches in either direction
- B. from indicated plan position.
- C. Helical pile plumbness shall be within 2° of design alignment.
- D. Top elevation of installed helical pile shall be within 1 inch of the design vertical elevation.

1.7 QUALITY ASSURANCE

- A. Perform work in accordance with the International Building Code (current edition) as modified by the Massachusetts State Building Code (current edition).
- B. Field Monitoring and Testing
 - 1. Install all piles in the presence of an authorized representative of the Owner.
 - 2. Certification of quality of pile materials to be used in the Work shall be furnished at the time of delivery of materials to the site. Pile materials shall also be subject to on-site observation for conformance with Contract Documents.

3. Approvals given by the Engineer shall not relieve the Contractor of their responsibility for performing the Work in accordance with the Contract Documents.

1.8 PROJECT/SITE CONDITIONS

A. Existing Conditions

1. The Contractor shall examine the project site conditions, drawings, survey of existing utilities and reference soils information.
2. Sieve analysis reports of soil samples obtained from Test Pits dug at the base of the existing rock revetment and well drilling logs obtained at the top of the bank are included in the Appendix.
3. Additional soil test borings or other exploratory operations needed to determine helical pile installation parameters shall be conducted by the Contractor, with the approval of the Engineer, at no additional cost to the Owner.
4. The Contractor is hereby informed that fill deposits in the sloping embankment may contain potential obstructions to the helical pile installation including, but not limited to cobbles, glass, and brick. The requirements for removing obstructions or alternate helical pile design locations are contained in Subsection 3.4.

1.9 SEQUENCING AND SCHEDULING

- A. Provide fully equipped pile installation equipment in full-time operation at the site during the Work and mobilize additional equipment, if necessary, to complete the Work on schedule.
- B. Piles located in areas to be excavated or demolished shall not be installed until the excavation and/or demolition has been completed.
- C. Commence installing the initial pile(s) for the load test immediately upon mobilizing the pile installation equipment to the site.
- D. Once the test pile(s) has been installed, tested, and approved, commence installation of production piles.
- E. Coordinate pile installation operations with work by others on the project.

PART 2 PRODUCTS

2.1 MATERIALS

A. Pile Shafts

1. The central steel shaft, consisting of lead sections, helical extensions, and plain extensions, shall be round shaft, structural steel pipe or tube conforming to ASTM A500, A513, A53, A242, or A618, and shall have a minimum outside diameter of 3.5 inches and a minimum wall thickness of 0.25 inches.
2. Helical piles shall be newly manufactured and shall be free of defects and corrosion.

3. If splices are anticipated, place splices in the lower third of the pile. Splice lengths shall not be less than 10 feet, and only one splice per pile is allowed.
- B. Helix Bearing Plates
1. The helix bearing plates shall be hot-rolled carbon steel formed on matching metal dies to true helical shape and uniform pitch as required by the Contractor's pile design, conforming to ASTM A656, A1018, A36, or A572. Minimum plate thickness shall be 0.375 inches.
- C. Coupling Bolts
1. Coupling bolts shall be of appropriate diameter, meeting ASTM A193, Gr. B7, or SAE J429, Gr. 5 or 8.
- D. Couplers
1. Couplers shall be formed as an integral part of the plain and helical extension material as hot upset forged sockets or internal sleeve-wrought steel connectors.
- E. Concrete Pile Cap Connections
1. Helical piles terminated in concrete pile caps shall be embedded into the pile caps shown on the Drawings.
 2. The pile head shall be fitted with fabricated bearing plate assembly. The assembly shall consist of a coupler sleeve bolted to the helical shaft and a welded base plate. Steel plate shall conform to ASTM A36 or A575 Gr. 50. Coupler sleeve shall be pipe and conform to ASTM A53 Gr. B or HSS conforming to ASTM A500 Gr. B.
- F. Stair Column Connection
1. Helical piles connected directly to stairway columns shall be similar to Concrete Pile Cap Connections and provide a bolted connection to the stair column base plate.
 2. Provide separation barrier between dissimilar metals.
- G. Corrosion Protection
1. The helical piles, bracing, brackets, and all components thereof, shall be hot-dip galvanized after fabrication in accordance with ASTM A123, with a minimum of 3.9 mils coating thickness.

PART 3 EXECUTION

3.1 PREPARATION

- A. Load, transport, unload, store, and handle piles so that the metal is kept clean and free from damage and distortion. Piles damaged during installation will not be accepted unless the capacity is proven to be 100 percent of the required ultimate capacity by load tests and the galvanization is undamaged. Perform load tests to prove capacity of damaged piles at no cost to the Owner.
- B. Protect existing structures and utilities at all times.

- C. Determine pile locations in the field and establish all elevations required.
- D. The Contractor shall employ a licensed Massachusetts Professional Land Surveyor, familiar with pile installation, who shall establish lines and levels. The Contractor shall be responsible for correctly locating piles prior to installation, keeping up-to-date records of the amount of heave of individual piles, and surveying final pile locations.

3.2 EQUIPMENT

- A. Helical pile shall be installed using a rotary torque motor with clockwise and counterclockwise rotation capabilities. The torque motor shall be capable of continuous adjustment of the rotation rate during installation. The torque motor shall have a torque capacity that is at least 15% greater than the torsional strength rating of the central steel shaft to be installed.
- B. A torque indicator shall be used during helical pile installation that provides continuous measurement of the applied torque. The torque indicator shall be capacity of torque measurements in increments of 500 foot-pounds or less.
- C. Equipment shall be capable of applying adequate down pressure and torque simultaneously with continuous position adjustment to maintain pile alignment and to uniformly advance the helical pile sections approximately 3 inches per revolution.
- D. Pre-boring and jetting shall not be used unless approved in writing by the Engineer.

3.3 INSTALLATION

- A. Install all piles at the proper locations shown on the pile design submittal. Pile locations shall be checked during installation and appropriate measures taken, as necessary to maintain the correct pile location and orientation. Sufficient downward pressure shall be applied to uniformly advance the helical pile sections approximately 3 inches per revolution. The rate of rotation and magnitude of downward pressure shall be adjusted for different soil conditions and depths.
- B. Install piles to the designed minimum installation torque and to the depth necessary to obtain the required ultimate pile capacity. The torque as measured during installation shall not exceed the torsional strength rating of the central steel shaft.
- C. If the designed minimum installation torque is not achieved at the designed minimum embedment depth, the Contractor shall do one of the following at no cost to the Owner:
 - 1. Install the helical pile deeper using additional extension sections.
 - 2. Remove the helical pile and install a new pile with additional and/or larger diameter helix plates. The pile designer shall submit the proposed new helix configuration prior to installation of the new pile. If the new pile is installed at the same location as the original pile, the top-most helix of the new helical pile shall be terminated at least 3 feet below the tip elevation of the original helical pile.
 - 3. Install additional helical piles to provide the required capacity.

- D. The average torque of the final 3 feet of penetration shall be used as the basis of comparison with the minimum installation torque provided in the design submittal. The average torque shall be defined as the average of the last three readings recorded at 1-foot intervals.
- E. If the torsional strength rating of the central steel shaft and/or installation equipment is reached prior to proper positioning of the last plain extension section relative to the final elevation, the Contractor may cut said extension shaft to the correct elevation or remove the last plain extension and replace it with a short plain section. The Contractor shall not reverse (back-out) the helical pile to facilitate extension removal.
- F. Immediately after installation of each pile, establish a reference point and its elevation on the pile for the purpose of checking movement of the pile as additional piles are installed.
- G. Check for pile heave during installation operations. Take level readings immediately after each pile is installed and again after piles within a radius of 15 feet are installed. Reinstall all piles to the designed torque or penetration that heave more than ¼ inch.
- H. Protect piles from damage at all times during and after installation.

3.4 OBSTRUCTIONS

- A. The Contractor shall resort to all usual methods to install piles when obstructions are encountered within a depth of six feet beneath the surface of the existing ground surface. Such usual methods shall include excavation or auguring. No excavation or other method of by-passing obstructions may be utilized within the bearing strata of the helical bearing plates. If, in the judgment of the Owner's representative, the Contractor is unable to complete the proper installation of any pile by and after resorting to the above methods, the pile installation at that location shall be abandon, and an additional pile or piles shall be installed.
- B. Piles abandoned because of unknown obstructions encountered before reaching the bearing strata shall be removed. If the pile cannot be removed, then the abandoned pile shall be cut off or removed so as not to interfere with future construction. The Contractor will be paid for the pile if the obstruction is encountered deeper than six feet and cannot be removed. Additional payment will be made for replacement piles in accordance with the General Conditions
- C. **TESTING**
- D. A minimum of one test pile shall be loaded to the highest ultimate capacity for each pile size/configuration and orientation proposed, and for each soil strata present at the top of the pile. For piles having the pile head within the peat or organic silt strata, the test pile shall have the same pile head elevation as the pile that is closest to the top of the peat and organic silt strata. The load test results shall be evaluated by the Contractor for compliance with pile performance requirements and shall be submitted to the Engineer. Axial and lateral load testing of each capacity pile shall be considered one test.
- E. Test piles shall be installed with the same equipment as the production piles.

- F. The load shall be applied with a calibrated hydraulic jack. A leveling plate shall be attached to the surface of the test pile and the jack shall be set in position with the load centered on the pile.
- G. Vertical Load Test
1. Perform vertical load testing in accordance with ASTM D1143, ASTM 3689, and the following.
 - a. The load test equipment shall be capable of increasing or decreasing the applied load in increments that provide the required percentage of the ultimate pile capacity.
 - b. The reaction system shall be designed to have sufficient strength and capacity to distribute the test loads to the ground. It shall be designed to prevent movement of the loading apparatus during testing and to prevent eccentric loading of the pile head. The direction of the applied load shall be collinear with the axis of the pile at all times.
 - c. Dial gauges shall be used to measure pile movement. The dial gauge shall have an accuracy of at least ± 0.001 -inch and a minimum travel sufficient to measure all pile movements without resetting the gauge. The dial gauge shall be positioned so its stem is parallel with the axis of the pile. The stem shall rest on a smooth plate located at the pile head, perpendicular to the axis of the pile. The dial gauge shall be supported by a reference apparatus to provide an independent fixed reference point. Said reference apparatus shall be independent of the reaction system and shall not be affected by movement of the reaction system.
 - d. The hydraulic jack shall be positioned at the beginning of the test such that the unloading and repositioning of the jack during the test shall not be required. The jack shall be positioned co-axially with the pile-head and shall be positioned to prevent eccentric loading. The hydraulic jack shall be capable of applying a load not less than two times the proposed design load (DL). The pressure gauge shall be graduated in 100 psi or smaller increments. The stroke of the jack shall not be less than the theoretical elastic shortening of the total pile length at the maximum test load.
 - e. An alignment load (AL) shall be applied to the pile prior to setting the deflection measuring equipment to zero or a reference position. The AL shall be no more than 10% of the design load (0.1 DL).
 - f. Axial compression or tension load tests shall be conducted by loading the pile incrementally as shown in the following table. Pile head deflection shall be recorded at the beginning of each step and after the end of the hold time. The beginning of the hold time shall be defined as the moment when the load equipment achieves the required load increment or decrement.
 - g. Test loads shall be applied until continuous jacking is required to maintain the load step or until the test load increment equals 200% of the service load (DL) (i.e., 2.0 DL), whichever occurs first. The

observation period for this last load increment shall be 10 minutes. Displacement readings shall be recorded at 1, 2, 3, 4, 5 and 10 minutes.

- h. The applied test load shall be removed in four approximately equal decrements as shown in the following table. The hold time for these load decrements shall be 1 minute, except for the last decrement, which shall be held for 5 minutes.

Load Testing Steps and Hold Times

Load Step	Hold Time (min.)
AL	1.0
0.20 DL	2.5
0.40 DL	2.5
0.60 DL	2.5
0.80 DL	2.5
1.0DL	2.5
0.75 DL	1.0
0.50 DL	1.0
0.25 DL	1.0
AL	1.0
0.5 DL	1.0
1.0 DL	1.0
1.2 DL	2.5
1.4 DL	2.5
1.6 DL	2.5
1.8 DL	2.5
2.0 DL	10.0
1.5 DL	1.0
1.0 DL	1.0
0.5 DL	1.0
AL	5.0

- H. The test piles shall withstand loading at the compression and tension service capacities with no more than ½ inch of total vertical movement of the pile head relative to the pile head position prior to the start of testing.
- I. Failure at the ultimate compression and tension capacities shall be defined by one of the following, whichever results in the lesser load:

1. The point at which the movement of the helical pile tip exceeds the elastic compression/tension of the pile shaft by 8% of the diameter of the largest helix.
 2. The point at which the slope of the load versus deflection curve (at the end of the load increment) exceeds 0.05 inches/kip.
- J. Lateral Load Test
1. Perform lateral load testing of piles in accordance with ASTM D3966.
- K. The test pile may be used as a production pile provided it passes the load test. If the test pile fails to give acceptable results, the Contractor shall modify their design and install and test another pile at their expense. Remove test piles not incorporated into the completed Work to at least 2 feet below finished grade or 2 feet below the bottom of structures and utilities, whichever is deeper.

3.5 WARRANTY

- A. The Contractor shall guarantee that they will repair or replace at their own expense all structural damage caused by inability of their piles to satisfactorily support the service loads for a period of two years.

3.6 SAFETY

- A. The Contractor is responsible for the safe operation of pile installation equipment and maintenance of safe and controlled work area.
- B. Never allow unauthorized or unqualified people to operate, maintain, or come within 100 feet of the equipment.
- C. Pile installation equipment shall be inspected thoroughly before use. Any equipment that has any cracks, broken pieces, or thin wall sections that might break in use shall be rejected before installation begins. During use, equipment shall be inspected frequently for developing cracks or broken or missing pieces, and removed from the job if any of these is discovered during inspection.

END OF SECTION

SECTION 02 70 50

GEOSYNTHETICS

PART 1 GENERAL

1.1 SUMMARY

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

1.2 REFERENCES

- A. Data Sheet DS1 - Non-Woven Geotextiles
- B. Data Sheet DS2 - Woven Geotextiles
- C. ASTM D1248 - Specification for Polyethylene Plastics Molding and Extrusion Materials
- D. ASTM D1388 - Test Methods for Stiffness of Fabrics
- E. ASTM D3786 - Test Method for Hydraulic Bursting Strength of Knitted Goods and Non-woven Fabrics: Diaphragm Bursting Strength Tester Method
- F. ASTM D4218 - Test Method for Carbon Black Content in Polyethylene Compounds by the Muffle-Furnace Technique
- G. ASTM D4491 - Test Methods for Water Permeability of Geotextiles by Permittivity
- H. ASTM D4533 - Test Method for Trapezoid Tearing Strength of Geotextiles
- I. ASTM D4632 - Test Method for Grab Breaking Load and Elongation of Geotextiles
- J. ASTM D4751 - Test Method for Determining the Apparent Opening Size of a Geotextile
- K. ASTM D4833 - Test Method for Index Puncture Resistance of Geotextiles Geomembranes and Related Products
- L. ASTM D5261 - Test Method for Measuring Mass per Unit Area of Geotextiles
- M. ASTM D5262 - Standard Test Method for Evaluating the Unconfined Tension Creep Behavior of Geosynthetics
- N. GRI-GG1 - Geogrid Rib Tensile Strength
- O. GRI-GC8 - Determination of the Allowable Flow Rate of a Drainage Geocomposite

1.3 SUBMITTALS

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

1.4 QUALITY ASSURANCE

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

1.5 DELIVERY, STORAGE AND PROTECTION

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

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Group 1 Non-Woven Geotextile
 - 1. "C-46NW" as manufactured by Contech Construction Products, Inc.
 - 2. "FX-40HS" as manufactured by Carthage Mills
 - 3. "140NC" as manufactured by Mirafi Inc.
 - 4. Or equal
- B. Group 2 Non-Woven Geotextile
 - 1. "4506" as manufactured by Amoco Fabrics and Fibers
 - 2. "FX-60HS" as manufactured by Carthage Mills
 - 3. "160N" as manufactured by Mirafi Inc.

4. Or equal
- C. Group 3 Non-woven Geotextile
 1. "4508" as manufactured by Amoco Fabrics and Fibers
 2. "FX-80HS" as manufactured by Carthage Mills
 3. "180N" as manufactured by Mirafi Inc.
 4. Or equal
- D. Group 4 Non-woven Geotextile
 1. "4512" as manufactured by Amoco Fabrics and Fibers
 2. "350 EX" as manufactured by LINQ Industrial Fabrics
 3. "C-160 NW" as manufactured by Contech Construction Products, Inc.
 4. Or equal
- E. Group 5 Non-woven Geotextile
 1. "4516" as manufactured by Amoco Fabrics and Fibers
 2. "FX160HS" as manufactured by Carthage Mills
 3. "UV 516" as manufactured by Tenax Corporation
 4. Or equal
- F. Group 1 Woven Geotextile
 1. "2000" as manufactured by Amoco Fabrics and Fibers
 2. "FX-44" as manufactured by Carthage Mills
 3. "100X" as manufactured by Mirafi Inc.
 4. Or equal
- G. Group 2 Woven Geotextile
 1. "2002" as manufactured by Amoco Fabrics and Fibers
 2. "FX-55" as manufactured by Carthage Mills
 3. "500X" as manufactured by Mirafi Inc.
 4. Or equal
- H. Group 3 Woven Geotextile
 1. "2006" as manufactured by Amoco Fabrics and Fibers
 2. "FX-66" as manufactured by Carthage Mills
 3. "600X" as manufactured by Mirafi Inc.

4. Or equal
- I. Group 4 Woven Geotextile
 1. "2019" or "1199" as manufactured by Amoco Fabrics and Fibers
 2. "GTF 400E" as manufactured by Linq Industrial Fabrics
 3. Or equal
- J. Non-woven Protection Geotextiles
 1. "Geo Cushion 32R" by Cetco (32oz/yd²)
 2. "UV 532" by Tenax Corporation (32oz/yd²)
 3. "Polyfelt TS 013" by Polyfelt GmbH (36oz/yd²)
 4. Or equal
- K. Temporary Degradable Erosion Control Blankets
 1. "LANDLOK C2" as manufactured by SI Geosolutions, Inc.,
 2. "C125" as manufactured by North American Green,
 3. Or equal
- L. Temporary 100% Degradable Erosion Control Blankets
 1. "LANDLOK ENC2" as manufactured by SI Geosolutions, Inc.,
 2. "C125 BN" as manufactured by North American Green,
 3. Or equal
- M. Permanent Non-Degradable Erosion Control Blankets
 1. "P300" as manufactured by North American Green
 2. "LANDLOK TRM 450" as manufactured by SI Geosolutions, Inc.,
 3. Or equal

2.2 MATERIALS

- A. Non-woven geotextiles shall be manufactured from a continuous polypropylene filament. A needle punching process shall achieve bonding.
- B. Woven geotextiles shall be manufactured from a polypropylene slit-film monofilament.
- C. Non-woven protection geotextiles shall have a minimum mass per unit area of 32oz/yd².
- D. Temporary, degradable erosion control blankets (ECBs) shall be composed of a core of 100% coconut fiber and two external confining meshes of non-degradable material. The minimum manufacturer's suggested design life of the ECB shall be 12 months.

- E. Temporary, 100% degradable ECBs shall be composed of a core of 100% coconut fibers encased between two confining meshes of degradable material.
 - 1. As a minimum, 100% degradable ECBs shall be recommended by the manufacturer for use on 2:1 slopes.
- F. Permanent, non-degradable ECBs shall consist of a three-dimensional matrix of UV-stabilized polypropylene encased between two polypropylene nets. The blanket shall be cross-stitched on two inch centers maximum with polypropylene thread
 - 1. Each of the polypropylene nets shall have a mass per unit area of at least three pounds per one thousand square feet.
 - 2. Permanent, non-degradable ECBs shall be recommended by the manufacturer for use on 1:1 slopes and in drainage channels, and shall have a minimum, limiting shear stress of eight pounds per square foot, measured over 50 hours.

PART 3 EXECUTION

3.1 EXAMINATION

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

3.2 INSTALLATION

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

3.3 QUALITY CONTROL

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

END OF SECTION

(DATA SHEETS FOLLOW)

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Data Sheet DS1 - Non-Woven Geotextile Mechanical Properties								
Property	Test Method	Units	Testing Frequency	Value				
				Group 1	Group 2	Group 3	Group 4	Group 5
Mass per Unit Area	ASTM D5261	oz/yd²	1/150,000 ft²	4	6	8	12	16
AOS	ASTM D4751	US Sieve	1/150,000 ft²	70	70	100	100	100
Permitivity	ASTM D4491	gal/min/ft²	1/150,000 ft²	140	90	80	70	50
Puncture Strength	ASTM D4833	lbs	1/150,000 ft²	60	90	130	195	245
Mullen Burst Strength	ASTM D3786	lbs/in²	1/150,000 ft²	225	350	400	650	800
Trapezoidal Tear Strength	ASTM D4533	lbs	1/150,000 ft²	35	65	80	115	145
Grab Tensile/Elongation	ASTM D4632	lbs(%)	1/150,000 ft²	95 (50)	150 (50)	200 (50)	300 (50)	400 (50)

Data Sheet DS2 - Woven Geotextile Mechanical Properties							
Property	Test Method	Units	Testing Frequency	Value			
				Group 1	Group 2	Group 3	Group 4
Puncture Strength	ASTM D4833	lbs	1/150,000 ft²	60	90	120	135
Mullen Burst Strength	ASTM D3786	lbs/in²	1/150,000 ft²	300	400	600	480
Trapezoidal Tear Strength	ASTM D4533	lbs	1/150,000 ft²	45	75	115	95/55
Grab Tensile/Elongation	ASTM D4632	lbs(%)	1/150,000 ft²	120 (15)	200 (15)	300 (15)	350/250 (15)

SECTION 03 10 00

CONCRETE FORMS AND ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Wood Form Material
 - 2. Prefabricated Forms
 - 3. Formwork Accessories
- B. Related Sections
 - 1. Section 03 30 00 - Cast-in-Place Concrete

1.2 REFERENCES

- A. American Concrete Institute (ACI)
 - 1. ACI 301 - Specifications for Structural Concrete for Buildings
 - 2. ACI 318 - Building Code Requirements for Reinforced Concrete
 - 3. ACI 347 - Guide to Formwork for Concrete
- B. American Society for Testing and Materials (ASTM)
 - 1. D4 - Standard Test Method for Bitumen Content
 - 2. D6 - Standard Test Method for Loss on Heating of Oil and Asphaltic Compounds
 - 3. D71 - Standard Test Method for Relative Density of Solid Pitch and Asphalt (Displacement Method)
 - 4. D217 - Standard Test Method for Cone Penetration of Lubricating Grease
 - 5. D1056 - Specification for Flexible Cellular Materials - Sponge or Expanded Rubber
 - 6. D1751 - Standard Specifications for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types)
 - 7. D1752 - Standard Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction
 - 8. D4397 - Standard Specification for Polyethylene Sheeting for Construction, Industrial and Agricultural Applications
- C. American Association of State Highway and Transportation Officials (AASHTO)

1. AASHTO Standard Specifications for Transportation Materials and Methods of Sampling and Testing
 - D. National Institute of Standards and Technology (NIST)
 1. Voluntary Product Standard PS 1-95 - Construction and Industrial Plywood
- 1.3 SUBMITTALS
- A. Drawings showing schedule of placement, location of all construction joints and all control joints with methods of forming. Show the location and elevation of all sleeves, wall pipes and embedded items.
 - B. Drawings showing sizes and materials for forms, form bracing, and form ties.
 - C. Product Data on form release agent, permanent formwork and inserts.
 - D. Samples for the following materials:
 1. Form ties (including cones) and spreaders
 2. Other materials requested by the Engineer
- 1.4 DESIGN REQUIREMENTS
- A. Design formwork and shoring at the Contractor's expense by a Professional Engineer registered in the State where the work will be performed to conform to all design and code requirements in ACI 301, ACI 318 and ACI 347 and other applicable regulations and codes. The design shall consider any special requirements that may result due to the use of super plasticized and/or retarded set concrete.

PART 2 PRODUCTS

2.1 WOOD FORM MATERIALS

- A. Plywood: Class I High Density Overlay plyform, exterior grade, not less than 5 ply nor less than 5/8 inches thick conforming to Voluntary Product Standard PS 1-95
- B. Lumber: Douglas Fir species, No. 1 grade S4S with grade stamp clearly visible

2.2 PREFABRICATED FORMS

- A. Manufacturers:
 1. Symons Corporation, DesPlains, Illinois
 2. HICO Corporation, Bronx, NY
 3. Or equal
- B. Preformed Steel Forms: Minimum 16 gage (1.5 mm), tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearances of finished concrete surfaces; with clean, warp free, undented, un gouged, undamaged surfaces
- C. Glass Fiber Fabric Reinforced Plastic Forms: Matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearances of finished concrete surfaces

2.3 FORMWORK ACCESSORIES

A. Form Ties:

1. Ties for foundation walls shall be metal and designed with removable setback cones so that after removal of the projecting part, no metal shall remain within 1½ inches of the face of the concrete.
2. Form ties for tanks, wet wells, pump chambers, below grade structures and other water retaining structures shall have a neoprene waterstop washer placed on each form tie, or on the inside tie rods for systems which use she bolts, and shall have setback cones.
3. Flat bar snap ties for panel forms shall have plastic or rubber inserts with 1½ inch minimum depth to allow patching of tie hole after removal.
4. Setback cones shall be wood or plastic tapered cones 1 inch diameter and 1½ inches deep to allow filling and patching of the concrete surface after removal.
5. Common wire ties shall not be used.

B. Form Release Agent:

1. Non-staining and non-emulsifiable type which will not stain concrete or absorb moisture nor interfere with adherence of any material to be applied to concrete surfaces.
2. Form release agent for potable water tanks and structures shall be vegetable oil based and shall be NSF approved for use with potable water.

C. Corners:

1. Chamfered No. 1 Poplar wood strips; ¾ inch by ¾ inch; maximum possible lengths

D. Dovetail Anchor Slot:

1. Galvanized steel 22 gage thick; non-filled, release tape sealed slots for securing to concrete formwork

E. Flashing Reglets:

1. Galvanized steel 26 gage thick, longest possible lengths, with alignment splines for joints, release tape sealed slots for securing to concrete formwork

F. PVC Waterstops:

1. Virgin polyvinyl chloride, minimum 2000 ± 50 psi tensile strength, minus 50°F to plus 170°F working temperature range, 3/8 inches thick, factory made corner sections, heat welded jointing; manufactured by Paul Murphy Plastics, Greenstreak, Vinylex or equal
2. Exceed the requirements set forth in the U.S. Army Corps of Engineers waterstop specification (CRD-C572-84)
3. Must exhibit zero water leakage when tested in accordance with the American Concrete Institute (ACI) standard test method for waterstop

4. Heat fused field splices shall be tested for a complete seal by use of a corona discharge unit.
 5. Multi-rib design with center bulb shall be used for all expansion joints as noted on Drawings and proposed for the work.
 6. Ribbed flat heavy duty design shall be used for all construction joints as noted on Drawings and proposed for the work.
- G. Compressible Filler:
1. Closed cell expanded neoprene, ASTM D1056, Grade No. 2C1, ozone and weather resistant
- H. Premolded Joint Filler:
1. Buildings and Structures: Self-expanding cork, ASTM D1752, Type III; and Federal Specification HH-F-341-F, Type II, Class C; capable of one directional swelling up to 140% of its original thickness
 2. Sidewalks: Asphalt impregnated, ASTM D1751, 3/4 inch thick unless otherwise shown on the Drawings

PART 3 EXECUTION

3.1 GENERAL

- A. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with Drawings.
- B. Review all work prepared by others to receive work of this Section and correct any defects affecting installation. Commencement of work by the Contractor will be construed as complete acceptance of preparatory work by others.
- C. Handle and store materials separately in such manner as to prevent intrusion of foreign matter, segregation, or deterioration. Do not use foreign materials or those containing frozen material. Remove improper and rejected materials immediately from point of use. Cover materials and accessories during construction period.

3.2 EARTH FORMS

- A. Earth forms are not permitted.

3.3 FORM PREPARATION

- A. Coat contact surfaces of forms with a form release agent prior to form installation.
- B. Thoroughly clean steel forms between uses using high pressure water or jet or sand blasting to remove all mill scale, concrete laitance or other ferrous deposits from the contact surfaces of the forms.
- C. Before re-use of wood forms, thoroughly clean form contact surfaces, repair damaged areas and remove projecting nails. A partial or complete steel lining on wood sheathing or plywood will not be allowed.

3.4 ERECTION - FORMWORK

- A. Erect formwork, shoring and bracing to achieve design requirements of ACI 301 and the following additional requirements:
 - 1. Variation from plumb in the lines and surfaces of columns, piers, and in walls
 - a. In any 10 feet of length $\frac{1}{4}$ inch
 - b. Maximum for entire length $\frac{1}{2}$ inch
 - 2. Variation of the linear building lines from established position in plan and related positions of columns, walls and partitions:
 - a. In any bay $\frac{1}{4}$ inch
 - b. In any 20 foot of length $\frac{1}{4}$ inch
 - c. Maximum for the entire length $\frac{1}{2}$ inch
 - 3. Variation in cross-sectional dimensions of columns and beams and in thickness of slabs and walls:
 - a. Minus $\frac{1}{8}$ inch
 - b. Plus $\frac{1}{4}$ inch

3.5 JOINTS

- A. Construction and expansion joints indicated on the Drawings are mandatory and shall not be omitted.
- B. Use premolded joint filler at expansion joints unless otherwise noted.
- C. Form construction and expansion joints with a keyway and waterstop unless otherwise shown on the Drawings. The depth of the keyway shall be approximately 3 inches, and the minimum width of keyway shall be one-third the width of the wall or floor section unless otherwise shown on the Drawings. The maximum width of any key at a joint with waterstop shall be 3 inches. Construction and expansion joints are to be formed in place prior to notifying the Engineer for inspection of formwork.
- D. Where joints other than those shown are required, obtain approval prior to installation.
- E. For slab-on-grade construction (welded wire fabric reinforcement only) with large floor areas where construction joints are not shown, the maximum area per section is approximately 600 square feet, but will not limit the number of sections which may be placed at one time. For structural slabs reinforced with deformed bars where construction joints are not shown on the Drawings, the maximum area will be approximately 900 square feet. Slab dimensions between construction joints for floor areas shall be as "square" as possible, but the length shall not exceed 1.5 times the width under any circumstances.
- F. For slab-on-grade construction, a preformed metal keyway with removable top strip may be substituted for intermediate construction joints unless otherwise shown on the Drawings.
- G. Joints shall be straight and true. Brace all slab bulkheads adequately to keep joints straight. Construction joints in slabs exceeding 5 inches in thickness shall be keyed

using a keyway nominally 3-5/8 inches by 1/3 of the slab thickness but not greater than 3 inches wide.

- H. Wall construction joints shall be placed as shown on the Drawings, or the maximum spacing of vertical construction joints in walls shall not exceed 40 feet where construction joints are not shown.
- I. Joints not indicated or specified shall be placed to least impair strength of structure and shall be subject to approval of the Engineer.

3.6 INSERTS, EMBEDDED ITEMS, AND OPENINGS

- A. Provide formed openings where required for items to be embedded in or passing through concrete work in conformance with requirements of ACI 318, paragraph 6.3, "Conduits and pipes embedded in concrete."
- B. Locate and set in place items that will be cast directly into concrete.
- C. Coordinate work of other Sections in forming and placing openings, slots, reglets, recesses, chases, sleeves, wall pipes, anchor bolts and other inserts. Wall pipes and sleeves shall conform to the requirements of Section 15050.
- D. Install accessories in accordance with manufacturer's instructions, straight, level and plumb. Ensure items are not disturbed or damaged during placement of concrete.
- E. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at the bottom of forms to allow flushing water to drain.
- F. Close temporary openings with tight fitting panels, flush with inside face of forms and neatly fitted so that joints will not be apparent in exposed concrete surfaces after concrete placement.

3.7 WATERSTOPS

- A. Install PVC waterstops in all construction and expansion joints in walls and slabs unless otherwise noted on the Drawings. Position waterstop in the center of the joint and extend the entire length of the joint. Securely fasten waterstop to reinforcing steel or formwork on both sides at 12 inch maximum spacing. Provide 2 inch minimum clearance between waterstop and reinforcing steel.
- B. Heat and splice PVC waterstop with a thermal splicing unit designed for that specific purpose. Only properly mitered, straight butt splices shall be made in the field. All field splices shall be tested for a complete seal by use of a corona discharge unit.
- C. No holes will be permitted in the PVC waterstop. Nail holes or other penetrations in the waterstop shall be repaired prior to placement of concrete.
- D. Hydrophilic waterstop shall be installed in accordance with the manufacturer's recommendations.
- E. The Engineer shall approve of the proposed location, concrete cover and steel reinforcement prior to the installation of any Hydrophilic waterstop.

- F. The Hydrophilic waterstop ends shall be cut square or mitered at corners. In addition, all waterstop splices shall be sealed in accordance with the manufacturer's requirements.

3.8 ACCESSORIES

- A. Install form liners into formwork prior to placement of reinforcing steel or concrete in compliance with the manufacturer's requirements.
- B. Neoprene waterstop washers are to be placed along the form ties or inside ties so they are in the middle third of the thickness of the structural element.

3.9 FORM REMOVAL

- A. The Contractor shall be responsible for damage resulting from form removal. Forms and shoring for structural slabs or beams shall remain in place in accordance with requirements in ACI 301. Form removal shall also conform to the requirements specified in Section 03300.

3.10 INSPECTION

- A. The Engineer shall be notified when the forms are complete and ready for inspection at least thirty-six hours prior to the proposed concrete placement.
- B. Failure of the forms to comply with the requirements specified herein, or to produce concrete complying with requirements of these Specifications, shall be grounds for rejection of that portion of the concrete work. Rejected work shall be repaired or replaced at no additional cost to the Owner. Such repair or replacement shall be subject to the requirements of these Specifications and approval of the Engineer.

END OF SECTION

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SECTION 03 20 00

CONCRETE REINFORCEMENT

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Reinforcing Steel Bars
 - 2. Post- Tensioning Strands
 - 3. Welded Wire Fabric
 - 4. Reinforcing Accessories
- B. Related Sections
 - 1. Section 03 10 00 - Concrete Forms and Accessories
 - 2. Section 03 30 00 - Cast-in-Place Concrete
 - 3. Section 03 48 50 - Precast Concrete

1.2 REFERENCES

- A. The Massachusetts State Building Code, latest edition.
- B. American Concrete Institute (ACI)
 - 1. ACI 117 - Standard Tolerance for Concrete Construction and Materials
 - 2. ACI 301 - Specifications for Structural Concrete for Buildings
 - 3. ACI 315 - Details and Detailing of Concrete Reinforcement
 - 4. ACI 318 - Building Code Requirements for Reinforced Concrete, American Concrete Institute
 - 5. ACI 350R - Environmental Engineering Concrete Structures
 - 6. ACI SP-66 - Detailing Manual
- C. American Society for Testing and Materials (ASTM)
 - 1. A185 - Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement
 - 2. A615 - Specification for Deformed and Plain Billet - Steel Bars for Concrete Reinforcement
 - 3. A675 - Specifications for Steel Bars, Carbon, Hot Wrought, Special Quality, Mechanical Properties
- D. American Welding Society (AWS)
 - 1. D1.4 Structural Welding Code - Reinforcing Steel

- E. Concrete Reinforcing Steel Institute (CRSI)
 - 1. CRSI 63 - Recommended Practice for Placing Reinforcing Bars
 - 2. CRSI 65 - Recommended Practice for Placing Bar Supports, specifications and nomenclature

1.3 SUBMITTALS

- A. Provide shop drawings in accordance with the recommendations of ACI 315, "Details and Detailing of Concrete Reinforcement" and show the following: elevations, dimensions of concrete work with specified reinforcement clearances; ledges, brackets, openings, sleeves or other items furnished by other Sections, where interference with reinforcement may occur; bending diagrams; assembly diagrams; splices and laps of reinforcement; temperature and shrinkage reinforcement; construction joint reinforcement and shape; dimensions, grade designations, and details of reinforcement and accessories. Show dowels with concrete work to be placed first. Shop drawings shall be drawn to scale.
- B. Bar Bending Details - The bars shall be referenced to the same identification marks shown on the placement drawings. Bars to have special coatings and/or to be of special steel or special yield strength are to be clearly identified.
- C. Prior to delivery of reinforcing steel or concrete to job site, submit certified mill test reports of reinforcing steel and cement (including names and locations of mills and shops, and analyses of chemical and physical properties), properly correlated to concrete to be used in this project.
- D. At the conclusion of stressing, qualified personnel shall prepare and submit a stressing report based on actual material properties used on site to the engineer approval.

1.4 DELIVERY, HANDLING AND STORAGE

- A. Reinforcing steel shall be substantially free from mill scale, rust, dirt, grease, or other foreign matter.
- B. Reinforcing steel shall be covered and stored off the ground, protected from moisture, and kept free from dirt, oil, or other foreign matter.

PART 2 PRODUCTS

2.1 REINFORCING STEEL BARS

- A. Reinforcing steel bars shall be newly rolled billet steel conforming to ASTM A615, Grade 60.
- B. Minimum yield strength shall be 60,000 psi.
- C. All reinforcing steel shall be epoxy coated in accordance with ASTM A775.
- D. Where reinforcing steel bars are called for to be grouted into existing concrete, the anchorage shall develop an allowable bond strength equal to 24,000 psi times the cross section area of the bar, or an ultimate strength equal to the tensile strength of the bar.

1. For installations in non-submerged concrete with an ambient temperature greater than or equal to 40 degrees Fahrenheit, the epoxy adhesive shall be, Hilti HIT_HY 200, Simpson SET-XP, Powers PE 1000+ or approved equal.
2. For installation in wet or submerged concrete with an ambient temperature greater than or equal to 40 degrees Fahrenheit, the epoxy adhesive shall be Hilti HIT RE-500SD, Simpson ET-HP, Powers Pure 110+ or approved equal.
3. For installation in concrete below 45 degrees Fahrenheit the epoxy adhesive shall be Hilti HIT ICE, Simpson AT-XP or equal.

2.2 WELDED WIRE FABRIC

- A. Welded wire fabric shall conform to ASTM A185

2.3 REINFORCEMENT ACCESSORIES

- A. Reinforcement accessories shall conform to Product Standard PS7-766, National Bureau of Standards, Department of commerce, Class C, as produced by Dayton Superior Corporation; R.K.L. Building Specialties Co., Inc. or equal approved by the Engineer.
- B. Reinforcement accessories shall include spacers, chair ties, slab bolsters, clips, chair bars, and other devices for properly assembling, placing, spacing, supporting, and fastening reinforcement.
- C. Tie wire shall be of sufficient strength for all intended purpose, but not less than No. 18 gauge. Metal supports shall be of such type as not to penetrate surface of formwork and show through surface of concrete.
- D. Accessories touching interior formed surfaces exposed to view shall have not less than 1/8 inch of plastic between metal and concrete surface. Plastic tips shall extend not less than 1/2 inch up on metal legs.
- E. Individual and continuous slab bolsters and chairs shall be of type to suit various conditions encountered and must be capable of supporting 300 pound load without damage or permanent distortion.
- F. Expansion Joint Dowels
 1. Dowels shall conform to ASTM A675.
 2. Expansion dowel caps shall be No. 87 dowel caps as manufactured by Heck Building Products, Inc., Type F-46 dowel caps as manufactured by the Dayton Sure-Grip and Shore Company, or equal.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Review all work prepared by others to receive work of this Section. Commencement of work will be construed as complete acceptance of preparatory work by others.

3.2 PREPARATION

- A. Notify the Engineer prior to the start of any phase of the reinforcing work so as to provide the opportunity to inspect the work. Such notification shall be made at least 24 hours in advance of reinforcement placements and at least 36 hours in advance of other inspections (forms, etc.).

3.3 REINFORCING BAR FABRICATION

- A. Fabrication of reinforcement shall be in accordance with the recommendations of CRSI.
- B. Reinforcing bars shall be cold bent and shall not be straightened or re-bent. Bars shall not be field bent unless approved by the Engineer.
- C. Reinforcing bars shall be bent around a revolving collar having a diameter of not less than that recommended by the CRSI.
- D. Reinforcing bar ends that are to be butt spliced or threaded, shall have the applicable end saw-cut. Such ends shall terminate in flat surfaces at a right angle to the axis of the bar.
- E. Where reinforcing bars are called for to be welded, the welding shall conform to AWS D1.4 Structural Welding Code - Reinforcing Steel.

3.4 POST-TENSIONING STRAND FABRICATION

- A. Strand: Prestressing steel shall use strand conforming to ASTM A416, Low-Relaxation Type, and shall have a minimum guaranteed ultimate tensile strength of 270,000 psi based on the nominal area of the strand. The strand shall additionally conform to the "Specification for Unbonded Single Strand Tendons" PTI M10.2-17. The strand shall be free of dirt, corrosion or injurious marks, scratches, seams, and sharp kinks. Surface rust shall be removed with a fine steel wool pad or by vigorous rubbing with a cloth. Pits on steel surface shall not exceed .002 in. in diameter or length. Oil-tempered strand is prohibited. Certified mill reports giving name of drawing mill shall be submitted.
- B. Bar: Prestressing bars shall conform to ASTM A722, Type II-Deformed, and shall have a minimum ultimate tensile strength of 150 ksi.
- C. Typical size of post tension tendons is ½" diameter with a cross sectional area of 0.153 square inches. Tendons are typically composed of 7-wire strands made from high strength prestressing steel with a specified tensile strength (fpu) of 270 ksi.
- D. The strands are unbonded, meaning they are encased in a greased plastic sheathing to prevent bonding to the concrete.

3.5 INSTALLATION

- A. Reinforcement shall be placed in accordance with requirements of CRSI -63 - "Recommended Practice for Placing Reinforcing Bars" and CRSI 65, "Recommended Practice for Placing Bar Supports" and with further requirements below.
- B. Reinforcement shall be accurately placed in accordance with Contract Documents and shall be firmly secured in position by wire ties, chairs, spacers, and hangers, each of type approved by the Engineer. For slabs, grade beams, etc. where concrete is poured

on grade, use additional setup bars and concrete brick to provide required cover over reinforcement.

- C. Bending, welding or cutting reinforcement in field in any manner other than as shown on Drawings, is prohibited, unless specific approval for each case is given by the Engineer.
- D. Reinforcement shall be continuous through construction joints unless otherwise indicated on Drawings.
- E. Reinforcement shall be spliced only in accordance with requirements of Contract Documents or as otherwise specifically approved. Splices of reinforcement at points of maximum stress shall generally be avoided.
- F. Welded wire fabric shall lap 6 inches or one space plus 2 inches whichever is larger, and shall be wired together. Provide No. 4 set up bars spaced 30 inches on center for slabs-on-grade or elevated slabs with composite decks.
- G. Proceed with installation of embedded items, and reinforcement, but do not place concrete into or around such items until the Engineer has approved work.
- H. During field assembly of the precast boardwalk units, all joints between precast boardwalk units shall be drawn together tight and shall be secured using post-tensioning strands such that all joints shall remain tightly drawn together in the permanent condition. No waterstop material or similar material shall be installed between the precast boardwalk units.

3.6 POST-TENSIONED STRANDS

- A. The maximum jacking force of a ½ inch tendon is $0.8 \text{ fpu} = 33 \text{ kips}$ per ACI 318.
- B. PT slabs on grade are typically designed to have a residual pre-compression stress in the range of 150 psi after losses to prevent cracking. The common effective prestress force obtained for a ½" diameter strand is about 26.3 kips
- C. The Post Tension Institute (PTI) recommends limiting the average prestress in slabs not exposed to corrosive environments to 300 psi.

3.7 FIELD QUALITY CONTROL

- A. The Engineer shall have the right to postpone or stop concrete operations when in his judgment, reinforcement and embedded item installation has not been properly completed or the quality of construction will impair strength and durability or desired finished product. Costs arising from delays due to noncompliance will not be considered.
- B. Any material or workmanship that is rejected, either at the batch plant or at the site, shall be replaced promptly at no additional cost to the Owner.
- C. Before concrete is placed, reinforcement shall be free of excessive rust, dirt, oil, scale or other foreign matter that will destroy or reduce bond requirements. Reinforcement expected to be exposed to weather for a considerable length of time shall be painted with a heavy coat of cement grout. Protect stored materials so as not to bend or distort bars in any way. Bars that become damaged will be rejected.

- D. Before concrete is placed, check all installed reinforcement to ensure that it conforms to Contract Documents and approved Shop Drawings. Such checking shall be done only by qualified experienced personnel. In addition, the Engineer shall be notified at least 36 hours prior to concrete placement and given opportunity to inspect completed reinforcement. Prior approval of Shop Drawings shall in no way limit the Engineer's right to require modifications or additions to reinforcement or accessories.
- E. Expansion joint dowels must be straight and clean, free of loose flaky rust and loose scale. Dowels may be sheared to length provided deformation from true shape caused by shearing does not exceed 0.04 inches on the diameter of the dowel and extends no more than 0.04 inches from the end. Bars shall be coated with a bond breaker on the expansion end of the dowel. Expansion caps shall be provided on the expansion end.

3.8 ADJUSTING

- A. Carry out corrections without delay as directed by the Engineer when construction operations indicate that requirements of Contract Documents or prudent construction practices are being or are about to be violated.

END OF SECTION

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SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Concrete Materials
 - 2. Admixtures
 - 3. Concrete Mix
 - 4. Miscellaneous Concrete Materials
- B. Related Sections
 - 1. Section 03100 - Concrete Forms and Accessories
 - 2. Section 03200 - Concrete Reinforcement

1.2 REFERENCES

- A. The Massachusetts State Building Code, latest edition.
- B. American Association of State Highway and Transportation Officials (AASHTO)
 - 1. T 104 - Standard Method of Test for Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
- C. American Concrete Institute (ACI)
 - 1. ACI 301-95 - Specifications for Structural Concrete for Buildings, (included as part of this specification)
 - 2. ACI 305 - Hot Weather Concreting
 - 3. ACI 306.1-90 - Standard Specifications for Cold Weather Concreting
 - 4. ACI 318-14 - Building Code Requirements for Reinforced Concrete
- D. American Society for Testing and Materials (ASTM)
 - 1. C33 - Standard Specification for Concrete Aggregates
 - 2. C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete specimens
 - 3. C40 - Standard Test Method for Organic Impurities in Fine Aggregates for Concrete
 - 4. C42 - Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
 - 5. C78 - Standard Test Method for flexural Strength of Concrete (Using Simple Beam with Third-Point Loading)

6. C87 - Standard Test Method for Effect of Organic Impurities in Fine Aggregate on Strength of Mortar
7. C94 - Standard Specification for Ready-Mixed Concrete
8. C109 - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. Cube Specimens)
9. C131 - Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
10. C138 - Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
11. C150 - Standard Specification for Portland Cement
12. C260 - Standard Specification for Air-Entraining Admixtures for Concrete
13. C293 - Standard Test Method for Flexural Strength of Concrete (Using Simple Beam With Center-Point Loading)
14. C330 - Standard Specification for Lightweight Aggregates for Structural Concrete
15. C494 - Standard Specification for Chemical Admixtures for Concrete
16. C496 - Standard Test Method for Splitting Tensile Strength of Cylindrical Concrete Specimens
17. C535 - Standard Test Method for Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
18. C567 - Standard Test Method for Determining Density of Structural Lightweight Concrete
19. C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete
20. C666 - Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing
21. C881 - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete
22. C882 - Standard Test Method for Bond Strength of Epoxy-Resin Systems used With Concrete By Slant Shear
23. C884 - Standard Test Method for Thermal Compatibility Between Concrete and an Epoxy-Resin Overlay
24. C989 - Standard Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars
25. D1622 - Standard Test Method for Apparent Density of Rigid Cellular Plastics
26. D1623 - Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics

27. D2126 - Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging

1.3 SUBMITTALS

- A. Submit a detailed list of concrete materials, and corresponding sources, proposed for use in concrete. If conveying concrete by pump is requested, related data regarding concrete materials, pumping device and methods shall be submitted for approval three weeks before such method is proposed for use. Tests for approval of concrete mixtures to be pumped shall be paid for by Contractor. Provide certified mill test reports of cement, (including names and locations of mills and shops, and analyses of chemical and physical properties), properly correlated to concrete to be used.
- B. Submit Methods of Construction three weeks prior to starting work, describing methods, sequence of construction, manpower and type of equipment proposed for use for performing cast-in-place concrete work including special requirements for mat foundations where required. This submission shall not relieve Contractor of his responsibility for providing proper methods, equipment, workmanship, and safety precautions.
- C. Submit data and descriptive literature for concrete constituents including admixtures, aggregate tests, floor hardener, bond breaker, bonding agent, chemical grout foam and repair grout.
- D. Submit detailed methods proposed for curing and protection of concrete not less than 10 days prior to the placement of any concrete.
- E. Submit drawings showing details of any proposed corrective work.
- F. Submit a truck load ticket for every concrete delivery. Ticket information shall include batch time and date, weights of all constituents, quantity of admixtures, water added at the batch plant and moisture content of coarse and fine aggregates.
- G. Maintain an accurate daily record of the locations and quantity of concrete placed. Submit a certified copy of this record with each pay estimate.

1.4 WARRANTY/GUARANTEE

- A. Upon completion of the work, and prior to final payment, the Contractor shall submit a Guarantee of his work to be free of defect in materials and workmanship. This Guarantee shall be for a period of two (2) years and shall be signed by a Principal of the Contractor's firm and sealed if a corporation.
- B. Provide manufacturer's warranty against defects in manufacturing.

1.5 QUALITY ASSURANCE

- A. Provide inspection of cast-in-place concrete work, and testing, including slump tests, air content, and standard compression testing. Materials and workmanship shall be subjected to inspection and testing in mill, shop and/or field by the Engineer. Such inspection and testing shall not relieve Contractor of his responsibility to provide his own inspection, testing, and quality control as necessary to furnish materials and workmanship in accordance with requirements of this Section.
- B. Provide source of and allow access to materials required to be sampled and tested.

- C. Sampling and testing required by the Engineer to determine if materials proposed for use in the project comply with Specification requirements shall be made prior to actual use of materials in project. Coordinate the work to ensure that materials are supplied, sampled, tested, and approved so as not to delay progress of the work.
- D. Whenever source, quality, or characteristics of approved material changes, or indicates lack of compliance with requirements of Contract Documents, resubmit additional materials for sampling and testing until requirements are satisfied. Additional sampling, testing and inspection of materials and workmanship not originally conforming to requirements of Contract Documents shall be provided at no additional cost.
- E. Provide notification prior to the start of any phase of concrete placement work so as to provide the opportunity to inspect the work. Such notification shall be made at least 24 hours in advance of concrete placements and at least 36 hours in advance of other inspections (forms, rebars, etc.).
- F. Facilitate observation by the Engineer as well as inspection and testing by the concrete testing agency, and furnish the following:
 - 1. Information as to time and place of shipments of materials to plant and project site
 - 2. Representative sample pieces requested for testing
 - 3. Safe access to the work at all times to allow proper inspection of the work
 - 4. Full and ample means and assistance for sampling and testing materials and proper facilities for inspection of work in plant and at project site
 - 5. Covered box large enough to contain twenty-four standard concrete cylinders. At temperatures below 60°F., box shall be electrically heated and thermostatically controlled to maintain inside temperature of 60° to 80°F. Cylinders shall be placed in box immediately after molding and shall be covered with moist burlap until delivery to laboratory, 24 to 72 hours after molding.
 - 6. Access by the Engineer to the batch plant supplying the concrete at any time.
- G. Compression tests shall consist of one set of 4 cylinders for each test made, cured, and tested by testing laboratories during progress of job. 6 cylinders will be required for each test made with concrete mix containing fly ash or ground granulated blast furnace slag. One set of cylinders shall be taken for every 100 cubic yards of concrete or fraction thereof placed in any 1 day.
 - 1. 1 cylinder of each set shall be tested for 7-day compressive strength; 2 cylinders shall be tested for 28-day compressive strength. The remaining cylinder shall be tested for 56-day compressive strength if either one of the 28-day tests are below the specified strength, otherwise the 56-day test will be eliminated.
 - 2. For modified mix with fly ash or ground granulated blast furnace slag, 1 cylinder of each set shall be tested for 7-day compressive strength, 2 cylinders shall be tested for 28-day compressive strength and 2 cylinders shall be tested for 56-days compressive strength. The remaining cylinder shall be tested for

- 84-day compressive strength if either one of the 56-day tests are below the specified strength, otherwise the 84-day test will be eliminated.
3. Compression strength test of cylinders shall conform to ASTM Designation C39, latest revision. The testing laboratory will submit certified copies of the test results directly to the Engineer and the Owner within 24 hours after tests are made.
 4. Sampling, molding, curing and testing of cylinders shall conform to ASTM requirements. Specimens shall be cured under laboratory conditions. The Engineer may require additional cylinders to be cured under field conditions when unusual conditions may tend to reduce concrete strength.
 5. Report of tests shall include: name of project, date and location of concrete placement, design strength of concrete, mix data, slump, air content (if tested), compressive strength, age and condition of test cylinder, type of fracture, and type of curing.
- H. Slump test, to check consistency, shall be made from the sample used to mold cylinders. Additional slump tests may be taken of every batch delivered to job site.
- I. Tests for determination of air content shall be made as required to verify conformance with the specifications.
- J. The strength level of the concrete mix shall be considered satisfactory if both of the following criteria are satisfied:
1. Every arithmetic average of any three consecutive strength tests equals or exceeds the specified design strength.
 2. No individual strength test (average of two cylinders from the same test group) falls below the specified design strength by more than 500 psi when the specified design strength is 5000 psi or less or by more than 10 percent of the specified design strength when the design strength is more than 5000 psi.
- K. When tests of control specimens fall below these requirements, the Engineer will require 56 day or 84 day cylinder tests or core specimens taken from concrete in question and tested in accordance with ASTM C42. If these specimens do not meet strength requirements, the Engineer has the right to require additional curing, load tests, strengthening or removal and replacement of those parts of the structure which are unacceptable, and in addition, removal of such sound portions of structure as necessary to ensure safety, appearance, and durability of structure. Additional testing, load tests, strengthening or removal and replacement of parts or structure and any costs associated with delay of project shall be at no additional cost to the Owner.
- L. Any material or workmanship that is rejected, either at the batch plant or at the site, shall be replaced promptly at no additional cost to the Owner.
- M. If arrangements for corrections and/or replacements are not made within seven days after notice of rejection, the Owner has the right to have corrections and/or replacement made and charge cost thereof and any costs associated with delay of project against balance of monies withheld.

- N. Acceptance of work and admixtures at the batch plant shall not prevent final rejection at job site upon arrival or after it has been installed, if work is found to be defective.
- O. Portions of a structure which do not meet the requirements of the Contract Documents based on appearance or for any other aesthetic reason, shall be corrected or removed and replaced at no additional cost to the Owner.
- P. Work on new concrete structures shall conform to the requirements of ACI 306.1, Standard Specifications for Cold Weather Concreting, except as modified herein.

PART 2 PRODUCTS

2.1 AMERICAN IRON AND STEEL

- A. All iron and steel products included in this section shall be manufactured in the US. Refer to Section 00800 for further description of the American Iron and Steel requirement.

2.2 CONCRETE MATERIALS

- A. Cement shall be American-made Portland Cement, free from water soluble salts or alkalis which will cause efflorescence on exposed surfaces. Portland Cement shall be Type II, ASTM C150 except in foundation mat where either Type II or Type IV, ASTM C150 may be used, as required, to meet heat gain requirements specified herein. Air entraining cements are prohibited.
- B. Use only one brand of cement for each type of cement throughout project. Contractor shall be responsible for whatever steps are necessary to ensure that no visual variations in color will result in exposed concrete and shall place on order and secure in advance a sufficient quantity of this (these) cement(s) to complete concrete work specified herein.
- C. Pozzolans and Blast Furnace Slag
 - 1. Fly Ash: Class F conforming to the requirements of ASTM C618
 - 2. Ground Granulated Blast Furnace Slag: Conform to ASTM C989
- D. Normal Weight Fine Aggregate
 - 1. Washed, inert, natural sand conforming to ASTM C33 and the following additional requirements:

- a. Gradation Table

Sieve Size	Percent Passing
3/8-in.	100
No. 4	95 to 100
No. 8	80 to 100
No. 16	55 to 80
No. 30	25 to 60

No. 50	10 to 25
No. 100	2 to 8
No. 200	0 to 3

- b. Fineness Modulus 2.75 (plus/minus 0.25)
 - c. Clay lumps and friable particles – 3.0 percent maximum
 - d. Coal and lignite – 0.5 percent maximum
 - e. Organic Impurities (ASTM C40) – Organic Plate No. 2
 - f. Strength of Mortar (ASTM C87) – not less than 95 percent at 7 days
 - g. Soundness (AASHTO T-104) - 10 percent maximum loss (magnesium sulfate solution, five cycles)
- E. Normal Weight Coarse Aggregate:
- 1. Well graded crushed stone or washed gravel conforming to ASTM C33 and the following additional requirements.
 - a. Material finer than No. 200 sieve – 1.0 percent maximum
 - b. Clay lumps and friable particles – 2.0 percent maximum
 - c. Chert (less than 2.40 specific gravity, saturated surface dry) – 3.0 percent maximum by weight.
 - d. Sum of clay lumps, friable particles, and chert (less than 2.40 specific gravity, saturated surface dry) – 3.0 percent maximum by weight. This limitation only applies to aggregates in which chert appears as an impurity.
 - e. Coal and lignite – 0.5 percent maximum
 - f. Soundness - 18 percent maximum loss (magnesium sulfate solution, five cycles)
 - g. Soundness - 10 percent maximum loss (sodium sulfate solution, five cycles)
 - 2. Coarse aggregates shall not exceed 35 percent by weight "percentage of wear" as determined by the Los Angeles Abrasion and Impact Tests in ASTM C131 and C535.
 - 3. Provide designated sizes noted in Table A for normal weight coarse aggregate to minimize shrinkage and cracking. The sizes shall also be chosen in accordance with ACI requirements for actual reinforcement clearances.
- F. Lightweight Fine and Coarse Aggregates: rotary kiln expanded shale conforming to ASTM C330 and as specified herein. Aggregate sizes shall include fine aggregate designated as "sand size", and coarse aggregate designated as graded 3/4 inch size or 3/8 inch size.

- G. Water shall be from approved source, potable, clean and free from oils, acids, alkali, organic matter and other deleterious material.

2.3 ADMIXTURES

- A. Mid-range water-reducing agent:
 - 1. Mid-range water-reducing agent shall be by same manufacturer as air-entraining agent.
 - 2. Daracem - 55 W.R. Grace & Co.
 - 3. Pozzolith 220N - BASF Admixtures, Inc.
 - 4. Eucon MR - Euclid Chemical Co.
 - 5. Or equal conforming to ASTM C494 Type A
- B. High-range water reducing agent:
 - 1. Daracem - 100 W.R. Grace & Co.
 - 2. Reobuild 1000 - BASF Admixtures, Inc.
 - 3. Eucon-37 - Euclid Chemical Co.
 - 4. Or equal conforming to ASTM C494 Type F
- C. Air-entraining agent:
 - 1. DAREX AEA - W.R. Grace & Co.
 - 2. MB-VR or MB-AE90 - BASF Admixtures, Inc.
 - 3. Air-Mix - Euclid Chemical Co.
 - 4. Or equal conforming to ASTM C260
- D. Admixtures which retard setting of cement in concrete shall not be used without written approval of the Engineer. Admixtures causing accelerated setting of cement in concrete shall not be used.

2.4 CONCRETE MIX

- A. Development of concrete mix design and testing shall be by an independent ACI certified concrete testing agency engaged by and at the expense of the Contractor and shall conform to the following requirements:
 - 1. Select proportions of ingredients to meet the design strength and materials limits specified in Table B and to produce concrete having proper placability, durability, strength, appearance and other required properties. Proportioning shall also conform to the requirements in ACI 301 and ACI 318.
 - 2. The design mix shall be selected based on standard deviation data where a production facility has sufficient test records for a mix with essentially the same proportions.

3. If sufficient test records are not available, (at least 30 consecutive strength tests or two groups of tests totaling at least 30 within the past 12 months), the design mix shall be developed using laboratory trial mixtures.
 4. Water content and cement content of concrete to be used in the work shall be based on a curve showing the relationship between water content, cement content, and 7 and 28 day compressive strengths of concrete made using proposed materials. Maximum water/cement (W/C) materials ratio or minimum cementitious materials content to be used in the proposed work shall be shown by the curve to produce the average strength required in Table C. Curves shall be determined by four or more points, each representing an average of at least three test specimens at each age, and shall have a range of values sufficient to yield desired data, including all compressive strengths required by the Contract Documents, without extrapolation. Design mix of concrete to be used in the work, as determined from the curve, shall correspond to the following test strengths (Table C) obtained in laboratory trial mixtures, but in no case shall resulting mix conflict with limiting values as specified in Table B.
 5. Sufficient materials for concrete mix design shall be furnished not less than five weeks before use. Duplicate small samples plainly and neatly labeled with source, where proposed to be used, date, and name of collector shall be provided and presented to the testing agency for permanent reference.
 6. All concrete is normal weight unless specifically designated otherwise with air-dry weight not to exceed 150 lbs. per cubic foot.
- B. Concrete mix designs shall meet the requirements outlined in Table 1.
- C. Concrete exposed to seawater or brackish water shall satisfy the requirements of Marine Concrete.
1. Marine Concrete shall have a slump of 4 inches \pm 2 inches. If Marine concrete is to be pumped, a slump range of 3 to 6 inches will be permitted.

TABLE 1
Concrete Proportioning and Requirements

Type	Minimum 28-Day Compressive Strength	Maximum Aggregate Size	Water Cement Ratio ¹	Cementitious Material		Air Entrainment (air content)
				Minimum Cementitious Material ²	Maximum Cement Replacement	
Marine Concrete	5,000	3/4"	0.40	705 lbs/CY	Note 3	6% \pm 1%

¹The water content of all additives shall be included in the water-cement ratio.

²Cementitious content shall be the sum of all Portland cement, silica fume, fly ash, slag cement, and all other approved pozzolanic admixtures.

³Cement replacement, based on dry weight shall be included in the mix design as follows: Silica fume shall constitute $6 \pm 1\%$ of the cementitious content. Fly ash, if used instead of slag cement, shall constitute 15% of the cementitious content. Slag cement, if used instead of fly ash, shall constitute 25% to 40% of the cementitious content. Combinations of fly ash and slag cement may be used provided the permeability and strength provisions are satisfied, however shall not exceed 50% of the total cementitious content.

- D. Concrete in foundation mat shall conform to the requirements specified for massive concrete in ACI 301 and ACI 318 except as extended or modified by this Section.
- E. Limiting values shown in Table B apply for specific strengths of concrete with 3/4 inch coarse aggregates unless noted otherwise.
- F. In slabs and walls exposed to weather, concrete shall contain the approved air-entraining admixture as per manufacturers written instructions to provide entrained air by volume in the cured concrete between 4.5 and 7.5 percent.
- G. The approved water-reducing admixture shall be used in all concrete, in accordance with manufacturer's written instructions. Concrete mix with a 0.45 or lower water/cement ratio shall require a high range water reducer.
- H. Structural lightweight concrete shall have an air dry unit weight of 109 to 115 pounds per cubic foot as determined in accordance with ASTM C567, and a corresponding wet density not to exceed 120 pounds per cubic foot as determined in accordance with ASTM C138. Splitting tensile strength as determined by laboratory tests in accordance with ASTM C330 and ASTM C496 shall equal or exceed 330 pounds per square inch.
- I. Deviation from the approved mix design will not be allowed without written approval of the Engineer. Additional testing by testing agency associated therewith shall be at no additional cost to the Owner.

2.5 MISCELLANEOUS CONCRETE MATERIALS

- A. Grout shall be a ready-to-use, non-metallic, non-shrink aggregate product requiring only the addition of water at the job site. Grout shall be as manufactured by Five Star Products, Inc.; Euclid Chemical Company; Master Builders; or equal equal. Grout shall be easily workable and shall have no drying shrinkage at any age. Compressive strength of grout (2 inch by 2 inch cubes) shall not be less than 5000 psi at 7 days, and 7500 psi at 28 days.
- B. Floor Hardener, Sealer, and Waterproofing Treatment:
 - 1. Concrete floor surfaces not covered with resilient flooring or carpet shall receive a surface treatment after steel trowel finishing.
 - 2. Product and Manufacturer:
 - a. Ashford Formula hardener and sealer as manufactured by Concrete Chemical Company, Inc., Springville, Utah

- b. Seal Hard concrete sealer as manufactured by L&M Construction Chemicals, Inc., Omaha, Nebraska
 - c. Approved equal
 - C. Concrete Construction Joint Roughener:
 - 1. Provide a water soluble non-flammable, surface-retardant roughener.
 - 2. Product and Manufacturer:
 - a. Rugasol-S by Sika Corporation for horizontal joints only
 - b. MasterFinish QD 200 by BASF Corporation for vertical joints
 - c. Approval equal
 - D. Bond Breaker:
 - 1. Provide an adhesive-backed glazed butyl or polyethylene tape, which will satisfactorily adhere to the premolded joint filler or concrete surface as required. The tape shall be the same width as the joint.
 - 2. Bond breaker for concrete other than where tape is specifically called for shall be either bond breaker tape or an ASTM C309 non-staining type bond prevention coating such as Masterkure 100WB by Degussa Construction Chemicals, Dayton Superior Sure Lift J6WB, StarSeal Clean Lift by Vexcon Chemicals or equal.
 - E. Bonding Agent:
 - 1. Provide a two-component, 100% solids, moisture-tolerant structural epoxy adhesive conforming to ASTM C881, Type II. The bonding agent shall be Sikadur 32 Hi-Mod by Sika Corporation of Lyndhurst, NJ, Concesive Liquid (LPL) by Degussa Admixtures, Inc. of Cleveland, OH or equal.
 - 2. Latex bonding agent shall be a non-reemulsifiable acrylic-polymer latex conforming to ASTM C1059 Type II.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify all work prepared by other trades to receive work of this Section and correct any defective installations.
- B. Verify cover requirements over all reinforcement.
- C. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not cause hardship in placing concrete.
- D. Verify site conditions to ensure that full access is available for placement of concrete.

3.2 HANDLING, STORAGE, AND PROTECTION OF MATERIALS

- A. Handle and store materials separately in such manner as to prevent intrusion of foreign matter, segregation, or deterioration. Do not use foreign materials or those containing

frozen material. Remove improper and rejected materials immediately from point of use. Cover materials including steel reinforcement and accessories during construction period. Stockpile concrete constituents properly to assure uniformity throughout project.

3.3 JOINTS

- A. Construction and expansion joints indicated on Drawings are mandatory and shall not be omitted. Construction joints shall conform to the requirements of Section 03100 and the following:
 - 1. All horizontal construction joints are to be treated as follows: After placing of the concrete and after initial set of the concrete has taken place, the construction joint is to be cleaned off with a jet of water, air, or a jet of air and water mixed. The jet shall have sufficient force to clean off all loose concrete, scum, and laitance. The jet shall expose and clean off aggregate but shall not undercut or loosen the aggregate.
 - 2. Before placing new concrete against concrete already in place and hardened, the surface shall again be cleaned with a jet where practical.
 - 3. Where joints other than those shown are required, they shall be made at such locations as the Engineer may allow, and shall in no case impair the structural strength of the structure.
- B. Joints not indicated or specified shall be placed to least impair strength of structure and shall be subject to approval of the Engineer.
- C. Saw-cut joints shall be installed in the locations shown on the Drawings. Saw-cut joints shall not be substituted for formed construction joints unless approved by the Engineer. Saw-cut joints shall conform to the following requirements:
 - 1. The depth of the saw cut shall be at least $\frac{1}{4}$ of the slab thickness or a minimum depth of one inch unless otherwise shown on the Drawings.
 - 2. Do not saw cut through slab reinforcing steel unless directed to do so in writing by the Engineer.
 - 3. Joints produced using conventional wet-cut process shall be completed within 4 to 12 hours after the slab has been finished - 4 hours in hot weather conditions and 12 hours in cold weather conditions.
 - 4. Joints produced using the early-entry dry cut process shall be formed using diamond-impregnated blades and shall be completed within 1 to 4 hours after the slab has been finished - 1 hour in hot weather conditions and 4 hours in cold weather conditions. The maximum depth of joints produced by the dry cut process shall not exceed 1-1/4 inches. Care should be taken to make sure that the saw does not ride up over large or hard coarse aggregates.
 - 5. Regardless of the saw cutting process chosen, the saw cutting must be performed before the concrete starts to cool, as soon as the concrete surface is firm enough not to be torn or damaged by the cutting blade, and before random-drying-shrinkage cracks can form in the concrete slab.

3.4 INSTALLATION OF EMBEDDED ITEMS

- A. Conform to requirements of ACI 318, paragraph 6.3, "Conduits and Pipes Embedded in Concrete", and as specified below.
- B. Install sleeves, furnished by other trades, at locations shown on the Drawings.

3.5 MIXING, CONSISTENCY, AND DELIVERY OF CONCRETE

- A. Concrete shall be ready-mixed, produced by a central batch plant. Hand or site mixing shall not be allowed. Constituents, including admixtures, except certain corrosion inhibitors and superplasticizers, shall be batched at the central batch plant. Admixtures shall be premixed in solution form and dispensed as recommended by the manufacturer.
- B. Central plant and rolling stock equipment and methods shall conform to Truck Mixer and Agitator Standard of Truck Mixer Manufacturer's National Ready-Mixed Concrete Association, ASTM C94, ASTM C685, and Contract Documents. Consistency of concrete at time of placement shall be as specified in Table D.
- C. Ready mixed concrete shall be transported to the site in watertight agitator or mixer trucks loaded not in excess of rated capacities. Discharge at site shall be within one and one-half hours after cement is first introduced into the aggregates. Concrete with a temperature greater than 90°F. shall be rejected and removed from the site.
- D. During hot weather conditions as defined in ACI 306R (i.e., any of the following conditions: high ambient temperature, high concrete temperature, low relative humidity, increased wind velocity, high solar radiation), when the temperature of the concrete is 85°F or above, the time between the introduction of cement to the aggregates and discharge shall not exceed one hour. In addition, when the rate of evaporation on the surface of the concrete is expected to approach 0.2 lb/ft²/hr. (see chart in ACI 305R) special precautions shall be taken against the formation of plastic shrinkage cracking on the surface of the concrete after placement.
- E. During cold weather conditions, that is, any period when for more than three successive days the average daily outdoor temperature drops below 40°F, the concrete temperature at the time of placement shall be as specified in Table E.
- F. Central mixed concrete shall be plant mixed a minimum of five minutes. Agitation shall begin immediately after premixed concrete is placed in truck and shall continue without interruption until discharged. Transit mixed concrete shall be mixed at mixing speed for at least ten minutes immediately after charging truck followed by agitation without interruption until discharged. All transit mixed truck load ticket information shall include batch time, load weights of constituents, gallonage of water added and amounts of additives.
- G. Retempering of concrete, which has partially hardened by mixing with or without additional cement, aggregates, or water shall not be permitted.

3.6 PLACING CONCRETE

- A. Pumping of concrete will be permitted. If selected for any portion of the work, submit the list of equipment to be provided and mix design suitable for pumping for approval.

- B. Remove excess water and foreign matter from forms and excavations. Do not place concrete on frozen soil. Provide adequate protection against frost action during freezing weather.
- C. Do not place concrete having slump outside of allowable range.
- D. Transport concrete from mixer to place of final deposit as rapidly as practical by methods which prevent separation of ingredients and displacement of reinforcements, and which avoid rehandling. Do not deposit partially hardened concrete. When concrete is conveyed by chutes, equipment shall be of such size and shape to ensure continuous flow in chute. Flat (coal) chutes shall not be used. Chutes shall be of metal or metal lined and uniformly sloped. Slope shall not be less than 25 degrees nor more than 45 degrees from horizontal. Discharge end of chute shall be provided with baffle plate or spout to prevent segregation. If discharge end of chute is more than five feet above surface of concrete in forms, a spout shall be used. Concrete shall be lowered and maintained as near to the surface of deposit as practicable. When operation is intermittent, the chute shall discharge into hopper. The chute shall be thoroughly cleaned before and after each use and debris and any water shall be discharged outside of the forms. Concrete shall not be allowed to flow horizontally over distances exceeding 10 feet or dropped vertically over 6 feet.
- E. Place concrete in such a manner as to prevent segregation and accumulations of hardened concrete on forms or reinforcement above the grade of concrete being placed. Suitable hoppers and spouts with restricted outlets and tremies shall be used as required.
- F. Thoroughly consolidate each layer of concrete by rodding and vibrating using internal type mechanical vibrator. Vibration shall be done by experienced operators under close supervision and shall be carried on only enough to produce homogeneity and optimum consolidation without permitting segregation of constituents or "pumping" of air. Vibrators used for normal weight concrete shall operate at speeds of not less than 7,000 vpm and be of suitable capacity. Do not use vibrators to move concrete. Vibration shall be supplemented by spading to remove bubbles and honeycombs adjacent to visible surfaces. At least one vibrator shall be on hand for every 10 cubic yards of concrete placed per hour, plus one spare. Vibrators shall be operable and on site prior to starting concrete placement.
- G. Vertical lifts shall not exceed 36 inches. Vibrate completely through successive lifts to avoid pour lines. Vibrate first lift thoroughly until top of lift glistens to avoid stone pockets, honeycomb, and segregation.
- H. Deposit concrete continuously, and in layers of such thickness that no concrete will be deposited on concrete which has hardened sufficiently to cause formation of seams and planes of weakness within the section. If a section cannot be placed continuously between planned construction joints, as specified, field joints and additional reinforcement shall be introduced at the Contractor's expense to preserve structural continuity.
- I. Cold joints, particularly in exposed concrete, including "honeycombs", are unacceptable. If they occur in concrete surfaces exposed to view, the Engineer will require that entire section in which blemish occurs be removed and replaced with new materials at the Contractor's expense.

- J. When placing exposed concrete in walls or columns, strike corners of forms rapidly and repeatedly from outside along full height while depositing concrete and vibrating. Care shall be taken to thoroughly vibrate the concrete below and around wall penetrations.
- K. Chutes, hoppers, spouts, adjacent work, etc., shall be thoroughly cleaned before and after each use, and water and debris shall be discharged outside form.
- L. Sloped floors shall be placed with the use of pipe screeds for grade control. Pipe screeds shall be in place prior to placing the concrete for the floors.

3.7 CURING AND PROTECTION

- A. When concrete is placed at or below an ambient air temperature of 40°F. or whenever this temperature or lower values are likely to occur within 48 hours after placement of concrete, cold weather concreting procedures, according to ACI 306.1 and as specified herein, shall be followed. The entire area affected shall be protected by adequate housing or covering, and heating. No salt, chemicals or other foreign materials shall be used in the mix to lower the freezing point of concrete. No oil or kerosene fixed heaters shall be utilized. Vent flue gases from combustion heating units to the outside of the enclosure.
- B. No frozen materials shall be used in batching concrete and any ice shall be removed from coming into contact with the concrete.
- C. Protect concrete work against injury from heat, cold, and defacement of any nature during construction operations.
- D. Concrete shall be treated and protected immediately after concreting or cement finishing is completed, to provide continuous moist curing above 50°F. for at least 7 days, regardless of ambient air temperatures.
- E. All concrete shall be cured immediately after finishing in accordance with the following requirements:
 - 1. Curing shall be accomplished by a continuous soaking process such as the use of soaker hose, sprinklers or accomplished through the use of a laminated reinforced asphalt impregnated paper which is non-staining or by use of plastic roll materials either of which shall be thoroughly wetted at least once a day or more often as required in very hot weather. Such paper or plastic shall be placed as soon as possible after finishing of concrete so that scarring of the surface will not occur. Paper or plastic shall be held in place on the surface of the concrete in such a manner and means as will not allow it to be blown off or otherwise dislodged from the concrete surface. Curing procedures shall be maintained continuously for a period of at least 7 days unless otherwise directed and approved by the Engineer.
 - 2. All methods of curing shall be subject to approval of the Engineer, and each method employed shall be practical and adequate for the curing required.
 - 3. Curing compounds in lieu of wet curing will not be allowed.
- F. Apply floor hardener in accordance with manufacturer's recommendations for new concrete surfaces. Spray apply immediately following the finishing operation. Keep

surface wet by brooming excess material onto dry areas or by respraying. Upon drying and becoming slippery wet lightly with water. With second drying flush the surface with water to remove excess materials and surface alkali. Wet cure concrete as specified above.

- G. Keep a permanent temperature record showing date and outside temperature during concreting operations. Thermometer readings shall be taken at start of work in morning, at noon, and again late in afternoon. Locations of concrete placed during such periods shall likewise be recorded in such manner as to show any effect temperatures may have had on construction. Copies of temperature records shall be distributed daily to the Engineer.

3.8 REMOVAL OF FORMWORK, SHORING AND RESHORING

- A. Forms and shoring shall not be removed until concrete has attained sufficient strength to support its own weight, construction loads to be placed thereon and lateral loads, without damage to structure or excessive deflection.
- B. With the exception of construction joint bulkheads and keyways, forms and supports shall remain in place for not less than the minimum time periods noted below.
 - 1. Unless specifically authorized by the Engineer, forms for vertical surfaces shall not be removed before the concrete has attained a strength of not less than 30 percent of the minimum allowable prescribed compressive strength nor not less than the minimum time period specified in Table F.
 - 2. Unless specifically authorized by the Engineer, forms for horizontal surfaces shall not be removed before the concrete has attained a strength of not less than 60 percent of the minimum allowable prescribed compressive strength nor not less than the minimum time period specified in Table F.
 - 3. Definition of degree-days - Total number of days times mean daily air temperature at the surface of the concrete. For example, 5 days at temperature of 60°F. equals 300 degree-days. Days or fractions of days in which temperature is below 50°F. shall not be included in calculation of degree-days except where modified by Table E.
- C. Forms for construction joint bulkheads and keyways may be removed the following day, after the concrete pour. Extreme caution must be used to avoid damage to the concrete surface, keyway, and waterstop.
- D. Form removal shall be so performed that reshores are placed at same time as stripping operations where required, and that no area larger than one-fourth of a slab panel is unsupported at any time.
- E. Any test cylinders required to verify the specified minimum strengths for form removal shall be field cured under the same conditions as the concrete they represent. Such cylinders and testing shall be at the Contractor's expense.

3.9 FINISHING OF CAST-IN-PLACE CONCRETE

- A. Upper Horizontal Surfaces

1. Horizontal surfaces not subjected to wear, such as tops of parapets, copings, walls, etc., shall be formed by placing an excess of material in the forms and removing or striking off such excess with a template, forcing the coarse aggregate below the surface of the mortar.
2. Horizontal surfaces shall be attained by striking off excess concrete and in no case shall concrete be added to the tops of walls, etc., once initial set has taken place.
3. The top of such surfaces shall be finished in a manner as required and dictated by the necessary appearance of the part being finished. For covered surfaces, a wood float finish will in most cases be sufficient. Steel troweling may be necessary where concrete is exposed to view and adjacent surfaces have a steel trowel finish. In other cases, a "broom" finish may be required.

B. Slab Surfaces

1. Interior traffic bearing slab surfaces shall have a steel trowel finish and exterior slabs shall have a wood or magnesium trowel non-slip finish. The finish shall be accomplished by a procedure as follows, but shall be the Contractor's responsibility to produce a good and proper finish on all parts of the work:
 - a. "Steel Trowel Finish" - The surface shall be screeded and given a minimum of two trowelings using a steel trowel. The final troweling shall be done at a time when the concrete has set to a point where troweling produces a ringing sound as the trowel is drawn across the surface. Where surface areas are large enough to permit their use, power finishing machines will be used. For all steel trowel finishes a fine textured dense surface shall be the final result and premature finishing will require additional troweling until such is the result.
 - b. "Wood Float Finish" - The surface shall be screeded, given a minimum of one steel troweling and shall then be finished with a wood, cork or other float as required to produce the desired finish. In cases where a rough wood float finish is sufficient, the above procedure may be executed, omitting the steel troweling. A rough wood float finish shall be used only when allowed in writing by the Engineer.
 - c. "Broom Finish" - On exterior work such as sidewalks and where else called for, a broom finish shall be used. The finishing shall be accomplished in the following manner. Screeding shall be done and the surface worked up with a wood float. At a proper time thereafter, the surface shall be steel troweled at least once and more if so directed. Upon completion of troweling, a sufficiently stiff bristled broom shall be drawn lightly across the surface to produce a slightly striated finish. The brooming shall in general be in a direction of 90 degrees to the longitudinal axis of the completed work as in the case of sidewalks and stair treads, but for all other shall be as directed by the Engineer.
2. For all of the finishing procedures described, the time element is important and something that must be determined during the progress of the work as conditions warrant. Normally, free water on the surface of concrete should not

occur. Allow the concrete surface to dry before starting finishing operations. Do not, under any circumstance, add dry cement to wet areas in order to accelerate drying. Finishing and rubbing required for all parts of the work shall be done only by competent "Cement Finishers" trained for the work.

C. Formed Surfaces

1. Immediately after the end of the wet cure period, remove form ties and patch all tie-holes, rat holes, and other surface voids with a non-metallic, non-shrink grout, which most nearly matches the color and texture of the concrete surface. All protrusions shall be ground smooth with an approved mechanical grinder.

3.10 REPAIRING OF HARDENED CONCRETE SURFACES

- A. Defective concrete and honeycombed areas shall not be patched unless examined and approval is given by the Engineer. After approval, areas involved shall be cut back to a minimum depth of 1 inch from the finished surface, or as otherwise directed, whichever is greater. Edges of areas to be repaired shall be cut square to a minimum depth of 3/4 inch. Feathered edges will not be allowed. Any voids or honeycomb around reinforcing steel shall be chipped away to provide at least 3/4 inch clearance all around to permit proper placement of repair concrete around the steel to the parent, sound concrete.
- B. Exposed surfaces shall be thoroughly cleaned of all mud, paint, grime, scum, laitance, organic matter, detritus, calcareous growth and other foreign matter by sand and water blasting or other acceptable means. Immediately after cleaning, the surface shall be checked by the Engineer for proper surface preparation, including fractured concrete or loose aggregate. Any such material shall be removed using pneumatic or hand tools. The final surfaces shall be thoroughly rinsed with clean water to remove remaining dirt and dust.
- C. Premoisten the prepared surface for at least 2 hours or reduce absorption of water by the parent concrete and to provide a reservoir for moist curing at the interface of the repair. The substrate should be saturated surface dry with no standing water. While the concrete surface is still damp, apply a thin 1/16 inch coat of neat cement slurry (mixed to the consistency of a heavy paste) with a bristle brush to provide a bond coat throughout the entire cavity of the repair. Before the slurry has dried or changed color, promptly install the repair concrete or dry-pack, as may be required or selected.
- D. For relatively small areas, ram repair concrete into this portion of the formed void. This concrete shall comprise a crumbly-dry 1-1-1.5 mixture of cement, concrete sand and pea gravel (or 3/4" gravel) mixed slightly damp to the touch (just short of "balling"). The "dry-pack" consistency of the concrete shall be zero slump, but moist enough so that when it is rodded and tamped until dense, an excess of paste will appear on the surface in the form of a spider web. In cases of unformed voids of thinner section, do not build-up repair in excess of a depth which will sag with the weight of the fresh mortar or concrete. Trowel smooth with heavy pressure.
- E. Large areas may be repaired with the normal concrete mix approved for use on the project.
- F. The concrete shall be of the driest possible consistency and mix composition so that it can be worked into the corners and angles of forms and around the reinforcement,

without permitting the materials to segregate or free water to collect on the surface, due consideration being given to the methods of placing and compacting. Source and mixture of concrete shall be submitted for approval.

- G. Concrete shall be deposited continuously, or in layers of such thickness that no concrete will be deposited which has hardened sufficiently to cause the formation of seams and planes of weakness within the section. Concrete shall be thoroughly consolidated and trowelled dense, smooth and plane. Avoid premature and excessive trowelling that could cause sagging.
- H. Repair areas and adjacent parent concrete surfaces shall be treated immediately after finishing providing continuous moist curing without change in color for at least 7 days. Surfaces shall be covered with damp burlap and sealed with taped polyethylene. Membrane curing compounds shall not be used.
- I. Leave finished work and adjacent concrete surfaces in a neat, clean condition with no evidence of spillovers or staining.

3.11 CLEANING

- A. Concrete surfaces shall be cleaned of objectionable stains as determined by the Engineer. Materials containing acid in any form or methods which will damage the "skin" of concrete surfaces shall not be employed, except where otherwise specified.

Cast-In-Place Concrete Data Sheet

TABLE A
 Coarse Aggregate Size

Concrete Section	Coarse Aggregate Size (inches)	ASTM C33 Size Number
Mat Foundations	1-1/2	467
All other concrete	3/4	67

TABLE B
 Maximum Allowable Water/Cement Ratios

Compressive Strength (PSI)	Maximum Allowable Water/Cement Ratio ¹	Total Cementitious Material (lbs.) ^{2, 3}	
		Minimum	Maximum
4500 ⁴	0.45	635	658
4000	0.45	611	635
3500	0.45	565	590
3000	0.50	517	540
2500	0.55	451	

¹Maximum; decrease if possible. This represents total water in mix at time of mixing, including free water on aggregates. Maximum W/C ratio for all water retaining structures and below grade structures (pump chambers, tunnels, etc.) shall be 0.42.

²Total cementitious material is for ¾" coarse aggregate mix - use lower quantity for larger coarse aggregate size mix. Fly ash may be substituted for up to 20 percent by weight of the total cementitious material in all classes of concrete. Ground granulated blast furnace slag may be substituted for up to 40 percent by weight of the total cementitious material in all classes of concrete. For all water retaining structures and below grade structures, fly ash shall be substituted for a minimum of 15 percent and a maximum of 25 percent of the total cementitious material, or ground granulated blast furnace slag shall be substituted for a minimum of 25 percent and a maximum of 40 percent of the total cementitious material.

³For concrete flatwork with a steel trowel finish, fly ash may be substituted for up to 10 percent by weight and ground granulated iron blast-furnace slag may be substituted for up to 25 percent by weight of the total cementitious material.

⁴For all water retaining structures exposed to freeze/thaw conditions, concrete exposed to freezing and thawing in a moist condition, and/or concrete exposed to deicing chemicals, use 4500 psi minimum design mix.

Cast-In-Place Concrete Data Sheet (Cont.)

TABLE C
 Minimum Strength of Lab Mixes (PSI)

Design Strength	Trial Mix Strength 28 Days
4500	5700
4000	5200
3500	4700
3000	4200

TABLE D
 Concrete Slump⁵

Portion of Structure	Recommended (inches)	Maximum Range (inches)
Mats	2	2-3
Walls, Column, Beams	4	3-5
Slabs	3	2-4

⁵After addition of high range water reducer

TABLE E
 Concrete Temperature During Cold Weather Conditions

Least Dimension of Section (Inches)	Minimum Temperature Of Concrete As Placed And Maintained During The Protection Period, °F	Maximum Gradual Decrease In Surface Temperature During Any 24 Hours After End Of Protection, °F
Less than 12	55	50
12 to less than 36	50	40
36 to less than 72	45	30
Greater than 72	40	20

Cast-In-Place Concrete Data Sheet (Cont.)

TABLE F
Minimum Degree Day Requirement for Form Removal

Form Use	Degree-Days
Walls and Vertical Surfaces	200
Elevated Slabs	400
Beams and Girders	600

END OF SECTION

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SECTION 03 48 50

PRECAST CONCRETE STRUCTURES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Precast Concrete Boardwalk Structure Sections
2. Precast Concrete Headwall

B. Related Sections

1. Section 02 31 50 - Excavating, Backfilling, and Compacting
2. Section 03 20 00 - Concrete Reinforcement
3. Section 03 30 00 - Cast-in-Place Concrete

1.2 REFERENCES

A. Commonwealth of Massachusetts State Building Code, most recent edition.

B. Precast Concrete Institute (PCI)

1. MNL-116 - Manual for Quality Control for Plants and Production of Structural Precast Concrete Products.

C. American Concrete Institute (ACI)

1. ACI 301 - Specifications for Structural Concrete for Buildings, (included as part of this specification).
2. ACI 318 - Building Code Requirements for Reinforced Concrete.
3. ACI 350 - Environmental Engineering Concrete Structures.

D. American Society for Testing and Materials (ASTM)

1. ASTM A615 - Specification for Deformed and Plain Billet - Steel Bars for Concrete Reinforcement.
2. ASTM C33 - Standard Specification for Concrete Aggregates.
3. ASTM C39 - Standard Method of Testing for Compressive Strength of Cylindrical Concrete Specimens.
4. ASTM C150 - Standard Specification for Portland Cement.
5. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
6. ASTM C494 - Standard Specification for Chemical Admixtures for Concrete.

1.3 SUBMITTALS

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- A. Submit to the Engineer, as provided in Section 01 33 00, material specifications, and shop drawings for all materials specified and furnished under this Section. Submittals shall detail size and elevations of all structure penetrations, sleeve materials and sleeve elevations.
- B. The drawings show a generalized configuration for the precast concrete structures. Submittals shall include separate scaled, detailed drawings for each precast concrete structure.
- C. Submit to the Engineer shop drawings sealed by an Engineer registered in the Commonwealth of Massachusetts, and material specifications for all materials specified and furnished under this Section. Submittals shall include: details of underground structures, accessories, fittings, connections, size and elevations of all structure penetrations, sleeve materials and sleeve elevations.
 - 1. Where indicated, provide post-tensioning recesses at the cold-joint end of precast unit. The contractor is responsible for design of the post-tensioning recesses. Post-tensioning recesses shall have the minimum dimensions necessary to accommodate jacking operations and permanent post-tensioning equipment.
 - 2. Means and Methods of pulling post-tensioned strands, anchoring strands, and grouting strands.
- D. Submit structural design calculations including verification of adequate anti-flotation features prepared and sealed by an Engineer registered in the Commonwealth of Massachusetts.
- E. Submit manufacturer's data on structures, and associated specialty products.
- F. Submit Certificates of Compliance for reinforcing steel and concrete.

1.4 QUALITY ASSURANCE

- A. Design Criteria
 - 1. Precast concrete units shall be design for all temporary loads and stresses, including but not limited to handling stresses and anchorage designs for pick points.
 - 2. Precast unit shall be designed in accordance with ACI 318 and ACI 350.
 - 3. Comply with applicable requirements of American Society for Testing and Materials (ASTM) standards pertaining to construction and materials for precast structures.
- B. Fabricator Qualifications – Contractor shall employ a firm that has at least 5 years successful experience in fabrication of precast concrete units similar to units required for this project.
- C. Contractor's Qualifications - Firms with at least 4, years of successful installation on projects with structures, similar to those required for project.
- D. Allowable Tolerances

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1. Dimensional and erection tolerances shall be in accordance with PCI MNL-116 or as modified herein.
 2. Compression test results shall be evaluated in accordance with ACI 214. Concrete strength level will be considered satisfactory if the average of all sets of 3 consecutive strength test results equal or exceed the specified compressive strength and no individual strength test results fall below the specific compressive strength by more than 500 psi.
- E. Source Quality Control
1. One set of 4 compression test cylinders shall be made for each day's production for each type of precast Unit. Make compression test specimens in accordance with ASTM C31. Obtain concrete for specimens from actual production batch. Cure specimens using same methods used for curing precast units.
 2. 2 specimens shall be tested at 28 days for acceptance, one shall be tested prior to removing forms, and one shall be tested at seven days. Compression tests shall be conducted in accordance with ASTM C39. Do not remove precast units from forms unless strength tests have been completed and results are equal to, or greater than, minimum required values.
- F. Provide 7 day written notification to the Owner's Project Representative prior to casting the structures. The Engineer may sample the concrete and inspect reinforcement placement at the time of fabrication.
- G. The quality of all materials, the process of manufacture, and the finished sections shall be subject to inspection and approval by the Owner's Project Representative. Such inspection may be made at the place of manufacture, or on the work after delivery, or at both places, and the materials shall be subject to rejection at any time on account of failure to meet any of the Specifications requirements, even though samples may have been accepted as satisfactory at the place of manufacture. Material rejected after delivery to the job shall be marked for identification and shall be removed from the job at once. All materials, which have been damaged after delivery will be rejected, and if already installed, shall be acceptably repaired, if permitted, or removed and replaced, entirely at the Contractor's expense.
- H. At the time of inspection, the materials will be carefully examined for compliance with these Specifications, and with the approved manufacturer's drawings. All sections shall be inspected for general appearance, dimension, "scratch-strength," blisters, cracks, roughness, soundness, etc. The surface shall be dense and close-textured.
- I. Imperfections in sections may be repaired, subject to the approval of the Owner's Project Representative, after demonstration by the manufacturer that strong and permanent repairs result. Repairs shall be carefully inspected before final approval. Cement mortar used for repairs shall have a minimum compressive strength of 4,000 psi. at 7 days and 5,000 psi. at 28 days, when tested in 3 inch by 6 inch cylinders stored in the standard manner. Epoxy mortar may be utilized for repairs subject to the approval of the Engineer.

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- J. Plans and calculations for the precast structures shall be approved and stamped by a Structural/Civil Professional Engineer registered in the Commonwealth of Massachusetts.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Equip and protect factory-fabricated product to prevent damage, including chipping and cracking during transportation, storage and handling. Do not install damaged units; replace, and remove damaged units from project site at the Contractor's expense.
- B. Lift and support units only at designated lift points. Provide lifting points at locations concealed by the permanent surrounding construction.
- C. Protect all lifting devices from rusting by applying red lead primer.
- D. Do not store units on soft ground.
- E. Provide setting diagrams and instructions as required for installation.

PART 2 PRODUCTS**2.1 CONCRETE MATERIALS**

- A. Concrete used for the precast units shall meet the requirements of Marine Concrete. Refer to Section 03 30 00 Cast-in-Place Concrete

2.2 FORM MATERIALS

- A. Refer to Section 03 10 00 Concrete Formwork
- B. Refer to Section 03 30 00 Cast-in-Place Concrete

2.3 REINFORCEMENT

- A. Steel reinforcement used for the precast units shall be as specified for cast-in-place concrete. Refer to Section 03 20 00 Concrete Reinforcement.

2.4 GROUT MATERIALS

- A. Non-metallic Shrinkage-Resistant Grout - Pre-mixed, non-metallic, non-corrosive, non-staining product containing selected silica sands, Portland cement, shrinkage compensating agents, plasticizing and water reducing agents. Compressive strength not less than 10,000 psi. at 28 days.

- 1. Products - Subject to compliance with requirements, provide one of the following:

- a. Eucocrete; Euclid Chemical Co.
- b. Crystex; L&M Construction Chemicals
- c. Masterflow 713; Master Builders
- d. Five Star Grout; U.S. Grout Corp.
- e. Upcon; Bostik Construction Products

f. or equal.

2.5 PROPORTIONING AND DESIGN OF MIXES

A. Refer to Section 03 30 00 Cast-in-Place Concrete

2.6 FABRICATION

- A. General - Fabricate precast concrete units complying with manufacturing and testing procedures, quality control recommendations, and dimensional tolerances specified for the type of unit required.
- B. Clean reinforcement of the loose rust and mill scale, earth and other materials that reduce or destroy bond with concrete.
- C. Place concrete in a continuous operation to prevent formation of seams or planes of weakness in precast units. Thoroughly consolidate placed concrete by internal and external vibration without dislocation or damage to reinforcement and built-in items.
- D. Identification - Provide permanent markings to identify pickup points and orientation in structure, complying with markings indicated on final shop drawings. Imprint date of casting on each precast unit on a surface, which will not show in finished structure.
- E. Fabricate precast concrete units as detailed in accordance with approved erection drawings and to meet requirements of these specifications.
- F. Each precast module shall be provided with formed male and female joints to insure accurate joint surfaces and tolerance for a watertight seal. All joints between adjoining precast modules shall be sealed when modules are set in the field utilizing a vulcanized butyl rubber compound sealant conforming to AASHTO M-198 (latest revision). Sealant shall be "Conseal CS-102" as manufactured by Concrete Sealants, New Carlisle, Ohio or equivalent.
- G. All surfaces of the precast structure shall be smooth, even and free from roughness, irregularities and other defects, and shall be suitable for receiving the interior and exterior finishes specified elsewhere herein.
- H. Protruding ends of prestressed concrete members shall be as recommended by PCI MNL-116, Division V, except as modified herein. Prestressed members will be rejected for any of the following:
 - 1. Length variation in excess of ½ inch (¼ inch each end) of adjacent units or 1 inch maximum between the longest and shortest units.
 - 2. Edges not straight and parallel.
 - 3. Deviation from design camber, differential camber between adjacent members of the same design, or warp or camber that cannot be controlled by the fastening system between members.
 - 4. Improperly placed accessories or box-outs.
 - 5. Unsatisfactory surface finish.
 - 6. Exposure of wire mesh, reinforcing steel, or prestressing strand, except where cut off at the ends.

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7. Honeycomb.
8. Fractures, cracks, chips, or spalls, which cannot be repaired to the satisfaction of the Engineer.
9. Irregularities resulting from damaged forms.
- I. Sleeves for pipe and conduit penetrations shall be Schedule 80 aluminum or stainless steel. Surfaces in contact with concrete shall be bituminous coated. Sleeves shall be sized to accommodate compression bolted linked rubber sealing devices. Conduit shall be sealed watertight utilizing compression bolted conduit seals. Mechanical seals shall be "Link-Seal" as manufactured by Thunderline, or equivalent. Omni-sleeves are acceptable in lieu of linked rubber sealing devices.
- J. Where indicated, provide post-tensioning recesses at the cold-joint end of precast unit. The contractor is responsible for design of the post-tensioning recesses. Post-tensioning recesses shall have the minimum dimensions necessary to accommodate jacking operations and permanent post-tensioning equipment.
- K. A flexible pipe-to-structure connector shall be used.
 1. The flexible connectors shall be designed to provide a positive seal between the connector and the structure wall and between the connector and the pipe.
 2. The flexible boot shall be manufactured of EPDM synthetic rubber in accordance with ASTM C443 and C923 and shall be $\frac{3}{8}$ inch thick or greater.
 3. The external bands shall be made entirely of 304 series non-magnetic stainless steel.
 4. The flexible connectors shall be provided with a wedge-type or toggle-type expander to secure the pipe in the structure opening.
 5. The flexible connectors shall meet the following criteria, in accordance with ASTM C923:
 - a. Shall not leak when subjected to a head pressure of 10 psi for 10 minutes.
 - b. Shall have the ability to deflect 7 degrees in any direction without leakage under the head pressure conditions described above.
 - c. Shall not leak when subject to a load of 150 lbs./in. pipe diameter and the head pressure conditions described above.
- L. The precast concrete structures shall be constructed to the lengths, widths and heights as shown on the Plans. The structures shall be designed to adequately and safely support all live and dead loads to which the structure will be subjected, and to withstand all conditions which may be encountered. Structural drawings and calculations shall be prepared, signed and sealed by a registered Professional Engineer in the State in which the structure is to be installed, and shall be included with the submittal by the Contractor.
 1. Design calculations shall verify that the structure has been designed to withstand the burial depth, submergence due to flooding, anti-flotation, if applicable, and the dead and live loads anticipated for the structure. The structures shall have

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adequate wall, floor and roof thickness and steel reinforcement sufficient for the depth of burial shown on the Plans.

2. Roof slab/ceiling designs shall account for the loads imposed on the slab by the weight of pumps or other equipment that will be lifted from their positions for maintenance purposes by lifting hooks or other hoisting equipment installed in the slab.
- M. The precast concrete structures shall have minimum wall, floor and roof thickness of 18 inches and be constructed of 5,000 psi. 28 days strength concrete. Reinforcing steel shall be in accordance with ASTM A615 Grade 60 with a minimum of 2.5 inches of concrete cover.

2.7 ACCEPTABLE PRECAST STRUCTURE MANUFACTURERS

- A. Manufacturers - Subject to compliance with requirements, provide prefabricated unit of one of the following:
1. Arrow Concrete Products, Inc.
 2. American Precast Corp.
 3. Chase Precast
 4. Old Castle/Rotondo & Sons, Inc.
 5. Ditullio & Sons, Inc.
 6. Utility Vault Co.
 7. TRENWA
 8. or equal

PART 3 EXECUTION**3.1 INSPECTION**

- A. Installer must examine areas and conditions under which each structure is to be installed and notify Contractor in writing of those conditions detrimental to proper completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Contractor.

3.2 INSTALLATION OF FACTORY-FABRICATED UNITS

- A. General - Install structure as indicated, in accordance with manufacturer's written instructions, and in accordance with recognized industry practices to ensure compliance with requirements and intended purposes.
- B. Transport and erect precast concrete units in accordance with PCI MNL-116 and as specified herein.
- C. Erect precast concrete units and accurately install in place with mechanical hoisting equipment more than adequate for the loads.
- D. Maintain precast concrete unit in upright position at all times. Handle unit only by indicated lifting devices or cushioned pads, and in a manner that will not

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overstress or damage the unit.

- E. Erect precast concrete units in accordance with indicated erection tolerances and the requirements of ACI 117. Comply with erection sequences indicated. Position units to avoid eccentric application of forces and make complete and uniform contact with bearing surfaces.
- F. Provide anchorage and attachment welding and bolting, as indicated, in accordance with PCI MNL-116. Provide touch-up painting of field welds and abraded steel surfaces.
- G. At completion, units shall be plumb, level, and square, true to line, with angles and edges parallel with related building lines.
- H. Precast Concrete Units - Place precast concrete manhole sections as indicated.
 - 1. Install rubber joint gasket at joints between sections.
 - 2. Apply bituminous mastic coating at joints between sections.
 - 3. Apply butyl rubber sheet patch at exterior of all joints.
 - 4. Apply bonding agent to enhance the adhesion of the grout to the concrete floor.
- I. Prestressed concrete members shall be handled carefully in a manner that will cause no damage and shall be kept from contact with adjacent concrete members. Members shall be stored off the ground on timber skids, and leveled to avoid twisting or introduction of other undesirable stresses. Members shall not be moved from their fabricator's yard until completion of specified curing period.
- J. Prestressed concrete members shall be set in position in accordance with the manufacturer's layout and the Drawings. Members shall rest solidly upon the supports without rocking.
- K. Members in final position shall be loaded as necessary so that adjacent bottom edges are even, and the grout keys shall be filled with mortar. Mortar dams shall be provided at openings and other locations as necessary to prevent mortar leakage. Leveling loads shall be left in place until the mortar has attained sufficient strength to withstand the shear loads. All mortar that seeps through the joint shall be removed before it hardens.
- L. Holes, within the manufacturer's limitation, and not requiring cutting or prestressing strands, shall be cut in the field by the erector in accordance with the manufacturer's standard recommendations. Holes requiring cutting or prestressing strands shall be made during manufacture; prestressing strands shall not be cut in the field.
- M. All cutting of concrete sections shall be done with suitable concrete saws or core drilling equipment in a manner that will provide smooth, even cut surfaces.
- N. All lifting loops shall be cut off flush with the top surface of the member before any covering materials are placed.
- O. Mortar shall be firmly placed in all joints by methods that will insure complete, uniform and permanent filling of the entire space without disturbing or displacing the adjacent members. Mortar containing pea gravel shall be limited to spaces having one dimension greater than 1½ inches.

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- P. The underside of joints that will be permanently exposed to view after the work has been completed shall be caulked or grouted.
- Q. Precast reinforced concrete boardwalk units shall be installed as shown on the Construction Drawings, and according to manufacturer's recommendations as applicable.
- R. Precast unit includes lugs at one end of unit and sockets at other end of unit. Contractor shall ensure that lugs of each precast unit will fit securely with the corresponding sockets of the adjacent precast unit when the precast units are assembled at the project site. Contractor shall further ensure that non-lug/non-socket surfaces and features at each end of precast unit will fit securely with the corresponding non-lug/non-socket surfaces and features of the adjacent precast units when the precast units are assembled at the project site. Secure fit shall be deemed fit that results in:
1. No interference between lugs and sockets.
 2. Tight fit (no gaps) between non-lug/non-socket surfaces of adjacent precast units.
 3. Alignment between ends of pvc sleeves and conduit of adjacent precast units.
 4. No more than 3/16" possible lateral movement (movement perpendicular to the 7.5-foot unit length) between any two corresponding precast units.
- S. Where indicated, provide post-tensioning recesses at the cold-joint end of precast unit. The contractor is responsible for design of the post-tensioning recesses. Post-tensioning recesses shall have the minimum dimensions necessary to accommodate jacking operations and permanent post-tensioning equipment.
- T. Precast boardwalk units shall be drawn together and secured together using post-tensioning strands, and shall be plumb and properly oriented and located, prior to pouring adjacent cast-in-place concrete structures.
- U. Precast reinforced concrete boardwalk units shall not be backfilled until the installation has been inspected and approved. Structures backfilled prior to approval shall be uncovered and re-backfilled at the Contractor's expense.

3.3 DAMPPROOFING

- A. Below-grade outer surfaces of precast units shall be given two coats of bituminous dampproofing at the rate of 30-60 sq. ft. per gallon in accordance with manufacturer's instructions.

3.4 BACKFILLING

- A. General - Delay backfilling of excavation until after Owner's Project Representative's inspection has been completed. Backfilling shall be in accordance with Section 02315.

END OF SECTION

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SECTION 05 50 00

WELDING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Welding for fabrication and installation of metals
- B. Related Sections
 - 1. Section 05 50 00 – Miscellaneous Metals

1.2 REFERENCES

- A. American Society of Mechanical Engineers (ASME):
 - 1. BPVC SEC V, Nondestructive Examination.
 - 2. BPVC SEC IX, Qualification Standard for Welding and Brazing Procedures, Welders, Brazers, and Welding and Brazing Operators.
- B. American Society of Nondestructive Testing (ASNT): SNT-TC-IA, Personnel Qualification and Certification in Nondestructive Testing.
- C. American Welding Society (AWS):
 - 1. B2.1, Specification for Welding Procedure and Performance Qualification.
 - 2. D1.1, Structural Welding Code - Steel.
 - 3. D1.2, Structural Welding Code - Aluminum.
 - 4. QC 1, Standard for AWS Certification of Welding Inspectors.

1.3 DEFINITIONS

- A. CWI-Certified Welding Inspector.
- B. NDT-Nondestructive Testing.

1.4 SUBMITTALS

- A. Shop Drawings:
 - 1. Shop and field welding procedure specifications (WPS).
 - 2. Procedure qualification records (PQR).
 - 3. Welding Documentation: Submit on appropriate forms in referenced welding codes.
 - 4. Nondestructive testing procedure specifications prepared in accordance with ASME BPVC SEC V.
- B. Quality Control Submittals:

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1. Welder/welding operator performance qualifications (WPQ).
 2. Certified welding inspector (CWI) credentials.
 3. Testing agency personnel credentials.
 4. Welding inspector's reports.
 5. Shop inspection and quality control records when requested.
- C. As specified in Section 01330, submit certifications regarding all iron or steel products that all manufacturing processes occurred in the US.

1.5 QUALITY ASSURANCE**A. Qualifications:**

1. Welding Procedure Specifications: In accordance with AWS D1.1 (Annex E) or AWS B2.1 (App. A) or ASME BPVC SEC IX (Forms QW-482 and QW-483).
2. Welding Procedure Specifications: In accordance with AWS D1.1 (Annex E) or AWS B2.1 (App. A) or ASME BPVC SEC IX (Forms QW-482 and QW-483).
3. Welding Inspector: Certified in accordance with AWS QC 1, and having prior experience with the welding codes specified.
4. Testing Agency: Personnel performing tests shall be NDT Level II Certified in accordance with ASNT SNT-TC-1A.

1.6 SEQUENCING AND SCHEDULING

- A. Unless otherwise specified, Submittals required in this Section shall be submitted and approved prior to commencement of welding operations.

PART 2 PRODUCTS**2.1 AMERICAN IRON AND STEEL**

- A. All iron and steel products included in this section shall be manufactured in the US. Refer to Section 00800 for further description of the American Iron and Steel requirement.

2.2 SOURCE QUALITY CONTROL

- A. Welding fabrication, materials, and workmanship shall be subjected to inspection and testing during the fabrication process.
- B. Welding of parts shall be in accordance with the Standard Code for Arc and Gas Welding in Building Construction of the AWS and shall only be done where shown, specified, or permitted by the Engineer.
- C. Welding shall be done only by welders certified as to their ability to perform welding in accordance with the requirements of the AWS Code.

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- D. Component parts of built-up members to be welded shall be adequately supported and clamped or held by other adequate means to hold the parts in proper relation for welding.
- E. Notify the Owner's Project Representative prior to the start of any fabrication or other phases of the work to afford them reasonable opportunity to inspect work.
- F. A Certified Welding Inspector (CWI) shall be retained by the fabricator to visually inspect all fabrication welds in accordance with AWS D1.1, Section 6 and Table 6.1, Visual Acceptance Criteria.
- G. The CWI shall be present whenever shop welding is performed. The CWI shall perform inspection before, during, and after welding. CWI duties include:
 - 1. Verifying conformance of specified job material and proper storage.
 - 2. Monitoring conformance with approved WPS.
 - 3. Monitoring conformance of WPQ.
 - 4. Inspecting weld joint fit-up and in-process inspection.
 - 5. Providing 100 percent visual inspection of all welds.
 - 6. Supervising nondestructive testing personnel and evaluating test results.
 - 7. Maintaining records and preparing report confirming results of inspection and testing comply with the Work.
- H. Maintain inspection and quality control records of shop work.
- I. Acceptance of work at the shop shall not prevent its final rejection at the jobsite, even after erection, if it is found to be defective in any way.
- J. Nondestructive testing of fabrication welds will be conducted by an independent Testing Agency, retained by the Owner, in accordance with the criteria specified below and in conjunction with the testing required for field welding.

PART 3 EXECUTION**3.1 GENERAL**

- A. Welding and Fabrication by Welding:
 - 1. Conform to governing welding codes referenced in the attached Welding and Nondestructive Testing Requirements Data Sheet.
 - 2. Each welder working on the project, whether in the shop or in the field, shall be assigned an identification symbol or mark. Each welder shall mark or stamp his identification symbol at each weldment completed, whether in the shop or in the field.

3.2 WELDING ALUMINUM

- A. Where structural joints are required to be welded, details of joints, technique of welding employed, appearance and quality of welds made, and methods used in correcting defective work shall conform to AWS D1.2.

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- B. Welds shall be sound throughout and have no cracks or imperfections. The face of welds shall be dressed flush and smooth.
- C. Welded joints shall be rigid and continuously welded or spot welded as specified or shown. Exposed joints shall be close fitting and jointed where least conspicuous.
- D. Base metals shall be checked by Contractor to ensure absence of laminations or other defects.
- E. Groove and butt joint welds shall be full penetration welds, unless otherwise indicated.
- F. Shop Welding Process:
 - 1. Gas tungsten arc.
 - 2. Other process as approved by the Engineer.

3.3 FIELD QUALITY CONTROL

- A. Welding fabrication, materials, and workmanship shall be subjected to inspection and testing during the erection and installation process.
- B. Nondestructive testing of erection, installation and fabrication welds will be conducted by an independent Testing Agency, retained by the Owner, in accordance with the weld inspection criteria specified below.
- C. The Contractor shall facilitate inspection and testing by the Testing Agency. Furnish the Testing Agency, upon request, with the following:
 - 1. Complete sets of approved shop drawings and corrective work procedures at shop(s) and in the field.
 - 2. Cutting lists, order lists, material bills and shipping lists.
 - 3. Information as to time and place of all rollings and shipment of materials to the shop(s) and the field.
 - 4. Full and ample means and assistance for testing, including access to all field and shop welds required to be tested.

3.4 NONDESTRUCTIVE WELD TESTING REQUIREMENTS

- A. Weld Inspection Criteria:
 - 1. Selection of Welds to be Tested: As agreed upon between Engineer and Contractor.
 - 2. Unless otherwise specified, perform NDT of welds at a spot testing frequency as determined in the attached table in Data Sheet 05050 – A, in accordance with the referenced welding codes, as follows:
 - a. Butt Joint Welds: All butt welds to be provided shall be radiographically tested and repaired.
 - b. Groove Welds: All groove welds to be provided shall be ultrasonically tested and repaired.

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- c. Fillet Welds: A randomly sampled percentage of all fillet welds to be provided shall be examined and repaired, using either dye penetrant or magnetic particle inspection methods.
 - d. All Welds: 100 percent visually inspected.
3. Weld Acceptance:
- a. Visual Inspection (VT):
 - 1) Structural Tubing: AWS D1.1, paragraph 6.9, Visual Inspection, Tubular Connections;
 - 2) All Other Structural Steel: AWS D1.1, paragraph 6.9, Visual Inspection, Statically Loaded Nontubular Connections.
 - b. Ultrasonic Testing (UT): Perform UT of groove welds in accordance with AWS D1.1, paragraph 6.13.3, Class R Indications.
 - c. Radiographic Testing (RT): Perform RT of butt joint welds in accordance with AWS D1.1, paragraph 6.12.1.
 - d. Magnetic Particle (MT):
 - 1) Perform on fillet and partial penetration groove welds in accordance with AWS D1.1, paragraph 6.10.
 - 2) Acceptance shall be in accordance with VT standards specified above.
 - e. Liquid Penetrant (PT):
 - 1) Perform on fillet and partial penetration groove welds per AWS D1.1, paragraph 6.10.
 - 2) Acceptance shall be in accordance with VT standards specified above.

3.5 WELD DEFECT REPAIR

- A. Deficient welds shall be cut out to sound material and rewelded.
- B. Verify by retesting that rejected weld defects have been repaired and are acceptable in accordance with the appropriate welding codes.

3.6 SUPPLEMENTS

- A. The supplements listed below, following “END OF SECTION,” are a part of this Specification.
 - 1. DATA SHEET 05050 – A , Welding and Nondestructive Testing Requirements.

END OF SECTION

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DATA SHEET 05050-A

Welding and Nondestructive Testing Requirements

Specification Section	Governing Welding Codes or Standards	Submit Welding Procedure Spec.	Submit Welder/ Welding Operator Qual.	Onsite Welding Inspector Req'd	Submit Written Nondestructive Testing Procedure Specifications	Nondestructive Testing Requirements
05500 Metal Fabrications and Castings	AWS D1.1, Structural Welding Code-Steel or AWS D1.2, Structural Welding Code-Aluminum	Yes	Yes	Yes	Yes	100% VT ⁵ ; 100% UT ¹ or RT ² of all groove-and-butt joint welds; 10% MT ³ or PT ⁴ of all fillet welds; see Section 05500

¹UT-Ultrasonic Testing.

²RT-Radiographic Testing.

³MT-Magnetic Particle Testing.

⁴PT-Liquid Dye Penetrant Testing.

⁵VT-Visual Testing

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SECTION 05 50 00

MISCELLANEOUS METALS

1.1 SUMMARY

- A. Section Includes:
 - 1. Galvanized steel handrail
- B. Related Sections
 - 1. Section 05 05 00 – Welding.

1.2 REFERENCES

- A. The Commonwealth of Massachusetts State Building Code, Sixth Edition
- B. The Commonwealth of Massachusetts Architectural Access Board, 521 CMR
- C. American Iron and Steel Institute (AISI), Stainless Steel Types
 - 1. AISI Type 316 - Stainless Steel Bolts, Bars, Sheets and Shapes
 - 2. AISI Type 316L - Stainless Steel Bars, Shapes, Plates and Pipe
- D. American National Standards Institute (ANSI)
 - 1. A14.3, Safety Requirements for Fixed Ladders
- E. American Society for Testing and Materials (ASTM)
 - 1. A27, Standard Specification for Steel Casting, Carbon, for General Application
 - 2. A36, Standard Specification for Carbon Structural Steel
 - 3. A47, Standard Specification for Ferritic Malleable Iron Castings
 - 4. A48, Standard Specification for Gray Iron Castings
 - 5. A53, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
 - 6. A123, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
 - 7. A143, Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedures for Detecting Embrittlement
 - 8. A148, Standard Specification for Steel Castings, High Strength, for Structural Purposes
 - 9. A153, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
 - 10. A193, Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service

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11. A194, Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High-Pressure or High-Temperature Service
12. A240, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
13. A276, Standard Specification for Stainless Steel Bars and Shapes
14. A283, Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates
15. A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength
16. A325, Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
17. A384, Standard Practice for Safeguarding Against Warpage and Distortion During Hot-Dip Galvanizing of Steel Assemblies
18. A385, Standard Practice for Providing High-Quality Zinc Coatings (Hot-Dip)
19. A489, Standard Specification for Carbon Steel Lifting Eyes
20. A490, Standard Specification for Structural bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength
21. A500, Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
22. A501, Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing
23. A563, Standard Specification for Carbon and Alloy Steel Nuts
24. A568, Standard Specification for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for
25. A572, Standard Specification for High-Strength Low Alloy Columbium-Vanadium Structural Steel
26. A606, Standard Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance
27. A780, Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
28. A786, Standard Specification for Hot-Rolled Carbon, Low-Alloy, and Alloy Steel Floor Plates
29. A992, Standard Specification for Steel for Use in Buildings
30. F436, Standard Specification for Hardened Steel Washers
31. F593, Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs

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32. F594, Standard Specification for Stainless Steel Nuts
 33. F844, Standard Specification for Washers, Steel, Plain (Flat), Unhardened for General Use
 34. F959, Standard Specification for Compressible Washer-Type Direct Tension Indicators for Use with Structural Fasteners
 35. F1554, Standard Specification for Anchor Bolts, Steel, 36-, 55-, and 105-ksi Yield Strength
 36. F1852, Standard Specification for Twist Off Type Tension Control Structural Bolt/Nut/Washer Assemblies, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
- F. International Conference of Building Officials (ICBO): Evaluation Reports for Concrete and Masonry Anchors.
- G. Occupational Safety and Health Administration (OSHA):
1. 29 CFR 1910.27, Fixed Ladders.
- H. National Association of Architectural Metal Manufacturers (NAAMM):
1. ANSI MBG 531, Metal Bar Grating Manual.
 2. ANSI MBG 532, Heavy-Duty Metal Bar Grating Manual.
- I. Steel Structures Painting Council (SSPC)
- J. The Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities.

1.3 SUBMITTALS

- A. Product Data:
1. Concrete and Masonry Drilled Anchors:
 - a. Manufacturer's product descriptions.
 - b. Specific installation instructions, including drilled hole size, preparation, placement procedures, and instructions for safe handling of anchoring systems.
 2. Component Handrail Systems:
 - a. Manufacturer's product descriptions.
 - b. System installation and assembly instructions.
 3. Prime Paint.
 4. Fasteners (when requested by the Engineer).
 5. Railing Fittings.
 6. Galvanizing touch-up / repair materials.

- B. Shop Drawings:
 - 1. Detailed shop drawings, including erection drawings, for all metal fabrications, including welding and fastener information:
 - a. Submit for approval before fabrication.
 - b. Identify sizes of structural members, method of assembly, anchorage, and connection to other members.
 - 2. Setting drawings, templates, and directions for the installation of anchor bolts, or other items to be installed by others.
- C. Samples (when requested by the Engineer):
 - 1. Welded galvanized handrail post and rail assemblies, finished as specified.
- D. Quality Control Submittals:
 - 1. Connection Design Calculations: stamped by a licensed professional structural engineer, registered in the State where the work will be performed, properly coordinated with Shop Drawings.
 - 2. Concrete and Masonry Drilled Anchors:
 - a. Current test data or ICBO evaluation report.
 - b. Adhesive Anchor Installer Certification.
 - 3. Hot-Dip Galvanizing:
 - a. Certificate of compliance, signed by the galvanizer, referencing the specific project, with a description of the material processed and the ASTM standard used for coating.
 - b. Certificate shall verify the level of pre-galvanizing cleaning and the minimum coating thickness achieved.
 - 4. Welding: In accordance with the requirements of Section 05050.
 - 5. Provide Certificates of Compliance on other materials as requested by the Engineer.
- E. As specified in Section 01330, submit certifications regarding all iron or steel products that all manufacturing processes occurred in the US.

1.4 QUALITY ASSURANCE

- A. Shop Assembly: Pre-assemble items in shop to the greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- B. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

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- C. Qualifications for Welding Work: In accordance with the requirements of Section 05050.
- D. All handrails, etc. shall comply with OSHA, ADA, and The Commonwealth of Massachusetts State Building Code.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Handle and stack materials carefully to prevent deformation or damage.
- B. Store materials carefully on substantial timbers and blocking, so arranged that materials will be free from earth and properly drained, preventing any splattering with dirt or accumulation of water or snow in or about materials.
- C. Prevent accumulation of mud, dirt, or other foreign matter on materials. Any accumulation shall be completely removed prior to erection.
- D. Protect painted, hot-dip galvanized, and other finishes from damage due to metal banding and rough handling. Use padded slings and straps.
- E. Adhesive Anchor Systems:
 - 1. Store adhesive cartridges on pallets or shelving in covered storage area, in accordance with manufacturer’s written instructions.
 - 2. Cartridge Markings: Include manufacturer’s name, product name, material type, batch or serial number, and adhesive expiration date.
 - 3. Dispose of cartridges if shelf life has expired.

PART 2 PRODUCTS

2.1 AMERICAN IRON AND STEEL

- A. All iron and steel products included in this section shall be manufactured in the US. Refer to Section 00800 for further description of the American Iron and Steel requirement.

2.2 MATERIALS

- A. Unless otherwise indicated, meet the following requirements:

Item	ASTM Reference
Steel Shapes:	
W-Shapes	A992
M-, S-, and HP-Shapes	A36
Channels	A36
Angles	A36
Plates	A36
Steel Sheet	A570 or A611, Class 1.
Galvanized Structural Sheet Steel	A446, G90 coating thickness
Steel Pipe	A53, Grade B
Raised-Pattern Floor Plate	A786

Item	ASTM Reference
Hollow Structural Shapes	A500, Grade B
Stainless Steel:	
Bars and Angles	A276, AISI Type 316
Shapes	A276, AISI Type 304
Steel Plate, Sheet, and Strip	A240, AISI Type 316
Bolts, Threaded Rods, Anchor Bolts, and Anchor Studs	F593, AISI Type 316
Nuts	F594, AISI Type 316
Steel Bolts and Nuts:	
Carbon Steel	A307 bolts, with A563 nuts
High-Strength	A325, Type 1 bolts, with A563 nuts A153 for galvanized components
Anchor Bolts and Rods	F1554, Grade 55, with weldability supplement S1
Eyebolts	A489
Threaded Rods	A36
Flat Washers (Unhardened)	F844
Flat and Beveled Washers (Hardened)	F436
Thrust Ties for Steel Pipe:	
Threaded Rods	A193, Grade B7
Nuts	A194, Grade 2H
Plate	A283, Grade D
Cast Iron	A48, Class 35
Malleable Iron Castings	A47

2.3 MANUFACTURED UNITS

A. Concrete and Masonry Drilled Anchors

1. General: Materials shall be AISI Type 316 stainless, hot-dip galvanized, or zinc-plated steel, as shown in Data Sheet – 05 50 00 – A, FASTENER MATERIALS SCHEDULE, at end of this section.
2. Wedge Anchors:
 - a. Manufacturers and Products:
 - 1) ITW Ramset/Red Head, Wood Dale, IL; Trubolt Wedge Anchor.
 - 2) Hilti, Inc., Tulsa, OK; Kwik-Bolt II Stud Anchor.
 - 3) Powers Rawl, New Rochelle, NY; Power-Stud Anchor.

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- 4) Simpson Strong-Tie Co., Inc., Pleasanton, CA; Wedge-All Anchor.
 - 5) Wej-It Corp., Tulsa, OK; ANKRtite Wedge Anchor.
 - 6) U.S. Anchor, Pompano Beach, FL; Kingpin Wedge Anchor.
3. Expansion Anchors:
- a. Self-drilling anchors, snap-off or flush type, zinc-plated.
 - b. Nondrilling Anchors: Flush type for use with zinc-plated or stainless steel bolt, or stud type with projecting threaded stud.
 - c. Manufacturers and Products:
 - 1) ITW Ramset/Red Head, Wood Dale, IL; Multi-Set II Drop-In and Self Drill Anchor.
 - 2) Hilti, Inc., Tulsa, OK; Hilti HDI Drop-In Anchor.
 - 3) Powers Rawl, New Rochelle, NY; Steel Drop-In Anchor.
 - 4) Simpson Strong-Tie Co., Inc., Pleasanton, CA; Drop-In Anchor.
4. Sleeve Anchors:
- a. Manufacturers and Products:
 - 1) ITW Ramset/Red Head, Wood Dale, IL; Dynabolt Hex Nut Sleeve Anchor.
 - 2) Powers Rawl, New Rochelle, NY; Hex Head Power-Bolt Anchor.
 - 3) Simpson Strong-Tie Co., Inc., Pleasanton, CA; Sleeve-All Hex Head Anchor.
 - 4) Wej-It Corp., Tulsa, OK; Wej-It Sleeve Anchor.
5. Adhesive Anchors:
- a. Threaded Rod:
 - 1) ASTM F593 stainless steel threaded rod, diameter as shown on Drawings.
 - 2) Length as required, to provide minimum depth of embedment.
 - 3) Clean and free of grease, oil, or other deleterious material.
 - 4) For hollow-unit masonry, provide galvanized or stainless steel wire cloth screen tube to fit threaded rod.
 - b. Adhesive:
 - 1) Disposable, self-contained cartridge system capable of dispensing both components in the proper mixing ratio and fitting into a manually or pneumatically operated caulking gun.

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- 2) Two-component, designed to be used in adverse freeze/thaw environments, with gray color after mixing.
 - 3) Cure Temperature, Pot Life, and Workability: Compatible for intended use and environmental conditions.
 - 4) Nonsag, with selected viscosity base on installation temperature and overhead application where applicable.
- c. Manufacturers and Products:
- 1) ITW Ramset/Red Head, Wood Dale, IL; Epcon Ceramic 6 Epoxy or A7 Adhesive Anchor System. (Use only Epcon A7 Adhesive System for hollow masonry.)
 - 2) Hilti, Inc., Tulsa, OK; HIT Injection Adhesive System, HIT HY 200 (HIT HY 70 for hollow masonry).
 - 3) Powers Rawl, New Rochelle, NY; Power Fast Epoxy Injection Gel Cartridge System.
 - 4) Simpson Strong-Tie Co., Inc., Pleasanton, CA; Epoxy-Tie Adhesive ET.
 - 5) Covert Operations, Inc., Long Beach, CA; CIA-Gel 7000 Epoxy Anchors.
 - 6) Unitex, Kansas City, MO; Pro-Poxy 300 and Pro-Poxy 300 Fast Epoxy Adhesive Anchors.
6. Adhesive Threaded Inserts:
- a. Stainless steel, internally threaded insert.
 - b. Manufacturer and Product: Hilti, Inc., Tulsa, OK; HIS-R Insert with HIT HY 200 adhesive.
- B. Fasteners:
1. Use stainless steel, hot-dip galvanized steel, zinc-plated steel, and aluminum material types as indicated in Data Sheet – 05500 – A, FASTENER MATERIALS SCHEDULE, at the end of this section.
 2. Bolts, Nuts and Washers: ASTM A325, galvanized to ASTM A153 for galvanized members.
 3. Anchor Bolts: ASTM F1554, Grade 36
 4. High-Strength Bolts: ASTM A325 or ASTM A490, Type 1, plain uncoated. Bolt length and thread length shall be as required for the connection type shown, with hardened washers as required.
- C. Galvanized Steel Pipe Railings
1. Steel pipe railings and handrails shall be fabricated in accordance with the dimensions and details shown on the drawings and as specified herein.

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2. Provide railings and handrails members constructed from 1½ inch diameter schedule 40 or schedule 80 steel pipe as shown on the plans, but not less than that required to support design loading.
3. Interconnect railing and handrail members by butt-welding or welding with internal connectors, at fabricator's option, unless otherwise indicated.
 - a. Provide coped joints at tee and cross intersections.
 - b. Form bends by use of prefabricated elbow fittings and radius bends or by bending pipe, at fabricator's options.
4. Form simple and compound curves by bending pipe in jigs to produce a uniform curvature for each repetitive configuration required; maintain cylindrical cross-section of pipe throughout the entire bend without buckling, twisting or otherwise deforming exposed surfaces of pipe.
5. Provide wall returns at ends of wall-mounted handrails except where otherwise indicated.
6. Close exposed ends of pipe by welding 3/16 inch thick steel plate in place or by use of prefabricated fittings.
7. Provide wall brackets with not less than 1½ inches of clearance between the inside face of the handrail and the finished wall surface. Locate brackets as indicated or, if not indicated, at the spacing required for design loading. Secure wall brackets and wall return fittings to building construction as follows:
 - a. Use the type of bracket with pre-drilled hole(s) for exposed bolt anchorage.
 - b. For concrete and solid masonry anchorage, use drilled-in expansion shield and either concealed hanger bolt or exposed lag bolt, as applicable.
 - c. For hollow masonry and gypsum wallboard anchorage, use toggle bolts having square heads.
8. Brackets, Flanges, Fittings and Anchors – Provide end closures, flanges, miscellaneous fittings and anchors for interconnections of pipe and attachment of railings and handrails to other work. Furnish inserts and other anchorage devices for connecting railings and handrails to concrete or masonry work.
9. Hot-dip galvanize all handrails after fabrication and welding, in accordance with ASTM A123 as specified hereinafter.
10. Provide sleeves of galvanized steel pipe, not less than 6 inches long and with an inside diameter not less than ½ inch greater than the outside diameter of pipe, for railing posts set in concrete. Provide steel plate closure welded to bottom of sleeve and of width and length not less than 1 inch greater than outside diameter of sleeve. Provide friction fit, removable covers designed to keep sleeves clean and hold top edge of sleeve ½ inch below finished surface of concrete.

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11. All rails on landings shall be offset as required at door openings and shall be either post supported from the landing or wall supported at the sides of the doorjamb.

2.4 ACCESSORIES

- A. Welding Materials: In accordance with the requirements of Section 05050.
- B. Electrolysis Isolators: All dissimilar metals shall be isolated over their full length with 1/8 inch thick neoprene unless otherwise noted.

2.5 SHOP FABRICATION**A. General**

1. All dimensions shall be verified at the site before fabrication is started.
2. Galvanized items shall be shop fabricated and completely welded prior to galvanizing.
3. Fit and shop assemble items in largest practical sections, for delivery to site.
4. Fabricate items with joints tightly fitted and secured.
5. Welding shall be in accordance with the requirements of Section 05050.
6. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
7. Exposed Mechanical Fastenings: Flush countersunk screws or bolts, unobtrusively located, consistent with the design of the component, except where specifically noted otherwise.
8. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
9. Miscellaneous metals work shall be formed true to detail, with clean, straight, sharply defined profiles and smooth surfaces of uniform color and texture and free from defects impairing strength or durability.
10. Metal Surfaces: For fabrication of miscellaneous metal work that will be exposed to view, use only materials that are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness.
11. Connections and accessories shall be of sufficient strength to safely withstand stresses and strains to which they will be subjected. Accessories and connections to steel or cast iron shall be steel, unless otherwise specified. Threaded connections shall be made so that the threads are concealed by fittings.
12. Castings shall be of good quality, strong, tough, even-grained, smooth, free from scale, lumps, blisters, sand holes, and defects of any kind which render them unfit for the service for which they are intended. Castings shall be

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thoroughly cleaned and will be subjected to a hammer inspection in the field by the Engineer. Finished surfaces shown on the Drawings and/or specified shall be machined to a true plane surface and shall be true and seat at all points without rocking. Allowances shall be made in the patterns so that the thickness specified or shown shall not be reduced in obtaining finished surfaces. Castings will not be acceptable if the actual weight is less than 95% of the theoretical weight computed from the dimensions shown.

13. No splicing of any member or part of the work will be allowed where full-length members are commercially available.
14. Screws, bolts, studs and other connecting devices required in the work shall be concealed wherever possible. On all finish work where fasteners must be exposed to view, they shall be countersunk and finished flush with the exposed surfaces. All screws, bolts and other fastening devices used for exterior work shall be aluminum, bronze or stainless steel, whichever is appropriate for the work in which it is to be used.

B. Fabrication Tolerances:

1. Squareness: 1/8 inch maximum difference in diagonal measurements.
2. Maximum Offset Between Faces: 1/16 inch.
3. Maximum Misalignment of Adjacent Members: 1/16 inch.
4. Maximum Bow: 1/8 inch in 48 inches.
5. Maximum Deviation From Plane: 1/16 inch in 48 inches.

2.6 FINISHES

A. Hot Dip Galvanizing

1. Material for galvanizing shall be geometrically suitable as specified in ASTM A384 and A385.
2. To be chemically suitable for galvanizing, steel should contain carbon below 0.25%, phosphorous below 0.5%; and manganese below 1.35%. Contact galvanizer if steel does not comply to determine suitability for processing.
3. To safeguard against warpage or distortion of steel members, in conformance with ASTM A384, miscellaneous metals fabricator shall submit shop drawings of non-standard fabrications, all tubular fabrications, all fabrications involving any dimension that exceeds the size of the galvanizer's kettle, and any fabrication involving materials of different thickness. These drawings shall be submitted to the galvanizer prior to fabrication to determine the suitability of the material for galvanizing.
4. All ferrous metals specified herein or indicated on the drawings as galvanized shall be hot-dipped galvanized after fabrication in compliance with ASTM A123 as modified to include 0.5% nickel, A143, A153, A384, or A385 as applicable. Galvanizing bath shall include zinc, nickel, and other state of the art alloys designed to ensure homogeneous metallurgical growth and greater corrosion resistance.

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5. All galvanized materials must be inspected for compliance with these specifications and marked with a stamp indicating the name of the galvanizer, the ASTM number, and the weight of the zinc coating in ounces per square foot. Coating shall be not less than 2.3 oz. per square foot of surface. After galvanizing, steel to be painted shall be dipped in a 0.2% chromic acid solution.
6. Within 12 hours of galvanizing, a factory prime coating shall be applied to all galvanized steel that is to be painted. Prime paint shall conform to the requirements and be of the same manufacturer as that provided under Section 09900. Finish painting is included under the Work of Section 09900.
7. To minimize distortion, material less than thirty feet in length shall be preheated in a suitable chamber maintaining a constant heat of no less than 200°F immediately prior to immersion into the molten zinc.
8. To minimize surface imperfections (e.g., flux inclusions) material to be galvanized shall be dipped into a solution of Zinc Ammonium Chloride prior to galvanizing. The type of galvanizing kettle utilizing a flux blanket overlaying the molten zinc shall not be permitted.

2.7 SOURCE QUALITY CONTROL

- A. Miscellaneous Metals fabrications, materials, and workmanship shall be subjected to inspection and testing in mill, shop and/or field by the Engineer.
- B. Inspection and testing of shop welding shall be in accordance with the requirements of Section 05 05 00. Repair and retest defective welds as specified in Section 05 05 00.
- C. Maintain inspection and quality control records of shop and field work.
- D. The Contractor shall maintain records of each impact wrench used in the shop, showing dates, sizes of bolts tested and the corresponding torque values. Certified copies of the records shall be made available to the Engineer, upon request.
- E. Notify the Engineer prior to start of any fabrication, the start of sandblasting and painting, or other phases of work so as to afford them reasonable opportunity to inspect work.
- F. Furnish the Engineer upon request, with the following:
 1. Complete sets of approved Shop Drawings and corrective work procedures at fabricating shop(s) and in field.
 2. Cutting lists, order lists, material bills, and shipping lists.
 3. Information as to time and place of all rollings and shipments of material to shops and field.
 4. Representative sample pieces requested for testing.
 5. Full and ample means and assistance for testing materials, and proper facilities for inspection of work, in mill, shop and field.
- G. Do not remove any marks or tags identifying rejected work.

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- H. Any work found deficient shall be corrected or replaced in accordance with these specifications. Deficient welds shall be cut out to sound material and re-welded. Deficient assemblies shall be taken apart, corrected and reassembled, using new materials as required. ASTM A490 bolts shall not be reused. ASTM A325 bolts may be retightened once only.
- I. Miscellaneous Metals work that has been rejected by the Engineer in the mill or shop shall be corrected without delay and at no expense to the Owner.

PART 3 EXECUTION**3.1 EXAMINATION**

- A. Verify that field conditions are acceptable and are ready to receive work.
- B. Verify that anchor bolts, bearing plates, and other items furnished to be installed by others have been installed correctly.

3.2 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. All steel and aluminum surfaces to come in contact with exposed concrete or masonry shall receive a protective coating of an approved heavy bitumastic troweling applied in accordance with manufacturer's instructions prior to installation.

3.3 FIELD FABRICATION

- A. No fabricated section shall be cut in the field without the permission of the Engineer.
- B. All miscellaneous metals work shall be formed true to detail, with clean, straight, sharply defined profiles and smooth surfaces of uniform color and texture and free from defects impairing strength or durability.
- C. Connections and accessories shall be of sufficient strength to safely withstand stresses and strains to which they will be subjected. Accessories and connections to steel or cast iron shall be steel, unless otherwise specified. Threaded connections shall be made so that the threads are concealed by fittings.
- D. No splicing of any member or part of the work will be allowed where full-length members are commercially available. Jointing shall meet the approval of the Engineer.
- E. Screws, bolts, studs and other connecting devices required in the work shall be concealed wherever possible. On finish work where fasteners must be exposed to view, they shall be countersunk and finished flush with the exposed surfaces. Screws, bolts and other fastening devices used for exterior work shall be aluminum, bronze or stainless steel, whichever is appropriate for the work in which it is to be used.

3.4 INSTALLATION

- A. Install all items furnished except items to be imbedded in concrete or masonry. Items to be attached to concrete or masonry after such work is completed shall be installed in accordance with the details shown. Fastening to wood plugs in masonry will not be permitted.

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- B. Where aluminum contacts wood, apply two coats of aluminum metal and masonry paint to the wood.
- C. Railings and Handrails:
 - 1. Adjust railings prior to anchoring to ensure matching alignment at abutting joints. Plumb posts in each direction.
 - 2. Secure handrails to wall with wall brackets and end fittings.
 - 3. Expansion Joints - Provide expansion joints at the locations indicated, or if not indicated, at intervals not to exceed 40 feet. Provide a slip joint with an internal sleeve extending 2 inches beyond the joint on either side; fasten the internal sleeve securely to one side; locate joints within 6 inches of posts.
- D. Make no openings without the specific written approval of the Engineer. All re-entrant corners shall be shaped notch-free to a radius of at least 1/2 inch at blocks, copes, cuts and openings.
- E. Openings in structural steel shall be cut and/or reinforced only by the structural steel Contractor, and only with the specific prior written approval of the Engineer.

3.5 ANCHOR BOLTS

- A. Accurately locate and hold anchor bolts in place with templates at the time concrete is placed.
- B. Use sleeves for location adjustment and provide two nuts and one washer per bolt of same material as bolt.

3.6 CONCRETE AND MASONRY DRILLED ANCHORS

- A. Begin installation only after concrete or masonry to receive anchors has attained design strength.
- B. Install in accordance with manufacturer's instructions.
- C. Provide minimum embedment, edge distance, and spacing as follows, unless indicated otherwise by anchor manufacturer's instructions or shown otherwise on Drawings:

Anchor Type	Min. Embedment (bolt diameters)	Min. Edge Distance (bolt diameters)	Min. Spacing (bolt diameters)
Wedge	9	6	12
Expansion and Sleeve	4	6	12
Undercut	9	12	16
Adhesive	9	9	13.5

- D. Use only drill type, bit type, and diameter recommended by anchor manufacturer. Clean hole of debris and dust with brush and compressed air.
- E. For undercut anchors, use special undercutting drill bit and rotary hammer drill and apply final torque as recommended by anchor manufacturer.

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- F. When embedded steel or rebar is encountered in the drill path, slant drill to clear obstruction. If drill must be slanted more than 10 degrees to clear obstruction, notify Engineer for direction on how to proceed.
- G. Adhesive Anchors:
 - 1. Do not install adhesive anchors when temperature of concrete is below 40 degrees F or above 100 degrees F.
 - 2. Remove any standing water from hole with oil-free compressed air. Inside surface of hole shall be dry where required by manufacturer's instructions.
 - 3. Do not disturb anchor during recommended curing time.
 - 4. Do not exceed maximum torque as specified in manufacturer's instructions.

3.7 FIELD QUALITY CONTROL

- A. The fact that Miscellaneous Metals work has been accepted at the shop shall not prevent its final rejection at the job site, even after it has been erected, if it is found to be defective in any way.
- B. Miscellaneous Metals erection, materials, and workmanship shall be subjected to inspection and testing in mill, shop and/or field by the Engineer.
- C. Inspection and testing of field welding shall be in accordance with the requirements of Section 05050.
- D. Maintain inspection and quality control records of shop and field work.
- E. Notify the Engineer prior to start of any miscellaneous metals erection, or other phases of work so as to afford them reasonable opportunity to inspect work.
- F. Furnish the Engineer upon request, with the following:
 - 1. Complete sets of approved Shop Drawings and corrective work procedures at fabricating shop(s) and in field.
 - 2. Full and ample means and assistance for testing materials, and proper facilities for inspection of work, in mill, shop and field.
- G. Do not remove any marks or tags identifying rejected work.
- H. Any work found deficient shall be corrected or replaced in accordance with these specifications, without delay and at no expense to the Owner.

3.8 ADJUST AND CLEAN

- A. Touch-Up Painting - Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as approved for use for shop painting.
- B. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- C. For galvanized surfaces, clean field welds, bolted connections and abraded areas and touch-up all damage using suitable touch up material complying with ASTM A780.

3.9 FASTENERS

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- A. Anti-seizing Lubricant: Use on all stainless steel threads.
- B. Do not use adhesive anchors to support fire-resistive construction or where ambient temperature will exceed 120 degrees F.
- C. Provide fasteners in accordance with Data Sheet – 05 50 00 – A, following this section, unless otherwise noted on the drawings.

DATA SHEET 05500-A
Fastener Materials Schedule

Service Use and Location	Product	Remarks
Drilled Anchors for Metal Components to Concrete (Ladders, Handrail Posts, Electrical Panels, and other Equipment)		
Exterior and Interior Wet and Dry Areas	Hot-dip galvanized steel or stainless steel sleeve, wedge, or expansion anchors, or stainless steel adhesive anchors	Use zinc-plated undercut anchors for overhead and ceiling installations.
Submerged or Corrosive Areas	Stainless steel adhesive anchors	
Connections for Steel Fabrications and Wood Components		
All Areas	Stainless steel bolts	

END OF SECTION

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SECTION 05 51 00 – METAL STAIRS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies Aluminum stairs with railings.
- B. Types:
 - 1. Open riser stairs with treads and platforms for residential beach access stairs and public access ways.

1.2 RELATED WORK

- A. Section 05 50 00 – Miscellaneous Metals

1.3 SUBMITTALS

- A. Shop Drawings: Show design, fabrication details, installation, connections, material, and size of members.
- B. Shop drawings shall be submitted for each stair on site, including the Public Access Stairs and Residential Stairs. The following shall be included, but is not limited to:
 - 1. Public Access Stairs
 - a. Stairway Framing Plan
 - b. Stairway Profile and Cross Sections
 - c. Foundation connection details including, but not limited to
 - Stringer to concrete abutment
 - Stringer to concrete pile cap
 - Stringer to concrete landing
 - d. Guardrail, railing, handrail connection details
 - 2. Residential Access Stairs
 - a. Stairway Framing Plans for each structure (permanent and seasonably removable sections)
 - b. Stairway Profiles and Cross Sections
 - c. Landing Platform Bracing Details
 - d. Foundation connection details including, but not limited to
 - Support column to helical pile
 - Stringer to helical pile
 - e. Connection point details for seasonably removable stair sections
 - f. Pick point details for seasonably removable sections
 - The submittal shall clearly identify to the Contractor and Owner acceptable pick locations to prevent damage during installation and removal.
 - g. Guardrail, railing, handrail connection details
- C. Design Calculations
 - 1. Provide design calculations stamped by a licensed Professional Engineer in the Commonwealth of Massachusetts. Design calculations shall be provided for each unique staircase.

- D. Fabrication qualifications.
 - 1. Installer qualifications.
 - 2. Calculations.
- E. Welding qualifications.

1.4 QUALITY ASSURANCE

- A. Fabricator: A firm with a minimum of three (3) years' experience in type of work required by this section. Submit fabricator qualifications.
- B. Installer: A firm with a minimum of three (3) years' experience in type of work required by this section. Submit installer qualifications.
- C. Calculations: Provide professionally prepared calculations and certification of performance of this work, signed and sealed by a Professional Engineer registered in the state where the work is located. Perform structural design of the stair including supports for the metal stair frame. Indicate how Design Criteria as specified have been incorporated into the design.
- D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M and AWS D1.3/D1.3M.

1.5 APPLICATION PUBLICATIONS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by basic designation.
- B. American Society of Mechanical Engineers (ASME)
 - 1. B18.2.1-12: Square, Hex, Heavy Hex, and Askew Head Bolts and Hex, Heavy Hex, Hex Flange, Lobed Head, and Lag Screws (Inch Series)
 - 2. B18.2.3.8M-81(R2005): Metric Heavy Lag Screws
 - 3. B18.6.1-81(R2008): Wood Screws (Inch Series)
 - 4. B18.6.3-13: Machine Screws, Tapping Screws, and Metallic Drive Screws (Inch Series)
 - 5. B18.6.5M-10: Metric Thread Forming and Thread Cutting Tapping Screws
 - 6. B18.6.7M-10: Metric Machine Screws
 - 7. B18.22M-81(R2010): Metric Plain Washers
 - 8. B18.21.1-09: Washers: Helical Spring-Lock, Tooth Lock, and Plain Washer (Inch Series)
- C. ASTM International (ASTM)
 - 1. B209: Aluminum and Aluminum-Alloy Sheet and Plate
 - 2. B210: Aluminum and Aluminum-Alloy Drawn Seamless Tubes
 - 3. B211: Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod and Wire
 - 4. B221: Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes
 - 5. B241: Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube
 - 6. B247: Aluminum and Aluminum-Alloy Die Forgings, Hand Forging and Rolled Ring Forgings

7. B308: Aluminum-Alloy 6061-T6 Standard Structural Profiles
8. B429: Aluminum-Alloy Extruded Structural Pipe and Tube
9. B632: Tread Plate
- D. American Welding Society (AWS):
 1. D1.2: Structural Welding Code-Aluminum
- E. The National Association of Architectural Metal Manufactures (NAAMM) Manuals:
 1. MBG 531-17: Metal Bar Gratings
 2. AMP521-01(R2012): Pipe Railing Manual, Including Round Tube
- F. Massachusetts Standard Construction Specifications:
 1. Section M8.00.0: General
 2. Section M8.10.1: Aluminum Pipe Rail or Fence
- G. National Fire Protection Association (NFPA):
 1. 101-18: Life Safety Code
- H. Society for Protective Coatings (SSPC):
 1. Paint 25(1997; E 2004): Zinc Oxide, Alkyd, Linseed Oil Primer for Use Over Hand Cleaned Steel, Type I and Type II

PART 2 - PRODUCTS

2.1 DESIGN CRITERIA

- A. Design all stairs to support live load of 100 pound force/square feet and a concentrated load of 300 pound force applied on an area of 4 square inch.
 1. Uniform and concentrated loads need not be assumed to act concurrently.
 2. Provide stair framing capable of withstanding stresses resulting from railing loads in addition to the loads specified above. Limit deflection of treads, platforms, and framing members to L/360 or 1/4 inch, whichever is less.
- B. Design handrails, top rails of guards, and posts to support uniform load of 50 pound force/feet applied in any direction and a concentrated load of 200 pound force applied in any direction. Uniform and concentrated loads need not be assumed to act concurrently.
- C. Infill of guards to support concentrated load of 50 pound force applied horizontally on an area of one square foot.
- D. All residential staircases shall be designed in accordance the latest edition of the International Residential Code and as amended by the Massachusetts State Building Code.
- E. The Public Access Staircase shall be designed in accordance with the latest edition of the Internation Building Code and as amended by the Massachusetts State Building Code.

2.2 MATERIALS

- A. Unless otherwise indicated, all aluminum assemblies shall be fabricated from aluminum Alloy 6061-T6.

2.3 CONNECTION HARDWARE

- A. All bolts, hex cap screws and studs shall be stainless steel ASTM F593, Alloy Group 2 (Alloy 316), Condition CW.
- B. All nuts and washers shall be stainless steel ASTM F594, Alloy Group 2 (Alloy 316), Condition CW.
- C. All nuts shall be self-locking or provide double nuts on each bolt.
- D. All dissimilar metals shall be separated by plastic separation sheets or bushings not less than 1/16 inch thick. The separation sheets shall be Nylatron-GS, plastic sheet conforming to Military Specification MIL-P-15035 or other suitable material for precluding galvanic corrosion.
- E. Aluminum Planking: McNichols Diamondback, Diamond-Vented & Solid Planking or similar approved alternate

2.4 FABRICATION GENERAL

- A. Fasteners:
 - 1. Conceal bolts and screws wherever possible.
 - 2. Use countersunk heads on exposed bolts and screws with ends of bolts and screws dressed flush after nuts are set.
- B. Welding:
 - 1. All aluminum, AWS D1.2.
 - 2. Where possible, locate welds on unexposed side.
 - 3. Grind exposed welds smooth and true to contour of welded member.
 - 4. Remove welding splatter.
- C. Remove sharp edges and burrs.
- D. Fit stringers to head channel and close ends with steel plates welded in place where shown.
- E. Fit face stringer to newel post by tenoning into newel post, or by notching and fitting face stringer to side of newel where shown.
- F. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 0.8 mm (1/32 inch), and bend metal corners to the smallest radius possible without causing grain separation or otherwise impairing the work.
- G. Continuously weld corners and seams in accordance with the recommendations of AWS D1.2. Grind smooth exposed welds and flush to match and blend with adjoining surfaces.
- H. Form exposed connections with hairline joints that are flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of the type indicated or, if not indicated, use Phillips flathead (countersunk) screws or bolts.
- I. Provide and coordinate anchorage of the type indicated with the supporting structure. Fabricate anchoring devices, space as indicated and required to provide adequate support for the intended use of the work.

2.5 ALUMINUM STAIRS AND PLATFORMS

- A. General
 - 1. Miter and weld and grind smooth internal and external corners of welded framing connections or assemblies.
 - 2. Countersink bolt heads and screw of assembly hardware on finished surfaces or cut off flush with such surfaces.
 - 3. Properly fit and securely fasten together all parts making exposed joints close fitting. Cut, drill, punch, and tap as required for installation.
 - 4. Make joints as strong and rigid as adjoining sections. Weld continuously along entire line of contact except where spot welding is indicated.
- B. Stair Framing:
 - 1. Fabricate stringers of aluminum channels. Extend stringers to frame perimeter of intermediate platforms.
 - 2. The minimum flange width for stringers shall be 3 inches where required to allow for handrail posts to attach to stringer.

2.6 RAILINGS

- A. Fabricate railings, including handrails and brackets, from extruded aluminum sections.
 - 1. Connections may be standard fittings designed for welding, or coped, or mitered pipe with full welds.
 - 2. Wall handrails are provided under Section 05 50 00 - Metal Fabrications.
- B. Return ends of handrail to wall and close free end.
- C. Space intermediate posts not over 4 feet on center between end post.
- D. Provide standard terminal fittings at ends of post and rails.
- E. Aluminum railing systems required in the work shall be constructed of 1½ inch diameter aluminum pipe designation 6063-T6. Aluminum rail posts and top rails shall be constructed of schedule 80 pipe designation 6063-T6. All railing posts shall be filled with a 1½ inch round aluminum rod designation 6061-T6. Aluminum railing mid-rails shall be constructed of schedule 40 pipe designation 6063-T6.
- F. Interconnect railing and handrail members by butt-welding or welding with internal connectors, at fabricator's option, unless otherwise indicated.
 - 1. Provide coped joints at tee and cross intersections.
 - 2. Form bends by use of prefabricated elbow fittings and radius bends or by bending pipe, at fabricator's options.
- G. Form simple and compound curves by bending pipe in jigs to produce a uniform curvature for each repetitive configuration required; maintain cylindrical cross-section of pipe throughout the entire bend without buckling, twisting or otherwise deforming exposed surfaces of pipe.
- H. Railings shall be mounted utilizing side or bottom mount aluminum brackets. Posts shall be mechanically fastened to mounting brackets; welded posts to brackets will not be permitted. Brackets shall be isolated from steel utilizing ¼ inch thick full bearing neoprene isolations. The maximum spacing of aluminum pipe rail posts shall be 4 feet on center.
- I. Provide wall returns at ends of wall-mounted handrails. Close exposed ends of pipe with welded ¼ inch plate, or by use of a prefabricated fitting.

2.7 OPEN RISER STAIRS

- A. Provide treads, platforms, railings, stringers, headers, and other supporting members.
- B. Fabricate stringers, headers, and other supporting members from structural aluminum.
- C. Landing Platform and stair treads shall be comprised of McNichols Diamondback, Diamond-Vented & Solid Planking or similar approved alternate.

PART 3 - EXECUTION

3.1 COORDINATION

- A. Contractor shall coordinate the design and installation of the foundation structure (helical piles and/or concrete pile caps) with the Stairway designer and installer including all necessary installation tolerances for both systems.

3.2 STAIR INSTALLATION

- A. Provide columns, hangers, and struts required to support the loads imposed.
- B. Perform job site welding and bolting as specified for shop fabrication.
- C. Set stairs and other members in position and secure to structure as shown.
- D. Install stairs plumb, level and true to line.
- E. Provide aluminum closure plate to fill gap between the stringer and surrounding wall.

3.3 RAILING INSTALLATION

- A. Install standard terminal fittings at ends of posts and rails.
- B. Secure brackets, posts, and rails to aluminum by welds, and to masonry or concrete with expansion sleeves and bolts, except secure posts at concrete by setting in sleeves filled with commercial non-shrink grout.
- C. Set rails horizontal or parallel to rake of stairs to within 1/8-inch in 12 feet.
- D. Set posts plumb and aligned to within 1/8 inch in 12 feet.

END OF SECTION

SECTION 06130

HEAVY TIMBER CONSTRUCTION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Timber framing for the Beach Access Ramp
- B. Related Sections
 - 1. Section 05550 – Miscellaneous Metals.
 - 2. Section 02317 – Round Timber Piles

1.2 REFERENCES

- A. Except as noted, all work shall conform to the latest editions of the following codes specifications and standards:
 - 1. Building Code of State of Massachusetts
 - 2. Massachusetts Accessibility Code
 - 3. Southern Pine Inspection Bureau (SPIB)
 - 4. West Coast Lumber Inspection Bureau (WCLIB)
 - 5. Western Wood Products Association (WWPA)
 - 6. National Forest Products Association (NFPA)
 - 7. American Society for Testing and Materials (ASTM)
 - 8. American Institute of Timber Construction (AITC)

1.3 SUBMITTALS

- A. Certification of timber species.
- B. Certification of timber treatment.
- C. Shop Drawings:
 - 1. Detailed shop drawings, including erection drawings, for all timber framing and railing systems, and fastener information:
 - a. Identify sizes of structural members, method of assembly, anchorage, and connection to other members.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Handle and stack materials carefully to prevent deformation or damage.

- B. Store materials carefully on substantial timbers and blocking, so arranged that materials will be free from earth and properly drained, preventing any splattering with dirt or accumulation of water or snow in or about materials.
- C. Timber shall be handled in an approved manner such that the material will not be damaged.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Unless otherwise indicated, meet the following requirements:
 - 1. All timber to be used shall be No. 2 Southern Pine as graded by SPIB and with design values per NFPA National Design Specification or the equivalent for Douglas Fir as graded by WCLIB and WWPA.
 - 2. All timber top rails shall be tropical hardwood Ipe.
 - 3. All timber shall be new and supplied with nominal dimensions unless otherwise noted.
 - 4. All timber members shall be treated with alkaline copper quaternary (ACQ) in accordance with AWPA Standards for material subject to salt water use and shall obtain a green tint due to the treatment.
 - 5. All timber fasteners shall meet ASTM A-307 and shall be hot-dipped galvanized in accordance with ASTM A-123 and A-153.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Prior to installation, all demolition affecting the new work shall be complete.
- B. Verify that field conditions are acceptable and are ready to receive work.

3.2 TIMBER TREATMENT

- A. All timber to be treated with alkaline copper quaternary (ACQ) shall be treated to a retention of 0.6 pounds per cubic foot.
- B. Sealing compound for treatment of field cuts and drilled holes shall be two (2) coats of copper naphthenate meeting AWPA standard P8.

3.3 INSTALLATION

- A. Joints are to be square, tight and well-fastened with all members assembled in accordance with the Drawings.
- B. Holes for bolts shall be drilled the same diameter as the bolt prior to galvanizing. Holes shall be treated prior to bolt installation.

- C. Bolts shall be tightened to provide a rigid connection. No more than one (1) washer shall be installed under the bolt head or nut. Bolt threads shall project no less than two (2) bolt threads and no more than one (1) bolt diameter beyond the nut.
- D. All timber shall be cut and fit in such a manner as to have full bearing over the entire contact surface.
- E. All cut faces of timber shall be treated prior to installation.

END OF SECTION

SECTION 10 14 00 – SIGNAGE

PART 1 – GENERAL

1.1 SCOPE OF WORK

- A. The work of this Section consists of all site improvements and related items as indicated on the Drawings and/or as specified herein and includes, but is not limited to, the following:
 - 1. Any relevant signage required by the Town for the Walkway.

1.2 RELATED DOCUMENTS AND SECTIONS

- A. The following items of related work are specified and included in other Sections of the Specifications:
 - 1. Division 3 Section 03 30 00 - Cast-In-Place Concrete.
 - 2. Division 3 Section 03 30 00 - Precast Structural Post-Tensioned Concrete.
 - 3. Division 5 Section 05 51 00 - Metal Stairs.
 - 4. Division 32 Section 32 17 23 - Pavement Markings.
- B. Examine all Drawings and other Sections of the Specifications for requirements therein affecting the work of this trade.

1.3 REFERENCES

- A. NAVY G 88-0-4 (C90300) - Alloy Specification for Tin Bronze.
- B. MassDOT Standard Specifications:
 - 1. Standard Specifications for Highways and Bridges, 2023, published by the Massachusetts Department of Transportation.

1.4 EXAMINATION OF CONDITIONS

- A. The Contractor shall fully inform himself of existing conditions of the site before submitting his bid and shall be fully responsible for carrying out all site work required to fully and properly execute the work of the Contract, regardless of the conditions encountered in the actual work. No claim for extra compensation or extension of time will be allowed on account of actual conditions inconsistent with those assumed.
- B. Plans, surveys, measurements, and dimensions under which the work is to be performed are believed to be correct to the best of the Landscape Architect's knowledge, but the Contractor shall have examined them for himself during the bidding period, as no allowance will be made for any errors or inaccuracies that may be found therein.

1.5 SCHEDULING

- A. Comply with Division 1 requirements.
- B. The Contractor shall submit to the Landscape Architect, for approval by the Owner, a progress schedule for all work as specified herein in accordance with General Conditions.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer to have a minimum of 10 years-experience in manufacturing letters.
- B. Installer Qualifications: Minimum 2 years experience installing similar products.

1.7 SUBMITTALS

- A. General: Refer to and comply with Division 1 Section 01 33 00 – SUBMITTAL PROCEDURES for procedures and additional submittal criteria.
- B. Statement of Qualifications: Submit to identify and exhibit stone installer qualifications as specified in Article “Quality Assurance” herein. Submittal shall be in addition to and as confirmation of requested information submitted with Bid Proposal.
- C. Product Data: Manufacturer's illustrated product literature and specifications to be used, including:
 - 1. Available Materials, Colors, Fonts, Mounting Options.
 - a. Include two complete sets of color chips, if available.
 - 2. Preparation instructions and recommendations.
 - 3. Storage and handling requirements and recommendations.
 - 4. Installation methods.
- D. Shop Drawings:
 - 1. Submit detailed drawings of products, installation, and artwork for all signs.
- E. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship. Finish areas designated by Architect. Do not proceed with remaining work until workmanship is approved by Architect. Rework mock-up area as required to produce acceptable work.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.
- B. Handle materials to avoid damage.

1.9 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.10 SEQUENCING

- A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.11 WARRANTY

- A. Manufacturer's Warranty: Provide manufacturer's standard warranty against defects in materials and workmanship. Letters shall be guaranteed for the life of the business against defects.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Requests for substitutions will be considered in accordance with provisions of Division 1 Section 01 60 00 – PRODUCT REQUIREMENTS.
- B. Signage: As provided by owner.
- C. Design: As indicated on the drawings.
 - 1. Mounting: A mounting template designating stud locations shall be provided. Stud size and type shall be required by manufacturer for application and design intent.
 - 2. TBD, based on manufacturers standard finishes.
- D. Mounting:
 - 1. Flat cut letters and elevation markers shall have threaded stud bosses or drilled and tapped for stud insertion. Studs shall be 316 Stainless Steel.
 - 2. Mounting shall be templated designating stud locations required for mounting on substrate surface as indicated.
- E. Design:
 - 1. Design: As per drawings.
 - 2. Edges: No border.
 - 3. Surface finish: TBD, based on manufacturers standard finishes.
- F. Mounting:
 - 1. Hardware and instructions to be provided for selected mounting methods.
 - 2. Plaques shall have threaded stud bosses or drilled and tapped for stud insertion. Studs shall be 316 Stainless Steel.
 - 3. Mounting shall be templated designating stud locations required for mounting on substrate surface as indicated.

PART 3 - EXECUTION

3.1 PRE-INSTALLATION MEETINGS

- A. Convene minimum two weeks prior to starting work of this section.

3.2 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Landscape Architect of unsatisfactory preparation before proceeding.

3.3 PREPARATION

- A. Clean surfaces thoroughly prior to installation.

3.4 INSTALLATION

- A. Install in accordance with manufacturer's instructions and in proper

relationship to adjacent construction.

3.5 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 31 11 00 - SITE CLEARING

PART 1 – GENERAL

1.1 SCOPE OF WORK

- A. The work of this Section consists of providing all labor, equipment, materials, incidental work, and construction methods necessary to prepare the site, complete, as indicated on the Contract Documents, as specified, and as follows:
 - 1. Clearing and grubbing of existing vegetation
 - 2. Tree protection
 - 3. Invasive plant management

1.2 RELATED DOCUMENTS

- A. The General Documents, as listed on the Table of Contents, and applicable parts of Division 01, 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.

1.3 RELATED SECTIONS

- A. The following items of related work are specified and included in other Sections of the Specifications:
 - 1. Section 02 41 00 - Demolition
 - 2. Section 02 41 13 - Site Preparation

1.4 QUALIFICATIONS

- A. To demonstrate qualifications for the work outlined in this specification section each bidder, either individually or in conjunction with its subcontractor, must demonstrate experience in working on at least three (3) projects within the last five (5) years, similar in scope to the project described here in involving ecological restoration.
- B. Tree removal shall be completed by a professional certified arborist with a minimum of five (5) years' experience who has successfully completed a certification program equal to the Massachusetts certified arborist (MCA) program/examination sponsored by the Massachusetts Arborists Association, Natick, MA, or is certified by the International Society of Arboriculture.
- C. Herbicide application shall be completed by a professional with a minimum of five (5) years' experience with invasive vegetation management, shall hold a Massachusetts pesticide applicator's license, and a Massachusetts invasive plant certificate.

PART 2 – PRODUCTS

2.1 TREE PROTECTION FENCE

- A. Tree protection fencing shall be one of the following, at the Contractor's option.
 - 1. Galvanized chain link fencing: Posts for fencing shall be nominal 2-1/2 inches diameter, galvanized steel posts, driven a minimum of 3 feet into the ground. Posts shall be spaced 8 feet on center maximum. Fence fabric shall be 2-inch mesh, 11-gauge minimum.
 - 2. Wire bound wood roll snow fence with 3/8 of an inch x 1-1/2-inch-wide pickets, spaced approximately 2 inches apart and bound together with at least 13-gauge

galvanized steel wire with brightly painted top edge. Stakes for fencing shall be steel or wood posts. Posts shall be spaced 8 feet maximum.

3. Polypropylene barricade fencing manufactured by Forestry Suppliers (formerly Ben Meadows Co.), 3589 Broad Street, Atlanta, GA. Stakes for fencing shall be 2-inch x 4-inch wood posts, driven a minimum of 3 feet into the ground. Posts shall be spaced 8 feet maximum.
4. Plastic polymer safety fence, Model BX2050 Safety Grid, manufactured by the Tensar Corporation, Morrow, GA, or approved equal. Color shall be high visibility orange. Stakes for fencing shall be 2-inch x 4-inch wood posts, driven a minimum of 3 feet into the ground. Posts shall be spaced 8 feet on center maximum.
4. Unless otherwise indicated, the height of fencing shall be 4 feet.

2.2 TREE PROTECTION – WOOD BOARD WRAPPING

- A. Tree protection lumber, as designated, shall consist of 2-inch by 4-inch (nominal) lumber wired together in close spacing with 16-gauge galvanized steel wire to form a protective enclosure around tree trunks.
- B. Wood lath snow fencing shall be new 4 feet high wood lath snow fencing.

PART 3 – EXECUTION

3.1 SEQUENCE OF WORK

- A. With the exception of Japanese knotweed, treatment of invasive vegetation shall occur between October and April. Japanese knotweed shall be performed between July 15 and September 15 unless otherwise noted.
- A. The Contractor shall be permitted to treat, in approximately no more than 300 linear feet or 12,000 square feet maximum of coastal bank at one time. The Contractor shall divide this maximum square footage into at least three zones for restoration and those zones shall not be contiguous to one another. It is imperative that removal of invasive species in any designated area is promptly followed by the treatment, erosion control, and re-vegetation to ensure that the coastal bank maintains its structural integrity.
- B. Immediately after treatment and removal of invasive vegetation, slopes shall be seeded according to Division 32 Section, TURF & GRASSES of this Specification and erosion control blankets shall be installed according to the SWPPP and Weymouth Conservation Order of Conditions, including as Appendices of this Project Manual.
- C. Restoration planting shall be undertaken when the eradication of invasive and non-native species has reached 80% control; this will likely occur one growing season after the treatment and removal of invasive and non-native plant species. Maintenance of the coastal bank, including weeding, shall be conducted during this time.

3.2 CLEARING

- A. **No tree or shrub clearing work (pruning or removals) shall occur prior to a site walk and meeting with the Town representatives and Engineer.**
- B. **All work included herein shall conform to the Conservation Commission Order of Conditions; see Appendix.**
- C. Trees, shrubs, stumps, brush, grasses, turf, herbaceous plants, downed timber, rubbish, organic matter, miscellaneous vegetation, or extraneous debris not indicated on the Contract Documents or designated in the field by the Engineer to remain shall be cleared.
- D. Clearing shall include the felling, cutting, and satisfactory disposal of all trees and vegetative debris produced through the clearing operations.

- E. Fell trees in such a way as to not injure trees to be saved. Excavation or grading within the branch spread of trees to be saved shall be performed only under the direction of the Engineer unless otherwise directed.
- F. Clearing includes felling of individual trees and removal of areas of other vegetation.
- H. Stumps shall be cut flush to grade and left in place.
 - 1. Cut trees directed to be removed flush to grade and treat stumps with herbicide tinted with green dye. The dye allows for easy visual metering during application and proof that work has been completed. Stumps shall be coated with herbicide within 1 hour of cutting.
 - 2. Provide herbicide that will inhibit re-sprouting or re-growth of the plant. All chemicals and herbicides shall be approved by the federal Environmental Protection Agency and the Massachusetts Department of Food and Drug Agriculture for the intended uses and application rates. Herbicide shall be glyphosate specifically formulated for use for application and vegetation type within this scope of work. Submit for approval by Engineer.
 - 3. Spraying or other application of herbicide shall be completed State-licensed professionals. Submit proof of applicator's license for herbicide application to Engineer. Before commencing with vegetation removal in this area and herbicide application, hold on-site conference with Engineer and Town's Conservation Agent to review the scope of work, herbicide to be used, application methods, and schedule.

3.2 PROTECTION OF EXISTING TREES

- A. The Contractor shall make every effort not to damage existing plant materials to remain. The Contractor is required to install protection as necessary to assure undamaged plant material and adjacent conditions.
- B. Trees designated to remain shall be protected by the placement of a tree protection fence. The Contractor shall provide wood board trunk wrapping for the trees noted on Contract Drawings. All other trees noted to be protected shall have fence protecting the trunks and critical root zones from damage.
- C. Place tree protection additionally at all other locations where trees and/or shrubs may be jeopardized by construction activities. Tree protection fencing shall be supported with specified stakes at maximums established in Part 2 of this Division 31 Section.
- D. Tree protection shall remain in place and be maintained in working condition by the Contractor until directed for removal by the Engineer. All tree protection devices shall be removed from the site by the Contractor at the completion of the work.
- E. Vehicles shall not be parked within the dripline or where damage may result to trees to be saved. No construction materials shall be stored beneath the dripline of trees to be saved.

3.3 TREE PRUNING & REMOVAL

- A. Pruning shall be specified, performed, and paid for under the work of the Division 32 Section, TREE PRUNING & REMOVAL, of this Specification.
- B. Tree removal shall be specified, performed, and paid for under the work of the Division 32 Section, TREE PRUNING & REMOVAL, of this Specification.
- C. Trees and plants designated to be saved shall be protected during pruning operations and all subsequent construction. The Contractor shall provide the handwork necessary to complete pruning operations without damage to adjacent trees as specified, performed, and paid for under the work of the Division 32 Section, TREE PRUNING & REMOVAL, of this Specification. The Contractor shall provide the means necessary to prevent scrapes and scars to trunks and branches, and such damage shall require the Contractor to be assessed

as previously specified above, or to replace damaged material to the satisfaction of the Engineer.

3.4 INVASIVE VEGETATION MANAGEMENT

- A. Plants are listed as invasive plants by the Massachusetts Prohibited Plants List from the State's Office of Energy and Environmental Affairs, or by the Massachusetts Invasive Plant Advisory Group shall be removed from the site, as designated on the Contract Documents. Unless otherwise noted on Contract Documents, the Contractor shall remove all invasive/noxious plants within areas identified for invasive plant management.
- B. Before commencing with vegetation removal or herbicide application, hold an on-site conference with the Engineer, the Weymouth Conservation Agent, and the Owner to review the scope of work, herbicide to be used, application methods, and schedule.
- C. Prior to commencing with invasive vegetation removal, the Contractor shall review the final **Order of Conditions (DEP File No. 81-1245) dated July 16, 2019**, included herein as an appendix, and shall follow all stipulated conditions. Any questions or concerns shall be addressed to the Engineer and Owner immediately.
- D. Qualifications for invasive management: Contractor shall have five years' experience with invasive vegetation management, shall hold a Massachusetts Pesticide Application License or a Massachusetts Invasive Plant Certificate.
- E. The contractor shall take care not to damage, destroy, or kill trees, shrubs, or other plants that are located adjacent to the invasive plants to be removed. These plants shall be protected by means determined necessary by the Contractor.
- F. Several types of invasive/noxious plant species are to be controlled in this scope of work. Below is a list of the Massachusetts invasive/noxious upland vegetation species that are to be addressed and the methods to be employed. This list is not intended to be all inclusive and species may not be limited to the following:
 - 1. Japanese knotweed (*Polygonum cuspidatum*): Cut stems down between the second and third node (from the ground) and inject or drip 5 ml of herbicide into the stem. The Contractor shall re-apply herbicide (a second application) in the succeeding autumn. An approved alternate method is to cut the stems, allow for low re-growth of shoots, and spray new growth. Two applications will be required. Treatment of Japanese knotweed shall be performed between July 15 and September 15 unless otherwise noted.
 - 2. Multiflora rose (*Rosa multiflora*): Cut shrubs 2 to 4 inches above finished grade and wipe or wick apply herbicide immediately on the cut stems. An approved alternative method is to cut the stems, allow for low re-growth of shoots, and spray new growth.
 - 3. Norway maple (*Acer platanoides*): Pull seedlings when soil is moist. For larger plants, dig them out including all roots up to 8" D.B.H. For large trees, cut trunk flush to grade, cut back any shoots, and grind stump. Treat and remaining stumps or roots with herbicide using wipe or wick method around the outer ring of the stump. Treat in early spring or between June 1 and September 30. Refer to Order of Conditions for more detail.
 - 4. Oriental bittersweet (*Celastrus orbiculatus*): Cut vines 2 to 4 inches above finished grade and apply herbicide by wiping or wicking immediately on the cut stems.
 - 5. Buckthorn (*Rhamnus cathartica*): Cut shrubs 2 to 4 inches above finished grade and apply herbicide by wiping or wicking immediately on the cut stems.
 - 6. Black locust (*Robinia pseudoacacia*): Treat large trees after girdling with a basal bark application of herbicide by wiping or wicking around the outer ring of the stump. Treat between mid-July and December 31st.

7. Poison ivy (*Toxicodendron radicans*): Apply herbicide as a foliar spray treatment following the herbicide manufacturer's recommended application rate. No glyphosate may be used, refer to Order of Conditions for suitable control measures. Add dye to herbicide to target spray application. Two weeks following the foliar application, cut the stems and apply herbicide immediately to the cut stems.
8. Burning bush (*Euonymus alatus*): Pull seedlings up to 2 feet tall when soil is moist. Larger plants and root systems shall be removed using a spading fork or weed wrench. Larger shrubs shall be cut 2 to 4 inches above finished grade and apply herbicide by wiping or wicking immediately on the cut stems.
- G. Herbicide to be applied immediately following vegetation being cut. Herbicide shall include a colored dye to identify which stems have been treated.
- H. Remove all vines and cut trunks, branches, and brush from the site.
- I. With the exception of Japanese knotweed, treatment of invasive vegetation shall occur between October and April.

3.5 POST-TREATMENT

- A. Immediately after treatment and removal of invasive vegetation, slopes shall be seeded according to Division 32 Section, TURF & GRASSES of this Specification.
- B. Follow up invasive management as needed, as outlined per the Order of Conditions.

END OF SECTION

SECTION 31 62 19.13 – MARINE TIMBER PILES

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. This work pertains to furnishing and installing Class B Marine Timber Piles shown in the Contract in accordance with the Drawings and this specification. Each Marine Timber Pile shall be installed at the location and to the elevation, minimum length, and allowable capacities shown on the Plans.

1.2 REFERENCED CODES AND STANDARDS

- A. This specification is based on nationally recognized codes and standards including the references listed below. In case of a conflict between the reference and this specification, this specification shall govern.
- B. American Wood Protection Association (AWPA)
 - 1. AWPA A3 (2015) Standard Method for Determining Penetration of Preservatives and Fire Retardants
 - 2. AWPA M2 (2019) Standard for the Inspection of Preservative Treated Wood Products for Industrial Use
 - 3. AWPA M4 (2021) Standard for the Care of Preservative-Treated Wood Products
 - 4. AWPA M6 (2013) Brands Used on Preservative Treated Materials
 - 5. AWPA P1/P13 (2019) Standard for Creosote Preservative
 - 6. AWPA P5 (2015) Standard for Waterborne Preservatives
 - 7. AWPA P34 (2014) Standard for Copper Naphthenate, Waterbone (CuN-W)
 - 8. AWPA T1 (2022) Use Category System: Processing and Treatment Standard
 - 9. AWPA U1 (2022) Use Category System: User Specification for Treated Wood
- C. American International (ASTM)
 - 1. ASTM D25 (2012; R 2017) Standard Specification for Round Timber Piles
 - 2. ASTM D1143/D1143M (2007; R 2013) Piles Under Static Axial Compressive Load
 - 3. ASTM A36/A36M Structural Steel
 - 4. ASTM A123-02 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
 - 5. ASTM A153-05 Standard Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware
 - 6. ASTM A450/A450M-07 Standard Specification for General Requirements for Carbon and Low Alloy Steel Tubes
- D. American Society of Mechanical Engineers (ASME):
 - 1. ANSI/ASME Standard B18.2.1-1996, Square and Hex Bolts and Screws, Inch Series

- E. Occupational Safety and Health Administration (OSHA):
 - 1. Excavation Safety Guidelines
- F. ICC-Evaluation Services, Inc.:
 - 1. AC308 Acceptance Criteria for Helical Foundation Systems and Devices
- G. American Welding Society
 - 1. ANSI/AWS B2.1-00 Standard for Welding Procedure and Performance Qualification

1.3 DEFINITIONS

- A. Class B Timber Pile: Class B piles are those listed with a specified required minimum circumference at 3 ft from butt of 12 inches.
- B. Engineer: Individual or firm retained by Owner or General Contractor to verify Marine Timber Pile quality assurance with the Contract, the Drawings, and this specification.
- C. Allowable Bearing Capacity: Ultimate bearing capacity of the bearing stratum divided by a factor of safety.
- D. Pile Design Professional: Individual or firm responsible for the design of Marine Timber Piles.

1.4 QUALITY ASSURANCE

- A. Preservative Treatment
 - 1. The Contractor must be responsible for the quality of treated wood products. The Contractor must provide the Engineer's Representative (COR) with the inspection report of an independent inspection agency, approved by the Engineer, certifying that the offered products comply with applicable AWPA standards. Identify treatment on each piece by the quality mark of an agency accredited by the Board of Review of the American Lumber Standard Committee. Inspect all preservative-treated wood visually to ensure there are no excessive residual materials or preservative deposits. Material must be clean and dry, or it will be rejected because of environmental concerns.
- B. SDS and CIS
 - 1. Provide Safety Data Sheets (SDS) and Consumer Information Sheets (CIS) associated with timber pile preservative treatment. Contractor must comply with all safety precautions indicated on the SDS and CIS.
- C. Delivery and Inspection List
 - 1. Field inspect and submit a verification list of each treated timber pile indicating the wording and lettering of the quality control markings, the species, and the condition of the wood. Do not incorporate piles damaged in transport from plant to site. Inspect all preservative-treated piles, visually to ensure there are no excessive residual materials or preservative deposits. Material must be clean and dry, or it will be rejected due to environmental concerns.

1.5 SUBMITTALS

- A. Contractor shall prepare and submit to the Engineer for review and approval:

1. Marine timber pile specifications, preservative treatment, pile origination including appropriate chain of custody and country of origin.
 2. Pile driving plan, method, and equipment. Pile driving plan shall include proposed sequencing and templates or falsework. Pile driving method and equipment shall include name and model of machinery, complete descriptions of other pile driving equipment, including leads, driving helmets, cushion blocks, driving blocks, collars, extractors, and other appurtenances.
 3. Submit list of pile lengths and diameters at tip and butt.
- B. Work shall not begin until all the submittals have been received and approved by the Engineer. The Contractor shall allow the Engineer a reasonable number of days to review, comment, and return the submittal package after a complete set has been received.
- C. At the completion of the Marine Timber Pile installation work, the contractor shall deliver a Final As-built Pile Installation Report containing the location and length of each pile installed at the site.

1.6 SHIPPING, STORAGE, AND HANDLING

- A. Handle and store piles in accordance with AWPA M4. Follow precautions identified in SDS or CIS provided by the supplier of treated wood products. Special care must be taken in supporting piles to prevent the induction of excessive bending stresses in the piles. Piles must be carefully handled without dropping, breaking of outer fibers, and penetrating the surface with tools. Peaveys, cant hooks, pikes, and other pointed tools must not be used in handling treated piles.

PART 2 - PRODUCTS

2.1 MARINE TIMBER PILES

- A. Provide Southern pine treated piles in accordance with AWPA U1 Commodity Specification G and conforming to ASTM D25 and other requirements as specified. Piles must be in one piece for the length shown on the Drawings. Splices will not be permitted. Each treated pile must be branded by the producer, in accordance with AWPA M6. Pile circumferences must be as follows:
1. Piles: Minimum butt circumference measured at 3 feet from the butt end must be 12 inches at a minimum.

2.2 WOOD-PRESERVATIVE TREATED MATERIALS

- A. Preservative Treatment by Pressure Process: AWPA C2, except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPA C31 with inorganic boron (SBX). Acceptable treatments and preservative retention:
1. Marine Construction: 2.5 pcf CCA
- B. Kiln-dry material after treatment to maximum moisture content of 19 percent.
- C. Mark each treated item with treatment quality mark of an inspection agency approved by the American Lumber Standards Committee Board of Review.
- D. Application: Treat items indicated on Drawings, and the following:

1. Class B Marine Timber Piles

2.3 FIELD TREATMENT

- A. Piles must be field treated in accordance with AWWA M4. All cuts, holes, and injuries such as holes from removal of spikes or nails which may penetrate the treated zone must be field treated with copper naphthenate conforming to AWWA P34.

2.4 CONNECTION HARDWARE

- A. Pile hardware must consist of bolts with necessary nuts and washers, timber connectors, drift pins, dowels, nails, screws, spikes, and other fastenings. Provide bolts with washers under nut and head. Bolts and nuts must conform to ASTM A307. Provide cast-iron ogee, malleable iron washers, or plate or cut washers where indicated. Provide bolts with washers under nut and head. Provide timber connectors and other metal fastenings of type and size indicated. Hot-dip galvanize all hardware in accordance with ASTM A123 or ASTM A153, as applicable.

PART 3 - EXECUTION

3.1 PILE DRIVING EQUIPMENT

- A. Pile Driving Hammer: Marine Timber Piles shall be installed with an impact hammer or with a vibratory hammer. The size or capacity of hammers must be as recommended by the manufacturer for the pile weights and solid formation to be penetrated. The pile hammer must be of sufficient weight and energy to install the specified pile without damage. Diesel powered hammers must be operated at the rate recommended by the manufacturer throughout the entire driving period.
- B. Leads
 - 1. Leads are required and must be fixed at the top and adjustable at the bottom.
- C. Pile Collars
 - 1. Collars or bands for protecting pile butts against splitting, brooming, and other damage while being driven must be of an approved design.
- D. Pile Installation
 - 1. Inspect piles when delivered and when in the leads immediately before driving. Cut piles at cutoff grade with pneumatic tools by sawing or other approved method. Where cutoff is below existing mudline elevation, complete excavation, sheeting and dewatering before pile is driven to cutoff elevation.

3.2 Pile Driving

- A. A complete and accurate record of the driving of piles must be compiled by the Contractor for approval by the Engineer. During driving, pile driving hammers must be operated at all times at the rate and conditions recommended by the hammer manufacturer. Each pile must be driven continuously and without interruption to the indicated minimum elevation, and then until basic refusal. Deviation from this procedure will be permitted only in case the driving is

stopped by causes which reasonably could not have been anticipated. Piles must be driven to the full penetration required where practicable to do so without damage to the piles. If found impracticable to drive any pile to the depth required, such pile must be cut off and abandoned or pulled as directed. Driven piles which have a penetration of less than 20 feet and have not been driven to the established maximum penetration per blow are not satisfactory. Driving of piles beyond the point of refusal, as indicated by excessive bonding of the hammer or kicking of the pile, or a blow count of greater than twice the blow count required to produce the safe bearing capacity must not be attempted. Piles which have uplifted after driving must be redriven to grade after conclusion of driving in that general area. The maximum permissible penetration per blow for the last 20 blows will be established by the Engineer. When the penetration per blow of any pile during the final blows exceeds that permitted or it is found that a pile is not of sufficient length to give the capacity specified, and the pile has been driven to its full depth, the Contractor must pull the pile, furnish, and drive a longer pile or take other corrective measures as directed by the Engineer. The use of followers or splices must not be permitted. After driving is completed, all piles must be "headed" or cut off normal at the cutoff elevation. The piles must have tops beveled outboard as indicated. Pile heads at cutoff must be sound. Headed treated piles must be treated with copper naphthenate per AWWA M4. Piles driven in locations where they are constantly subject to water spray must be given this treatment immediately after they are cut off and before the cutoff surface has been wetted. Cutoffs must become the property of the Contractor and must be removed at his expense.

- B. Bearing piles: Drive without interruption to the specified tip elevation or capacity.
- C. All piles shall be driven to an allowable capacity of 10 tons as determined by the wave equation analysis below:
 - 1. $R = 2E / (S + C)$ where:
 - a. R = Allowable pile load in pounds
 - b. E = Energy per blow in foot-pounds
 - c. S = Penetration of last blow or average penetration of last few blows experienced in inches
 - d. C = Constant equal to 1.0 for drop hammer and 0.1 for steam or air hammer
 - e. The value of "S" must be determined with the hammer operated at one hundred (100) percent of the rated number of blows per minute for which the hammer is designed.
 - f. Any driving resistance developed in strata overlying the bearing material shall be discounted.

3.3 PROTECTION OF PILES

- A. Square the heads and tips of piles to the driving axis. Laterally support piles during driving, but do not unduly restrain piles from rotation in the leads. Where pile orientation is essential, take precautionary measures to maintain the orientation during driving. Handle, protect, and field treat piles in accordance with AWWA M4.
- B. Driving of piles must not subject them to damage. Piles which are damaged, split, broomed, or broken by reason of internal defects or by improper driving below cutoff elevation so as to impair them for the purpose intended must be removed and replaced; a second pile may be driven adjacent thereto at the Contractor's expense. Minor damaged areas of treated piles must be field treated in accordance with AWWA M4.
- C. Equipment or methods which result in regular or repeated damage to piles will be rejected by the Engineer.

3.4 ALLOWABLE TOLERANCES

- A. Marine Timber Piles shall be installed as close to the specified location and alignment both laterally and longitudinally and to the vertical as shown. Any pile not within the limits shall be rejected.
 - 1. The maximum deviation of the piles axial alignment from the values given on the drawings is not more than 1/4 inch per foot of pile length from the vertical for plumb piles.
 - 2. At cutoff elevation, pile head must be within 3 inches laterally of the location indicated. Manipulation of piles is prohibited.
 - 3. The correct relative position of group piles must be maintained by the use of templates or by other approved means. Redesign of pile caps or additional work required due to improper location of piles will be the responsibility of the Contractor.
 - 4. Inspect piles for heave. Piles must be driven to the depths as directed. Redrive heaved piles to the required tip elevation.

3.5 QUALITY ASSURANCE

- A. The Contractor shall provide the Engineer and Owner copies of installation records within 48 hours after each installation is completed. These installation records shall include, but are not limited to, the following information:
 - 1. Name of project and Contractor
 - 2. Name of Contractor's supervisor during installation
 - 3. Date and time of installation
 - 4. Name and model of installation equipment
 - 5. Installation duration and observations
 - 6. Location of Pile
 - 7. Diameter at the Tip and Cutoff
 - 8. Elevation at top of the pile
 - 9. Elevation at the cutoff
 - 10. Pile Length.
 - 11. Final plumbness
 - 12. Comments pertaining to interruptions, obstructions, or other relevant information.

- B. Remove and replace with new piles those damaged, misplaced, driven below the design cutoff, or driven out of alignment, or provide additional piles, driven as directed at no additional cost to the Owner.
- C. Unless specified otherwise on the Drawings or by local codes, the Engineer, the Pile Design Professional, or an inspection agency accepted by the Engineer shall observe and document the pile driving installation.

END OF SECTION

SECTION 32 01 90 – TREE PRUNING & REMOVAL

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. The General Documents, as listed on the Table of Contents, and applicable parts of Division 01, 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.

1.2 SUMMARY

- A. The work of this Section consists of providing all labor, equipment, materials, incidental work, and construction methods necessary to perform selective tree removal within the limits indicated on the Contract Documents and as specified herein. Work shall include, but not be limited to, the following:
 - 1. Tree removal

1.3 REFERENCES

- A. The following standards shall apply to the work of this Section. All references relate to the latest edition. The Contractor shall be responsible for being aware of current industry standards.
 - 1. American National Standards Institute (ANSI):
 - A300 Tree Care Operations; Tree, Shrub, and Other Woody Plant Maintenance, Standard Practices, latest edition:
 - a. Part 1, Pruning
 - b. Part 2, Fertilization
 - c. Part 3, Support Systems a. Cabling, Bracing, and Guying
 - Z133.1 Safety Requirements for Pruning, Trimming, Repairing, Maintaining and Removing Trees, and for Cutting Brush
 - 2. Tree Care Industry Association (TCIA)
 - 3. Massachusetts Food and Agriculture Department (MA Pest Identification Guide for Weeds, Insects and Diseases of Woody Ornamentals
 - 4. Occupational Safety & Health Administration (OSHA)

1.4 RELATED SECTIONS

- A. The following items of related work are specified and included in other Sections of the Specifications:
 - 1. Division 02 Section: SITE PREPARATION & DEMOLITION
 - 2. Division 31 Section: SITE CLEARING

1.5 SUBMITTALS

- A. At least 90 days prior to the start of construction activities, submit to the Engineer the name of professional Certified Arborist hired to perform the work of this Section and proof of arborist's certification.

106 QUALITY ASSURANCE

- A. Selective pruning methods shall conform to the applicable requirements of ANSI Z133.1.
- B. Work of this Section shall be completed by a professional Certified Arborist with a minimum five years' experience, who has successfully completed a certification program equal to the Massachusetts Certified Arborist (MCA) program/examination sponsored by

the Massachusetts Arborists Association, Natick, MA, or is certified by the International Society of Arboriculture.

1.7 COORDINATION

- A. Notify the Engineer at least 48 hours before work that requires inspection or testing or both.
- B. Do not perform hand trenching and/or tunneling work until required root and crown pruning is complete and Engineer is present for inspection.

1.8 WARRANTY

- A. Damage and Destruction of Trees shall be in accordance with the requirements of Division 31 Section, SITE CLEARING of this Specification.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

3.1 PREPARATION

- A. The Contractor shall be responsible for the protection of all existing trees and plants designated to remain for the length of the construction period, including liability for all damages as specified in this Section.

3.2 TREE REMOVAL

- A. Trees designated for removal on the plans shall be removed from the site. This work shall include the felling of the trees in such a way as to not injure trees to be saved, utility lines and poles, houses, garages, lawns, plantings, and pavement. Tree removal also shall include the satisfactory disposal of all tree trunks, branches, and vegetative debris produced through the tree removal operation.
 - 1. Stumps shall be left in situ.
- B. Prior to the commencement of tree removal operations, the Contractor shall review with the Engineer and the Town Conservation Agent which trees shall be removed. Under no circumstances shall the tree removal operation commence without the written concurrence of the Engineer and Town Conservation Agent.

3.3 PUBLIC HEALTH & SAFETY

- A. Upon encountering any condition of tree work or tree health which might threaten the public health, safety, or welfare and which is not directly addressed by this Section the certified arborist and the Contractor shall notify the Engineer and Town of Weymouth Conservation Agent immediately and shall make recommendations pertaining to the resolution of said conditions.

END OF SECTION

SECTION 32 12 26 – ASPHALT PAVING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 – GENERAL REQUIREMENTS, which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. The work of this Section consists of providing all labor, equipment, materials, incidental work, and construction methods necessary to furnish and install replacement ASPHALT PAVING on Wessagussett Road along the work area trench located adjacent to the new granite curbing to be installed, as indicated on the Contract Documents, and as specified herein.
- B. The work of this Section includes, but is not limited to the following:
 - 1. Gravel base course construction.
 - 2. Bituminous materials.
 - 3. Patching and resurfacing disturbed paved areas.
 - 4. Traffic line striping and markings.

1.3 RELATED WORK

- A. Carefully examine all the Contract Documents for requirements that affect the work of this Section. Other specification sections that directly relate to the work of this Section include, but are not limited to the following:
 - 1. Division 2 Section 02 41 13 – Site Preparation
 - 2. Division 31 Section 31 20 00 – Earthwork
 - 3. Division 32 Section 32 14 40 – Granite Curbing
 - 4. Division 32 Section 32 30 00 – Site Improvements

1.4 SUBMITTALS

- A. At least 30 days prior to intended use, submit material certificates signed by material producer and Contractor indicating that products comply with requirements. Provide master mix formula for all asphalt paving specified in this Section with a description of mix ingredients, proportions and aggregate gradation for review and approval.
- B. Do not order materials until Engineer's approval of mix formula has been obtained. Delivered materials shall conform to the approved samples.
- C. Submit product data for pavement marking paint.

1.5 PROJECT CONDITIONS

- A. Weather: Perform work only when existing and forecasted weather conditions are within the limits established by referenced standards. Perform work only when ambient temperature is forecasted to be at least 50-degrees Fahrenheit and when temperatures have not been below 35- degrees Fahrenheit for 12 hours immediately prior to application. Do not apply when base is wet or contains an excess amount of moisture or is in a frozen state.

1. Asphalt paving shall not be applied until the finished compacted gravel base has been tested and approved. A delay in paving after the gravel base is tested and approved may require re- compaction and testing at no additional cost to the Owner.
 2. Construction methods, transportation, and delivery of mixtures, spreading, finishing, compaction joints, etc. shall conform to Section 460 of the Massachusetts Department of Transportation Standard Specifications for Highways and Bridges unless otherwise specified herein.
- B. Substrates: Proceed with work only when substrate construction and penetrating work is complete, and base is dry.
- C. Traffic Control: Maintain access for vehicular and pedestrian traffic as required and for other construction activities.
- D. Grade Control: Establish and maintain required lines and elevations.

1.6 REGULATORY REQUIREMENTS

- A. Strictly comply with applicable codes, regulations and requirements of authorities having jurisdiction.

1.7 QUALITY ASSURANCE

- A. Bituminous concrete shall be prepared, mixed, transported, placed, compacted and finished in accordance with the requirements set forth in the latest edition of the “Standard Specifications for Highways and Bridges” (hereinafter referred to as “SSHB”), as published by the Massachusetts Department of Transportation.
- B. Tolerances
- C. Establish and maintain grade control to required elevations and slope tolerances indicated the Drawings. The maximum deviation in the finished surface planarity shall be 3/16 inch when measured in any direction with a 10 ft. straightedge.

1.8 TESTING

- A. During the placing and rolling operation, repeated checks shall be made to ascertain the correct rate of application to provide the required compacted thickness.
- B. If the average thickness is deficient from the specified thickness by one quarter (1/4) inch or more, the extent of the deficient area shall be corrected at the Contractor’s expense.
- C. Upon completion of testing, the Contractor shall properly fill all test holes by compacting a fine aggregate bituminous concrete for the full depth of the core. The finished surface shall be smooth.

1.9 COORDINATION

- A. The Contractor shall coordinate with all other trades especially grading, curb installation, electrical and plumbing contractors, in order to prevent covering up unfinished or uninspected work. Any rework shall be done at no cost to the Owner.

1.10 LAYOUT AND GRADES

- A. A Registered Land Surveyor employed by the Contractor shall lay out all lines and grade work in accordance with the Contract Documents.

1.11 DISTURBING EXISTING PAVEMENT DURING CONSTRUCTION

- A. Existing paved areas indicated on the drawings to remain shall be protected from damage by construction activities. Where sections of the finished paved areas have to be removed, all edges shall be saw cut and patched in accordance with this Section.
- B. Existing finished paved areas that require extensive cutting and patching or have become damaged and cannot be satisfactorily repaired by cutting and patching shall be resurfaced. Shape of these resurfaced areas shall be near and in rectangular patterns or shall conform to the shape or edges of other adjacent surface improvements. Edges of resurfaced areas shall be saw cut and existing pavements shall be removed from a distance of two feet into areas to be resurfaced, so that new pavement can neatly blend into existing pavement showing no joints or imperfections. If the gravel base course has been disturbed, the Contractor shall remove the disturbed material, repair the existing gravel base and apply a new binder course as specified herein.
- C. All paving beyond the project's property line shall be in accordance with the requirements of the Weymouth DPW. Provide traffic control as necessary for any work within the Town Road Layout.

PART 2 - PRODUCTS

2.1 ASPHALT PAVING MATERIALS AND PRODUCTS

- A. Coarse Aggregates: Provide clean, sound, angular crushed stone, crushed gravel, complying with ASTM D 692-88.
- B. Fine Aggregate: Provide sharp-edged natural sand or sand prepared from stone, gravel or combination thereof, complying with ASTM D 1073.
- C. Tack Coat: Asphalt tack coat shall be diluted asphalt emulsion SS-1.

2.2 ASPHALT PAVING MIXES

- A. Provide Class I asphalt aggregate mixture in compliance with Section 460, Paragraph 460.40, SSHB and as follows:
- B. Binder Course and Top Course: Provide Binder Course and Top Course conforming with the Job-Mix Formula given in Section M, paragraph M3.11.03, SSHB.
- C. The Binder Course shall consist of one lift of Binder Course asphalt paving to thickness as shown on the Contract Documents. The aggregate for the binder course shall conform to the following gradation requirements:

<u>SIEVE SIZE</u>	<u>PERCENT PASSING</u>
1”	100
3/4”	80 – 100
1/2”	55 – 75
#4	28 – 50
#8	20 – 38
#30	8 – 22
#50	5 – 15
#200	0 – 5
Bitumen % of mix	4.5 – 5.5

- D. The Top Course for all asphalt paving shall consist of one lift of Top Course asphalt paving to thickness as shown on the Contract Documents. The surface tolerance after completion shall be 1/8 inch when measured in any direction with a 10 ft. straightedge. The aggregate for the top course shall conform to the following gradation requirements:

<u>SIEVE SIZE</u>	<u>PERCENT PASSING</u>
5/8”	100
1/2”	95 – 100
3/8”	80 – 100
#4	50 – 76
#8	37 – 54
#30	17 – 29
#50	10 – 21
#200	2 – 7
Bitumen % of mix	5.5 – 7.0

A.C. 20 of 30
Voids content less than 9%.

2.3 TRAFFIC LINE STRIPPING AND MARKINGS

- A. Pavement-Marking Paint: Fast Drying White Water-borne White Traffic Paint and Fast Drying Yellow Water-borne Traffic Paint as specified in SSHB under Sections M7.01.23 and M7.01.24, respectively.
- B. Provide international symbol of accessibility at the designated accessible parking spaces. Color for accessible parking space lines and symbols shall be white. A blue painted square shall be painted at each symbol location prior to painting symbol.
- C. Stenciled pavement markings shall be installed on pavements as indicated on the Drawings and as required to designate Fire Lanes and Reserved Parking as determined by the Owner.
- D. Lines shall be true to alignment indicated on the Drawings. Stall lines shall be four inches wide with length and spacing as indicated on the Drawings.

2.4 BITUMINOUS MATERIALS

- A. Bituminous material for tack coat shall be one of the following:

1. Cut-back asphalt (rapid curing type) conforming to AASHTO M81, Grade RC-70 or
 2. Emulsified asphalt rapid-setting type conforming to AASHTO M140, Grade RS-1
- B. Bitumen shall be rapid setting type emulsified asphalt conforming to AASHTO M 140, Grade RS-1.
- C. Bituminous crack sealer shall be a hot-applied bituminous sealer conforming to Fed. Spec. SS-S-1401.

PART 3 - EXECUTION

3.1 GRADING AND COMPACTION OF SUB-BASE

- A. Subgrade preparation and base course materials and construction shall be performed as specified in Division 31 Section 31 20 00 - Earthwork.
- B. Start of work under this Section shall constitute acceptance of the base conditions to which this work is to be applied. Any defects in work resulting from such conditions shall be corrected under this Section, at no additional cost to the Owner.

3.2 INSTALLATION OF ASPHALT PAVING

- A. Preinstallation Examination Required: The Asphalt Paving Installer of asphalt paving shall examine the subbase and all related work, and the conditions under which this work is to be performed and notify the Contractor in writing of all deficiencies and conditions detrimental to the proper completion of their work. Beginning work means Installer accepts substrates, previous work and site conditions.
- B. Reference Standards: Install asphalt concrete in strict compliance with Sections 460.60 through 460.68 of the State Standard Specifications, except where more restrictive requirements are specified.
- C. Subbase Preparation: Do necessary grading in addition to that specified under Division 31 Section 31 20 00 - Earthwork to bring sub-grade to required grades and sections for asphalt pavement base course construction. Tamp traces of trenches. Remove soft and otherwise unsuitable material and replace with approved material. Take every precaution to obtain a foundation of uniform bearing strengths. Any defects in this work shall be corrected under this Section at no additional cost to the Owner.
 1. Gravel Base Course Preparation: shall consist of approved gravel fill and placed on approved subgrade to the depth indicated on the Drawings and as specified under Division 31 Section 31 20 00 - Earthwork. The surface of the gravel base shall be shaped to the cross section of the pavement.
 2. The gradation shall conform to Processed Gravel as specified in Division 31 Section 31 20 00 - Earthwork. Gradation shall be determined by a mechanical wet sieve analysis and in accordance with ASTM D- 422. The gravel shall be spread in layers from self-spreading vehicles or with power graders of approved types, or by hand methods upon the prepared subgrade. The gravel shall be compacted to not less than 95-percent of the maximum dry density of the material as determined by the Method

- of Test for ASTM Designation D - 1557, Method D. Grading and compaction shall continue until the surface is even and true to the proposed lines and grades within a tolerance of 3/8-inch above or below the required cross sectional elevations and to a maximum irregularity not exceeding 3/8-inch under a ten foot line longitudinally. Any specific area which after being rolled, does not form a satisfactory, solid foundation shall be removed, replaced, and re-compacted. The gravel shall be spread and compacted in layers not exceeding 6-inches in compacted thickness. The Contractor shall furnish, set and maintain all line and grade stakes necessary to guide the automated grade control equipment.
3. Contractor shall maintain base course in an acceptable condition, protected from traffic, erosion and other elements until the surface is placed.
 4. After the subgrade and /or existing pavement surfaces have been prepared as specified herein, the Contractor shall check all frames, covers, grates, and all miscellaneous castings that are located in the proposed pavement area to ensure that all such items have been accurately positioned and set to the proper slope and elevation. All covers and grates shall be set flush with the required finished pavement surface. No depressions or mounds will be permitted in the pavement to accommodate inaccuracies in the setting of these appurtenances.
 5. For reclaimed base course requirements refer to Division 2 Section 02 41 13 – Site Preparation.
- D. Tack Coat: Tack coat shall be applied to previously paved, hardened surfaces. Apply uniformly by mechanical means at a rate of 0.05 gal/s.y. after thoroughly cleaning such surfaces of all foreign matter and loose material. Surfaces shall be dry before the tack coat is placed. The tack coat shall be applied immediately prior to laying the new pavement.
- E. Placing Mix: Paving shall be laid in two courses except as noted on the Drawings. The thickness of each course shall be as shown on the Drawings and measured in place after compaction. The first course shall be the Binder Course and the second course shall be Top Course as defined in “Table A” of Section M3.11.03 “Job-Mix Formula” of the SSHB. A minimum of two weeks shall pass between the installation of the binder course and top course.
1. Any unsatisfactory irregularities or defects remaining after the final compaction shall be corrected by removing and replacing with new material as specified, to form a true and even surface. All minor surface projections, joints and minor honeycombed surfaces shall be ironed out smoothly to grade, as directed.
 2. No vehicular traffic or loads shall be permitted on the newly completed pavement until stability has been attained and the material has cooled sufficiently to prevent distortion or loss of fines.
- F. Bituminous Concrete Curb: The bituminous concrete mixture shall be machine formed by a self- powered curbing machine capable of extruding and compacting the mixture, free of honeycombs. The berms shall be installed on the Binder Course prior to the installation of the Top Course.
1. Bituminous concrete curb shall conform to Section 501.64 of the “Standard Specifications” for Class 1 Bituminous Concrete Curb and shall meet the dimensions as shown on the Contract Documents.

2. Bituminous concrete shall meet the requirements of Dense Mix, “Standard Specifications” Section M3.12.00.
- G. Rolling: Begin rolling mixture when asphalt concrete can bear weight of roller without excessive displacement. Roll at least three times and provide a smooth, compact, uniform surface free of roller marks. After first rolling repair displaced area as needed with additional hot material. Roll at least two additional times to thoroughly compact concrete to maximum density and to remove roller marks.
- H. Tolerances: The finished surface of each hot-mixed asphalt course shall be tested for smoothness using a 10-foot straight edge applied parallel with and at right angles to the center line of the paved area. Surfaces exceeding the following tolerances within the 10-feet will not be accepted:
1. Binder Course: 1/4-inch
 2. Top Course: 3/16-inch

3.3 PATCHING EXISTING ASPHALT PAVEMENT

- A. In areas on site where new pavement abuts existing pavement and/or where existing pavement requires patching due to removal of existing pavement for installation of work under this Contract, patching of existing pavement shall be as follows:
1. Sawcut the existing edge of pavement in a straight line at a 90-degree angle to the vertical in such a manner that all existing loose or cracked areas of pavement are removed.
 2. Edges of existing pavement shall be painted with a thin coat of bitumen (RS-1) immediately before placing new pavement.
 3. Any joints at junctions of old and new pavements shall be sealed with a hot poured rubber asphalt sealer and covered with sand.
 4. Asphalt shall be installed as specified herein. Smooth transition surfaces shall be provided where new pavement abuts existing paved surfaces.
- B. All asphalt patching work within public right-of-ways shall be completed in accordance with the requirements of the authority having jurisdiction.
1. Provide traffic control for work within the public right-of-way.
 2. All road surfaces shall be saw cut before any excavation to prevent damage to pavement to remain.
 3. Excavation shall be completed in a safe and workmanlike manner and shall minimize obstruction of pedestrian and vehicular traffic.
 4. Processed gravel shall be used for base course construction and placed in six-inch lifts compacted to 95% of the maximum dry density by mechanical means.

3.4 PAVEMENT MARKINGS

- A. Work under this item shall be in conformance with Section 860 of the Standard Specifications and the Manual on Uniform Traffic Control Devices, current edition.

- B. Provide painted parking stripes and other pavement markings, as indicated on the drawings. Apply paint with mechanical methods and templates to ensure uniform, straight lines and even line widths. Clean surface to totally eliminate all loose material and dust. Apply paint in strict compliance with manufacturer's instructions and recommendations. Allow for proper curing of substrates before application of paints. Apply number of coats and dry film thickness as recommended by paint manufacturer.
- C. Pavement markings shall be reapplied during the one-year guarantee period specified herein if the markings exhibit wear under normal use.

3.5 CLEANING, REPAIR AND PROTECTION

- A. Three days after rolling, the finished pavement shall be tested. Any section that shows ponding, indentation, rutting or picking up shall be resurfaced at the Contractor's expense.
- B. Provide temporary protection to ensure work is completed without dirt, stains, damage, or deterioration at time of final acceptance. Clean up stains and spills as they occur. Remove protection and clean as necessary immediately before final acceptance review.

3.6 GUARANTEE

- A. The Contractor shall guarantee all pavement and pavement marking installations, including materials and workmanship, for a period of one year from the date of acceptance. The Contractor shall make interim repairs as necessary to maintain all paved areas in good, usable conditions.

END OF SECTION

SECTION 32 16 13

GRANITE CURBING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Vertical Granite Curbing
 - 2. Sloped Granite Curbing
 - 3. Installation, repair and replacement of granite curbing.
- B. Related Sections
 - 1. Section 02 32 00 - Borrow Material

1.2 REFERENCES

- A. AASHTO Standard Specifications for Transportation Materials and Methods of Sampling and Testing, 1986 Edition, as amended.
- B. Commonwealth of Massachusetts Department of Public Works "Standard Specifications for Highways and Bridges", 1988 Edition, as amended.

1.3 SUBMITTALS

- A. Submit to the Engineer, shop drawing showing dimensions, layouts and details of construction and accessories required.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Granite Curbing
 - 1. In accordance with the Commonwealth of Massachusetts Department of Public Works "Standard Specifications for Highways and Bridges", 1988 Edition, as amended, granite curbing shall conform to the requirements of Article M.9.04.1.
 - 2. Granite curbing shall be hard and durable, fundamentally of light color, of general uniform texture, of smooth splitting appearance, and free from seams or imperfections.
 - 3. No top projections of greater than 1/8 inch shall exist, and no more than 1" projections shall exist on the back and bottom of each section.
 - 4. Vertical Granite Curbing
 - a. Granite curbing shall be Type SB in accordance with Commonwealth of Massachusetts Department of Public Works "Standard Specifications for Highways and Bridges", 1988 Edition, as amended.

- b. Standard laying length shall be no less than 6-feet.
- 5. Granite Slope Curbing
 - a. Granite curbing shall be Type SB in accordance with Commonwealth of Massachusetts Department of Public Works "Standard Specifications for Highways and Bridges", 1988 Edition, as amended.
 - b. Standard laying length shall be no less than 2-feet.
- B. Mortar
 - 1. In general, mortar shall be one part Portland cement and two parts (by volume) dry fine aggregate.
 - 2. Hydrated lime in an amount of less than 4 pounds of lime to each bag of Portland cement may be added if approved by the Engineer.
- C. Gravel Base
 - 1. Processed gravel base shall be as specified in Section 02 32 00 - Borrow Material
- D. Concrete Base
 - 1. Fill concrete shall be Massachusetts Department of Transportation (formerly MHD) Standard 3000 psi mix.
 - 2. Concrete fill shall meet the requirements of Section 03 30 00 (Cast-In-Place Concrete).

PART 3 EXECUTION

3.1 INSTALLATION

- A. All granite curbing, inlets, and corners shall be installed in accordance with the "Commonwealth of Massachusetts Department of Public Works Standard Specifications for Highway and Bridges 1988, as amended.
- B. Excavation shall be made of sufficient depth and width to accommodate the granular base.
- C. The line of the curbing shall be set straight and true for the full depth.
- D. The joints of all granite curbing shall be filled with cement mortar and neatly pointed on exposed surfaces. The joints of the stone curbing shall be pointed with mortar for the full depth of the curbing. Excess mortar shall be satisfactorily cleaned from the curb.
- E. At approximately 50-foot intervals, a ½ inch joint shall not be filled with mortar to be left free for expansion.
- F. The joints of all granite curbing shall be filled with cement mortar and neatly pointed on exposed surfaces. Excess mortar shall be satisfactorily cleaned from the curb.

3.2 REMOVING AND RESETTING GRANITE CURBING

- A. Remove curbs without causing damage.
- B. Store curbs removed in a manner that protects them from damage or discoloration. Replace curbs that are lost or damaged.
- C. Reset curbs in accordance with Section 500 of the "Commonwealth of Massachusetts Department of Public Works Standard Specifications for Highway and Bridges 1988, as amended.

END OF SECTION

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SECTION 32 17 23 – PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Traffic lines, legends and markings on asphalt and concrete surfaces.
2. Waterborne Traffic Paint.
3. Thermoplastic Pavement Markings.
4. Glass beads.

B. Related Sections:

1. Division 32 Section 32 12 16 - Asphalt Paving.

1.2 REFERENCES

A. American Association of State Highway and Transportation Officials:

1. AASHTO M247 - Standard Specification for Glass Beads Used in Traffic Paint.

B. MassDOT Standard Specifications:

1. Standard Specifications for Highways and Bridges, 2023, published by the Massachusetts Department of Transportation.

1.3 PERFORMANCE REQUIREMENTS

A. Paint Adhesion: Adhere to road surface forming smooth continuous film one minute after application.

B. Paint Drying: Tack free by touch so as not to require coning or other traffic control devices to prevent transfer by vehicle tires within 10 minutes after application.

1.4 SUBMITTALS

A. Division 1 Section 01 33 00 – SUBMITTAL PROCEDURES: Requirements for submittals.

B. Product Data: Submit paint formulation for each type of paint and glass beads if required.

C. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

D. Manufacturer's Installation Instructions: Submit instructions for application temperatures, eradication requirements, application rate, line thickness, and application of glass beads if required.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with Section 800 Traffic Control Devices of MassDOT Standard Specifications.

B. Maintain one copy of document on site.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum 5 years experience.
- B. Applicator: Company specializing in performing work of this section with minimum 5 years experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Division 1 Section 01 60 00 – PRODUCT REQUIREMENTS: Requirements for transporting, handling, storing, and protecting products.
- B. Invert containers several days prior to use when paint has been stored more than two months. Minimize exposure to air when transferring paint. Seal drums and tanks when not in use.
- C. Where glass beads are required, store glass beads in cool, dry place. Protect from contamination by foreign substances.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Division 1 Section 01 60 00 – PRODUCT REQUIREMENTS: Environmental conditions affecting products on site.
- B. Do not apply materials when surface and ambient temperatures are outside temperature ranges required by paint product manufacturer or:
 - 1. Waterborne Paint: Apply when ambient air temperature and surface temperature is minimum 40 degrees F and rising and a maximum of 160 degrees F.
 - 2. Thermoplastic: Do not apply until ambient air temperature and temperature of the pavement is 50 degrees F or higher.
- C. Do not apply materials during rain or snow when relative humidity is outside humidity ranges or moisture content of surfaces exceed those required by paint product manufacturer.
- D. Volatile Organic Content (VOC). Do not exceed State or Environmental Protection Agency maximum VOC on traffic paint.

PART 2 - PRODUCTS

2.1 PAINTED PAVEMENT MARKINGS

- A. Manufactures:
 - 1. Ennis Paint Co., (ennispaint.com).
 - 2. Franklin Paint Company (franklinpaint.com).
 - 3. EZ-Liner Industries (ezliner.com).
 - 4. TAPCO, Inc. (tapconet.com).
 - 5. Pervo Paint Company (pervo.com).
 - 6. Substitutions: Equal per Division 1 Section 01 60 00 – PRODUCT REQUIREMENTS.
- B. Furnish materials in accordance with Division 600 of MassDOT Standard Specifications.

- C. Waterborne Paint: Ready mixed, fast dry waterborne traffic paints, lead-free, non-toxic, suitable for roadway or parking lots.
- D. Thermoplastic: Alkyd based ready mixed, fast dry, lead free, non-toxic, for roadways.
- E. Glass Beads: AASHTO M247, Type 1, coated to enhance embedment and adherence with paint.

2.2 EQUIPMENT

- A. Roadway Application for Continuous Longitudinal Lines: Use equipment with following capabilities.
 - 1. Dual nozzle paint gun to simultaneously apply parallel lines of indicated width in solid or broken patterns or various combinations of those patterns.
 - 2. Pressurized bead-gun to automatically dispense glass beads onto painted surface, at required application rate.
 - 3. Measuring device to automatically and continuously measure length of each line placed, to nearest foot.
 - 4. Device to heat paint to manufacturer's temperature recommendation for fast dry and thermoplastic applications.
- B. Machine Calibration: Calibrate machines to meet specified tolerances.
- C. Other Equipment: For application of crosswalks, intersections, stop lines, legends, and other miscellaneous items by walk behind stripers, hand spray or stencil trucks, apply with equipment meeting requirements of this section. Do not use hand brushes or rollers. Optionally apply glass beads by hand.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not apply paint to concrete surfaces until concrete has cured for 28 days.

3.2 PREPARATION

- A. Maintenance and Protection of Traffic:
 - 1. Provide short-term traffic control in accordance with Division 1 Section 01 50 00 – TEMPORARY FACILITIES AND CONTROLS.
 - 2. Prevent traffic from interrupting or driving on newly applied markings before markings dry.
 - 3. Maintain roadway travel lanes between 7:00 a.m. to 9:00 a.m. and between 4:00 p.m. and 6:00 p.m.
 - 4. Maintain access to existing businesses and other properties requiring access.
- B. Surface Preparation.
 - 1. Clean and dry paved surface prior to painting.
 - 2. Blow or sweep surface free of dirt, debris, oil, grease, or gasoline.
 - 3. Spot location of final pavement markings as specified and as indicated on Drawings by applying pavement spots 25 feet on center.

4. Notify Engineer after placing pavement spots and minimum three days prior to applying traffic lines.

3.3 EXISTING WORK

- A. Remove existing markings in an acceptable manner. Do not remove existing pavement markings by painting over with black paint. Remove by methods that will cause least damage to pavement structure or pavement surface. Satisfactorily repair any pavement or surface damage caused by removal methods.
- B. Clean and repair existing or remaining lines and legends.
- C. Pavement markings shall be applied to the pavement only after the road has been milled and overlaid with new asphalt.

3.4 APPLICATION

- A. Agitate paint for 1-15 minutes prior to application to ensure even distribution of paint pigment.
- B. Dispense paint at temperature recommended by manufacturer to wet-film thickness of 15 mils.
- C. Dispense thermoplastic at temperature recommended by manufacture to thickness of:
 1. 120 mils for center lines, skip lines, transverse markings, and legends.
 2. 90 mils for edge lines diagonals and arrow symbols.
- D. Apply glass beads at rate of 1 to 3 pounds per gallon of paint.
- E. Apply markings to indicated dimensions at indicated locations.
- F. Prevent splattering and over spray when applying markings.
- G. Unless material is track free at end of paint application convoy, use traffic cones to protect markings from traffic until track free.
- H. When vehicle crosses a marking and tracks it or when splattering or overspray occurs, eradicate affected marking and resultant tracking, and apply new markings.
- I. Collect and legally dispose of residues from painting operations.

3.5 APPLICATION TOLERANCES

- A. Division 1 Section 01 40 00 – QUALITY REQUIREMENTS Tolerances.
- B. Maximum Variation from Wet Film Thickness: 1 mil.
- C. Maximum Variation from Wet Paint Line Width: Plus or minus 1/8 inch.
- D. Maintain cycle length for skip lines at tolerance of plus or minus 6 inches per 40 feet and line length or plus or minus 3 inches per 10 feet.
- E. Maximum Variation from Specified Application Temperature: Plus or minus 5 degrees F.

3.6 FIELD QUALITY CONTROL

- A. Division 1 Section 01 40 00 – QUALITY REQUIREMENTS: Field inspecting, testing, adjusting, and balancing.
- B. Inspect for incorrect location, insufficient thickness, line width, coverage,

retention, uncured or discolored material, and insufficient bonding.

- C. Repair lines and markings which after application and curing do not meet following criteria:
 - 1. Incorrect Location: Remove and replace incorrectly placed patterns.
 - 2. Insufficient Thickness, Line Width, Paint Coverage, Retention or Glass Bead Coverage (where required): Prepare defective material by acceptably grinding or blast cleaning to remove substantial amount of beads and to roughen marking surface. Remove loose particles and debris. Apply new markings on cleaned surface in accordance with this Section.
 - 3. Uncured or Discolored Material, Insufficient Bonding: Remove defective markings in accordance with this Section and clean pavement surface one foot beyond affected area. Apply new markings on cleaned surface in accordance with this Section.
- D. Replace failed or defective markings in entire section of defective markings within 30 days after notification when any of the following exists:
 - 1. Marking is discolored or exhibits pigment loss and is determined to be unacceptable by visual comparison with beaded color plates.
 - 2. If glass beads are used, the average retro-reflectivity is less than 375 mcd/m²/1x for white pavement markings and 250 mcd/m²/1x for yellow pavement markings.
- E. When eradication of existing paint lines is necessary, eradicate by shot blast or water blast method. Do not gouge or groove pavement more than 1/16 inch during removal. Limit area of removal to area of marking plus 1 inch on all sides. Prevent damage to transverse and longitudinal joint sealers, and repair any damage according to requirements in Division 32 Section 32 12 16 – Asphalt Paving.
- F. Maintain daily log showing work complete, results of inspections or tests, pavement and air temperatures, relative humidity, presence of any moisture on pavement, and any material or equipment problems. Make legible entries in log in ink, sign, and submit by end of each workday. Enter environmental data into log prior to starting work each day and at two additional times during day.

3.7 PROTECTION OF FINISHED WORK

- A. Division 1 Section 01 70 00 – EXECUTION REQUIREMENTS: Requirements for protecting finished Work.
- B. Protect painted pavement markings from vehicular and pedestrian traffic until paint is dry and track free. Follow manufacturer's recommendations or use minimum of 30 minutes. Consider barrier cones as satisfactory protection for materials requiring more than two minutes dry time.

3.8 SCHEDULES

- A. Pavement Markings:

Items	Location
4 inch white paint	Parking lot lines (18 feet long by 9 feet wide)
4 inch yellow paint	Parking lot lane lines
24 inch white thermoplastic	Stop line

6 inch yellow thermoplastic	Roadway center lines
6 inch white thermoplastic	Roadway edge lines

END OF SECTION

SECTION 32 32 23

SEGMENTAL RETAINING WALL SYSTEM

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Segmental retaining wall system
- B. Related Sections
 - 1. Section 02 31 50 – Excavation, Backfill, and Compaction
 - 2. Section 02 32 00 - Borrow Material
 - 3. Section 32 12 16 – Asphalt Pavement

1.2 REFERENCES

- A. National Concrete Masonry Association Design Manual for Segmental Retaining Walls – Latest Edition.

1.3 DESIGN REQUIREMENTS

- A. The contractor shall submit design and calculations for the retaining wall that shall be stamped by a professional engineer licensed in the state of Massachusetts. Calculations shall include a global stability analysis.
- B. Minimum design parameters:
 - 1. Global stability factor of safety = 1.3
 - 2. Overturning factor of safety under static loads = 1.5
 - 3. Sliding factor of safety under static loads = 1.5
 - 4. Geogrid pullout factor of safety = 1.5
 - 5. Seismic factor of safety = 1.1
- C. Minimum equivalent fluid pressure = 40 pounds per cubic foot (pcf) for gravity and cantilevered walls above groundwater and walls with appropriate drainage behind the wall.
- D. Hydrostatic water pressure along the height of the wall below groundwater should be included if drainage is not provided.
- E. Where the calculated earth pressure behind the wall is less than 250 pounds per square foot (psf), it should be increased to 250 psf to account for stresses created by compaction within 5 feet of the wall.
- F. Walls should be designed for appropriate sloping backfill.
- G. Walls should be designed to resist an earthquake force F_w evaluated in accordance with section 1610.2 of the Massachusetts state building code as follows:

$$F_w = 0.100 (S_s)(F_a)(GT)(H^2)$$

Where:

- S_s is the spectral response acceleration parameters at 0.2-second period equal to 0.206
- F_a is the site coefficient from Table 1613.3.3(1) of 2015 IBC (Site Class D);
- GT is the soil total unit weight ($GT = 130$ pcf for compacted gravel borrow);
- H is the height of the wall.

H. Wall designs shall consider effects of slope, traffic loads, building loads, guardrail and/or fencing as required. A minimum uniform surcharge load of 100 psf shall be used in the design

I. Wall design engineer shall consider height and specify safety rail where required.

1.4 SUBMITTALS

A. Submit a list of at least five successful projects of similar or greater size and complexity installed in the last five years by the Contractor using the same wall system proposed for this project. Project references shall include the following minimum information:

1. Project name and location
2. Owner contact information
3. Wall plans and specifications

B. Submit wall manufacturer product information for wall system proposed including a statement indicating project experience within the last five years of similar or greater size and complexity. Project references shall include the following minimum information:

1. Project name and location
2. Product brochures
3. Photographs of completed wall systems
4. Owner reference

C. Final design, which shall include detailed design calculations and all details, dimensions, quantities, and cross sections necessary to construct the wall. Along with the requirements of the Contract, the design shall conform to the latest edition of the National Concrete Masonry Association Design Manual for Segmental Retaining Walls. The fully detailed plans shall be 24" x 36" prints with Project Name, Number and Design Firm. The design parameters and factors of safety indicated on the contract drawings shall be used as minimum standard for this project. The shop drawings shall include, but not be limited to, the following items:

1. A plan and elevation sheet or sheets for each wall, containing the following:

- a. An elevation view of the wall which shall indicate the elevation at the top of the wall, at all horizontal and vertical break points and at least every twenty-five (25) feet along the wall, elevations at the top of leveling pads, elevations of reinforcement (if any), the designation as to the type of unit, and the location of the original and final ground line.
 - b. A plan view of the wall, which shall indicate: the offset from the construction centerline or baseline to the face of the wall at all changes in horizontal alignment and the limit of the widest unit.
 - c. Any general notes required for design and construction of the wall.
 - d. All horizontal and vertical curve data affecting wall construction.
2. All details for leveling pads, as well as allowable and calculated maximum bearing pressures.
 3. Backfill gradation, placement, and compaction requirements.
 4. Detailed design computations, including global stability calculations.
 5. The plans and calculations shall be prepared, stamped and signed by a Registered Professional Engineer in the Commonwealth of Massachusetts.
 6. The computations shall include all detailed explanation of any symbols and computer programs used in the wall design.
 7. Sample as requested by the Engineer

1.5 CLOSEOUT SUBMITTALS

A. As-Built Drawings

1. After completion of the installation and prior to final acceptance, the Contractor shall submit as-built Drawings of the wall construction stamped by a Registered Professional Engineer in the Commonwealth of Massachusetts.

1.6 QUALITY ASSURANCE

A. Certifications

1. The wall designer shall inspect the wall construction and provide a stamped Certification to the Engineer that it has been constructed in accordance with their design.

PART 2 PRODUCTS

2.1 MATERIALS

- A. All backfill material used in the wall construction shall be as specified by the wall designer on the approved wall plans. Backfill material requirements shown on the Drawings indicate the maximum particle size and maximum percentage of fines acceptable for use in the wall design. On-site material is not expected to be suitable as wall backfill unless approved by the projects geotechnical engineer.
- B. Retaining wall systems to be used on this Project shall be the product of one of these manufacturers:

1. Redi-Rock
2. Versa-Lok
3. Keystone
4. Or equal

PART 3 EXECUTION

3.1 PREPARATION

A. Foundation Preparation

1. The foundation for the structure shall be graded level as shown on the approved shop drawings. Prior to wall construction, the foundation, if not on sound, intact, bedrock, shall be compacted as indicated on the approved shop drawings. Any foundation soils found to be unsuitable, as defined in Section 02 13 50, shall be removed and replaced as directed by the Engineer. Subgrade preparation shall be performed in accordance with Section 02 31 50.

3.2 WALL ERECTION

- A. The wall system, including but not limited to, blocks, reinforcement, and backfill materials, shall be constructed in accordance with the wall manufacturer's recommendations and the latest edition of the National Concrete Masonry Association Design Manual for Segmental Retaining Walls, unless superseded by these Specifications or the approved shop drawings.
- B. Backfill placement shall closely follow erection of each course of wall units. Backfill shall be placed in such a manner as to avoid any damage to the wall materials or misalignment of the units. Any wall components, which become damaged or disturbed during backfill placement, shall be either removed and replaced or corrected at the Contractor's expense, as directed by the Engineer. All backfill material shall meet the requirements contained in Section 02 31 50 unless superseded by the approved shop drawings. Existing fill should not be used within three feet of cantilevered or gravity walls or within the reinforced area of MSE walls.

END OF SECTION

SECTION 32 90 00 – PLANTING

PART 1 – GENERAL

1.1 SCOPE OF WORK

- 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 shrubs and groundcovers
 - 2. Planting herbaceous plugs
 - 3. Planting bed preparation
 - 4. Installation of live stakes for bioengineering/slope stabilization
 - 3. Planting maintenance
 - 4. Two-year guarantee period for all plants

1.2 RELATED DOCUMENTS

- A. The General Documents, as listed on the Table of Contents, and applicable parts of Division 01, 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.

1.3 RELATED WORK UNDER OTHER SECTIONS

- A. The following items of related work are specified and included in other Sections of the Specifications:
 - 1. Division 31 Section: EARTHWORK
 - 2. Division 32 Section: PLANTING SOIL
 - 3. Division 32 Section: TURF & GRASSES

1.4 REFERENCES

- A. The following standards shall apply to the work of this Section.
 - 1. Michael Dirr's *Manual of Woody Landscape Plants* (latest revision 2009), or Michael Dirr's *Encyclopedia of Trees and Shrubs* (2011)
 - 2. Tree and Shrub Transplanting Manual, E.B. Himelick, 1991, International Society of Arboriculture
 - 3. American National Standards Institute (ANSI):
 - A300 Tree Care Industry Association (TCIA)
 - Z60.1 American Standard for Nursery Stock, latest edition, published by American Nursery & Landscape Association, (ANLA)

1.5 SUBMITTALS

- A. Submit proof of landscape contractor's experience to the Engineer in accordance with QUALITY ASSURANCE paragraph of this Section, PLANTING.
- B. 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.

- C. Material Sampling and Testing:
 - 1. Material Sampling and Testing of On-Site Loam: On-site loam shall be sampled and tested as specified, performed, and paid for under the Division 32 Section, PLANTING SOIL, of this Specification.
 - 2. Planting Mulch: Submit a one cubic foot sample.
 - 3. Anti-desiccant: Submit manufacturer's product data.
 - 4. Compost: Submit a one cubic foot sample and supplier's certification that compost conforms to these Specifications.
 - 5. Watering bags: Submit manufacturer's product data of product.
 - 6. 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 Section, PLANTING.

1.06 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.

1.07 QUALITY ASSURANCE

- A. Qualification of Landscape Contractor: The work of this 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 in ecological restoration. Proof of this experience shall be submitted per SUBMITTALS paragraph of this Section, PLANTING.

PART 2 – PRODUCTS

2.1 LOAM BORROW

- A. No loam borrow shall be used for this project. All planting soil shall be on-site soil amended as per the work of the Division 32 Section, PLANTING SOIL, of this Specification.
- B. Contractor shall perform a soil test with the on-site loam and submit to Engineer to determine if soil additives are needed.

2.2 SOIL ADDITIVES

- A. Soil additives shall be specified, provided, installed, and paid for under Section, PLANTING SOIL, of this Specification.

2.3 GRADES & STANDARDS OF PLANTS

- A. The Contractor shall furnish all plants shown on the Contract Documents, 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. Only plant stock grown within Hardiness Zones 1 through 6b, as established by the USDA Plant Hardiness Zone Map, latest edition, will be accepted.
- C. Plants shall be in accordance with ASNS Standards of the American Nursery & Landscape Association except as noted in this Section, PLANTING. Botanical plant names shall be in accordance with plant designations included in Dirr's *Manual of Woody Landscape Plants*.
- D. Plant materials that are grown in-ground shall be dug before deciduous trees leaf out, approximately May 1 (in Massachusetts). No in-ground plants dug after May 1 shall be accepted.
- E. 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.
- F. 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 one-quarter 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.
- I. All groundcover plants and vines shall meet the following standards:
 - 1. Groundcover plants and vines shall be of size, pot size, age, and condition listed in the PLANT SCHEDULE. When indicated on the PLANT SCHEDULE, the number of runners and the lengths of the runners of vines shall be minimums.
 - 2. Plants shall be healthy, free of insects, and diseases.
- J. All herbaceous material (perennial plugs) shall meet the following standards:
 - 1. Perennial plugs shall be listed in the PLANT SCHEDULE.
 - 2. Perennial plugs shall be healthy and well cared for, with no evidence of insects or diseases present. Insect-ridden or diseased plants shall be rejected. Plants shall have a deep green foliage and dense, compact growth. Perennials shall have multi-stemmed base.

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. 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.
- E. No plants shall be loose in the container.
- F. Container grown plants which have roots growing out of the container will be rejected.

2.5 LIVE STAKES FOR BIOENGINEERING

- A. Live stakes shall be 1/4-inch to 1-inch in diameter, in lengths from 2 feet to 4 feet.
- B. Live stakes shall be dormant at the time of delivery and installation.
- C. Live stakes shall be comprised of a mixture of the following species. Quantities, supplier, and species mix shall be submitted to the Landscape Architect for approval.

<u>Botanical name</u>	<u>Common name</u>
<i>Cornus amomum</i>	Silky dogwood
<i>Cornus sericea</i>	Redtwig dogwood
<i>Viburnum dentatum</i>	Arrowwood

- D. Approved Suppliers of live stakes include the following:
 - 1. New England Wetland Plants
South Hadley, Massachusetts
413-548-8000
www.newp.com
 - 2. Pierson Nurseries, Inc.
Biddeford, Maine
207-499-2994
www.piersonnurseries.com
 - 3. Ernst Conservation Seed
Meadville, PA
800-873-3321
www.ernstseed.com

2.5 PLANTING SOIL MIX

- A. Planting soil mix shall be an approved on-site loam specified, provided, installed, and paid for under the Division 32 Section, PLANTING SOIL, of this Specification and that has been pH adjusted according to planting applications and improved through the addition of organic matter as directed below. Contractor shall provide a soil test of the on-site loam and submit to the engineer to determine if any of the following amendments are need prior to planting. Planting loam 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, provided, installed, and paid for under the Division 32 Section, PLANTING SOIL.
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, provided, installed and paid for under the Division 32 Section, PLANTING SOIL, of this Specification.
3. In those areas indicated on the Contract Documents, augment planting soil mix with 10 percent gypsum. Thoroughly premix gypsum into planting soil mix prior to commencing the planting operations. Gypsum shall be specified, provided, installed, and paid for under the Division 32 Section, PLANTING SOIL, of this Specification.

2.6 WATER

- A. The Contractor shall be responsible to furnish their 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 their 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 ANTI-DESICCANTS

- A. Anti-desiccants 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 anti-desiccant shall be subject to the Engineer's approval and shall be used only after approval by the Engineer. Anti-desiccant 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 – GENERAL

- 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 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 loam, 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 Division 32 Section, PLANTING SOIL, of this Specification.
- 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 June 15
 - Evergreen materials: April 15 through June 1
 - Beachgrass and Live staking materials: November 1 through April 30

2. Fall:
 - Deciduous materials: October 1 through December 1
 - Evergreen materials: August 15 through October 15
 - Beachgrass and Live staking materials: Beachgrass materials: November 1 through April 30

- F. Plant Material Inspection:
 1. At a minimum of 21 days after the Notice to Proceed, the Contractor shall identify the supplying nursery or nurseries for approval. At least one month prior to the expected planting date, the Contractor shall request that the Engineer provide a representative to select and tag stock to be planted under this Section, PLANTING. The Contractor shall pay for the transportation, subsistence, and overnight accommodations, if necessary, for the Engineer's representative during the period of time required to select and tag the plant material.
 2. The Contractor shall be responsible to certify the availability of quality plants in specified sizes from his/her sources of supply prior to requesting that the Engineer make plant source inspections. In the event that plants at the inspection location are found to be unavailable or of insufficient size, the Contractor shall be liable to reimburse the Owner for all costs of the Engineer's hourly services which are incurred during unproductive inspection trips.
 3. Unless specifically designated otherwise, a representative of the Contractor shall accompany the Engineer on all plant material selection field trips.
 4. Plants to be inspected shall be in locations and conditions that allow direct and unobscured inspection by the Engineer. 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.
 5. 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.
 6. The Engineer and/or Conservation Agent reserves the right to reject any plant material once delivered to the site.

- H. Placement of Loam for planting soil shall be specified, performed, and paid for under the work of Section, PLANTING SOIL, of this Specification. Obtain Engineers written approval of work of rough grading and finish grading prior to starting the work of planting.

- I. Planting
 1. Notify the Engineer 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 the desired date of inspection of staking to schedule site visit.
3. 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 Section, PLANTING.
 4. 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 loam for reuse as backfill for plant pit. All subsoil excavated from the bottoms of planting pits shall be removed from the site.
 5. Plant pits shall be dug to the dimensions shown on the Contract Documents.
 - a. Plant pits for shrubs shall be dug to the depth of the rootball to be planted.
 - b. 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.
 6. 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.
 7. Remove container plants from containers prior to planting.
 8. 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 one-third of the root balls.
 10. Contractor shall 'butterfly' the root system for all container-grown plant material immediately prior to planting them. Butterflying shall consist of vertically cutting the containerized root ball with a spade through the bottom half of the rootball followed by gently pulling the rootball open at the cut while placing it into the planting hole. The butterflied root system shall be placed over a small ridge of soil in the planting pit in order to assure as much.
 11. Planting soil 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.
 12. 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, spread, and paid for under the Section, PLANTING SOIL, 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, performed, and paid for under the Section, PLANTING SOIL, of this Specification.
- J. 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.

- K. If planting is done after seeded areas have been installed, proper protection of seeded areas shall be provided. 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 Section, TURF & GRASSES, of this Specification and paid for under this Section, PLANTING.
- L. Absolutely no debris may be left on the site. Repair any damage to site as directed by the Engineer, at no additional cost.

3.2 PLANTING PLUGS

- A. Avoid digging holes for plants deeper than depth of root ball. Plant only to the depth directed.
- B. Avoid unnecessary soil compaction, including foot traffic, in planting area.
- C. Water plug trays thoroughly prior to laying out plants. Remove plugs from liner by hand by pushing up through bottom of liner. Do not pull the plant by the vegetative material. Do not 'tease' the root system apart.
- D. Install species in active growth, only. Installation of dormant material requires pre-authorization by Engineer.
- E. For areas with a slope greater than 3:1, use a biodegradable erosion control mat (RoLanka BioD-Mat 40, or approved equal) and/or approved cover crop. Secure erosion control matting prior to planting. Plant plugs through the erosion control layer.
- F. Mulch may be placed before planting.
- G. Ensure that the native soil level evenly matches the top of the plug. Tamp in soil around the plug to maximize soil-root contact and minimize potential for frost heaving.
- H. Thoroughly water each plug immediately after planting to reduce air pockets and maximize contact between plug roots and soil media.

3.3 LIVE STAKES FOR BIO-ENGINEERING

- A. Live stakes must be installed in their dormancy between November 1 and April 30. Live plant materials shall not be allowed to dry out.
- B. Live stakes shall be installed by manufacturer's instructions. A pilot hole shall be driven into firm soil. Stakes shall be planted at right angles with at least two-thirds of its length below finish grade. Plant stakes randomly approximately 42 inches apart.

3.4 MAINTENANCE

- A. Maintenance shall begin immediately after each plant is planted and shall continue for a minimum 90-day Monitoring Period within the growing season and until Final Acceptance.
 - 1. The growing season is from April 1 to November 1.
- 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, 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 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:

<u>Type of Plant/Size</u>	<u>Weekly Watering Rate</u>
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Shrubs:

Up to 2 ft. height	10 gallons
2 - 4 ft. height	20 gallons
4 - 6 ft. height	30 gallons

Perennials 5 gallons

- a. Water shall be applied by 1-inch diameter hose with an attached metering gauge.
 3. Individual plant pits shall be kept free of weeds, and mulch shall be replaced as required to maintain the specified layer of mulch. 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. Spraying of insecticides or herbicides shall be done by State-licensed professionals. Spraying for insects, pests and diseases shall conform to the National Arborist Association Standards under the section entitled "Standards for Pesticide Application Operations", as currently adopted and as approved by the Engineer. All insecticides, pesticides, and herbicides shall be EPA-approved and shall conform to the requirements of the Commonwealth of Massachusetts.
 6. 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.
- D. Contractor is responsible for watering the entire park for the duration of construction.

3.5 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 90-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 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.

3.6 GUARANTEE

- A. The date of the Certificate of Final Acceptance shall establish the commencement of the required two-year guarantee and establishment period for planting work.
- B. During the guarantee period, Contractor shall replace dead/damaged plants at their expense.
- C. 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 Section, PLANTING. Plants found to be unacceptable shall be removed promptly from the site and replaced according to this Section, PLANTING. A final inspection will be made after the replacement plants have lived through two years.
- 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

SECTION 32 91 13 – PLANTING SOIL

PART 1 – GENERAL

1.1 SCOPE OF WORK

- A. The work of this Section consists of providing all labor, equipment, materials, incidental work, and construction methods necessary to supply and place planting soil as indicated on the Contract Documents and as specified. Supplying and placement of planting soil shall include, but not be limited to:
 - 1. Sampling and testing of on-site loam
 - 2. Modifying, screening, placing, spreading, and grading of amended on-site loam
 - 3. Providing all other sampling, testing, supplying, placing, spreading, and grading of planting soil as required by this Section

1.2 RELATED DOCUMENTS

- A. The General Documents, as listed on the Table of Contents, and applicable parts of Division 01, 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.

1.3 RELATED WORK UNDER OTHER SECTIONS

- A. The following items of related work are specified and included in other Sections of the Specifications:
 - 1. Division 31 Section: EARTH MOVING
 - 2. Division 31 Section: SITE CLEARING
 - 3. Division 32 Section: PLANTING
 - 4. Division 32 Section: TURF & GRASSES

1.4 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - D 75 Practice for Sampling Aggregates
 - D 422 Test Method for Particle-Size Analysis of Soil
 - D698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³)
 - D1557 Moisture-Density Relations of Soil and Soil-Aggregate Mixtures using 10-lb Rammer and 18-in. Drop
- B. Association of Official Agricultural Chemists (AOAC)
- C. Massachusetts Department of Transportation (MassDOT): Standard Specifications for Highways and Bridges

1.5 SUBMITTALS

- A. 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 for approval in conformance with the requirements of Section, SUBMITTALS, of this Specification. 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 that does not meet these Specifications.

1. On-site Loam: The Contractor shall provide a 1 cubic foot representative sample for testing. All stockpile sampling shall be per ASTM D 75 and Appendixes for securing samples from stockpiles.

Testing will be at the Contractor's expense. Contractor shall deliver all samples to testing laboratories via overnight courier and shall have the testing report sent directly to the Engineer. Perform all tests for gradation, organic content, soil chemistry and pH by UMASS Soil and Plant Tissue Laboratory, West Experiment Station, North Pleasant Street, University of Massachusetts (UMass), Amherst, MA 01003, (413) 545-2311.

Testing reports shall be dated within 30 days of submission to the Engineer. Testing reports beyond 30 days old will be rejected and new testing reports mandated.

Testing reports shall include the following tests and recommendations. Contractor shall deliver samples to testing laboratories and shall have the testing report sent directly to the Engineer from the Soil and plant Tissue Laboratory.

Testing reports shall include the following tests and recommendations:

- a. Mechanical gradation (sieve analysis) shall be performed and compared to the USDA Soil Classification System. Sieve analysis shall be by combined hydrometer and wet sieving using sodium hexametaphosphate as a dispersant in compliance with ASTM D 422 after destruction of organic matter by H₂O₂. To facilitate review and approval of sieve analysis, provide a computer generated gradation curve from UMass Soil & Plant Tissue Laboratory.
 - b. Percent of organics shall be determined by the loss on ignition of oven-dried samples. Test samples minus #10 material shall be oven-dried to a constant weight at a temperature of 450 degrees Fahrenheit (752 degrees Centigrade).
 - c. Chemical analysis shall be undertaken for Nitrate Nitrogen, Ammonium Nitrogen, Phosphorus, Potassium, Calcium, Magnesium, extractable Aluminum, Lead, Zinc, Cadmium, Copper, Soluble Salts, and pH and buffer pH. A Conductivity Meter shall be used to measure Soluble Salts in 1:2 soil/water (v/v). Except where otherwise noted, nutrient tests shall be for available nutrients.
 - d. Soil analysis tests shall show recommendations for soil additives to correct soil deficiencies as necessary, and for additives necessary to accomplish turf areas and planting work as specified.
2. Compost: Submit a one cubic foot sample and supplier's certification that compost conforms to these Specifications.
 3. Limestone: Submit supplier's certification that the limestone being supplied conforms to these Specifications.
 4. Acidulant: Submit supplier's certification that the acidulant being supplied conforms to these Specifications.
 5. Mycorrhizal fungal inoculant for new planting of broadleaf evergreens: Submit manufacturer's product data.
 6. Fertilizer:
 - a. Submit product data of planting fertilizer and certificates showing composition and analysis. Submit fertilization rates for fertilizer product based upon soil testing, analysis, and recommendations as specified, performed and paid for under in this Section, PLANTING SOIL.
 - b. Submit the purchasing receipt showing the total quantity purchased for the project prior to installation.
 7. Gypsum: Submit manufacturer's product data and 2-pound sample.

8. Any and all additives needed to amend a specific soil in order to meet these specifications.

1.6 EXAMINATION OF CONDITIONS

- A. All areas of the existing site where topsoil is to be sampled for testing shall be inspected by the Contractor before starting work and any issues that might inhibit or prevent the sampling operation shall be reported to the Engineer prior to beginning this work.
- B. The Contractor and any sub-Contractor responsible for the execution of the Work of this Section, PLANTING SOIL, shall review and confirm in writing that the subsoil elevations have been brought to the proper subgrade elevations prior to proceeding with the spreading of the planting soil.

PART 2 – EXECUTION

2.1 FILLING & COMPACTION

- A. Subsoil or ordinary borrow shall have been excavated and filled as required by the Contract Documents and specified and paid for under the Division 31 Section, EARTH MOVING, of this Specification. Do not damage the work previously installed. Maintain all required angles of repose of materials adjacent to the loam as shown on the Contract Documents. Do not over excavate compacted subgrades of adjacent pavement or structures during loaming operations.
- B. Confirm that the subgrade is at the proper elevation and that no further earthwork is required to bring the subgrade to proper elevations. Subgrade elevations shall slope parallel to the finished grade and or toward the subsurface drain lines as shown on the Contract Documents.
- C. Clear the subgrade of all construction debris, trash, rubble, and any foreign material. In the event that fuels, oils, concrete washout or other material harmful to plants have been spilled into the subgrade material, excavate the soil sufficiently to remove the harmful material. Such construction debris, trash, rubble, and foreign material shall be removed from the site and disposed of in a legal manner. Fill any over excavation with approved fill and compact to the required subgrade compaction levels.
- D. Do not proceed with the installation of planting soil until all utility work in the area has been installed.
- E. Protect adjacent hardscape work and utilities from damage or staining by the planting soil. Use 0.5-inch plywood and or plastic sheeting as directed to cover existing concrete, metal and masonry work and other items as directed during the progress of the work. Clean up all trash and any soil spilled on any paved surface at the end of each working day.

2.2 FINE GRADING

- A. Place planting soil in two lifts. Place the first lift to a depth of 2 inches and harrow or till the planting soil into the underlying subsoil to a depth of 2 inches, creating a blended interface of planting soil and subsoil approximately 4 inches deep. Spread the second lift of planting soil to a minimum depth of 4 inches or greater as shown on the Contract Documents.
- B. No planting soil shall be handled, planted in any way if it is in a wet or frozen condition; moist planting soil is desirable.
- C. Soil additives shall be spread and thoroughly incorporated into the layer of planting soil by harrowing or other methods reviewed by the Engineer. The following soil additives shall be incorporated:
 1. Ground limestone or acidulant as required by soil analysis to achieve the required Ph.
 2. Fertilizer at the rate and of analysis recommended by the soil analysis

3. Other soil amendments as required by soil analysis.
 - D. Sufficient grade stakes shall be set for checking the finished grades. Stakes must be set in the bottom of swales and at the top of slopes. Deviation from indicated elevations that are greater than one-tenth of a foot shall not be permitted. Connect contours and spot elevations with an even slope. Finish grades shall be smooth and continuous with no abrupt changes at the top or bottom of slopes.
 - E. During the compaction process, all depressions caused by settlement or rolling shall be filled with additional planting soil and the surface shall be regraded and rolled until presenting a smooth and even finish corresponding to the required grades.
 - F. The Contractor shall install planting soil in successive horizontal lifts no thicker than 6 inches in seeded areas and 12 inches in plant beds to the desired compaction as described herein. The Contractor shall install the soil at a higher level to anticipate any reduction of planting soil volume due to compaction, settling, erosion, decomposition, and other similar processes during the warranty period. The Engineer will ensure that the full depths of planting soil for seeded areas and plant beds are obtained by digging holes in the planting soil at the same frequency as for compaction testing.
 1. Compact planting soil to the required density as specified herein.
 2. Maximum dry density for topsoil and loam shall be determined in accordance with ASTM D698. The following percentages of minimum to maximum dry densities shall be achieved for fill materials or prepared subgrades.
 - a. In seeded areas and plant beds: 80 to 85%
 3. The surface area of each lift shall be scarified by raking prior to placing the next lift.
 - G. Select equipment and otherwise phase the installation of the planting soil to ensure that wheeled equipment does not travel over subsoil, placed fills, or ordinary borrow or already installed soil.
 - H. Disturbed areas outside the limit of seeded areas shall be graded smooth and spread with a minimum of 6 inches of planting soil to the finished grade.
- 2.3 ACCEPTANCE
- A. Confirm that the final grade of the planting soil is at the proper finish grade elevations. Adjust grade as required to meet the contours and spot elevations noted on the Plans. Request the presence of the Engineer to inspect final grade. Do not proceed with the remaining work of this Contract until the Engineer has given his/her written approval of the final grade.

END OF SECTION

SECTION 32 92 00 – TURF & GRASSES

PART 1 – GENERAL

1.1 SCOPE OF WORK

- A. The work of this Section consists of providing all labor, equipment, materials, incidental work, and construction methods necessary to perform all installation of seeded areas 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. Conservation seed mix
 - 2. Planting of American beachgrass
 - 3. Maintenance & protection

1.2 RELATED DOCUMENTS

- A. The General Documents, as listed on the Table of Contents, and applicable parts of Division 01, 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.

1.3 RELATED WORK UNDER OTHER SECTIONS

- A. The following items of related work are specified and included in other Sections of the Specifications:
 - 1. Division 32 Section: PLANTING
 - 2. Division 32 Section: PLANTING SOIL

1.4 SUBMITTALS

- A. Submit proof of landscape contractor's experience to the Engineer in accordance with Quality Assurance paragraph of this Section.
- B. At least 30 days prior to intended use, the Contractor shall provide the following samples and submittals for approval in conformance with the requirements of Section, Submittals. Do not order materials until the 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.
 - 1. Material Sampling and Testing of On-Site Loam shall be specified, performed, and paid for under Division 32 Section, PLANTING SOIL, of this Specification.
 - 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 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 copies of manufacturer's literature and one material sample.
7. All additives needed to amend a specific soil in order to meet these specifications based on results of required testing.

1.5 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, TURF & GRASSES.
- B. The Contractor shall be solely responsible for judging the full extent of work requirements involved.

1.6 QUALITY ASSURANCE

- A. Qualification of Landscape Contractor: The work of this Section, Seeding, 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 paragraph of this Section, Seeding.
- 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. Certification shall be current. Proof of certification shall be submitted per Submittals paragraph of this Section, Seeding.

PART 2 – PRODUCTS

2.1 LOAM BORROW

- A. No loam borrow shall be used for this project. All planting soil shall be on-site soil amended as per the work of the Division 32 Section, PLANTING SOIL, of this Specification.

2.2 SOIL ADDITIVES

- A. Soil additives shall be specified and provided under the work of the Division 32 Section, PLANTING SOIL, of this Specification.

2.3 CONSERVATION SEED MIXES

- A. The Contractor shall provide Conservation Seed as designated on the Contract Drawings.
- B. Type 1: Native seed mix for steep slopes & erosion control
 1. The Basis of Design for Type 1 Conservation Seed Mix shall be ERNMX-181 "Native Steep Slope Mix" as manufactured by Ernst Seeds of Meadville, PA. Approved equals may be submitted for evaluation, but must be the following specifications:
 2. Seed Mixture Composition:

<u>Composition</u>	<u>Botanical name</u>	<u>Common name</u>
31.1%	<i>Sorghastrum nutans</i>	Indiangrass
14.0%	<i>Andropogon gerardii</i> , 'Southlow'	Big Bluestem
11.0%	<i>Elymus virginicus</i> , Madison	Virginia Wildrye
10.0%	<i>Elymus canadensis</i>	Canada Wildrye
4.0%	<i>Panicum virgatum</i> , 'Shawnee'	Switchgrass, 'Shawnee'
3.0%	<i>Panicum clandestinum</i> , Tioga	Deertongue, Tioga
1.5%	<i>Echinacea purpurea</i>	Purple Coneflower
1.3%	<i>Chamaecrista fasciculata</i>	Partridge Pea
1.2%	<i>Heliopsis helianthoides</i>	Oxeye Sunflower
1.0%	<i>Coreopsis lanceolata</i>	Lanceleaf Coreopsis
1.0%	<i>Rudbeckia hirta</i>	Blackeyed Susan
0.3%	<i>Monarda fistulosa</i> , Fort Indiantown Gap	Wild Bergamot
0.2%	<i>Asclepias syriaca</i>	Common Milkweed
0.2%	<i>Solidago rugosa</i>	Wrinkleleaf Goldenrod
0.1%	<i>Aster novae-angliae</i>	New England Aster
0.1%	<i>Aster pilosus</i>	Heath Aster

3. Conservation seed mix shall be applied at a rate of 75 pounds per acre.
4. Nurse crop
 - a. If planted in spring: *Avena sativa* (grain oats) shall be blended with the conservation seed mix by the fabricator at a minimum 20% composition; ERNMX-181-1
 - b. If planted in fall: *Secale cereal* (grain rye) shall be blended with the conservation seed mix by the fabricator at a minimum 20% composition; ERNMX-181-2

2.4 WOOD CELLULOSE FIBER MULCH

- A. Mulch to cover hydroseeded areas with slopes less than 3:1 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.

2.5 PLANTING OF AMERICAN BEACHGRASS

- A. All beachgrass shall meet the following standards: Beachgrass shall be dormant bare root culms as listed in the PLANT SCHEDULE.
- B. American beachgrass shall be planted in straight sand, per Item No. 154 SAND BORROW.

2.6 HERBICIDES, CHEMICALS & 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.

2.7 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.
- B. Contractor shall keep log of watering schedule and volume applied. Log shall be signed by Foreman and submitted to Engineer.

PART 3 – EXECUTION

3.1 FILLING & COMPACTION

- A. Filling and compaction of loam shall be specified, performed, and paid for under the work of the Division 32 Section, PLANTING SOIL, of this Specification.

2.2 FINE GRADING

- A. Fine grading shall be specified, performed, and paid for under the work of the Division 32 Section, PLANTING SOIL, of this Specification.

3.3 SEEDING

- A. Contractor shall obtain Engineer's written approval of fine grading and bed preparation before doing any seeding.
- B. Limit of grading and earthwork shall be limit of seeding unless otherwise indicated on the Contract Documents. All 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 June 1 and from August 15 to September 30.
 - 1. The actual planting of seed shall be done 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 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 of 46 pounds per 1,000 square feet or 2,000 pounds per acre.
 - 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 grading and earthwork shall be limit of hydroseeding unless otherwise indicated on the Contract Documents. All 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 PLANTING OF AMERICAN BEACHGRASS

- A. Season for Planting (Beachgrass): November 1 through April 1.

3.5 TURF MAINTENANCE

- A. Maintenance shall begin immediately after any area is seeded and shall continue for a 90-day active growing period for seeded areas past Final Acceptance. The completion of all lawn construction work, and until final acceptance of the project.
 1. In the event that seeding operations are completed too late in the autumn for adequate germination and growth of grass, then maintenance shall continue into the following spring for the minimum 60 Day period. In addition, install blankets or netting to prevent loam degradation and movement over the winter. Submit product literature and samples to the Engineer for review. Blankets and netting shall be placed in a timely manner at no additional cost to the Owner.
 2. Contractor shall be responsible for the timely care and maintenance of the existing turf areas in the park from receipt of Notice to Proceed until Final Completion. Maintenance shall include mowing (turf shall not be allowed to grow longer than 4 inches).
- B. Maintenance shall include reseeding, 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. Turf area 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 seeded 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 turfgrass stand. 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 2 inches for seeded areas. Begin watering immediately after seeding.

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. Fertilizing: The first application of fertilizer is specified, provided, performed, and paid for under Division 32 Section, PLANTING SOIL.

3.6 ACCEPTANCE

- A. Acceptance of seeded turf shall be in advance of contract Final Completion. If additional time is required for turf establishment, the Contractor shall notify the Engineer in writing at least 60 days in advance of Final Completion.
- B. Following the minimum required maintenance periods for seed establishment, 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.
- C. 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. Seeded areas to be corrected shall be prepared and reseeded in accordance with the requirements of this Section, TURF & GRASSES.
 2. At the time of acceptance, the Contractor shall remove temporary barriers used to protect turfgrass areas.
- D. Furnish full and complete written instructions for maintenance of the seeded areas to the Owner at the time of acceptance in conformance with Submittals requirements.
- E. Engineer's inspection shall determine whether maintenance shall continue in any part.

3.07 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.
- B. Clean wheels of vehicles before leaving site.

END OF SECTION

SECTION 33 05 62

BREAKING INTO EXISTING MANHOLES AND CATCHBASINS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Breaking through the walls and inverts of existing manholes.
 - 2. Connecting new pipes to existing structures.
 - 3. Ancillary work associated with making the new connections to the existing structures.

1.2 REFERENCES

- A. ASTM C443 – Standard Specification for Joints for Circular Concrete Sewer and Culvert Piping Using Rubber Gaskets.
- B. ASTM C923 - Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals.

1.3 SUBMITTALS

- A. Submit shop drawings showing pipe connection details.

1.4 QUALITY ASSURANCE

- A. Personnel shall have confined space entry training as appropriate for the work to be performed.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Flexible Pipe-to-Structure Connectors
 - 1. The flexible connectors shall be designed to provide a positive seal between the connector and the structure wall and between the connector and the pipe.
 - 2. The flexible boot shall be manufactured of EPDM synthetic rubber in accordance with ASTM C443 and C923 and shall be 3/8 inch thick or greater.
 - 3. The external bands shall be made entirely of 304 series non-magnetic stainless steel.
 - 4. The flexible connectors shall be provided with a wedge-type or toggle-type expander to secure the pipe in the structure opening.
 - 5. The flexible connectors shall meet the following criteria, in accordance with ASTM C923:
 - a. Shall not leak when subjected to a head pressure of 10 psi for 10 minutes.

- b. Shall have the ability to deflect 7 degrees in any direction without leakage under the head pressure conditions described above.
 - c. Shall not leak when subject to a load of 150 lbs./in. pipe diameter and the head pressure conditions described above.
- B. Non-shrink, water-proof grout
- 1. Non-shrink, water-proof grout shall be Hallemite; Waterplug; Embecco; or equal.

PART 3 EXECUTION

3.1 INSTALLATION

A. General

- 1. Core drill into existing structures in such a fashion as to make an opening of suitable size to accommodate the connecting pipe without excessive damage to the existing structure.

B. Manholes

- 1. For manholes, break out and rebuild existing inverts as required to provide an adequate base under the new channels being installed, and shaped to provide smooth continuous hydraulic flow through the manhole.
- 2. Control existing flows as required during the period of construction. No sewage or drainage will be permitted to flow directly against concrete or other masonry work until it is at least 48 hours old.
 - a. Temporary handling of sewage or drainage flows may be accomplished by inserting pipes from the inlet to the outlet of the manhole and by using temporary plugs, where appropriate, provided that such pipes do not interfere with satisfactory completion of the work and shaping of the inverts, nor cause excessive backing-up in the existing system upstream of the diversion. In cases where this type of temporary handling of flows is not possible, provide the necessary dams, plugs, etc., as required in upstream manholes, and pump the flow around the structure under construction.
 - b. When sewage is pumped or otherwise diverted around a particular structure, it shall be discharged back into the sewage system through existing downstream manholes. Under no circumstances shall sewage be permitted to run onto the surface of the ground.

C. Pipe Connections

- 1. Rebuild and tightly close existing manhole walls and inverts to provide an integral, water-tight structure around the new pipes.
- 2. For pipes with smooth exterior surfaces (PVC, ductile iron, HDPE, steel, etc), use flexible pipe-to-structure connectors.

3. Where flexible pipe-to-structure connectors cannot be used, such as pipes with rough, irregular or corrugated exterior surfaces (concrete, corrugated metal or HDPE, etc):
 - a. After the new pipe has been set in place, completely fill the hole around the new pipe and structure with non-shrink, water-proof grout.
 - b. Place a 6 inch thick concrete encasement a total of 12 inches in length around the pipe stub adjacent to the exterior wall of the structure. Concrete shall have a 28 day compressive strength of 3,000 psi.

END OF SECTION

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SECTION 33 42 13

HIGH DENSITY POLYETHYLENE PIPE AND FITTINGS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. High density polyethylene (HDPE) pipe for:
 - a. Storm drainage lines
2. Types of HDPE piping specified in this Section include:
 - a. Corrugated exterior, smooth interior, solid wall HDPE pipe

B. Related Sections

1. Section 02 31 50 – Excavation, Backfill, Compaction and Dewatering
2. Section 02 32 00 – Borrow Materials

1.2 REFERENCES

- A. AASHTO M252 –Corrugated Polyethylene Drainage Pipe
- B. AASHTO M294 – Corrugated Polyethylene Pipe, 300- to 1200-mm Diameter
- C. AASHTO MP7 – Corrugated Polyethylene Pipe, 1300- to 1500-mm Diameter
- D. AWWA C901 – Standard for Polyethylene Pressure Pipe and Tubing, ½-Inch through 3-Inch for Water Service
- E. AWWA C906 – Standard for Polyethylene Pressure Pipe and Fittings, 4-inch through 64-inch for Water Distribution.
- F. ASTM D1248 – Standard Specification for Polyethylene Plastics Extrusion Materials For Wire and Cable
- G. ASTM D2239 – Standard Specification for Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter
- H. ASTM D2321 – Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
- I. ASTM D2412 – Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading
- J. ASTM D2683 – Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing
- K. ASTM D2737 – Standard Specification for Polyethylene (PE) Plastic Tubing
- L. ASTM D2774 – Standard Practice for Underground Installation of Thermoplastic Pressure Piping

- M. ASTM D2837 – Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials
- N. ASTM D3212 – Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
- O. ASTM D3261 – Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing
- P. ASTM D3350 – Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
- Q. ASTM F405 – Standard Specification for Corrugated Polyethylene (PE) Tubing and Fittings
- R. ASTM F585 – Practice for Insertion of Flexible Polyethylene Pipe into Existing Sewers
- S. ASTM F667 – Standard Specification for Large Diameter Corrugated Polyethylene Pipe and Fittings
- T. ASTM F714 – Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter.
- U. ASTM F894 – Standard Specification for Polyethylene (PE) Large-Diameter Profile Wall Sewer and Drain Pipe
- V. ASTM F905 – Standard Practice for Qualification of Saddle Fusion Joints
- W. ASTM F1417 – Standard Test Method for Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air
- X. ASTM F1962 – Guide for Use of Maxi-Horizontal Directional Drilling for Placement of Polyethylene Pipe or Conduit Under Obstacles, Including River Crossings
- Y. ASTM F2620 - Standard Practice of Heat Fusion Joining of Polyethylene Pipe and Fittings
- Z. AWWA C153 / ANSI A21.53 – Standard for Ductile-Iron Compact Fittings for Water Service
- AA. AWWA C901 – Polyethylene (PE) Pressure Pipe and Tubing, ½-Inch (13 mm) Through 3-Inch (76 mm), for Water Service
- BB. AWWA C906 – Polyethylene (PE) Pressure Pipe and Fittings, 4-Inch (100 mm) Through 63-Inch (1,575 mm), for Water Distribution and Transmission
- CC. NSF/ANSI Standard 61 – Drinking Water System Components

1.3 SUBMITTALS

- A. Submit product data on the pipe, fittings, and accessories.
- B. Prior to first shipment of pipe, submit certified test reports that the pipe for this Contract was manufactured and tested in accordance with the appropriate ASTM standards specified herein.

1.4 QUALITY ASSURANCE

- A. Use an adequate number of skilled laborers, equipment of adequate size, capacity, and quantity to perform the work of this Section, and its related Sections, in a timely manner.

1.5 DELIVERY, STORAGE AND HANDLING

- A. When lifting with slings, only wide fabric choker slings capable of safely carrying the load shall be used. Wire rope or chain shall not be used to handle pipe.

PART 2 PRODUCTS

2.1 MANUFACTURER – GENERAL

- A. The manufacturer shall have manufacturing and quality assurance facilities capable of producing and assuring the quality of the pipe and fittings required by these specifications.
- B. Pipe and fittings from different manufacturers shall not be interchanged for the same type of pipe and application.

2.2 PIPE IDENTIFICATION

- A. The following shall be continuously indent printed on the pipe or spaced at intervals not exceeding five-feet:
 - 1. Name and/or trademark of the pipe manufacturer.
 - 2. Nominal pipe size.
 - 3. Dimension ratio.
 - 4. The letters “PE” followed by the polyethylene grade in accordance with the ASTM designation, followed by the hydrostatic design basis in PSI.
 - 5. A production code from which the date and place of manufacture can be determined.

2.3 SMOOTH INTERIOR/SMOOTH EXTERIOR HDPE PIPE

- A. Approved manufacturers include Performance Pipe, a Division of Chevron Phillips Chemical Company LP, or equal.
- B. Pipe shall be made of virgin, extra high molecular weight polyethylene compounds equaling a PE 4710 designation, which meet or exceed the requirements of ASTM D-3350, Cell Class 445574C.
- C. Pipe shall be manufactured in accordance with ASTM F-714.
- D. The pipe and fittings shall be free from foreign inclusions and visible defects. The ends of the pipe shall be cut squarely and cleanly so as not to adversely effect joining.
- E. Pipe and fittings shall be joined by butt fusion welding.
- F. Polyethylene fittings shall be fabricated to the same outside diameter, wall thickness, and tolerances as the mating pipe.

- G. Standard laying lengths shall be 40-feet.
- H. All smooth HDPE pipe and fittings shall have SDR ratings as shown on the project drawings.

2.4 CORRUGATED EXTERIOR/SMOOTH INTERIOR HDPE PIPE AND FITTINGS

A. General

1. The polyethylene pipe and fittings shall comply with AASHTO M294, Type S (smooth wall interior).
2. Piping shall be manufactured by Advanced Drainage Systems, Inc., or equal.
3. Pipe material and fittings shall be high density polyethylene meeting ASTM D3350 minimum cell classification 324420C (4"-10") or 325420C (12"-60").
4. Installation shall be in accordance with ASTM D2321.
5. Pipe shall be joined with the bell-and-spigot joint. Gaskets and joint lubricant shall be utilized.
6. Minimum parallel plate pipe stiffness shall be as recommended for each specified diameter pipe per ASTM Test Method D2412.
7. The pipe and fittings shall be free of foreign inclusions and visible defects. The ends of the pipe shall be cut squarely and cleanly so as not to adversely effect joining.
8. The nominal size of the pipe and fittings is based on the nominal inside diameter of the pipe. Corrugated fittings may be either molded or fabricated by the manufacturer. Fittings and gaskets supplied by manufacturers other than the supplier of the pipe shall not be permitted without the approval of the Engineer.

2.5 JOINTS FOR CORRUGATED PIPING

A. General

1. Joints of corrugated pipe sections and fittings other than smooth interior, shall be made with split couplings, corrugated to engage the pipe corrugations, and shall engage a minimum of 4 corrugations, 2 on each side of the pipe joint. Where required by the Engineer, a neoprene gasket shall be utilized with the coupling to provide a soil tight joint.
2. Joints of smooth interior, corrugated pipe sections shall be as per manufacturer's instructions utilizing gasketed PVC or HDPE joints meeting ASTM D-3212.
3. Installation shall be in accordance with ASTM Recommended Practice D-2321 or as specified by the Engineer or local approving agency.

B. Leak Resistant/Silt-Tight Pipe

1. Pipe shall provide soil-tight joints with built-in gaskets. Bee joints shall be same as the outside diameter of the pipe.

2. Shall be ADS, N-12 IB ST (soil-tight joint type) piping, or equal.
 3. Meets silt-tight & leak resistant (not defined as watertight) joint requirements.
 4. For non-watertight connections, exterior HDPE culvert coupling may be used with dedicated ties.
 5. Polyethylene flared end sections shall be manufactured to the same criteria as mainline pipe sections.
 6. Non-Watertight Manhole Connections - To be made with non-shrink grout.
- C. Watertight Pipe
1. Provides superior watertight performance.
 2. Meets ASTM D3212 requirements of 10.8 PSI for 10 minutes with no leakage.
 3. Shall be ADS, N-12 IB WT (watertight joint type) piping, or equal.
- D. Manhole Boot Connection
1. Watertight seal made with rubber manhole boot as manufactured by Press Seal, or equal.
 2. Alternatively, watertight seal made by Alok, or equal, in which case maximum insertion angle is 7 degrees.
- E. Watertight Seals for Corrugated HDPE Pipe - Shall be NPC Corrugated Pipe Adapter compatible with Kor-N-Seal manhole connector.

PART 3 EXECUTION

3.1 PREPARATION

- A. The Contractor shall verify that the surface has been prepared to the proper line and grade by shooting invert elevation grades.

3.2 INSTALLATION

A. Open-Cut Installations

1. Polyethylene pipe and fittings shall be installed in accordance with ASTM Standards, and the manufacturer's recommendations.
2. Pipe is to be lifted or rolled into position, not dragged over the prepared bedding.
3. The pipe is to be set at the slope and grades indicated on the plans. Ensure pipe remains at proper grades by shoring it.
4. All HDPE piping shall be bedded in 6" of crushed stone unless noted otherwise.
5. Crushed stone shall be used as backfill to a point of 6" above the top of the pipe unless noted otherwise.

6. Clay dams shall be installed in the stone backfill as directed by the Engineer to prevent groundwater migration. Spacing shall be 50 ft. maximum. Clay borrow shall be in accordance with Section 31 05 13 requirements for low permeability borrow.
7. Open-Trench Installations - Prepare the area in accordance with Section 31 23 00 – Excavation, Backfill and Compaction.
8. No single piece of pipe shall be laid unless it is generally straight. The centerline of the pipe shall not deviate from a straight line drawn between the centers of the openings at the ends of the pipe by more than 1/16 inch per foot of length. If a piece of pipe fails to meet this requirement check for straightness, it shall be rejected and removed from the site. Laying instructions of the manufacturer shall be explicitly followed.
9. Install piping and fittings true to alignment and grade. If necessary, each length of pipe shall be cleaned out before installation.

B. Joint Couplings

1. Joint couplings shall be installed in accordance with manufacturer's recommendations.
2. Remove the protective paper and wrap the collar around the pipe with the mastic side to the pipe. The overlap shall be at the top of the pipe.
3. Secure the steel straps.
4. The closing flap shall cover the exposed straps.
5. Encase the entire joint with a minimum of 8 inches of concrete on all sides. The concrete encasement shall extend along the pipe 12 inches on each side of the joint.

END OF SECTION

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SECTION 35 31 19 – STONE REVETMENTS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section covers all work involved with the harvesting of existing site stone, resetting of suitable harvested stone, and setting of the quarry supplied revetment as shown on the project drawings.

1.2 SUBMITTALS

- A. Shop drawings or work drawings and material specifications shall be submitted to the Engineer for review for each type of material furnished. General installation practices and installation schedule shall be included.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All materials shall be inert to chemical and biological degradation including to Seawater and UV rays from the sun, all materials shall have adequate freezing and thawing resistance for the range of anticipated weather conditions.
- B. Stones shall have high specific gravity and low absorption and shall be able to withstand the design impact conditions.

2.2 FILTER FABRIC

- A. The filter fabric shall be woven filtration geotextile comprised of monofilament polypropylene yarns. The filter fabric shall have the following general properties;

<u>Geotextile Property</u>	<u>Minimum Average Roll Value</u>
Grab Tensile Strength (lbs.):	315
Grab Tensile Elongation (%):	15
Trapezoidal Tear Strength (lbs.):	120
CBR Puncture Strength (lbs.):	900
Apparent Opening Size (AOS):	40 US std. (Maximum)
Permittivity (sec ⁻¹):	0.05
Flow Rate (gpm/sf):	4
UV Resistance (% strength retained):	70

- B. Filter Fabric: Mirafi 600X, or approved equal.

2.3 BEDDING LAYER

- A. The Bedding layer shall be installed to a minimum depth of 9 inch to 12 inch or as shown on the project drawings.

- B. Stones should be within the size range specified and the material should be well blended. Stones with the largest dimension greater than three times the least dimension should not constitute more than 10% of the total.

2.4 RIPRAP REVETMENT STONES

- A. Riprap toe stones shall be 5 ton to 6 ton stones installed to the depth shown on the project drawings.
- B. The riprap revetment shall be constructed in layers with the smaller 2 to 3 ton stones at the bottom layer of the revetment, and the larger 4 to 6 ton stones on the top or outer layer.
- C. At least 50% of the riprap stone shall exceed the mean weight specified (3 Ton). The maximum riprap stone dimension shall not be more than 2 times the minimum riprap stone dimension. Stones with their largest dimension greater than two times the least dimension will be rejected.
- D. Armor stones to be used on the slope above the boardwalk shall be a minimum of 200 lbs.

2.5 TESTING

- A. The Contractor shall submit to the Engineer for approval the source of the stone and evidence that the stone is suitable for the proposed application. The necessary evidence shall include, but not necessarily be limited to, the following testing:
 - 1. Grain Size: ASTM D422 or equivalent
 - 2. Abrasion Test: ASTM C5535 or equivalent
 - 3. Toughness Test: ASTM C-170 or equivalent
 - 4. Hardness Test: ASTM C-235 or equivalent
 - 5. Apparent specific gravity and absorption test: ASTM C-127 or equivalent
- B. Testing of materials shall be performed by an independent laboratory approved by the Engineer. The laboratory cost shall be paid by the contractor.
- C. Testing of stone shall be conducted every 100-foot length of revetment.
- D. The Engineer will conduct visual inspections of each truck load to visually assess the stone delivered to the Site. If in the opinion of the Engineer the stone is unsuitable, the stone shall be rejected. The Contractor will be responsible at their expense for removing all unsuitable stone.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. All stone installation work is to take place from the beach. Working from the beach, the Contractor will prepare the revetment footprint by harvesting the existing revetment and groin stone and stockpiling it for inspection and potential re-use. Harvesting shall be limited to the proposed footprint of the limits of removal shown on the contract drawings. Installation of the revetment shall be as shown on the contract drawings.

- B. Filter fabric shall be installed where shown on the drawings, prior to placing the bedding layer. Each width of filter fabric shall be overlapped in accordance with the manufacturer's recommendations, but no less than 3-feet. Filter fabric shall be installed in 2 layers and with staggered seams between the top and bottom layers at least 6-feet apart. Ends of cloth shall not butt each other.
- C. Bedding stone shall be placed over the filter fabric prior to the placement of the armor stone. The bedding stone shall be kept in an enclosed container, and not dumped on the beach. The Contractor shall place the bedding stone on the slope directly from the enclosed container.
- D. Stones shall be placed by equipment suitable for lifting, manipulating, and placing stones of the size and shape specified. Placing efforts shall ensure that each stone is firmly set and supported by underlying materials and adjacent stones. Loose stones shall be reset or replaced. Each stone shall be placed such that the end face of the longest dimension of the stone shall face seaward, the rock thus laying horizontally. Each stone shall be adequately "tapped" and "keyed" into proper seating to ensure tight fit before another stone is added. Stones not properly stacked so as to securely interlock, upon the Engineer's judgement, shall be removed and replaced to the Engineer's satisfaction.
- E. Set two layers of Armor Stones as shown on the drawings. The toe stones shall be minimum of 3.5 Ton.
- F. Placing of stones in layers by dumping into chutes or by other similar methods likely to cause segregation will not be permitted.
- G. Stones shall be placed and distributed such that there will be no large accumulation of either larger or smaller stones in any given area.

END OF SECTION

**APPENDIX - Permits
Local Order of Conditions
SE 81-1245**





**Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands**

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
81-1213
MassDEP File #

eDEP Transaction #
Weymouth
City/Town

A. General Information

Please note:
this form has been modified with added space to accommodate the Registry of Deeds Requirements

Important:
When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



1. From: Town of Weymouth
Conservation Commission

2. This issuance is for (check one):
a. Order of Conditions b. Amended Order of Conditions

3. To: Applicant:
Robert Luongo
a. First Name b. Last Name

Town of Weymouth Planning Dept.
c. Organization

75 Middle Street
d. Mailing Address

Weymouth MA 02189
e. City/Town f. State g. Zip Code

4. Property Owner (if different from applicant):
a. First Name b. Last Name

c. Organization

d. Mailing Address

e. City/Town f. State g. Zip Code

5. Project Location:
278 Wessagussett Rd. & 20 River St. Weymouth
a. Street Address b. City/Town

Map 4 Blk 21 Lot 3 (278 Wessagussett Rd) Map 2, Blk 12, Lot 10 (20 River St)
c. Assessors Map/Plat Number d. Parcel/Lot Number

Latitude and Longitude, if known: d m s d m s
d. Latitude e. Longitude



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
 Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
 81-1213
 MassDEP File # _____
 eDEP Transaction # _____
 Weymouth
 City/Town

A. General Information (cont.)

6. Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):
 Norfolk
 a. County _____ b. Certificate Number (if registered land) _____
 (278 Wessagussett) Bk 1757, Pg 62 (20 River St.) Bk 3610, Pg 316
 c. Book _____ d. Page _____
7. Dates: 05/15/2018 04/23/2019 05/13/2019
 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):
 Proposed Site Development Plan, Wessagussett Walk (8 sheets)
 a. Plan Title _____
 Coastal Engineering Co., Inc. Roger Michniewicz, PE
 b. Prepared By _____ c. Signed and Stamped by _____
 4/19/2019 1" = 20'
 d. Final Revision Date _____ e. Scale _____
 See attached list
 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. Public Water Supply b. Land Containing Shellfish c. Prevention of Pollution
 d. Private Water Supply e. Fisheries f. Protection of Wildlife Habitat
 g. Groundwater Supply h. 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. 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.

APPLICANT: Town of Weymouth
LOCATION: 278 Wessagussett Road (S 4, BL 21, L 3) and 20 River Street (S 2, BL 12, L10)
DEP FILE #: 81-1213 (Wessagussett Walk Project)

Approved Plans and Other Documents

1. Proposed Site Development Plan, Wessagussett Walk, Wessagussett Road, Regatta Road and River Street, Weymouth, MA. Prepared by Coastal Engineering Co., Inc. for Town of Weymouth. Rev 04-19-2019.
 - a. Cover Sheet
 - b. Sheet C3.1.1. Plan Showing Existing Conditions. 1" = 20'.
 - c. Sheet C3.1.2. Plan Showing Existing Conditions. 1" = 20'.
 - d. Sheet C3.2.1. Plan Showing Existing Conditions. 1" = 80'.
 - e. Sheet C3.2.2. Plan Showing Proposed Site Improvements Overview. 1" = 80'.
 - f. Sheet C3.2.3. Plan Showing Proposed Site Improvements Area 1. 1" = 20'.
 - g. Sheet C3.2.4. Plan Showing Proposed Site Improvements Area 2. 1" = 20'.
 - h. Sheet C3.2.7. Plan Showing Proposed Site Improvements, Details.
 - i. Sheet C3.2.8. Sections and Photos.
2. Stormwater Management Report for Proposed Boardwalk and associated improvements, Wessagussett and George E Lane Beach. Prepared for the Town of Weymouth by Coastal Engineering Co. May 23, 2018.
3. Letter Report titled "Coastal Resource Identification and Functional Analysis along a Section of Wessagussett Beach, Weymouth." Prepared by Jim O'Connell, Coastal Advisory Services, for Coastal Engineering, Co. Dated July 12, 2018.
4. Letter Report titled "Coastal Beach and Bank Analysis to Determine Volume, Grain Size and Placement of Sediment along a Section of Wessagussett Beach, Weymouth, as Mitigation for Proposed New Revetment Construction." Prepared by Jim O'Connell, Coastal Advisory Services, for Coastal Engineering, Co. Dated April 3, 2019.



Massachusetts Department of Environmental Protection
 Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
 Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
 81-1213
 MassDEP File #

eDEP Transaction #
 Weymouth
 City/Town

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. 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).**
- 3. 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. <input type="checkbox"/> Bank	_____ a. linear feet	_____ b. linear feet	_____ c. linear feet	_____ d. linear feet
5. <input type="checkbox"/> Bordering Vegetated Wetland	_____ a. square feet	_____ b. square feet	_____ c. square feet	_____ d. square feet
6. <input type="checkbox"/> Land Under Waterbodies and Waterways	_____ a. square feet	_____ b. square feet	_____ c. square feet	_____ d. square feet
	_____ e. c/y dredged	_____ f. c/y dredged		
7. <input type="checkbox"/> Bordering Land Subject to Flooding	_____ a. square feet	_____ b. square feet	_____ c. square feet	_____ d. square feet
Cubic Feet Flood Storage	_____ e. cubic feet	_____ f. cubic feet	_____ g. cubic feet	_____ h. cubic feet
8. <input type="checkbox"/> 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. <input type="checkbox"/> 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



**Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands**

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
81-1213

MassDEP File #

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B. Findings (cont.) *SEE ATTACHED FINDINGS INFORMATION

Coastal Resource Area Impacts: Check all that apply below. (For Approvals Only)

	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
10. <input type="checkbox"/> Designated Port Areas	Indicate size under Land Under the Ocean, below			
11. <input type="checkbox"/> Land Under the Ocean	<u> </u> a. square feet	<u> </u> b. square feet		
	<u> </u> c. c/y dredged	<u> </u> d. c/y dredged		
12. <input type="checkbox"/> Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below			
13. <input checked="" type="checkbox"/> Coastal Beaches	<u>19,178</u> a. square feet	<u>19,178</u> b. square feet	<u>Approx. 1,000</u> cu yd c. nourishment	<u>Approx. 1,000</u> cu yd d. nourishment
14. <input type="checkbox"/> Coastal Dunes	<u> </u> a. square feet	<u> </u> b. square feet	<u> </u> cu yd c. nourishment	<u> </u> cu yd d. nourishment
15. <input checked="" type="checkbox"/> Coastal Banks	<u>1,000 +/-</u> a. linear feet	<u>1,000 +/-</u> b. linear feet		
16. <input type="checkbox"/> Rocky Intertidal Shores	<u> </u> a. square feet	<u> </u> b. square feet		
17. <input type="checkbox"/> Salt Marshes	<u> </u> a. square feet	<u> </u> b. square feet	<u> </u> c. square feet	<u> </u> d. square feet
18. <input type="checkbox"/> Land Under Salt Ponds	<u> </u> a. square feet	<u> </u> b. square feet		
	<u> </u> c. c/y dredged	<u> </u> d. c/y dredged		
19. <input type="checkbox"/> Land Containing Shellfish	<u> </u> a. square feet	<u> </u> b. square feet	<u> </u> c. square feet	<u> </u> d. square feet
20. <input type="checkbox"/> Fish Runs	Indicate size under Coastal Banks, Inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above			
	<u> </u> a. c/y dredged	<u> </u> b. c/y dredged		
21. <input checked="" type="checkbox"/> Land Subject to Coastal Storm Flowage	<u>48,290 +/-</u> a. square feet	<u>48,290 +/-</u> b. square feet		
22. <input type="checkbox"/> Riverfront Area	<u> </u> a. total sq. feet	<u> </u> b. total sq. feet		
Sq ft within 100 ft	<u> </u> c. square feet	<u> </u> d. square feet	<u> </u> e. square feet	<u> </u> f. square feet
Sq ft between 100-200 ft	<u> </u> g. square feet	<u> </u> h. square feet	<u> </u> i. square feet	<u> </u> j. square feet

APPLICANT: Town of Weymouth

LOCATION: 278 Wessagussett Road (S 4, BL 21, L 3) and 20 River Street (S 2, BL 12, L10)

DEP FILE #: 81-1213 (Wessagussett Walk Project)

FINDINGS

Explanation of Resource Area Impacts

		Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
Coastal Beach	Revetment	2,478 sq ft +/-	2,478 sq ft +/-		
	Beach Nourishment	16,700 sq ft +/-	16,700 sq ft +/-	1,000 cu yds +/-	1,000 cu yds +/-
Coastal Bank	Revetment	1,000 linear ft +/-	1,000 linear ft +/-		
	Temporary	1,000 sq ft +/-	1,000 sq ft +/-		
Land Subject to Coastal Storm Flowage	Permanent	47,290 sq ft +/-	47,290 sq ft +/-		



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B. Findings (cont.)

* #23. If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.5.c (BVW) or B.17.c (Salt Marsh) above, please enter the additional amount here.

23. Restoration/Enhancement *:

a. square feet of BVW

b. square feet of salt marsh

24. Stream Crossing(s):

a. number of new stream crossings

b. number of replacement stream crossings

C. General Conditions Under Massachusetts Wetlands Protection Act

The following conditions are only applicable to Approved projects.

1. 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.
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.
3. 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, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this 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

8. 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 than two square feet or more than three square feet in size bearing the words,

"Massachusetts Department of Environmental Protection" [or, "MassDEP"]
"File Number 81-1213 "
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.
16. 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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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

- g) The responsible party shall:
 1. 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
 3. 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.
- l) 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):

Conditions #22 - #60

- 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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DEP FILE #: 81-1213 (Wessagussett Walk Project)

General Conditions

21. The Commission's actions on this project are taken under the Weymouth Code of Ordinances Chapter 7, subject to compliance with the conditions and limitations imposed herein, and any work authorized hereafter shall be completed within three (3) years from the date of issuance of this Order. This Order may be extended by the Weymouth Conservation Commission in accordance with Weymouth Code of Ordinances, Chapter 7, Section 301(k). A request for extension shall be made, in writing, not less than thirty (30) days before the expiration of this Order. An appeal of an Order issued under Weymouth Code of Ordinances Chapter 7, Section 301 may be taken in Superior Court.
22. No work may begin until the Commission has received certification from the Registry of Deeds or the Land Court or both, as appropriate, that this Order has been recorded in the line of title of the property.
23. A copy of this Order shall be kept on the work site at all times during construction. The applicant is responsible for providing a copy to all contractors and subcontractors, informing them of its requirements, and assuring that they comply with those requirements.
24. These Conditions are intended solely as a permit to perform work within areas of the Commission's jurisdiction, and nothing contained herein shall be construed as pre-empting or precluding any other bylaw, ordinance or local regulation.
25. Members and agents of the Commission have the right to enter and inspect the property, as per M.G.L. Ch. 131, §40, and Weymouth Town Code of Ordinances, Chapter 7, in order to evaluate and enforce compliance with this Order. The applicant shall submit data or information that the Commission deems necessary for that evaluation.
26. This Order shall apply to all successors in interest, successors in control, and successors in title. **This Condition shall remain in perpetuity and shall not expire with the issuance of the Certificate of Compliance.**
27. Before making any change in the project as designed and specified in the plans listed above or as specified in this Order, the applicant shall inquire of the Commission, in writing, whether the change is so substantial as to require the filing of a new Notice, may be permitted as an amendment to this Order, or may be carried out under these Conditions as issued.

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28. The Commission reserves the right to impose additional conditions or require the submission of additional information as necessary to protect the interests of the State and Local Wetland Protection Act.

Pre-Construction Conditions

29. This project will require additional state and federal permitting, including a Chapter 91 license and an Army Corps of Engineers permit. A copy of the applications for these permits shall be provided to the Commission. The Commission anticipates that there may be some changes to the Conservation-approved plans as part of the state and federal permitting process. The Conservation Commission shall be notified of any proposed changes to the approved plans required as part of state or federal permitting.
30. All required local, state and federal permits shall be obtained before construction begins and a copy of the following documents shall be provided to the Commission if they are required for the project: the Stormwater Pollution Prevention Plan, the NPDES general construction permit, the Chapter 91 permit or license, the 401 Water Quality Certificate, and the Army Corps of Engineers permit.
31. If construction drawings are prepared for the project that differ from the set of plans approved by the Commission under this Order, the applicant shall provide the Commission with the drawings and a description of changes within the Commission's jurisdiction.
32. Final construction plans shall include stationing for assistance in referencing specific locations along the proposed walkway.
33. Prior to the start of work, the Applicant or Contractor shall provide the Commission with the name, business phone number, email address, and mailing address of the person responsible for ensuring on-site compliance with this Order, and his or her alternate. This person shall be the Environmental Monitor for the site and shall be given the authority to stop construction for erosion control or other environmental purposes.
34. Prior to the start of work, the applicant shall provide an erosion and sediment control plan, for review and approval by the Conservation Commission or its Administrator. (The Stormwater Pollution Prevention Plan may suffice for all or part of the requirements of this condition.) The plan shall include:

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- a. Perimeter erosion control measures at the limit of work above the walkway.
 - b. Measures to be used to stabilize the coastal bank for all areas where vegetation is removed from or construction is occurring on the coastal bank. Temporary stabilization measures shall be taken immediately following disturbance and shall be maintained/replaced as needed until permanent measures (vegetative or physical) are in place. Vegetation removal, temporary stabilization measures, planting and seeding shall be coordinated with the applicant's landscape architect. Specific attention shall be given to the following areas:
 - i. The area at/near the toe of the coastal bank, between the revetment/walkway and the limit of work.
 - ii. The elevated stairway over the coastal bank.
 - iii. The drainage headwall and rip-rap drainage channel to be constructed between the elevated stairway and 109 Regatta Road. Proposed equipment access for this work shall be shown.
 - c. Location of stockpiling/laydown areas and showing erosion/sediment controls for stockpiles of erodible materials
 - d. Location for overnight storage of equipment.
 - e. Location of concrete washout areas (if any).
35. Prior to the start of work, the applicant shall submit a construction sequence and anticipated schedule for major project elements including vegetation removal, construction of major site features and permanent vegetative stabilization.
36. The seaward limit for equipment access on the beach shall be staked prior to use of heavy machinery on the beach. Equipment access shall be landward of viable shellfish habitat areas.
37. Prior to construction or cutting of vegetation, **the applicant and/or the project manager and the contractor shall meet on the site with the Conservation Administrator** to review the Order of Conditions issued for this project, the erosion control/stormwater pollution prevention plans and the project sequence and schedule.
38. If the on-site preconstruction meeting is scheduled prior to installation of erosion controls, the controls shall be installed and reviewed by the Conservation

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Administrator/Conservation Commission per the sequence in the approved erosion control plans.

39. The Conservation Commission shall be notified 48 hours prior to the start of active work at the site. If there is a significant stop in construction activities, the applicant shall notify the Commission 48 hours prior to the resumption of construction work.

Construction-Related Conditions

40. Work shall be conducted in accordance with the final approved plans (as revised), the approved erosion control/stormwater pollution prevention plan, this Order of Conditions and other applicable permits (Chapter 91 license, Army Corps of Engineers permit). If conflicts between these documents are found, the Conservation Administrator shall be notified. The Contractor shall utilize measures to protect coastal wetland resources as detailed in these documents, and shall ensure that workers are informed of all protection measures.
41. A Registered Professional Engineer (PE) shall provide construction oversight as needed to provide final certification that the project has been constructed in substantial compliance with governing documents.
42. Throughout the active construction period, the applicant or applicant's representative shall provide regular project updates.
43. It is anticipated that vegetation planting details not included in the Notice of Intent for this project (e.g., for the area between the walkway and the limit of work on the coastal bank) shall be part of a separate Notice of Intent for comprehensive vegetation management on the coastal bank, to be submitted by the Town of Weymouth.
44. The coastal bank shall be kept in stable condition throughout the project. Temporary stabilization measures shall be put in place immediately following bank disturbance and shall be maintained and replaced as needed until permanent stabilization measures are in place and effective. Erosion control barriers shall be maintained for the duration of the project; repairs and replacement shall be made as needed to assure their proper functioning.

Erosion controls shall be inspected by the applicant or their representative at least weekly and after every runoff-producing precipitation event. Accumulated sediments shall be removed as soon as possible from the front of the erosion controls; in no instances shall sediments be allowed to accumulate above one-half the height of the barrier.

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Workers at the site shall be told of the purpose of the erosion control measures and instructed to protect them from damage, including by tools or machinery. Erosion control barriers shall be removed after work is completed on all portions of the project and all bare ground has been stabilized.

The Conservation Commission reserves the right to require additional erosion control protection measures as needed to protect the resource area until the site is permanently stabilized.

45. An adequate stockpile of erosion control materials shall be on site at all times for emergency or routine replacement and shall include materials to replace or repair perimeter erosion controls, erosion control matting, stone riprap, filter berms or any other devices planned for use during construction.
46. Unless otherwise approved by the Conservation Commission, helical piles shall be used to install the footings for the elevated stairway over the coastal bank.
47. Site entry and exit locations shall be maintained in a condition that will prevent tracking or flowing of sediment onto the public roadway. Street sweeping shall be performed as needed to remove sediments that have entered the roadway.
48. Heavy machinery shall only be allowed on the dry beach. Work must be conducted around the tide cycles to ensure that heavy equipment is not on the beach when inundated.
49. Except for the beach nourishment work, heavy machinery shall only access the beach above the approved limit-of-work stakes on the beach.
50. During construction of the revetment, any beach material that is removed for installation of the toe stones shall be returned to the beach (e.g., above the imbedded toe stones). No beach materials shall be removed from the site.
51. Beach nourishment shall be provided as shown on the approved plans, as revised by federal and state permit plans. Unless specifically authorized otherwise, beach nourishment shall occur outside of viable shellfish habitat areas.
52. Final location of cut-outs in the wall for potential future stairways to private properties shall be coordinated with the Conservation Commission and the landscape architect to minimize damage to the coastal bank and vegetation to be preserved.
53. Any selective cutting or removal of trees conducted as part of work permitted in this Order shall include the complete removal of stumps, branches and limbs to a

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permissible disposal site. Burial on site is not allowed.

54. Debris on the beach (including concrete debris and other material) shall be removed during construction.
55. If dewatering is necessary during construction, the Conservation Administrator shall be notified. Dewatering shall be conducted in a manner that prevents discharge of turbid water to wetland resource areas. Unless otherwise directed by the Commission or its Administrator, excess water shall be pumped to a filter bag, lined haybale corral, sedimentation basin and/or sedimentation tank, located in an upland area as far as feasible from wetland resource areas.
56. At no time during or after construction shall fill or other materials be placed, slump into or fall beyond the limit of grading as shown on the plan. The applicant shall be responsible for inspecting and maintaining all slopes and walls and shall immediately notify the Commission if slumping, erosion or encroachment occurs.
57. If unforeseen problems occur during construction which may affect the statutory interest of the Wetlands Protection Act or the Town of Weymouth's Wetlands Protection Ordinance, upon discovery by either the Conservation Commission, its agent, or the applicant, the Commission shall immediately be notified, and an immediate meeting shall be held between the Commission or its agent, the applicant, and other concerned parties to determine the correct measures to be employed. The applicant shall then act to correct the problems using the corrective measures agreed upon. Subsequent to resolution, the activity, resulting actions and timeframes shall be documented in writing.
58. Servicing of equipment (including, but not limited to, fueling, changing, adding or applying lubricants or hydraulic fluids) shall be done as far as feasible from the coastal beach. Such equipment must be maintained to prevent leakage or discharge of pollutants. A spill kit shall be kept on site for response to accidental spills or leakage.
59. Unless otherwise approved, jute netting erosion control blankets shall be used on newly created slopes that are equal to or steeper than a 3:1 slope. Unless otherwise approved, physical controls (such as rip-rap slopes or heavy-duty erosion control fabrics) shall be used for slopes equal to or steeper than a 2:1 slope.

Post-Construction Conditions

60. Upon completion of the project, the applicant shall request a Certificate of Compliance. The applicant may request a Partial Certificate of Compliance upon completion of any discrete phase of the project. All Conditions in the Order must

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be complied with prior to the issuance of a Final Certificate. The request shall be accompanied by the following items:

- a. A written statement by a professional engineer or land surveyor registered in the Commonwealth of Massachusetts certifying compliance with the Notice of Intent, the approved plans, and this Order of Conditions and setting forth what deviations exist, if any;
- b. Two sets of as-built site plans prepared by a registered land surveyor or a registered professional engineer showing those activities for which the Certificate of Compliance is sought. The as-built plans shall include the location and elevations of major project elements including rip-rap revetment, walkway, stone slope above walkway, elevated staircase, and drainage work. Coastal wetland resource areas must also be shown on the final as-built plan.

[H: Orders\Wessagussett Walk_81-1213-Wessagussett Rd-River St]



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
 Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
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D. Findings Under Municipal Wetlands Bylaw or Ordinance

1. Is a municipal wetlands bylaw or ordinance applicable? Yes No
2. The Town of Weymouth hereby finds (check one that applies):
Conservation Commission
 - a. 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. that the following additional conditions are necessary to comply with a municipal ordinance or bylaw:

Town of Weymouth Code of Ordinances, Chapter 7, Section 301

1. Municipal Ordinance or Bylaw 2. Citation

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):

Conditions #21 - #60



WPA Form 5 – Order of Conditions

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.

05/13/2019

1. Date of Issuance

Please indicate the number of members who will sign this form.

5

This Order must be signed by a majority of the Conservation Commission.

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.

Thomas Tanner
Scott Dowd
George Loring

Signatures:

Thomas Tanner
Scott Dowd
George Loring

John Reilly

John Reilly

Frank Singleton

Frank Singleton

by hand delivery on

05/13/2019

Date

by certified mail, return receipt requested, on

Date

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.

Town of Weymouth
 Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

Town of Weymouth
 Conservation Commission

Please be advised that the Order of Conditions for the Project at:

Project Location _____ 81-1213
 MassDEP File Number

Has been recorded at the Registry of Deeds of:

Norfolk
 County _____ Book _____ Page _____

for: _____
 Property Owner

and has been noted in the chain of title of the affected property in:

Book _____ Page _____

In accordance with the Order of Conditions issued on:

Date _____

If recorded land, the instrument number identifying this transaction is:

Instrument Number _____

If registered land, the document number identifying this transaction is:

Document Number _____

Signature of Applicant _____



Massachusetts Department of Environmental Protection
 Bureau of Resource Protection - Wetlands
Request for Departmental Action Fee
Transmittal Form

DEP File Number:

81-1213

Provided by DEP

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

A. Request Information

1. Location of Project

_____	_____
a. Street Address	b. City/Town, Zip
_____	_____
c. Check number	d. Fee amount

2. Person or party making request (if appropriate, name the citizen group's representative):

Name

Mailing Address

_____	_____	_____
City/Town	State	Zip Code
_____	_____	_____
Phone Number	Fax Number (if applicable)	

3. Applicant (as shown on Determination of Applicability (Form 2), Order of Resource Area Delineation (Form 4B), Order of Conditions (Form 5), Restoration Order of Conditions (Form 5A), or Notice of Non-Significance (Form 6)):

Name

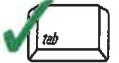
Mailing Address

_____	_____	_____
City/Town	State	Zip Code
_____	_____	_____
Phone Number	Fax Number (if applicable)	

4. DEP File Number:

81-1213

Important:
 When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



B. Instructions

1. When the Departmental action request is for (check one):

- Superseding Order of Conditions – Fee: \$120.00 (single family house projects) or \$245 (all other projects)
- Superseding Determination of Applicability – Fee: \$120
- Superseding Order of Resource Area Delineation – Fee: \$120



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

**Request for Departmental Action Fee
Transmittal Form**

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

DEP File Number:

81-1213

Provided by DEP

B. Instructions (cont.)

Send this form and check or money order, payable to the *Commonwealth of Massachusetts*, to:

Department of Environmental Protection
Box 4062
Boston, MA 02211

2. On a separate sheet attached to this form, state clearly and concisely the objections to the Determination or Order which is being appealed. To the extent that the Determination or Order is based on a municipal bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.
3. Send a **copy** of this form and a **copy** of the check or money order with the Request for a Superseding Determination or Order by certified mail or hand delivery to the appropriate DEP Regional Office (see <http://www.mass.gov/eea/agencies/massdep/about/contacts/>).
4. 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.

**APPENDIX - Permits
Local Order of Conditions
SE 81-1213**





Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
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A. General Information (cont.)

6. Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):
 Norfolk
 a. County _____ b. Certificate Number (if registered land) _____
 278 Wessagussett: Book 1757, Page 62 20 River St: Book 3610, Page 316
 c. Book _____ d. Page _____
7. Dates: 06/10/2019 06/25/2019 07/16/2019
 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):
 See attached list (1 page)
 a. Plan Title _____
 b. Prepared By _____ c. Signed and Stamped by _____
 d. Final Revision Date _____ e. Scale _____
 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. Public Water Supply b. Land Containing Shellfish c. Prevention of Pollution
 d. Private Water Supply e. Fisheries f. Protection of Wildlife Habitat
 g. Groundwater Supply h. 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. 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.

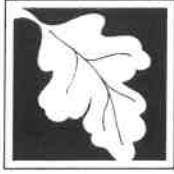
Attachment to Order of Conditions, DEP File #81-1245

APPLICANT: Town of Weymouth, Department of Planning & Community Development

LOCATION: 278 Wessagussett Rd (M4, B21, L3) and 20 River St (M2, B12, L10)

Final Approved Plans and Other Documents

1. Existing Conditions – Site Assessment, Town of Weymouth Wessagussett Road and River Street. Prepared by Kyle Zick Landscape Architecture, Inc. for Coastal Engineering Co. and the Town of Weymouth.
 - a. Sheet C3.1.1 (Overall site characterization). Dated 6-09-2017.
 - b. Sheets C3.1.2 through C3.1.5. Revised 06-20-2019. (Characterizes vegetation Zones A through V, from Wessagussett Rd/North Street intersection east to River Street/Neck Street intersection). 1" = 20'.
2. Vegetation Assessment, Weymouth Beach Connection. Updated May 3, 2019. (Detailed list, 3 pages, of existing species in plant zones A through V).
3. Notice of Intent: Landscape Drawing Set, Wessagussett Walk. Prepared by Kyle Zick Landscape Architecture, Inc. for Town of Weymouth, MA. Signed and Stamped by Kyle S. Zick, RLA. Dated June 7, 2019.
 - a. Sheet L0.0, Title Page.
 - b. Sheet L0.1., Overall Notes.
 - c. Sheets L1.1 through L1.4. Site Preparation and Invasive Species Control. Scale: 1" = 20'.
 - d. Sheets L2.1 through L2.4. Planting and Restoration Plan. Scale: 1" = 20'.
4. Notice of Intent forms and narrative. Dated June 7, 2019.
 - a. WPA Form 3
 - b. WPA Form 3, Appendix A: Ecological Restoration Limited Projects Checklist.
 - c. NOI Narrative, including:
 - i. Description of the Project's Ecological Restoration Goals
 - ii. Location of Ecological Restoration Project
 - iii. Description of Construction Sequence for Completing the Project



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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. 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).**
- 3. 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. <input type="checkbox"/> Bank	_____ a. linear feet	_____ b. linear feet	_____ c. linear feet	_____ d. linear feet
5. <input type="checkbox"/> Bordering Vegetated Wetland	_____ a. square feet	_____ b. square feet	_____ c. square feet	_____ d. square feet
6. <input type="checkbox"/> Land Under Waterbodies and Waterways	_____ a. square feet	_____ b. square feet	_____ c. square feet	_____ d. square feet
	_____ e. c/y dredged	_____ f. c/y dredged		
7. <input type="checkbox"/> Bordering Land Subject to Flooding	_____ a. square feet	_____ b. square feet	_____ c. square feet	_____ d. square feet
Cubic Feet Flood Storage	_____ e. cubic feet	_____ f. cubic feet	_____ g. cubic feet	_____ h. cubic feet
8. <input type="checkbox"/> 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. <input type="checkbox"/> 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.) *SEE ATTACHED ADDITIONAL FINDINGS (2 Pgs)

Coastal Resource Area Impacts: Check all that apply below. (For Approvals Only)

	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
10. <input type="checkbox"/> Designated Port Areas	Indicate size under Land Under the Ocean, below			
11. <input type="checkbox"/> Land Under the Ocean	<u> </u> a. square feet	<u> </u> b. square feet		
	<u> </u> c. c/y dredged	<u> </u> d. c/y dredged		
12. <input type="checkbox"/> Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below (Beach grass planting)			
13. <input checked="" type="checkbox"/> Coastal Beaches	<u>9,430</u> a. square feet	<u>9,430</u> b. square feet	<u> </u> c. nourishment cu yd	<u> </u> d. nourishment cu yd
14. <input type="checkbox"/> Coastal Dunes	<u> </u> a. square feet	<u> </u> b. square feet	<u> </u> c. nourishment cu yd	<u> </u> d. nourishment cu yd
15. <input checked="" type="checkbox"/> Coastal Banks	<u>1,997</u> a. linear feet	<u>1,997</u> b. linear feet	(Vegetation Management)	
16. <input type="checkbox"/> Rocky Intertidal Shores	<u> </u> a. square feet	<u> </u> b. square feet		
17. <input type="checkbox"/> Salt Marshes	<u> </u> a. square feet	<u> </u> b. square feet	<u> </u> c. square feet	<u> </u> d. square feet
18. <input type="checkbox"/> Land Under Salt Ponds	<u> </u> a. square feet	<u> </u> b. square feet		
	<u> </u> c. c/y dredged	<u> </u> d. c/y dredged		
19. <input type="checkbox"/> Land Containing Shellfish	<u> </u> a. square feet	<u> </u> b. square feet	<u> </u> c. square feet	<u> </u> d. square feet
20. <input type="checkbox"/> Fish Runs	Indicate size under Coastal Banks, Inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above			
	<u> </u> a. c/y dredged	<u> </u> b. c/y dredged		
21. <input checked="" type="checkbox"/> Land Subject to Coastal Storm Flowage	<u>46,300</u> a. square feet	<u>46,300</u> b. square feet	(Vegetation Management)	
22. <input type="checkbox"/> Riverfront Area	<u> </u> a. total sq. feet	<u> </u> b. total sq. feet		
Sq ft within 100 ft	<u> </u> c. square feet	<u> </u> d. square feet	<u> </u> e. square feet	<u> </u> f. square feet
Sq ft between 100-200 ft	<u> </u> g. square feet	<u> </u> h. square feet	<u> </u> i. square feet	<u> </u> j. square feet

ADDITIONAL FINDINGS

This Order of Conditions, issued under the jurisdictions of the Massachusetts Wetlands Protection Act and the Weymouth Wetlands Protection Ordinance, approves an Ecological Restoration Limited Project for the restoration of town-owned coastal bank and coastal beach in Weymouth, MA.

Resource area impacts shown on WPA Form 5 are for purposes of management of invasive species and restoration of coastal beach and coastal bank. Specifically:

- 9,430 square feet of work in Coastal Beach for planting of beach grass;
- 1,997 linear feet of work on Coastal Bank (comprising approximately 1.9 acres) for vegetation management including removal and management of invasive plant species and replanting with native species; and
- 46,300 square feet of work within Land Subject to Coastal Storm Flowage for vegetation management.

This project was designed in conjunction with the Wessagussett Walk pedestrian walkway, which was approved by the Weymouth Conservation Commission under DEP File #81-1213.

Goals for this Ecological Restoration Limited Project include:

- Management of invasive species, including Norway maple (*Acer platanoides*), Oriental bittersweet (*Celastrus orbiculatus*), common reed (*Phragmites australis*), Japanese knotweed (*Fallopia japonica*), and several others listed on the Massachusetts Prohibited Plants List from the Office of Energy and Environmental Affairs.
- Replanting of the coastal bank with species that are native to Massachusetts and tolerant of the extreme coastal conditions.
- Planting bare/formerly vegetated areas of the coastal beach with American beach grass (*Ammophila breviligulata*).
- Reducing erosion and storm damage potential, increasing coastal bank stability, and improving wildlife habitat.
- Providing a mechanism and framework for the long-term management of the town-owned coastal bank.

Because this Order of Conditions is intended to guide long-term management and maintenance of the town-owned coastal bank and coastal beach, the Conservation Commission has determined that the Order shall be valid for a period of five (5) years from the issuance date and that the Commission may authorize extensions for a five (5) year period.

Attachment to Order of Conditions, DEP File #81-1245

APPLICANT: Town of Weymouth, Department of Planning & Community Development
LOCATION: 278 Wessagussett Rd (M4, B21, L3) and 20 River St (M2, B12, L10)

The intention is for most of the vegetation management work to be conducted by the town. Because the town's resources are limited, the town intends to allow property owners to conduct vegetation management work on the town-owned coastal bank if conducted in compliance with this Order of Conditions and any relevant policies or procedures the town may issue.



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B. Findings (cont.)

* #23. If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.5.c (BVW) or B.17.c (Salt Marsh) above, please enter the additional amount here.

23. Restoration/Enhancement *:

a. square feet of BVW

b. square feet of salt marsh

24. Stream Crossing(s):

a. number of new stream crossings

b. number of replacement stream crossings

C. General Conditions Under Massachusetts Wetlands Protection Act

The following conditions are only applicable to Approved projects.

1. 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.
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.
3. 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, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this 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

8. 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 than two square feet or more than three square feet in size bearing the words,

"Massachusetts Department of Environmental Protection" [or, "MassDEP"]
 "File Number 81-1245 "
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.
16. 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 (Standard 8 only)
- (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.



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
 Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
 81-1245

 MassDEP File #

 eDEP Transaction #
 Weymouth

 City/Town

C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

- g) The responsible party shall:
 - 1. 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
 - 3. 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.
- l) 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):

Conditions #22 - #58

- 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.



Massachusetts Department of Environmental Protection
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Provided by MassDEP:
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 Weymouth
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D. Findings Under Municipal Wetlands Bylaw or Ordinance

1. Is a municipal wetlands bylaw or ordinance applicable? Yes No
2. The Weymouth Conservation Commission hereby finds (check one that applies):

- a. 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. that the following additional conditions are necessary to comply with a municipal ordinance or bylaw:

Town of Weymouth Code of Ordinances Chapter 7, Section 301

1. Municipal Ordinance or Bylaw _____ 2. Citation _____

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):

Conditions #21 - #58

APPLICANT: Town of Weymouth, Department of Planning & Community Development
LOCATION: 278 Wessagussett Rd (M4, B21, L3) and 20 River St (M2, B12, L10)

General Conditions

21. The Commission's actions on this project are taken under the Weymouth Code of Ordinances Chapter 7, subject to compliance with the conditions and limitations imposed herein, and any work authorized hereafter shall be completed within three (3) years from the date of issuance of this Order. This Order may be extended by the Weymouth Conservation Commission in accordance with Weymouth Code of Ordinances, Chapter 7, Section 301(k). Because this project entails long-term management, the Commission may allow extensions of a five-year period. A request for extension shall be made, in writing, not less than thirty (30) days before the expiration of this Order. An appeal of an Order issued under Weymouth Code of Ordinances Chapter 7, Section 301 may be taken in Superior Court.
22. No work may begin until the Commission has received certification from the Registry of Deeds or the Land Court or both, as appropriate, that this Order has been recorded in the line of title of the property.
23. A copy of this Order shall be kept on the work site at all times during construction. The applicant is responsible for providing a copy to all contractors and subcontractors, informing them of its requirements, and assuring that they comply with those requirements.
24. These Conditions are intended solely as a permit to perform work within areas of the Commission's jurisdiction, and nothing contained herein shall be construed as pre-empting or precluding any other bylaw, ordinance or local regulation.
25. Members and agents of the Commission have the right to enter and inspect the property, as per M.G.L. Ch. 131, §40, and Weymouth Town Code of Ordinances, Chapter 7, in order to evaluate and enforce compliance with this Order. The applicant shall submit data or information that the Commission deems necessary for that evaluation.
26. This Order shall apply to all successors in interest, successors in control, and successors in title. This Condition shall remain in perpetuity and shall not expire with the issuance of the Certificate of Compliance.
27. Before making any change in the project as designed and specified in the plans listed above or as specified in this Order, the applicant shall inquire of the Commission, in writing, whether the change is so substantial as to require the filing of a new Notice, may be permitted as an amendment to this Order, or may be carried out under these Conditions as issued.
28. The Commission reserves the right to impose additional conditions or require the submission of additional information as necessary to protect the interests of the State and Local Wetland Protection Act.

APPLICANT: Town of Weymouth, Department of Planning & Community Development

LOCATION: 278 Wessagussett Rd (M4, B21, L3) and 20 River St (M2, B12, L10)

Pre-Construction Conditions

29. All required local, state and federal permits and approvals shall be obtained before construction begins.
30. If construction drawings are prepared for the project that differ from the set of plans approved by the Commission under this Order, the applicant shall provide the Commission with the drawings and a description of changes within the Commission's jurisdiction. If changes are proposed from the approved plans cited by this Order, the applicant shall notify the Commission and shall follow the procedures as described in Condition #27.
31. A plan detailing proposed beach/site access shall be provided to the Landscape Architect and Conservation Administrator for review and approval prior to the start of work. Vehicle access to the site, and within the site, requires coordination with the Conservation Commission, DPW and Recreation Department. This includes the type of vehicles to be allowed, vehicle staging, access points, and time periods during which heavy equipment will be allowed on the beach.
32. Vehicle access paths to the coastal bank, where they cross areas with beach grass or other vegetation, shall be staked in the field and reviewed and approved by the Conservation Administrator prior to the start of work. Access paths to the bank shall be selected to minimize damage to beach grass or other vegetation. Pre-existing conditions shall be documented in the field. Staking for access paths shall be maintained throughout construction and beach grass areas damaged during construction shall be restored as per the approved plans and this Order.
33. Prior to the start of work, the Contractor shall provide a plan to the Conservation Administrator, for review and approval, showing the proposed locations for staging, servicing and storage of equipment and materials. Such equipment and materials shall not be stored on the coastal beach. Servicing includes, but is not limited to, fueling, and changing, adding or applying lubricants or hydraulic fluids.
34. **Prior to the start of vegetation clearing or pruning, or treatment of invasive plants, the Contractor shall meet on-site with the Conservation Administrator and the Landscape Architect** to review the project scope and this Order of Conditions, access to the beach and coastal bank, and native trees and other vegetation to be preserved, etc.
35. Protection measures for beach grass, trees and other vegetation to be preserved shall be in place prior to the start of vegetation clearing or pruning.
36. Prior to the start of work, the Contractor shall submit a sequence and anticipated schedule for major project elements. Construction sequencing shall be in

APPLICANT: Town of Weymouth, Department of Planning & Community Development
LOCATION: 278 Wessagussett Rd (M4, B21, L3) and 20 River St (M2, B12, L10)

accordance with the approved plans and documents.

37. Prior to the start of work, the Applicant or Contractor shall provide the Commission with the name, business phone number, email address, and mailing address of the person responsible for ensuring on-site compliance with this Order, and his or her alternate. This person shall be the Environmental Monitor for the site and shall be given the authority to stop construction for erosion control or bank stabilization concerns or other environmental purposes.
38. The Conservation Commission shall be notified 48 hours prior to the start of active work at the site. If there is a significant stop in construction activities, the applicant shall notify the Commission 48 hours prior to the resumption of construction work.

Construction-Related Conditions

39. The Applicant shall arrange for routine oversight of the project by the Landscape Architect and/or civil engineer, including routine reporting to the Conservation Administrator.
40. Work on the coastal bank, including tree removal, invasive species treatment and removal, slope stabilization, seeding, planting, and post-restoration monitoring shall be conducted by qualified professionals with expertise in invasive species management and ecological restoration of coastal banks. Work shall be conducted in a manner that maintains the stability of the coastal bank and preserves vital wildlife habitat during construction.
41. Work shall be conducted in accordance with the approved plans and documents and this Order of Conditions. Of particular note:
 - a. Coastal bank restoration shall be conducted in sections as per the Notice of Intent Narrative, "Description of Construction Sequence for Completing the Project."
 - b. The method of herbicide treatment for each invasive species shall be as specified on Sheet L0.1, Overall Notes.
 - c. Erosion control/bank stabilization measures shall be installed immediately following the removal of invasive plants. Measures shall be installed as per Sheet L0.1, Overall Notes and/or as further directed by the Landscape Architect, project engineer or Conservation Administrator.
42. The Contractor shall take measures to prevent the damage or destruction of trees, shrubs, or other plants that are located adjacent to the invasive plants to be removed and such measures shall be maintained throughout the construction period. All American beach grass (*Ammophila breviligulata*) shall be protected throughout the restoration process and fenced off with plant protection fencing

Attachment to Order of Conditions, DEP File #81-1245

APPLICANT: Town of Weymouth, Department of Planning & Community Development
LOCATION: 278 Wessagussett Rd (M4, B21, L3) and 20 River St (M2, B12, L10)

per specifications. Contractor shall be responsible for ensuring that fencing stays erect and secure for the project duration.

43. The Contractor shall be responsible for inspecting, maintaining and replacing erosion control measures throughout the construction period. The Contractor shall immediately notify the Commission if slumping, erosion or encroachment occurs.
44. An adequate stockpile of erosion control materials shall be kept on site at all times for emergency or routine replacement and shall include materials to replace or repair erosion control netting and other devices planned for coastal bank stabilization.
45. Chemical herbicide use is approved for management of invasive and noxious species in accordance with the approved plans. Best professional judgment shall be used to ensure that chemical herbicides are not overused and that such treatment occurs at the times of year and the manner to most effectively manage the target species.
46. Site entry and exit locations shall be maintained in a condition that will prevent tracking or flowing of sediment onto the public roadway. Street sweeping shall be performed as needed to remove sediments that have entered the roadway.
47. During tree cutting, no active nests of any bird species covered under the federal Migratory Bird Treaty Act shall be damaged or destroyed except under the terms of a valid federal permit. Any cutting or removal of trees conducted as part of work permitted in this Order shall include the complete removal of cut stumps, branches and limbs to a permissible disposal site. Burial on site is not allowed.
48. Pre-existing debris present within the buffer zone shall be removed and disposed of properly prior to or during the construction period.
49. The Town of Weymouth shall make the final determination on which private stairways shall be removed during the project period.
50. Final plant layout shall be coordinated with the landscape architect and Conservation Administrator. Changes to plant species shall be approved by the project landscape architect and the Conservation Commission or its Administrator. Plant species shall be selected for their appropriateness to these difficult site conditions (inundation by salt water or salt spray and heavy winds). Final layout of trees shall take into consideration vistas from the public lookout area (the "Shelf"). Planting below the Shelf shall be species that at final height will preserve views from the public lookout. Final layout of trees and shrubs shall take into consideration the location of access stairs or potential access stairs. Vistas from private houses shall be considered when siting canopy and understory trees.

Attachment to Order of Conditions, DEP File #81-1245

APPLICANT: Town of Weymouth, Department of Planning & Community Development
LOCATION: 278 Wessagussett Rd (M4, B21, L3) and 20 River St (M2, B12, L10)

51. Beach grass areas damaged during coastal bank restoration work shall be restored to pre-construction condition. American beach grass (*Ammophila brevigulata*) shall be planted three (3) culms per planting hole, spaced 18 inches on center.
52. If unforeseen problems occur during construction which may affect the statutory interest of the Wetlands Protection Act or the Town of Weymouth's Wetlands Protection Ordinance, upon discovery by either the Conservation Commission, its agent, or the applicant, the Commission shall immediately be notified, and an immediate meeting shall be held between the Commission or its agent, the applicant, and other concerned parties to determine the correct measures to be employed. The applicant shall then act to correct the problems using the corrective measures agreed upon. Subsequent to resolution, the activity, resulting actions and timeframes shall be documented in writing.
53. The locations for staging, servicing and overnight storage of equipment shall be as per the plan approved under Condition #33. Equipment shall be maintained to prevent leakage or discharge of pollutants. A spill kit shall be kept on site for response to accidental spills or leakage.
54. Stairways over the Coastal Bank. The Town of Weymouth is intending to develop a policy and/or other guidance documents to govern access/stairways from private property over the town-owned coastal bank. Construction, reconstruction or demolition of stairways shall follow the town policy, this Order of Conditions and other guidance documents issued.
 - a. The Conservation Commission may allow administrative approval for demolition, replacement or construction of stairways over the coastal bank if conducted in accordance with this Order of Conditions. The Commission reserves the right to require a separate NOI or RDA filing for new stairways over the coastal bank.
 - b. All new or replacement footings must be helical piles or diamond pier footings.
 - c. New stairways must be elevated above the bank to allow for vegetation growth beneath. Solid risers shall not be used between treads.
 - d. The area beneath new stairways shall be seeded with an approved, salt-tolerant conservation seed mix and stabilized with properly secured jute netting.
 - e. If stairways are proposed in the future in a location where the coastal bank has been restored, the homeowner shall be required to provide equivalent restoration of the coastal bank as directed by the Conservation Commission or its Administrator.

APPLICANT: Town of Weymouth, Department of Planning & Community Development
LOCATION: 278 Wessagussett Rd (M4, B21, L3) and 20 River St (M2, B12, L10)

- f. Access to the beach, from stairways that end at the beach, shall be via a minimum-width path sited to reduce impacts to beach grass.
 - g. It is anticipated that the Town will institute an annual fee for use of stairways over the town-owned coastal bank and that these fees will be deposited into a special account.
55. It is anticipated that the town coastal bank policy will contain procedures and guidance for vista pruning on the coastal bank and that vista pruning that is conducted in accordance with the coastal bank policy may be allowed via administrative approval under this Order of Conditions. The Conservation Commission reserves the right to require a separate RDA or NOI filing for vista pruning work.
56. Certificate of Compliance. This project will be eligible for a Partial Certificate of Compliance after all of the areas have been managed for invasive species and planted as per the approved plans and documents.
- The Request for a (Partial) Certificate of Compliance shall be accompanied by: a letter from the Landscape Architect certifying substantial compliance and noting deviations from the approved plans and approvals; and an as-built plan showing the location and species of plantings.
- The project will be eligible for a Final Certificate of Compliance after the 2-year monitoring period has been completed (2 calendar years after all planting has been completed). However, it is anticipated that the Order will be kept active to allow for long-term management of the coastal bank.
57. Long-term Management. The goal of the project is to restore the coastal bank to an ecosystem of native plants. Given the highly aggressive invasive plant species that currently dominate the bank, success will require a long-term monitoring and maintenance effort. Public-private partnerships will be encouraged to help realize the vision of this ambitious project.
58. Extensions. This Order may be extended for periods of up to 5 years in order to allow for long-term management of the coastal bank and beach.



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
 Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
81-1245
 MassDEP File #

eDEP Transaction #
Weymouth
 City/Town

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.

07/16/2019
 1. Date of Issuance

Please indicate the number of members who will sign this form.

3
 2. Number of Signers

This Order must be signed by a majority of the Conservation Commission.

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.

Signatures:

John Reilly

Thomas Tanner

Thomas Tanner

Scott Dowd

Scott Dowd

Frank Singleton

George Loring

Frank Singleton

by hand delivery on

by certified mail, return receipt requested, on

07/16/2019

Date

Date

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.



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
 Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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 Weymouth
 City/Town

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.

Weymouth
 Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

Weymouth
 Conservation Commission

Please be advised that the Order of Conditions for the Project at:

Project Location 81-1245
MassDEP File Number

Has been recorded at the Registry of Deeds of:

County Book Page

for: Property Owner

and has been noted in the chain of title of the affected property in:

Book Page

In accordance with the Order of Conditions issued on:

Date

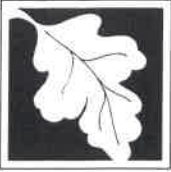
If recorded land, the instrument number identifying this transaction is:

Instrument Number

If registered land, the document number identifying this transaction is:

Document Number

Signature of Applicant



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

Request for Departmental Action Fee
Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

DEP File Number:

81-1245

Provided by DEP

A. Request Information

1. Location of Project

a. Street Address

b. City/Town, Zip

c. Check number

d. Fee amount

2. Person or party making request (if appropriate, name the citizen group's representative):

Name

Mailing Address

City/Town

State

Zip Code

Phone Number

Fax Number (if applicable)

3. Applicant (as shown on Determination of Applicability (Form 2), Order of Resource Area Delineation (Form 4B), Order of Conditions (Form 5), Restoration Order of Conditions (Form 5A), or Notice of Non-Significance (Form 6)):

Name

Mailing Address

City/Town

State

Zip Code

Phone Number

Fax Number (if applicable)

4. DEP File Number:

81-1245

Important:
 When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



B. Instructions

1. When the Departmental action request is for (check one):

Superseding Order of Conditions – Fee: \$120.00 (single family house projects) or \$245 (all other projects)

Superseding Determination of Applicability – Fee: \$120

Superseding Order of Resource Area Delineation – Fee: \$120



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
Request for Departmental Action Fee
Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

DEP File Number:

81-1245

Provided by DEP

B. Instructions (cont.)

Send this form and check or money order, payable to the *Commonwealth of Massachusetts*, to:

Department of Environmental Protection
Box 4062
Boston, MA 02211

2. On a separate sheet attached to this form, state clearly and concisely the objections to the Determination or Order which is being appealed. To the extent that the Determination or Order is based on a municipal bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.
3. Send a **copy** of this form and a **copy** of the check or money order with the Request for a Superseding Determination or Order by certified mail or hand delivery to the appropriate DEP Regional Office (see <http://www.mass.gov/eea/agencies/massdep/about/contacts/>).
4. 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.

APPENDIX - Permits
MassDEP 401 Water Quality
Certificate





Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

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

April 17, 2024

Robert Luongo
Town of Weymouth
Planning Department
75 Middle Street
Weymouth, MA 02189

DEP WQC APPLICATION # 24-WW08-0008-APP
Reissuance of expired 401 WQC Transmittal # X283696
EEA # 15877
DEP File # 081-1213
NAE-2018-01520
401 WQC Application Complete: 3/21/24

RE: 401 WATER QUALITY CERTIFICATION
Application for: BRP WW 08
WATER QUALITY CERTIFICATION FOR DREDGING – MINOR PROJECT

AT: 278 Wessagussett Road & 20 River Street – Weymouth
Boston Harbor Drainage Area

Dear Mr. Luongo:

The Department of Environmental Protection (“MassDEP”) has reviewed your application for a 401 Water Quality Certification for Dredging (“401 WQC”), as referenced above and is basing its certification upon an evaluation of the information contained in the application which is relevant to water quality considerations. In accordance with the provisions of Section 401 of the Federal Clean Water Act (33 U.S.C. § 1251 et seq.), M.G.L. c. 21, §§ 26-53, and 314 CMR 9.00, MassDEP has determined 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.

The waters of this portion of Weymouth Fore River are designated in the Massachusetts Surface Water Quality Standards as Class SB. Such waters are intended “as habitat for fish, other aquatic life and wildlife, and for primary and secondary contact recreation.” Antidegradation provisions of these Standards require that “existing uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.” In addition, this area has been designated for Shellfishing pursuant to 314 CMR 4.00.

The above-referenced project includes, but is not limited to, the following elements: the reconstruction of approximately 500 linear feet of an existing rock revetment, the construction of approximately 500 linear feet of a new rock revetment, the installation of a pedestrian boardwalk along that 1,000 linear foot revetment to provide access between Wessagussett Beach and George E. Lane Beach, and beach nourishment. It is important to note that only two of the larger project elements occur within the jurisdiction of this 401 WQC: the reconstruction of the existing rock revetment and beach nourishment. However, pursuant to 314 CMR 9.03(2), beach nourishment activities with a Final Order of Conditions issued under MGL c. 131, §40, which this project has received from the Weymouth Conservation Commission, do not require the filing of a 401 WQC. Therefore, this 401 WQC will only cover the reconstruction of the existing rock revetment.

Approximately 1,000 cubic yards of material, the majority of which is comprised of the existing revetment stone, will be repositioned below the Mean High Tide Line (“MHTL”). Approximately 2,000 square feet of land under water (“LUW”) will be impacted by the replacement of the revetment stone. The finer dredged materials will be placed behind filter fabric underneath the reconstructed rock revetment. All of the work below the MHTL will occur after the waters have receded, and the affected area will be stabilized before the waters return. The work is shown on the attached plans.

Sediment Chemistry Results: Two samples were collected for analysis within the proposed dredge footprint. The results of the chemical analysis that was performed on the samples were compared to MassDEP’s *Interim Policy for Sampling, Analysis, Handling and Tracking Requirements for Dredged Sediment Reuse and Disposal* (COMM-94-007). All of the results were either non-detect or well below the Reportable Concentration (“RC”) S-1 criteria of the Massachusetts Contingency Plan (“MCP”).

Public Notice: The 401 WQC Application public notice was published in *The Patriot Ledger* on February 29, 2024. No comments were received by MassDEP during the 21-day public comment period pursuant to 314 CMR 9.05(3)(e), which ended on March 21, 2024.

Section 61 Findings: Pursuant to M.G.L. Chapter 30, Sections 61 to 62H inclusive [the Massachusetts Environmental Policy Act (“MEPA”)], the project, as referenced in 401 WQC Application for Dredging, DEP Application # 24-WW08-0008-APP (previously Transmittal # X283696), was required to file an Environmental Notification Form (“ENF”). The Town of Weymouth (the “Proponent”) filed the ENF for the construction of the project under EEA # 15877 and noticed the ENF in the Environmental Monitor (the “Monitor”) on June 20, 2018. In the Certificate issued on August 17, 2018, the Secretary of Energy and Environmental Affairs (the “Secretary”) determined that “this project does not require the preparation of an Environmental Impact Report (“EIR”)” and that “no further MEPA review is required.” MassDEP has reviewed the findings in the ENF Certificate and confirms that based on the avoidance, minimization, and mitigation measures undertaken by the Applicant, in conjunction with the requirements set forth in this 401 WQC, all issues have been addressed satisfactorily.

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.

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 antidegradation provisions of the Massachusetts Surface Water Quality Standards, 314 CMR 4.00, that protect all waters, including wetlands. Pursuant to 314 CMR 9.01(3), this condition is necessary to ensure that any discharge from the project complies with the Massachusetts Surface Water Quality Standards, as provided in 314 CMR 4.00, to protect the public health and restore and maintain the chemical, physical, and biological integrity of the water resources of the Commonwealth.
2. Prior to the start of work, or for any portion of the work thereafter, MassDEP shall be notified of any change(s) in the proposed project or plans that may affect waters or wetlands. MassDEP will determine whether the change(s) requires a revision to this 401 WQC. Pursuant to 314 CMR 9.07(1) and 314 CMR 9.09(2), this condition is necessary to protect the public health and restore and maintain the chemical, physical, and biological integrity of the water resources of the Commonwealth.
3. Dredging in accordance with this 401 WQC may begin following the 21-day appeal period and once all other permits have been received. Pursuant to 314 CMR 9.10, this condition is necessary to ensure that due process is provided to certain persons deemed to be aggrieved by the 401 WQC.
4. All work shall be performed in accordance with the following documents and plans [Pursuant to 314 CMR 9.05(1), this condition is necessary as these documents outline how the execution of the project will meet the criteria of 314 CMR 9.07 thereby protecting water quality and preventing degradation to wetlands and waters of the Commonwealth]:
 - Application for 401 WQC for Dredging, DEP Application # 24-WW08-0008-APP, dated February 12, 2024, as revised through March 7, 2024, with attachments.
 - Plan entitled “Proposed Site Development Plan, Wessagussett Walk, Wessagussett Road, Regatta Road, and River Street, Weymouth, MA,” consisting of 9 sheets, various scales, dated May 12, 2018, as revised through April 14, 2019, signed, and stamped by Roger Paul Michniewicz, PE, and attached to this 401 WQC.

5. MassDEP shall be notified, attention Derek Standish [617-875-3843 derek.standish@mass.gov], 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. Pursuant to 314 CMR 9.05(4), this condition is necessary to ensure that construction practices are implemented in such a manner as to prevent degradation to wetlands and waters of the Commonwealth.
6. The term of this 401 WQC remains in effect for the same duration as the federal permit that requires it. Pursuant to 314 CMR 9.00, this condition is necessary to ensure that any dredging is conducted in a timely manner and complies with the Massachusetts Surface Water Quality Standards, as provided in 314 CMR 4.00, to protect the public health and restore and maintain the chemical, physical, and biological integrity of wetlands and waters of the Commonwealth.
7. 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. Pursuant to 314 CMR 9.07(1), this condition is necessary to ensure that construction practices are implemented in such a manner as to prevent degradation to wetlands and waters of the Commonwealth.
8. No later than four weeks after issuance of this 401 WQC, 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 including, but not limited to, observed dead or distressed fish or other aquatic organisms, observed oily sheen on the surface of the water, a sediment spill, a turbidity plume beyond the deployed Best Management Practices (“BMPs”), and a barge or equipment accident/spill. 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. Pursuant to 314 CMR 9.07(3), this condition is necessary to ensure that construction is conducted in a manner that minimizes short-term, long-term, and cumulative impacts on the aquatic ecosystem and provides protection to human health.
9. Future maintenance dredging is not authorized under this 401 WQC. Pursuant to 314 CMR 9.04(5), the project does not qualify for the routine maintenance exemption. This condition is necessary to ensure that the chemical, physical and biological integrity of wetlands and waters of the Commonwealth are protected.
10. Work shall only occur when the tide has receded, and the proposed work area is above water level. This area shall be stabilized and all equipment, stockpiled dredge materials, erosion controls, etc., shall be removed prior to the return of the waters. No work is allowed on the seaward side of the “limit of work” line depicted on the plans and documents cited in Condition # 4. Pursuant to 314 CMR 9.07(1), this

condition is necessary to ensure that construction will be conducted in a manner that will not adversely affect wetlands and waters of the Commonwealth.

11. No in-water or silt producing work, including, but not limited to dredging, shall occur from February 15th to June 30th. Pursuant to 314 CMR 9.07(3)(d), this condition is necessary to protect water quality by ensuring that the project proponent is using planning and construction practices that will maintain the aquatic resource functions and values in accordance with recommendations by the Massachusetts Division of Marine Fisheries.
12. The applicant, or its contractor, shall make every feasible effort to complete the project within the permitted timeframe. Should the applicant, or their contractor, fail to complete the project and wish to request an amendment to the 401 WQC for incursion into the Time of Year (“TOY”) restriction period, the written request shall be received by MassDEP by February 1st. The following information shall be included in the request:
 - a. project location and WQC Application Number,
 - b. the date on which dredging started,
 - c. the number of days and hours per day the dredge operated,
 - d. expected daily average production rate and the actual daily average production rate,
 - e. an explanation of why the project failed to remain on schedule,
 - f. an account of efforts made to get the project back on schedule,
 - g. a plan depicting the areas that remain to be dredged,
 - h. the number of cubic yards that remain to be dredged,
 - i. an accurate estimate of the number of days required to complete the project,
 - j. an evaluation of the impact of continued dredging on the species of concern,
 - k. a description of any efforts that will be made to minimize the impacts of the project on the species of concern, and a realistic assessment of any societal/financial effects of a denial of permission to continue dredging.

MassDEP will share the information with other resource agencies and a decision to grant or deny the amendment shall be made by February 15th. Requests for amendment received after February 1st will be considered at MassDEP’s discretion.

Pursuant to 314 CMR 9.09(2), this condition is necessary to protect water quality by ensuring that the project proponent is using planning and construction practices that will maintain both the integrity of the site hydrology and the aquatic resource functions and values.

13. All equipment/machinery shall be stored above the Mean High Tide Line (“MHTL”) and outside any wetland resource areas when not in use. Pursuant to 314 CMR 9.07(1), this condition ensures that no hazardous materials from equipment are inadvertently discharged into the resource area in which construction is occurring thereby protecting water quality.

14. 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, except as described in the documents and plans cited in Condition # 4. 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 MassDEP, 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 MassDEP pursuant to this 401 WQC. Pursuant to 314 CMR 9.07(1), this condition is necessary to ensure that construction will be conducted in a manner that will not adversely affect wetlands and waters of the Commonwealth.
15. No later than 21 days prior to commencement of dredging activity, a detailed plan of the physical dredging operation, including descriptions of the type of dredge equipment to be used, shall be submitted to MassDEP for review and written approval. Pursuant to 314 CMR 9.07(1), this condition is necessary to ensure that construction will be conducted in a manner that will not adversely affect wetlands and waters of the Commonwealth.
16. Within 30 days of the completion of dredging, photographs of the affected areas depicting post-dredge conditions shall be taken and submitted to Derek Standish [derek.standish@mass.gov] at MassDEP. Pursuant to 314 CMR 9.07(1), this condition is necessary to ensure that construction practices are implemented in such a manner as to prevent degradation to wetlands and waters of the Commonwealth.

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 401 WQC Application or supplemental documents will require further notification to and, if an amendment is required, approval by MassDEP.

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 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 401 WQC.

Department of Environmental Protection
Case Administrator
Office of Appeals and Dispute Resolution
100 Cambridge Street, Suite 900
Boston, MA 02114

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
Wetlands Program
100 Cambridge Street, Suite 900
Boston, MA 02114

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 401 WQC Application 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 401 WQC, 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 401 WQC, please contact Derek Standish at (617) 875-3843 [derek.standish@mass.gov].

Sincerely,



Lisa Rhodes
Wetlands Program Chief

ecc:Weymouth Conservation Commission, Town Hall, 75 Middle Street, Weymouth, MA 02189
Jenifer Leighton Gracia, Tighe & Bond, Inc., 260 Cranberry Highway, Orleans, MA 02653
Sean Duffey, Office of Coastal Zone Management, 100 Cambridge Street, 9th Floor, Boston, MA 02114
Maissoun Reda and Brendan Mullaney, MassDEP – SERO, 20 Riverside Drive, Lakeville, MA 02347
Ivan Morales-Parra, MassDEP – Waterways Program, 100 Cambridge Street, 9th Floor, Boston, MA 02114
Kate Frew, Division of Marine Fisheries, 30 Emerson Avenue, Gloucester, MA 01930
Katelyn M. Rainville and Paul M. Maniccia, Department of the Army, New England District, Corps of Engineers, 696 Virginia Road, Concord, MA 01742-2751
Edward Reiner and Rachel Croy, EPA, 5 Post Office Square, Suite 100, Boston, MA 02109

attachments: Communication for Non-English Speaking Parties document
Plans of Record



重要 महत्वपूर्ण σημαντικός
Important
կարևոր quan trọng مهم



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 Environmental Justice at the telephone number listed below.

Español Spanish

Este documento es importante y debe ser traducido inmediatamente. Si necesita traducir este documento, póngase en contacto con el Director de Justicia Ambiental de MassDEP (*MassDEP's Director of Environmental Justice*) en el número de teléfono que figura más abajo.

Português Portuguese

Este documento é importante e deve ser traduzido imediatamente. Se você precisar traduzir este documento, entre em contato com o Diretor de Justiça Ambiental do MassDEP no número de telefone listado abaixo.

繁體中文 Chinese Traditional

本文檔很重要，需要即刻進行翻譯。
如需對本文檔進行翻譯，請透過如下列示電話號碼與 MassDEP 的環境司法總監聯絡。

简体中文 Chinese Simplified

这份文件非常重要，需要立即翻译。
如果您需要翻译这份文件，请通过下方电话与 MassDEP 环境司法主任联系。

Ayisyen Kreyòl Haitian Creole

Dokiman sa a enpòtan epi yo ta dwe tradui l imedyatman. Si w bezwen tradui dokiman sa a, tanpri kontakte Direktè. Jistis Anviwònmanal MassDEP a nan nimewo telefòn ki endike anba a.

Việt Vietnamese

Tài liệu này và quan trọng và phải được dịch ngay. Nếu quý vị cần bản dịch của tài liệu này, vui lòng liên hệ với Giám Đốc Phòng Công Lý Môi Trường của MassDEP theo số điện thoại được liệt kê bên dưới.

ប្រទេសកម្ពុជា Khmer/Cambodian

ឯកសារនេះមានសារៈសំខាន់
ហើយគួរត្រូវបានបកប្រែភ្លាមៗ។
ប្រសិនបើអ្នកត្រូវការអោយឯកសារនេះបកប្រែ
សូមទាក់ទងនាយកផ្នែកយុត្តិធម៌បរិស្ថានរបស់
MassDEPតាមរយៈលេខទូរស័ព្ទដែលបានរាយដូចខា
ងក្រោម។

Kriolu Kabuverdianu Cape Verdean

Es dokumentu sta important i tenki ser tradusidu imediatamenti. Se nho ta presisa ke es dokumentu sta tradisidu, por favor kontata O Diretor di Justisia di Environman di DEP ku es numero di telefoni menxionadu di baixo.

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 • <https://www.mass.gov/environmental-justice>
(Version revised 8.2.2023) 310 CMR 1.03(5)(a)

Русский Russian

Это чрезвычайно важный документ, и он должен быть немедленно переведен. Если вам нужен перевод этого документа, обратитесь к директору Департамента экологического правосудия MassDEP (MassDEP's Director of Environmental Justice) по телефону, указанному ниже.

العربية Arabic

هذه الوثيقة مهمة وتجب ترجمتها على الفور.

إذا كنت بحاجة إلى ترجمة هذه الوثيقة، فيرجى الاتصال بمدير العدالة البيئية في MassDEP على رقم الهاتف المذكور أدناه.

한국어 Korean

이 문서는 중대하므로 즉시 번역되어야 합니다. 본 문서 번역이 필요하신 경우, 매사추세츠 환경보호부의 "환경정의" 담당자 분께 문의하십시오. 전화번호는 아래와 같습니다.

հայերեն Armenian

Այս փաստաթուղթը կարևոր է, և պետք է անհապաղ թարգմանել այն:
Եթե Ձեզ անհրաժեշտ է թարգմանել այս փաստաթուղթը, դիմեք Մասաչուսեթսի շրջակա միջավայրի պահպանության նախարարության (MassDEP) Բնապահպանական հարցերով արդարադատության ղեկավարին (Director of Environmental Justice)՝ ստորև նշված հեռախոսահամարով

فارسی Farsi Persian

این نوشتار بسیار مهمی است و باید فوراً ترجمه شود. اگر نیاز به ترجمه این نوشتار دارید لطفاً با مدیر عدالت محیط زیستی MassDEP در شماره تلفن ذکر شده زیر تماس بگیرید.

Français French

Ce document est important et doit être traduit immédiatement. Si vous avez besoin d'une traduction de ce document, veuillez contacter le directeur de la justice environnementale du MassDEP au numéro de téléphone indiqué ci-dessous.

Deutsch German

Dieses Dokument ist wichtig und muss sofort übersetzt werden. Wenn Sie eine Übersetzung dieses Dokuments benötigen, wenden Sie sich bitte an MassDEP's Director of Environmental Justice (Direktor für Umweltgerechtigkeit in Massachusetts) unter der unten angegebenen Telefonnummer.

Ελληνική Greek

Το έγγραφο αυτό είναι πολύ σημαντικό και πρέπει να μεταφραστεί αμέσως. Αν χρειάζεστε μετάφραση του εγγράφου αυτού, παρακαλώ επικοινωνήστε με τον Διευθυντή του Τμήματος Περιβαλλοντικής Δικαιοσύνης της Μασαχουσέτης στον αριθμό τηλεφώνου που αναγράφεται παρακάτω

Italiano Italian

Questo documento è importante e deve essere tradotto immediatamente. Se hai bisogno di tradurre questo documento, contatta il Direttore della Giustizia Ambientale di MassDEP al numero di telefono sotto indicato.

Język Polski Polish

Ten dokument jest ważny i powinien zostać niezwłocznie przetłumaczony. Jeśli potrzebne jest tłumaczenie tego dokumentu, należy skontaktować się z dyrektorem ds. sprawiedliwości środowiskowej MassDEP pod numerem telefonu podanym poniżej.

हिन्दी Hindi

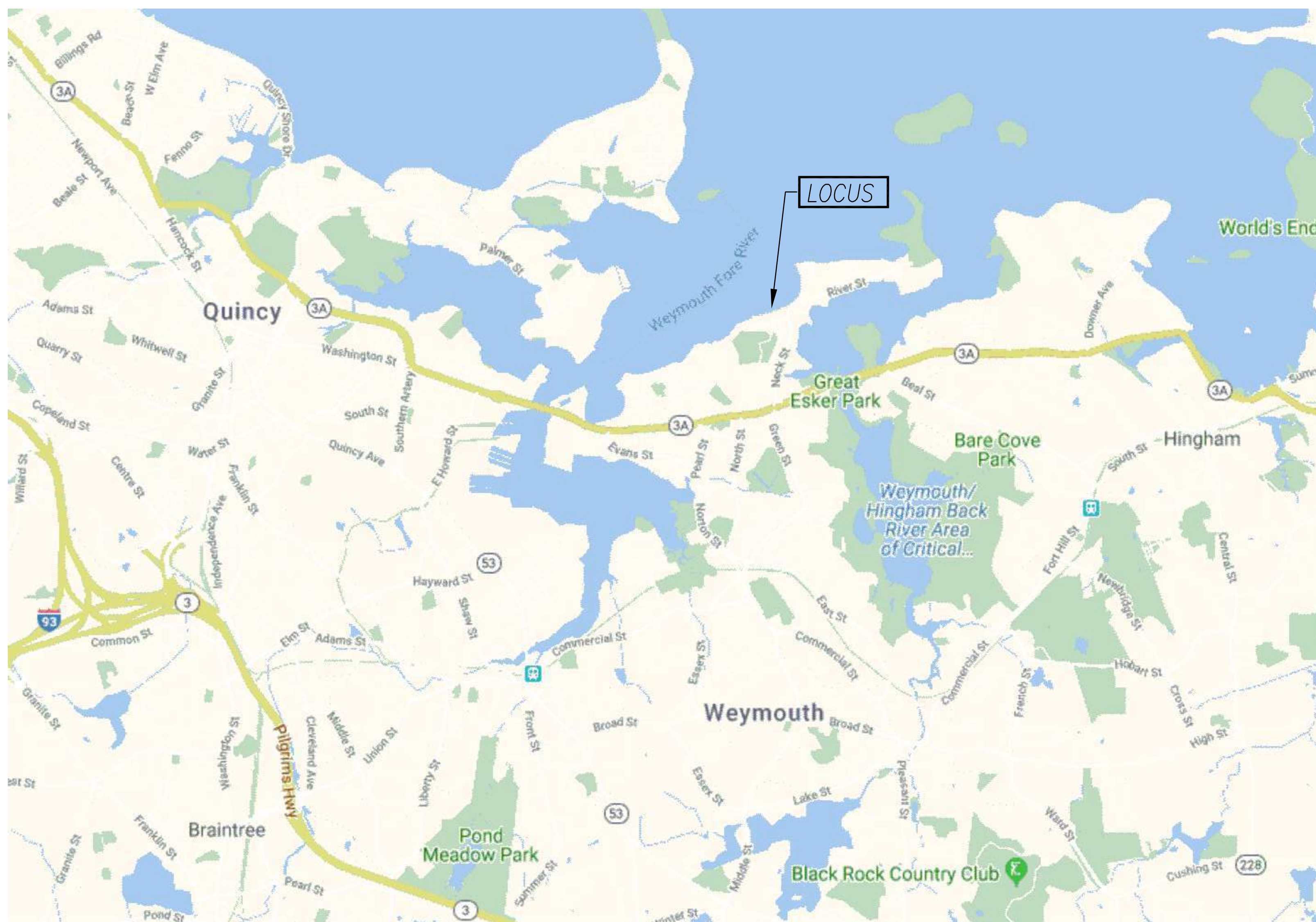
यह दस्तावेज महत्वपूर्ण है और इसका अनुवाद तुरंत किया जाना चाहिए। यदि आपको इस दस्तावेज का अनुवाद कराने की जरूरत है, तो कृपया नीचे दिए गए टेलीफोन नंबर पर MassDEP के पर्यावरणीय न्याय निदेशक से संपर्क करें।

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 • <https://www.mass.gov/environmental-justice>

(Version revised 8.2.2023) 310 CMR 1.03(5)(a)



MASSACHUSETTS
SCALE 1" = 2,500'



MASSACHUSETTS
SCALE 1" = 200'

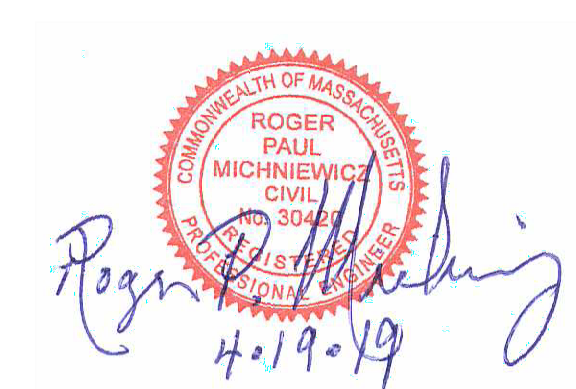
PROPOSED SITE DEVELOPMENT PLAN WESSAGUSSETT WALK WESSAGUSSETT ROAD, REGATTA ROAD AND RIVER STREET

WEYMOUTH, MA

~~05-12-2018~~

~~REV 04-16-2019~~

REV 04-19-2019



CIVIL ENGINEER:

COASTAL ENGINEERING CO., INC.
260 CRANBERRY HIGHWAY
ORLEANS, MASSACHUSETTS 02653
(508) 255-6511

APPLICANT AND OWNER:

TOWN OF WEYMOUTH
75 MIDDLE STREET
EAST WEYMOUTH, MA 02189

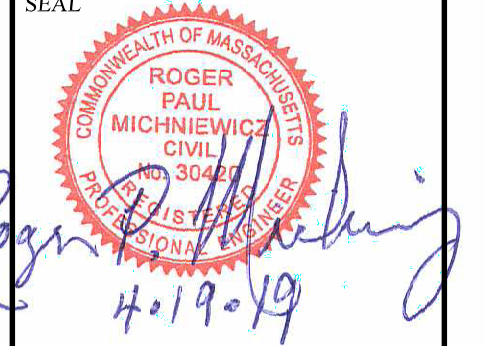
DRAWING INDEX

C3.2.1	PLAN SHOWING EXISTING SITE CONDITIONS OVERVIEW	ISSUED: 5/12/18	REV: 4/19/19
C3.2.2	PLAN SHOWING PROPOSED SITE IMPROVEMENTS OVERVIEW	ISSUED: 5/12/18	REV: 4/19/19
C3.2.3	PLAN SHOWING PROPOSED SITE IMPROVEMENTS AREA 1	ISSUED: 5/12/18	REV: 4/19/19
C3.2.4	PLAN SHOWING PROPOSED SITE IMPROVEMENTS AREA 2	ISSUED: 5/12/18	REV: 4/19/19
C3.2.5	PLAN SHOWING PROPOSED SITE IMPROVEMENTS AREA 3	ISSUED: 5/12/18	REMOVED
C3.2.6	PLAN SHOWING PROPOSED SITE IMPROVEMENTS AREA 4	ISSUED: 5/12/18	REMOVED
C3.2.7	SITE IMPROVEMENT DETAILS	ISSUED: 5/12/18	REV: 4/19/19
C3.2.8	SECTIONS AND PHOTOS	ISSUED: 5/12/18	REV: 4/19/19
C3.1.1	PLAN SHOWING EXISTING CONDITIONS	ISSUED: 4/16/19	
C3.1.2	PLAN SHOWING EXISTING CONDITIONS	ISSUED: 4/16/19	

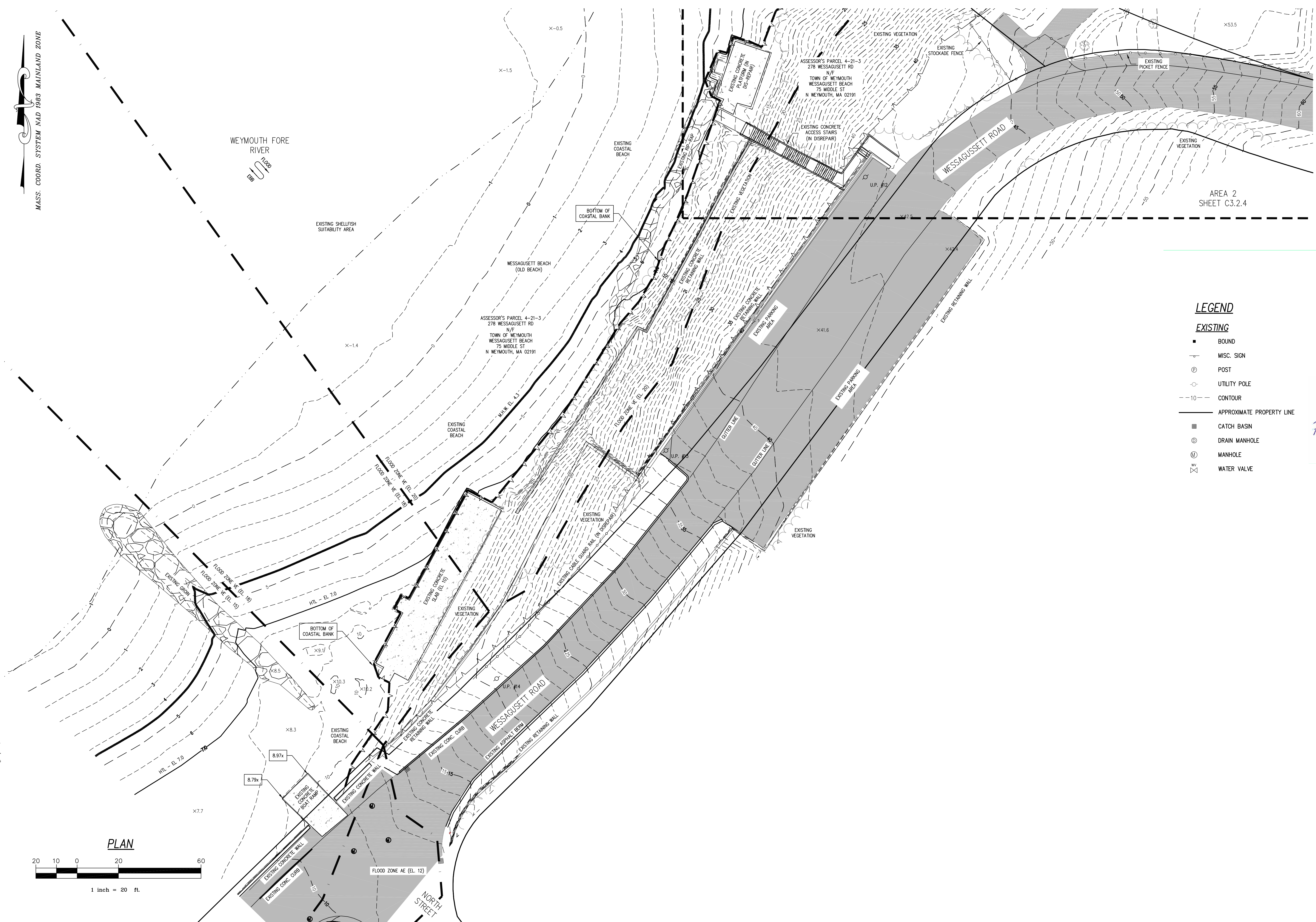
THIS DRAWING IS PREPARED FOR PERMITTING PURPOSES ONLY AND SHALL NOT BE USED FOR CONSTRUCTION. CONTRACTOR SHALL OBTAIN FINAL CONSTRUCTION DETAILS FROM THE ENGINEER PRIOR TO PREPARATION OF CONSTRUCTION BID AND BEFORE BEGINNING ANY WORK.

MASS. COORD. SYSTEM NAD 1983 MAINLAND ZONE

NO.	DATE	BY	REVISION

SEAL

 4.19.19

PROJECT	TOWN OF WEYMOUTH WESSAGUSETT ROAD AND REGATTA ROAD
SCALE	AS NOTED
DRAWING FILE	C18729-EXISTING COND 2019.dwg
DATE	04-16-19
DRAWN BY	KES
CHECKED BY	JRN / RPM
PROJECT NO.	C18729.00

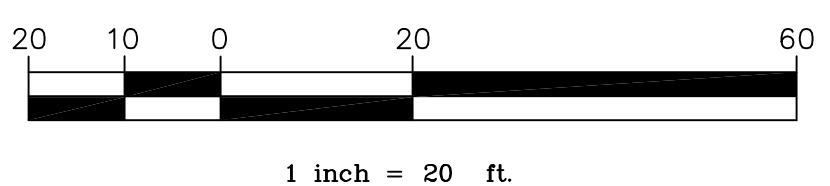


LEGEND

EXISTING

- BOUND
- ⊕ MISC. SIGN
- ⊙ POST
- ⊙ UTILITY POLE
- - - - - CONTOUR
- - - - - APPROXIMATE PROPERTY LINE
- ▣ CATCH BASIN
- ⊙ DRAIN MANHOLE
- ⊙ MANHOLE
- ⊙ WATER VALVE

PLAN



F:\SISK\PROJ\C1809\C18729\C18729-40\C18729-EXISTING COND 2019.dwg Apr 22, 2019 9:40am

Coastal Engineering Co., Inc. © 2019

C3.1.1

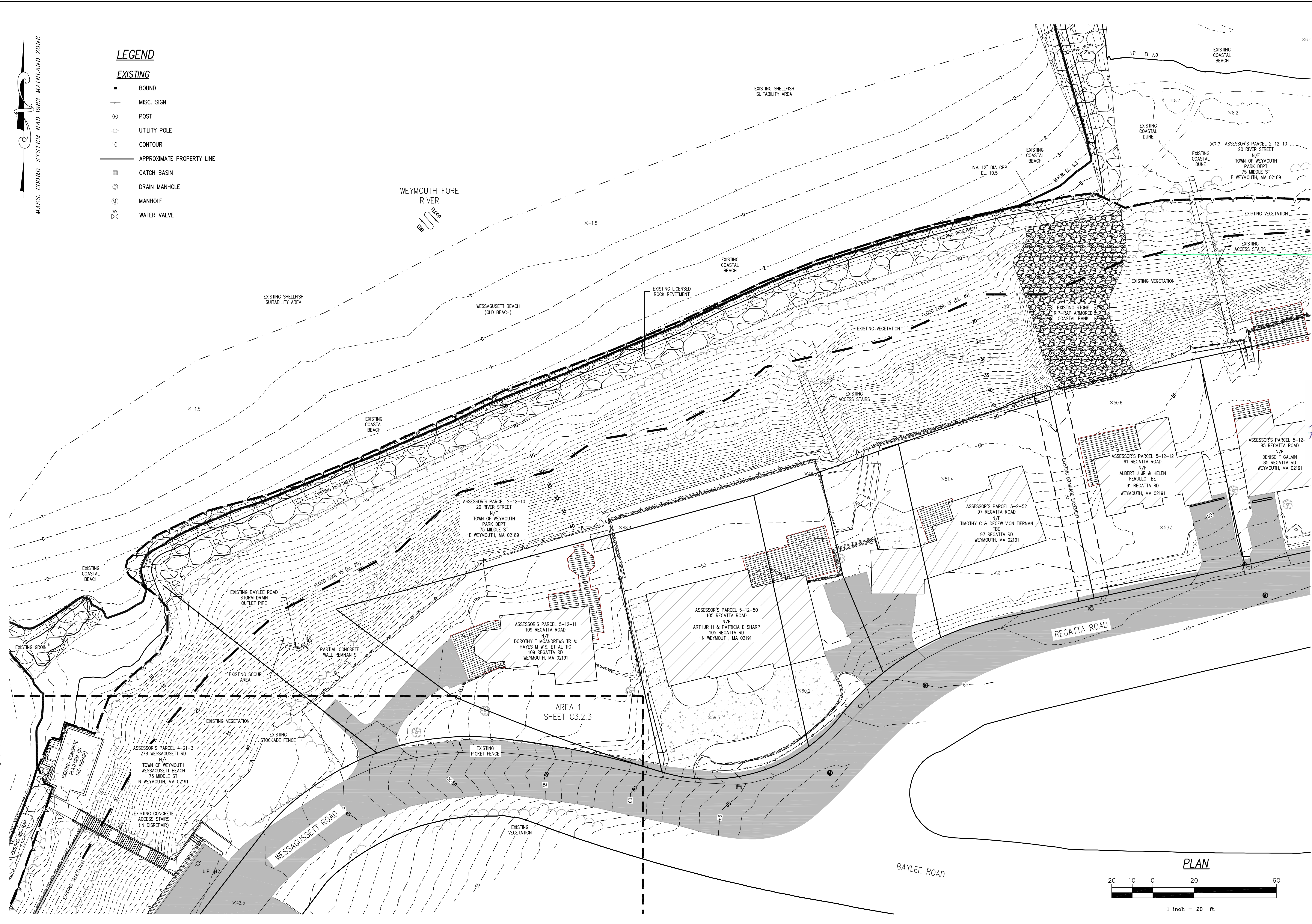
1 OF 2 SHEETS

MASS. COORD. SYSTEM NAD 1983 MAINLAND ZONE

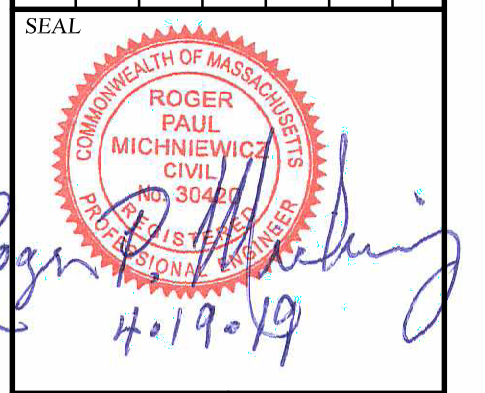
LEGEND

EXISTING

- BOUND
- MISC. SIGN
- ⊙ POST
- UTILITY POLE
- - - - CONTOUR
- - - - APPROXIMATE PROPERTY LINE
- ▨ CATCH BASIN
- ⊙ DRAIN MANHOLE
- ⊙ MANHOLE
- ⊙ WATER VALVE



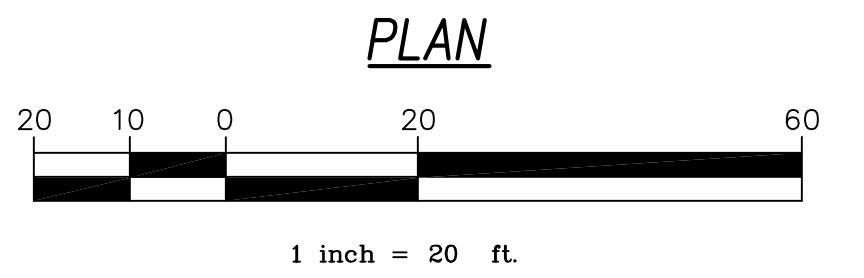
NO.	DATE	REVISION	BY



TOWN OF WEYMOUTH
 REGATTA ROAD
 SHEET TITLE
 PLAN SHOWING
 EXISTING CONDITIONS

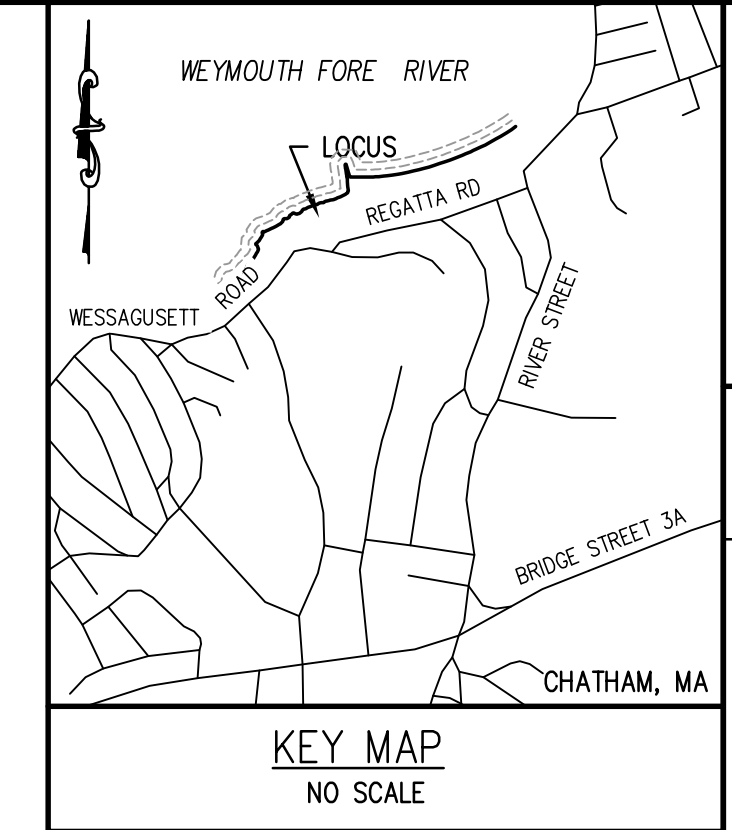
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DRAWING FILE	C18729-EXISTING COND 2019.dwg
DATE	04-16-19
DRAWN BY	KES
CHECKED BY	JRN / RPM

C3.1.2
 2 OF 2 SHEETS
 PROJECT NO. C18729.00



PLAN

F:\DISK\PROJ\C1800\C18729\C18729-40\C18729-EXISTING COND 2019.dwg, Apr 22, 2019, 9:44am



NO.	DATE	REVISION	BY
2	2019-04-19	REVISED PER CZM COMMENTS	KES
1	2019-04-16	REVISE LAYOUT AS PER REGULATORY COMMENTS	JRN

PLAN REFERENCES:

PLAN BOOK 204, PAGE 1280
 BASE PLAN PREPARED BY:
 JAMES W. SEWELL COMPANY
 136 CENTER STREET
 P.O. BOX 433
 OLD TOWN, ME. 04468
 PHONE 207-827-4456
 BASED UPON AERIAL IMAGERY PERFORMED IN MAY 2017

FLOOD NOTE:

FLOOD ZONES VE (EL. 15), VE (EL. 16), VE (EL. 18), VE (EL. 20) AND AE (EL. 12) AS SHOWN ON FEMA FIRM PANEL #25021C0089F EFFECTIVE: JUNE 9, 2014

DATUM NOTE:

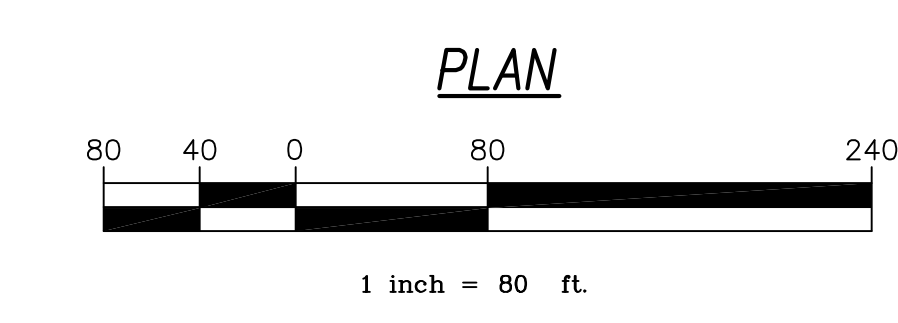
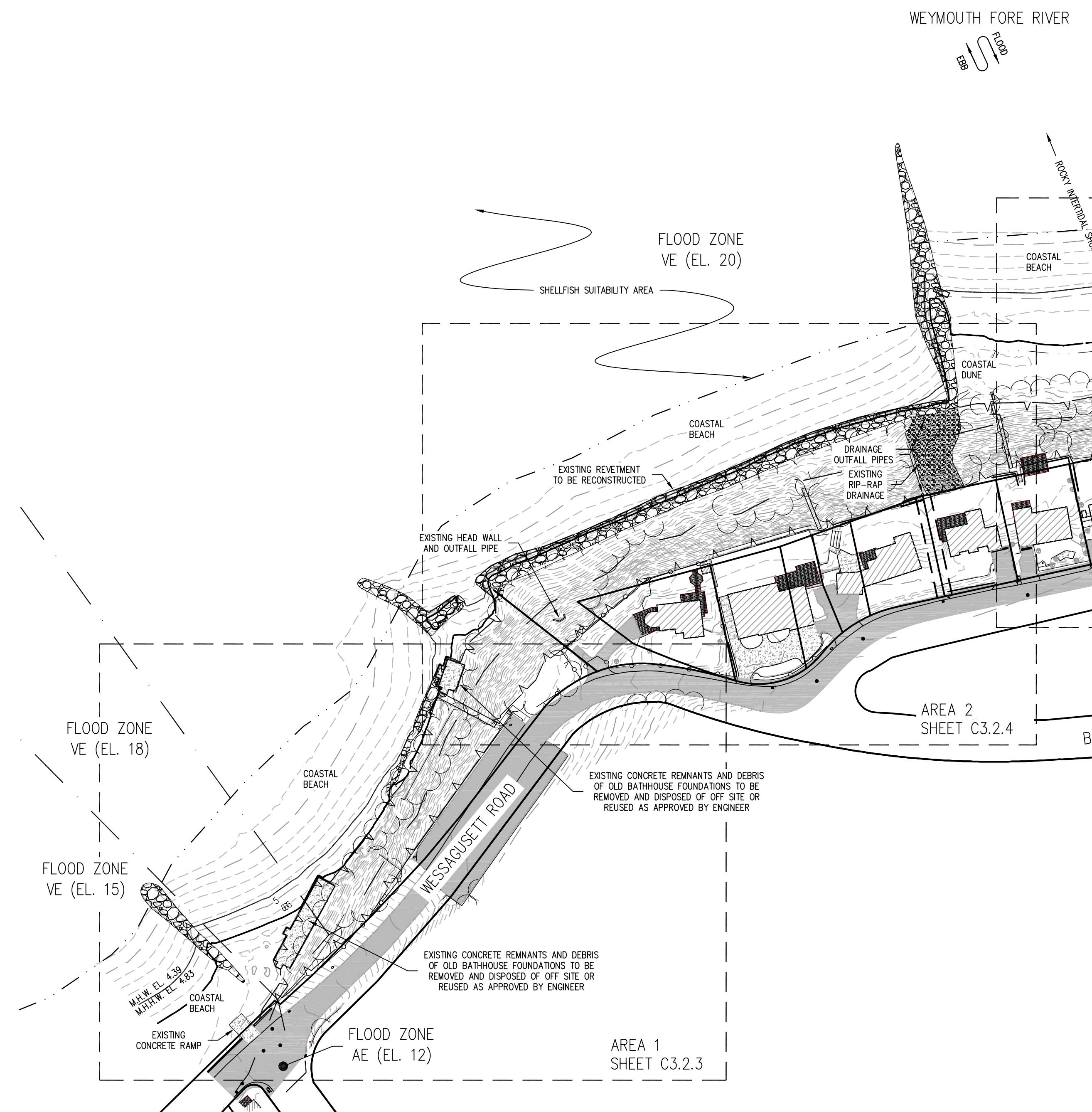
ELEVATIONS SHOWN HEREON ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM 1988 (NAVD 1988)
 MHW EXTRAPOLATED FROM BOSTON AND DUXBURY NOAA TIDE SHEETS

LEGEND

EXISTING

- BOUND
- ⊕ MISC. SIGN
- ⊙ POST
- UTILITY POLE
- - - - - CONTOUR
- - - - - APPROXIMATE PROPERTY LINE
- CATCH BASIN
- ⊕ DRAIN MANHOLE
- ⊙ MANHOLE
- ⊗ WATER VALVE
- - - - - FEMA FLOOD ZONE
- - - - - MATCH LINE
- MEAN HIGH WATER (M.H.W.) EL. 4.39
MEAN HIGH HIGH WATER OR SEASONAL HIGH TIDE (M.H.H.W.) EL. 4.83
- L.S.C.S.F. LAND SUBJECT TO COASTAL STORM FLOWAGE
- ⌋ COASTAL BANK

NOTE:
 PARCELS SHOWN ARE COMPILED FROM PLAN BOOK 204, PAGE 1280 RECORD PLAN AND PROPERTY LINES SHOWN HEREON ARE APPROXIMATE AND ARE SHOWN FOR REPRESENTATION PURPOSES ONLY.



THE INSTALLER SHALL ASCERTAIN THE LOCATION OF EXISTING UNDERGROUND UTILITIES PRIOR TO EXCAVATION, AND SHALL PROTECT UTILITIES WITHIN THE WORK AREA DURING CONSTRUCTION.

THIS DRAWING IS PREPARED FOR PERMITTING PURPOSES ONLY AND SHALL NOT BE USED FOR CONSTRUCTION. CONTRACTOR SHALL OBTAIN FINAL CONSTRUCTION DETAILS FROM THE ENGINEER PRIOR TO PREPARATION OF CONSTRUCTION BID AND BEFORE BEGINNING ANY WORK.



PROJECT
 NORTH WEYMOUTH BEACH CONNECTION PROJECT
 WEYMOUTH, MA
 WESSAGOUSSETT ROAD, REGATTA ROAD AND RIVER STREET
 SHEET TITLE
 PLAN SHOWING
 EXISTING CONDITIONS

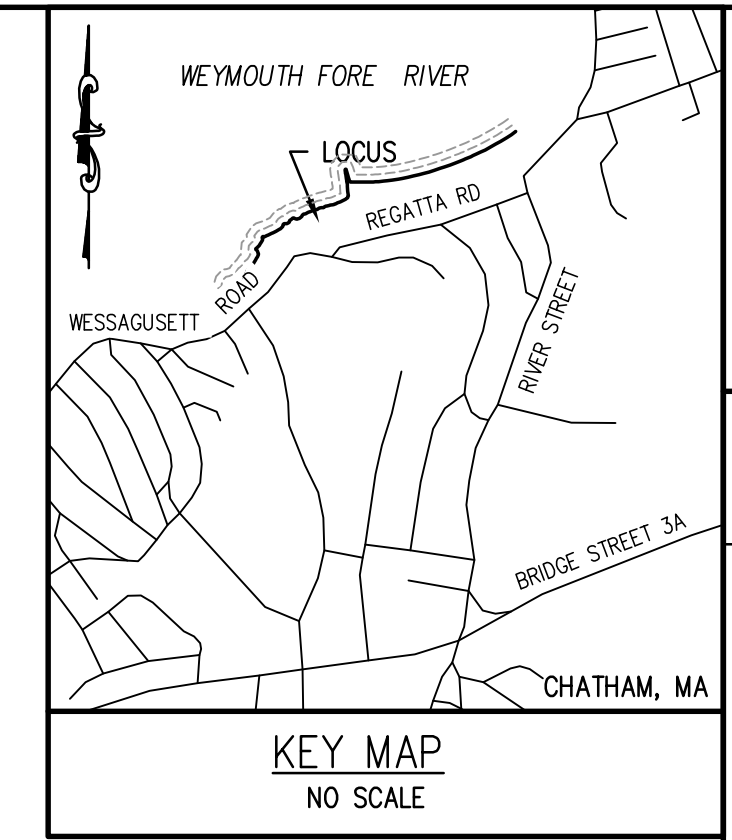
SCALE AS NOTED

DRAWING FILE	C18729-PROPOSED NOI 2019.dwg
DATE	5-12-19
DRAWN BY	KES
CHECKED BY	JRN / RPM

PROJECT NO. C18729.00

C3.2.1

1 OF 2 SHEETS



NO.	DATE	REVISION	BY
2	2019-04-19	REVISED PER CZM COMMENTS	KES
1	2019-04-16	REVISE LAYOUT AS PER REGULATORY COMMENTS	JRN

PLAN REFERENCES:

PLAN BOOK 204, PAGE 1280
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 JAMES W. SEWELL COMPANY
 136 CENTER STREET
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 OLD TOWN, ME. 04468
 PHONE 207-827-4456
 BASED UPON AERIAL IMAGERY PERFORMED IN MAY 2017

FLOOD NOTE:

FLOOD ZONES VE (EL. 15), VE (EL. 16), VE (EL. 18), VE (EL. 20) AND AE (EL. 12) AS SHOWN ON FEMA FIRM PANEL #25021C0089F EFFECTIVE: JUNE 9, 2014

DATUM NOTE:

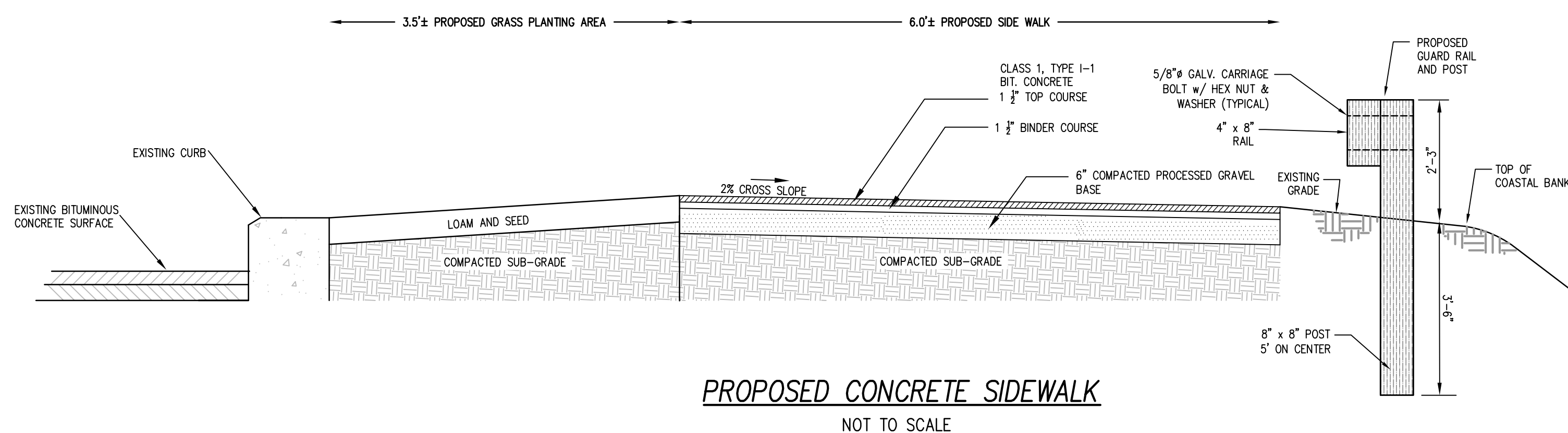
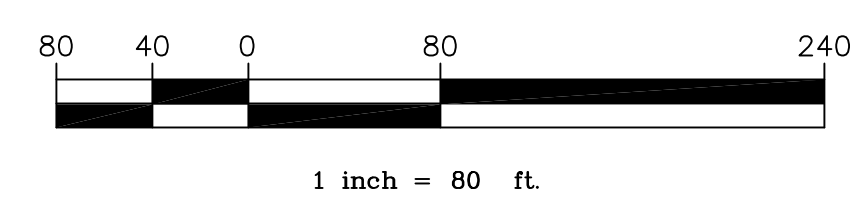
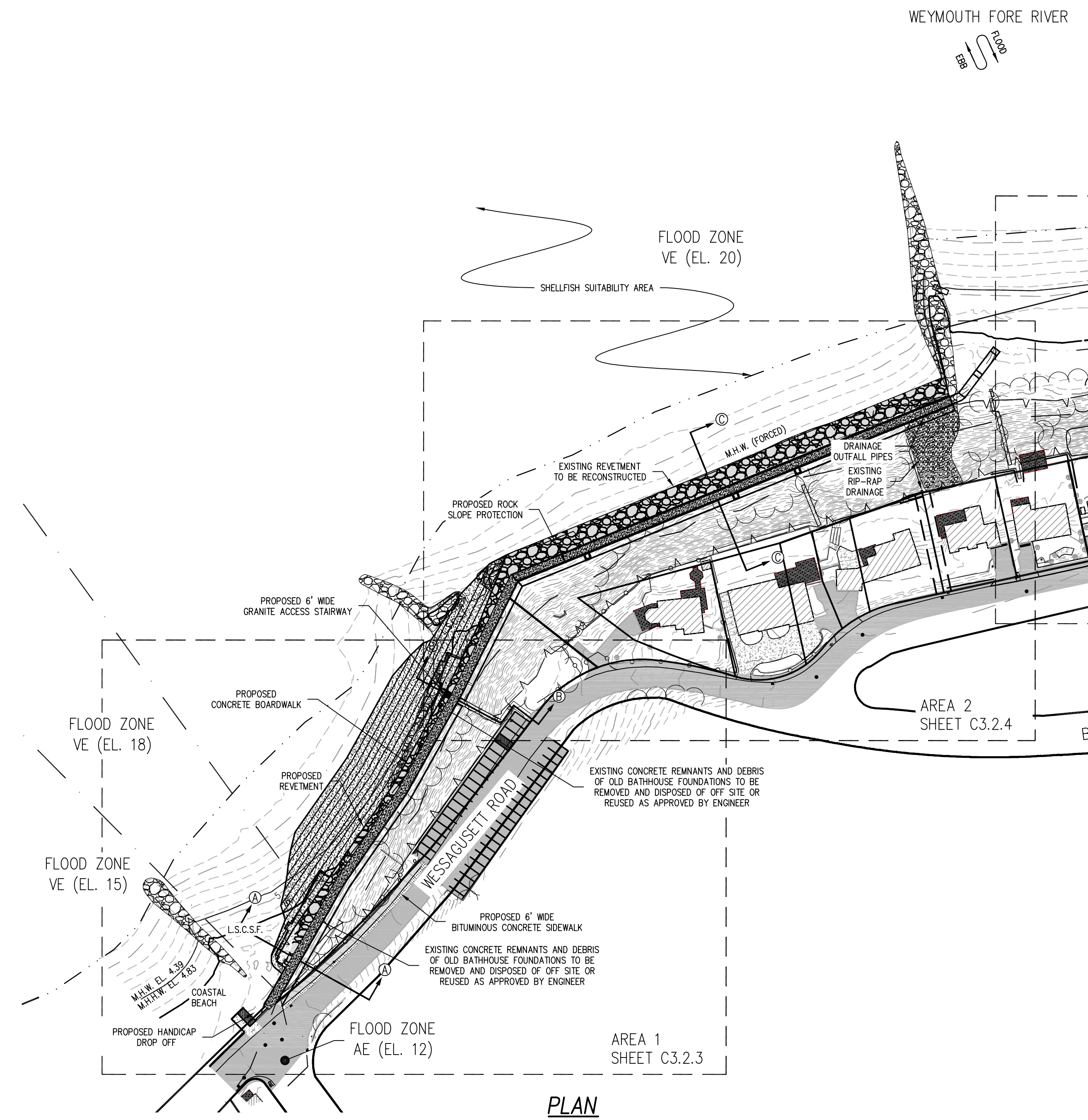
ELEVATIONS SHOWN HEREON ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM 1988 (NAVD 1988)
 MHW EXTRAPOLATED FROM BOSTON AND DUXBURY NOAA TIDE SHEETS

LEGEND

EXISTING

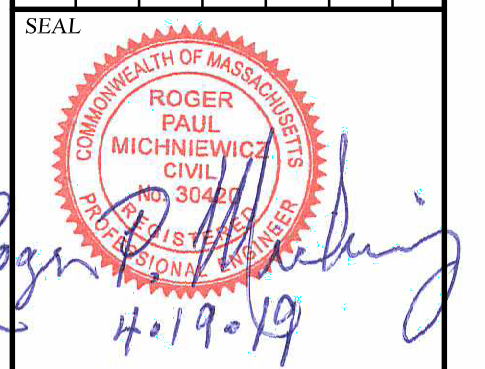
- BOUND
- ⊕ MISC. SIGN
- ⊙ POST
- ⊕ UTILITY POLE
- - - - - CONTOUR
- - - - - APPROXIMATE PROPERTY LINE
- CATCH BASIN
- ⊕ DRAIN MANHOLE
- ⊕ MANHOLE
- ⊕ WATER VALVE
- - - - - FEMA FLOOD ZONE
- - - - - MATCH LINE
- - - - - MEAN HIGH WATER (M.H.W.) EL. 4.39
- L.S.C.S.F. LAND SUBJECT TO COASTAL STORM FLOWAGE
- ~ ~ ~ COASTAL BANK

NOTE:
 PARCELS SHOWN ARE COMPILED FROM PLAN BOOK 204, PAGE 1280 RECORD PLAN AND PROPERTY LINES SHOWN HEREON ARE APPROXIMATE AND ARE SHOWN FOR REPRESENTATION PURPOSES ONLY.



THE INSTALLER SHALL ASCERTAIN THE LOCATION OF EXISTING UNDERGROUND UTILITIES PRIOR TO EXCAVATION, AND SHALL PROTECT UTILITIES WITHIN THE WORK AREA DURING CONSTRUCTION.

THIS DRAWING IS PREPARED FOR PERMITTING PURPOSES ONLY AND SHALL NOT BE USED FOR CONSTRUCTION. CONTRACTOR SHALL OBTAIN FINAL CONSTRUCTION DETAILS FROM THE ENGINEER PRIOR TO PREPARATION OF CONSTRUCTION BID AND BEFORE BEGINNING ANY WORK.



PROJECT: NORTH WEYMOUTH BEACH CONNECTION PROJECT
 WEYMOUTH, MA
 WESSAGUSSETT ROAD, REGATTA ROAD AND RIVER STREET
 SHEET TITLE: PLAN SHOWING PROPOSED SITE IMPROVEMENTS OVER VIEW

SCALE:	AS NOTED
DRAWING FILE:	C18729-PROPOSED NOI 2019.dwg
DATE:	4-12-19
DRAWN BY:	KES
CHECKED BY:	JRN / RPM
C3.2.2	
2 OF 2 SHEETS	
PROJECT NO.:	C18729.00

MASS. COORD. SYSTEM NAD 1983 MAINLAND ZONE

NO.	DATE	BY
2	2019-04-19	KES
1	2019-04-16	JRN

REVISION
REVISED PER CZM COMMENTS
REVISE LAYOUT BASED ON REGULATORY COMMENTS

SEAL

Roger Paul Michniwicki
 4.19.19

PROJECT
NORTH WEYMOUTH BEACH CONNECTION PROJECT
 WESSAGUSSETT ROAD AND REGATTA ROAD
 WEYMOUTH, MA

SHEET TITLE
PLAN SHOWING PROPOSED SITE IMPROVEMENTS AREA 1

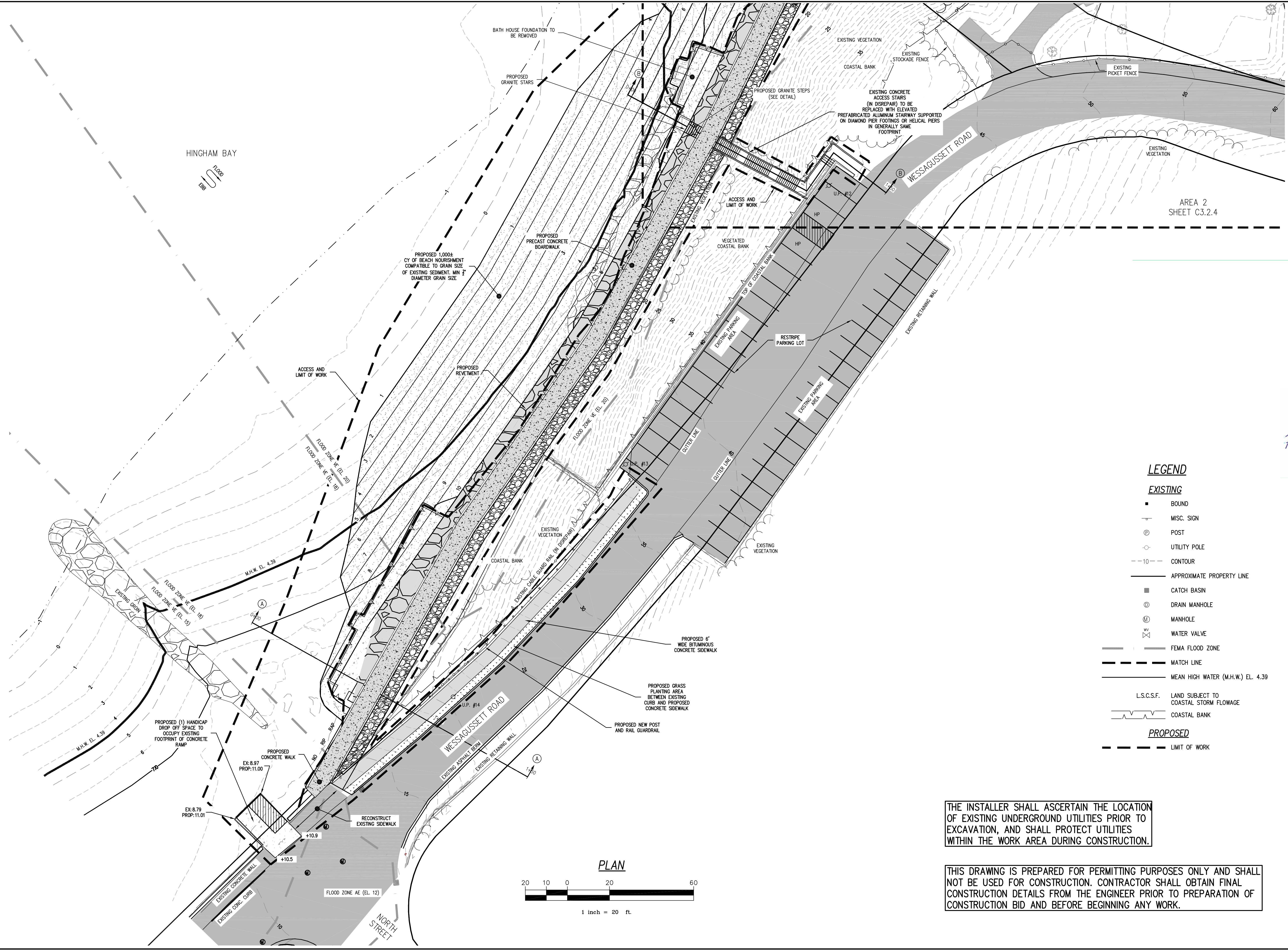
SCALE	AS NOTED
DRAWING FILE	C18729-PROPOSED NOI 2019.dwg
DATE	4-12-19
DRAWN BY	KES
CHECKED BY	JRN / RPM

Coastal Engineering Co., Inc. © 2019

C3.2.3

1 OF 2 SHEETS

PROJECT NO. C18729.00

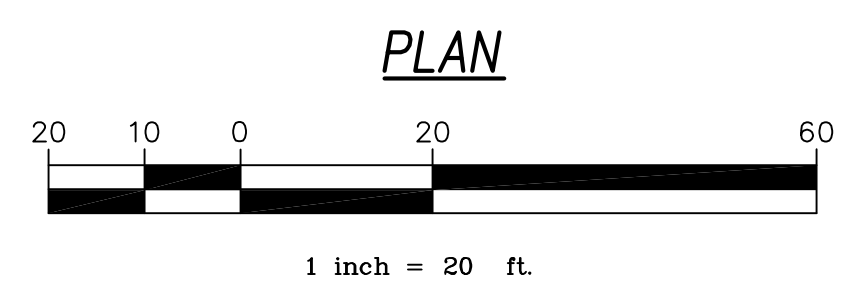


LEGEND

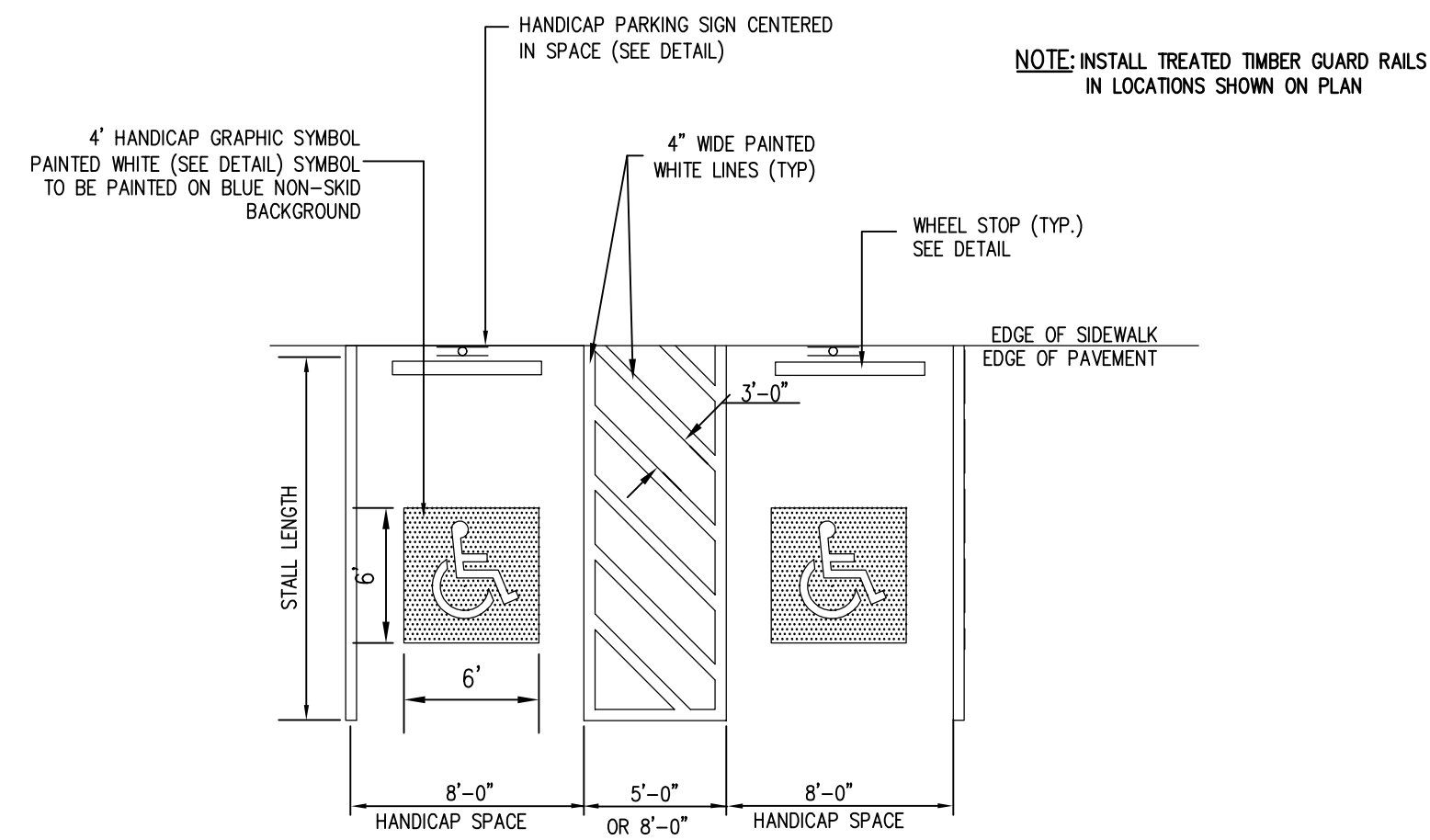
- EXISTING**
- BOUND
 - ⊕ MISC. SIGN
 - ⊙ POST
 - ⊕ UTILITY POLE
 - - - - - CONTOUR
 - - - - - APPROXIMATE PROPERTY LINE
 - CATCH BASIN
 - ⊕ DRAIN MANHOLE
 - ⊕ MANHOLE
 - ⊕ WATER VALVE
 - FEMA FLOOD ZONE
 - - - - - MATCH LINE
 - MEAN HIGH WATER (M.H.W.) EL. 4.39
 - L.S.C.S.F. LAND SUBJECT TO COASTAL STORM FLOWAGE
 - COASTAL BANK
- PROPOSED**
- - - - - LIMIT OF WORK

THE INSTALLER SHALL ASCERTAIN THE LOCATION OF EXISTING UNDERGROUND UTILITIES PRIOR TO EXCAVATION, AND SHALL PROTECT UTILITIES WITHIN THE WORK AREA DURING CONSTRUCTION.

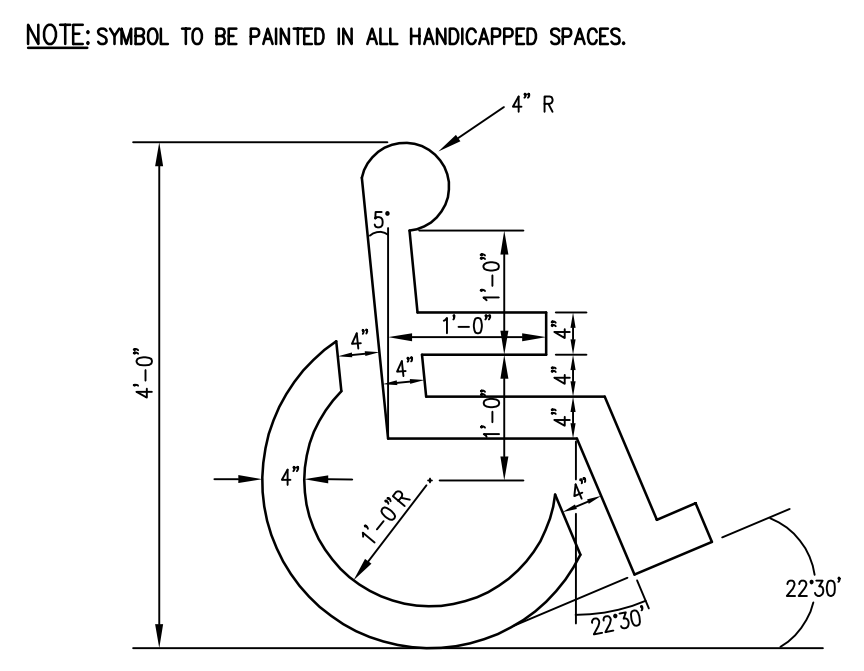
THIS DRAWING IS PREPARED FOR PERMITTING PURPOSES ONLY AND SHALL NOT BE USED FOR CONSTRUCTION. CONTRACTOR SHALL OBTAIN FINAL CONSTRUCTION DETAILS FROM THE ENGINEER PRIOR TO PREPARATION OF CONSTRUCTION BID AND BEFORE BEGINNING ANY WORK.



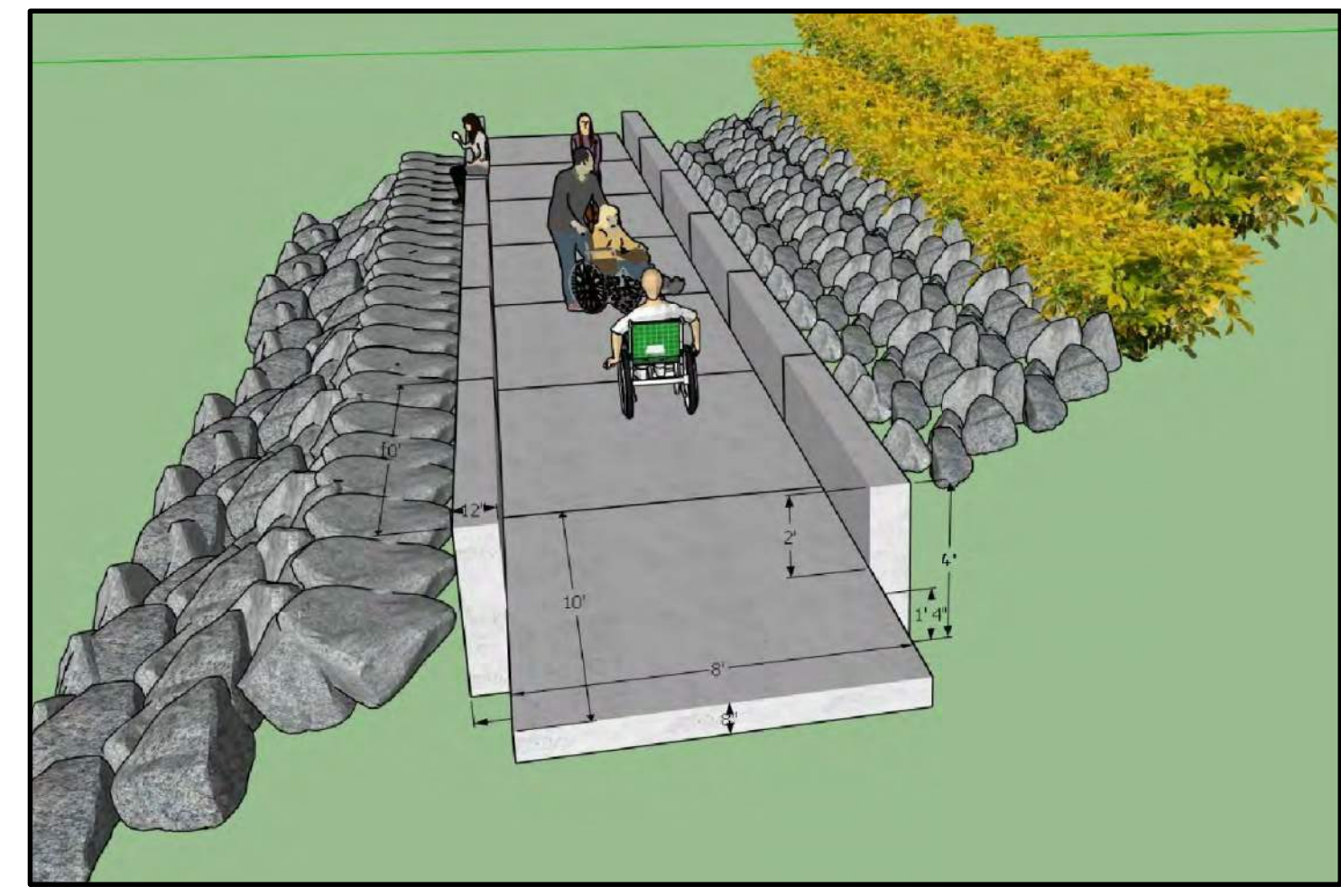
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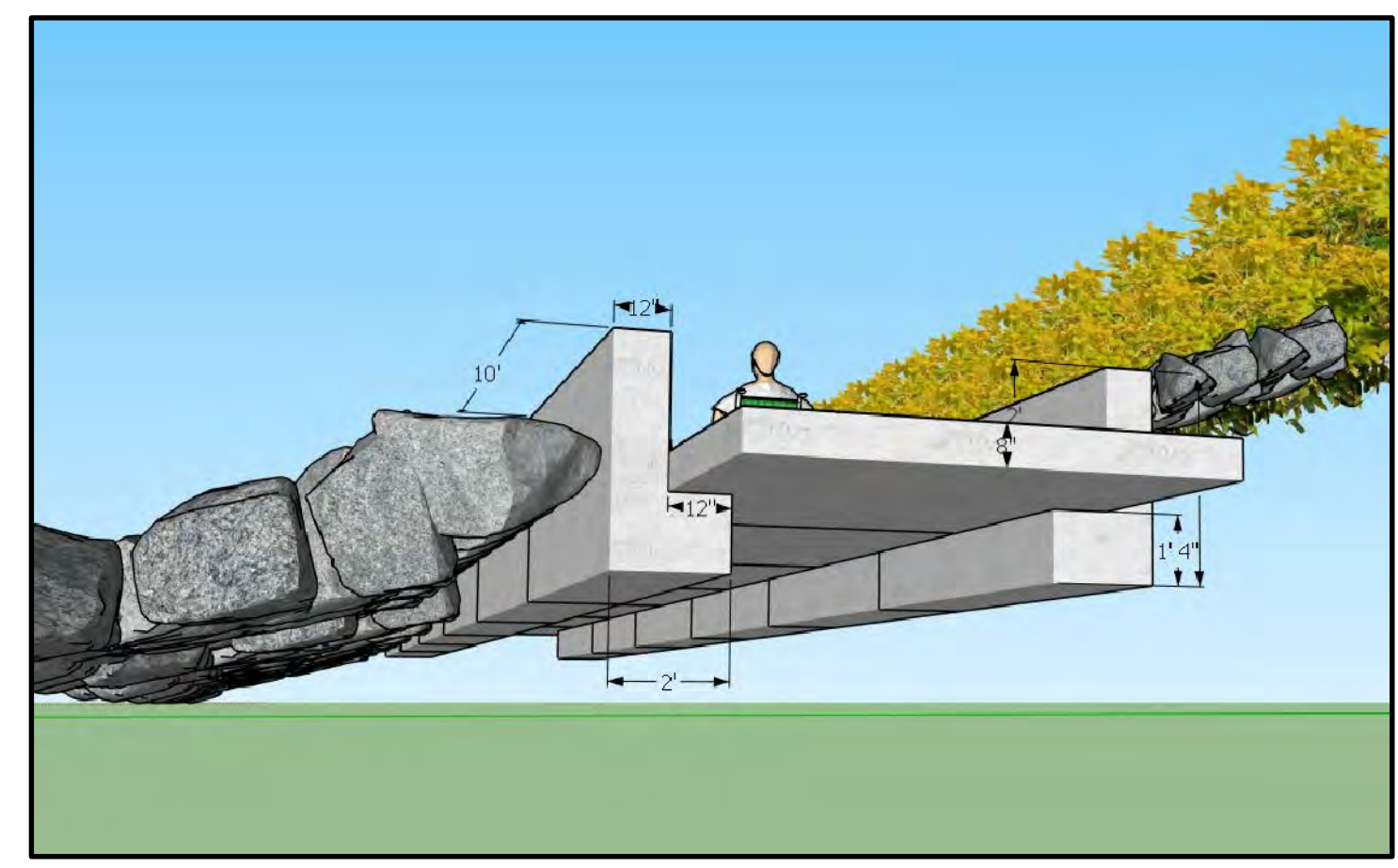
HANDICAP SPACE STRIPING



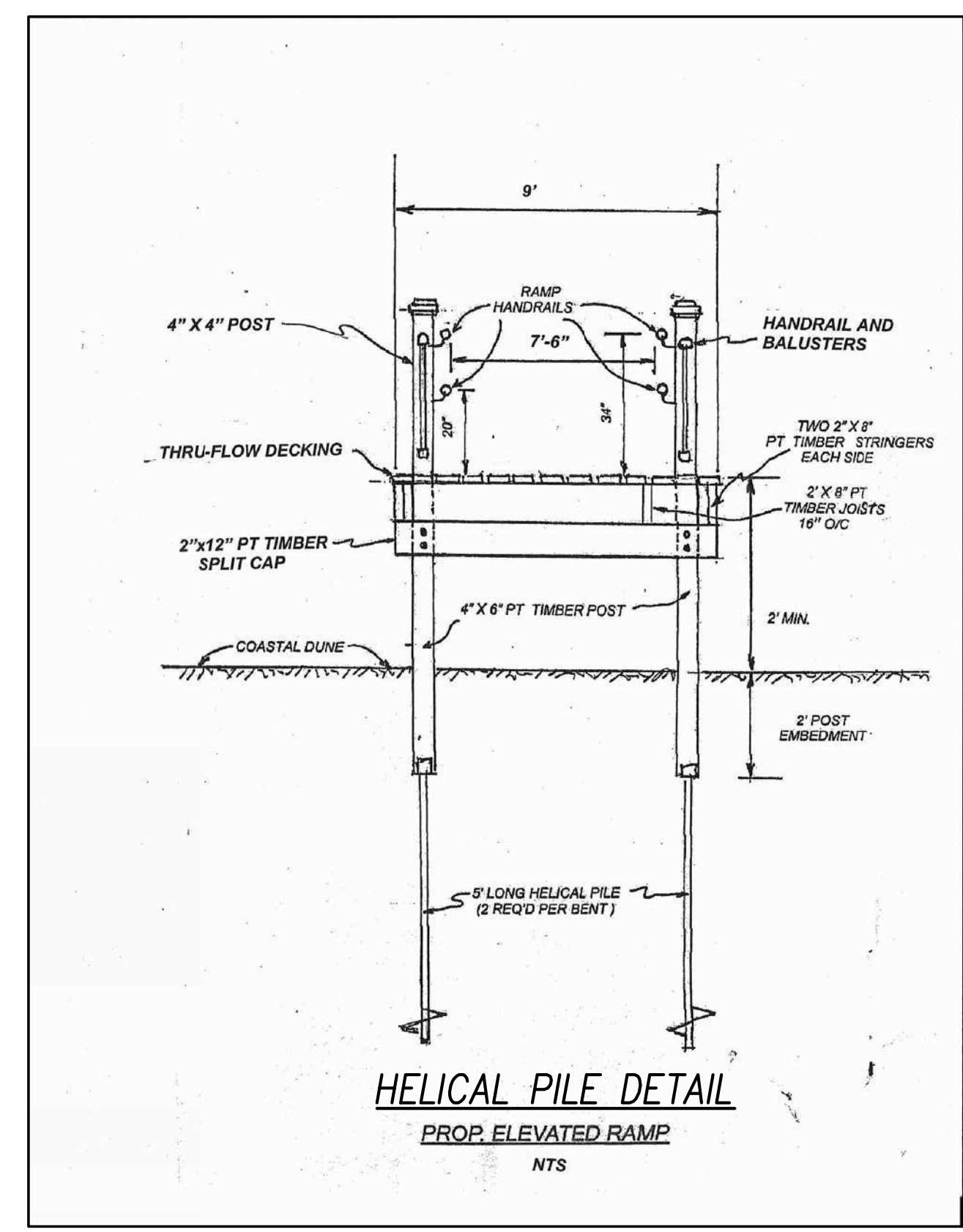
PAINTED HANDICAP SYMBOL
NOT TO SCALE



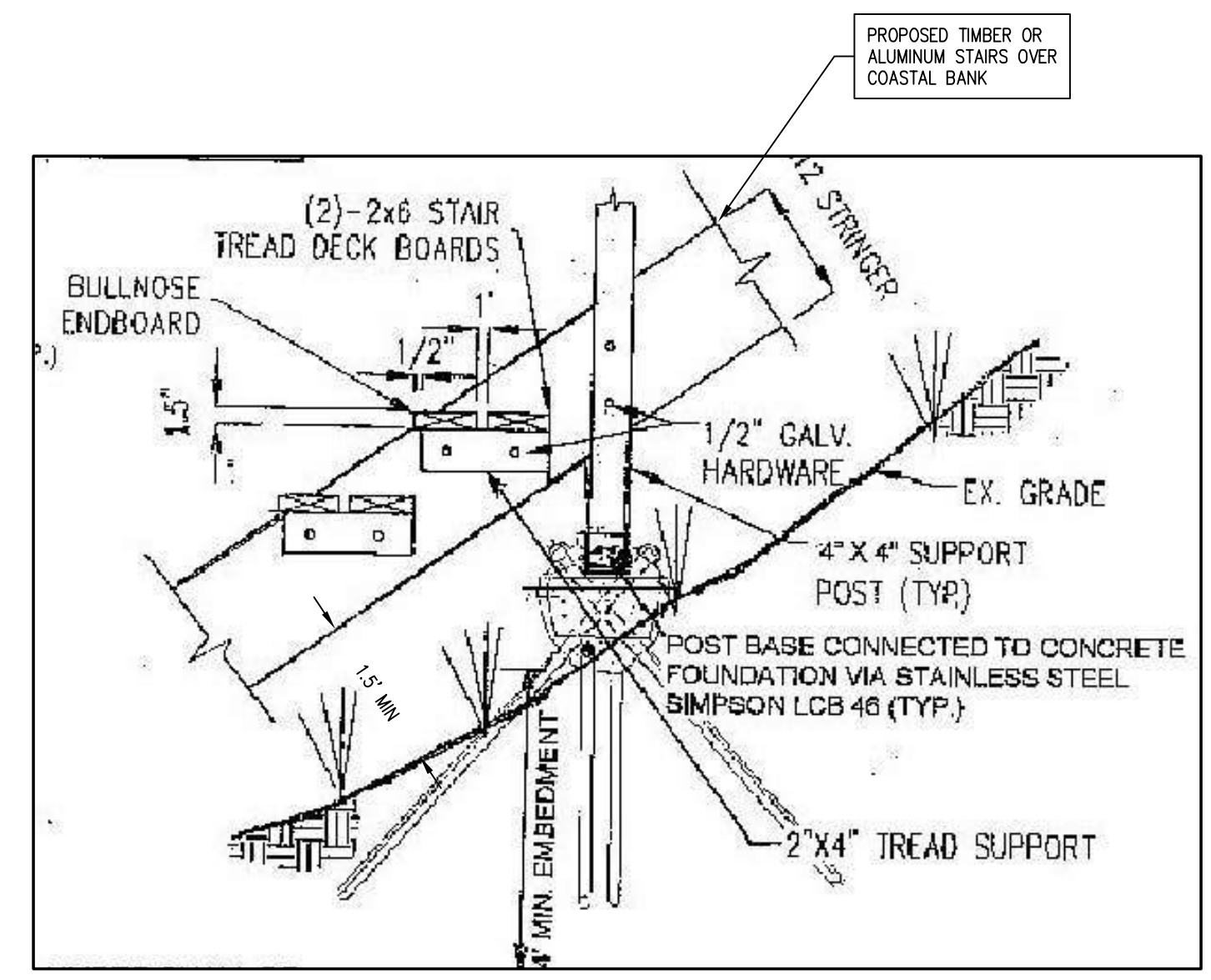
PRE-CAST CONCRETE BOARDWALK
NOT TO SCALE



PRE-CAST CONCRETE BOARDWALK
NOT TO SCALE

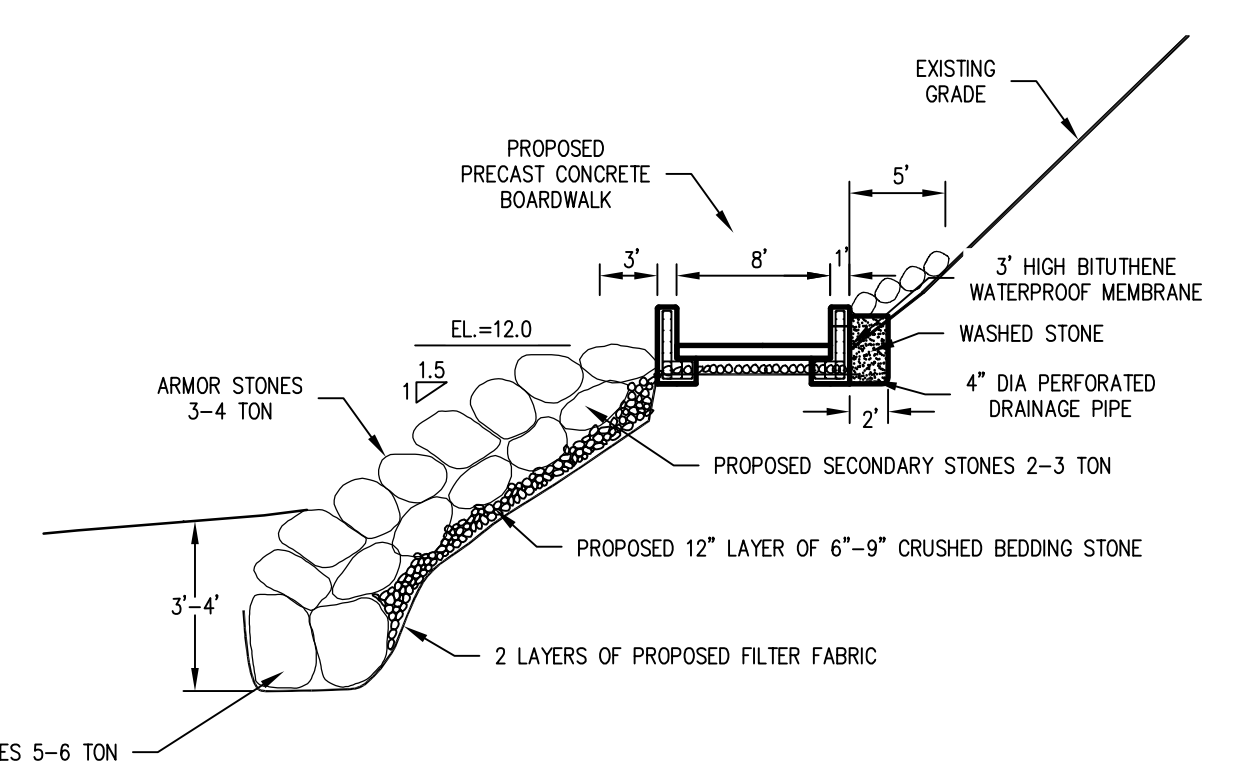


HELICAL PILE DETAIL
PROP. ELEVATED RAMP
NTS

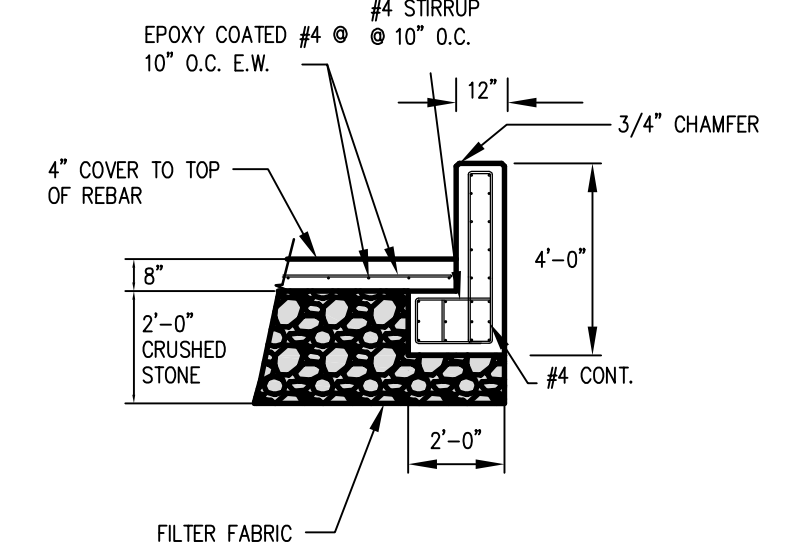


DIAMOND PIER DETAIL
NOT TO SCALE

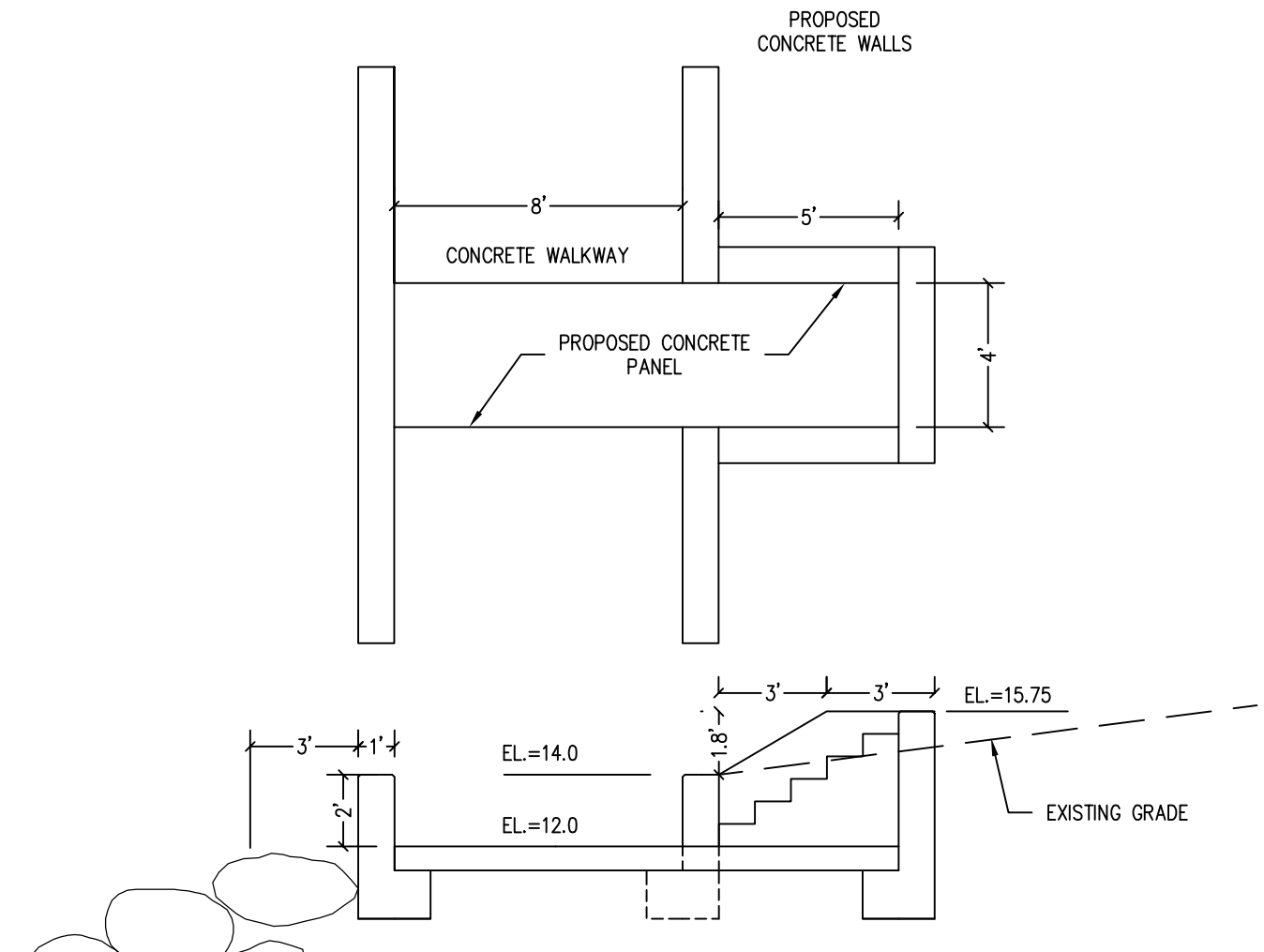
- STAIRWAY NOTES:**
- EXISTING CONCRETE STAIRS FROM THE "SHELF" TO THE BEACH SHALL BE REMOVED AND THE SURFACE OF THE COASTAL BANK SHALL BE FILLED WITH CLEAN SAND AND GRAVEL TO MATCH EXISTING ADJACENT GRADES.
 - THE FILL SHALL THEN BE COVERED WITH A 6" THICK LAYER OF LOAM & PLANTED WITH INDIGENOUS SPECIES.
 - EROSION CONTROL MATTING SHALL BE INSTALLED TO KEEP THE VEGETATION STABILIZED.



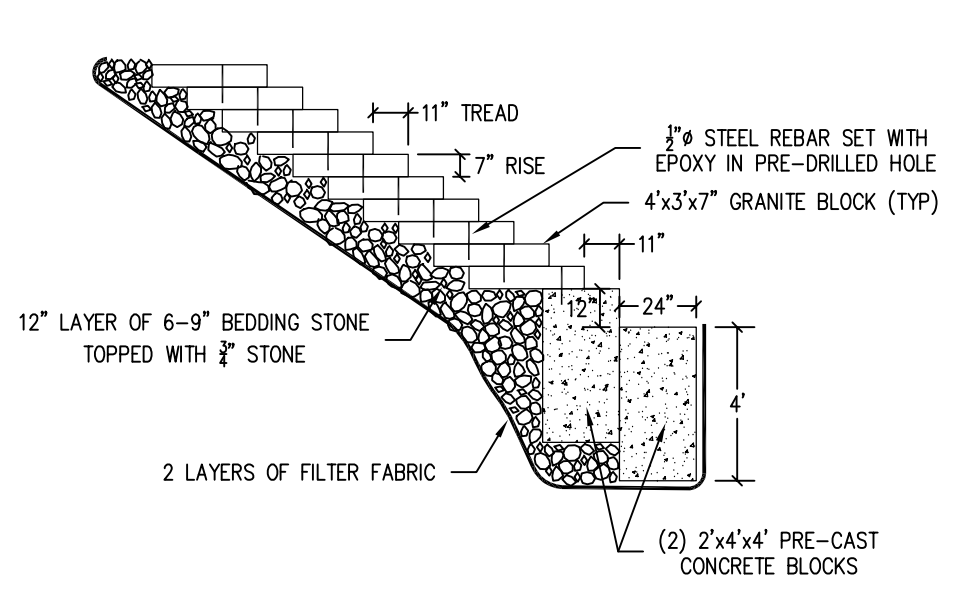
PRECAST CONCRETE WALKWAY DETAIL
NOT TO SCALE



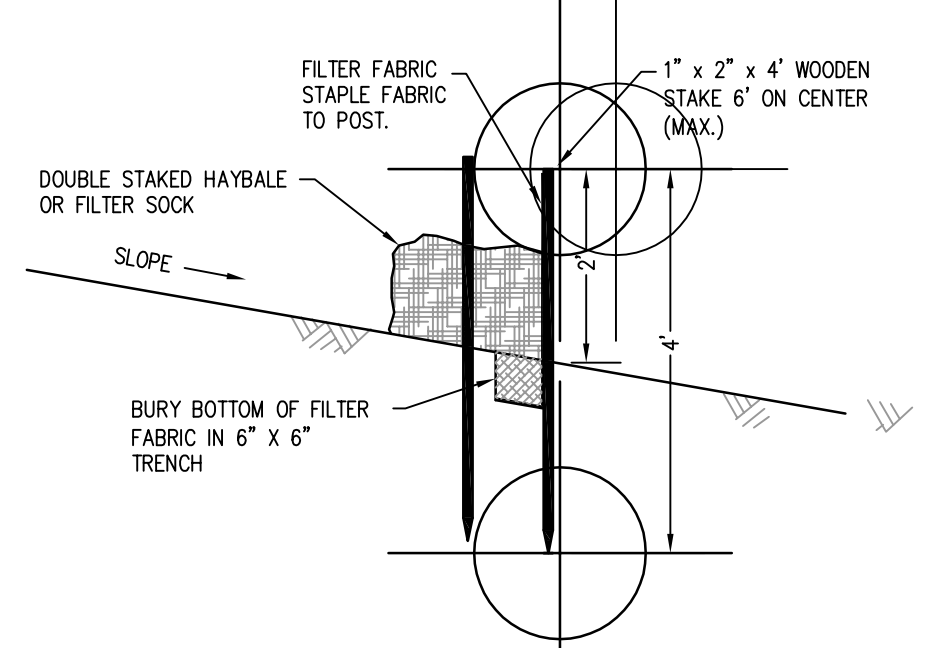
PRE-CAST CONCRETE DETAIL
SCALE: 1" = 4"



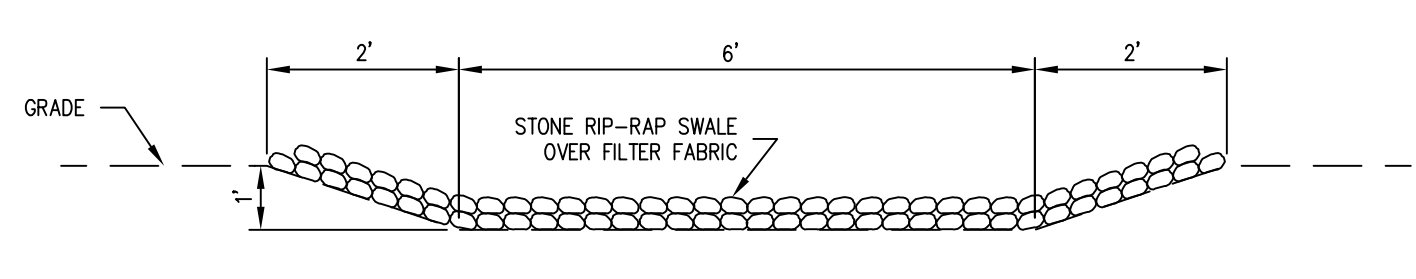
STAIRWAY CUTOUT DETAIL
SCALE: 1" = 5"



GRANITE STEPS DETAIL
SCALE: 1" = 5"



EROSION CONTROL BARRIER DETAIL
NO SCALE



DRAINAGE SWALE DETAIL
NOT TO SCALE

PLAN NOTES:

- SUPPLY ALL MATERIAL, EQUIPMENT AND LABOR FOR CONSTRUCTION OF ROCK REVETMENT ALONG THE SHOREFRONT AS DESCRIBED AND SHOWN ON PLAN AND DETAILS.
- ACCESS FOR MATERIAL AND EQUIPMENT TO BE FROM THE SUBJECT PROPERTY AT WESSAGUSSETT AND/OR GEORGE E LANE BEACH. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMISSION REQUIRED FOR USE OF ANY AND ALL ACCESS.
- PERFORMANCE OF THE WORK SHALL BE IN COMPLIANCE WITH THE PLAN AND DETAILS, AND ORDER OF CONDITIONS ISSUED BY THE WEYMOUTH CONSERVATION COMMISSION FOR THE REFERENCED PROJECT AND AS DESCRIBED BELOW.
- ANY FUTURE MAINTENANCE REQUIRED ON THE REVETMENT SHALL NOT COMMENCE UNTIL THE WEYMOUTH CONSERVATION AGENT HAS FIRST BEEN NOTIFIED AS TO THE SCOPE OF THE REPAIRS.
- ANY FILL MATERIAL REQUIRED SHALL BE CLEAN COMPACTED COARSE SAND BROUGHT ONTO SITE BY CONTRACTOR.
- FILTER CLOTH SHALL BE OF MIRAFI 600X, OR EQUAL, AS APPROVED BY THE ENGINEER.
- THE FILTER CLOTH SHALL BE PLACED IN TWO LAYERS ON TOP OF THE GRADED SLOPE OF THE BANK, AND BENEATH THE TOE MATERIAL. THE JOINTS OF THE FILTER CLOTH SHALL BE STAGGERED AT LEAST SIX FEET APART. THE FILTER CLOTH SHALL BE OVERLAPPED AT LEAST THREE FEET IN EACH DIRECTION. ENDS OF FILTER CLOTH SHALL NOT BUTT EACH OTHER.
- A MINIMUM OF A NINE TO TWELVE INCH LAYER OF BEDDING STONE SHALL BE PLACED OVER THE FILTER CLOTH PRIOR TO THE PLACEMENT OF THE ARMOR STONE. THE BEDDING STONE SHALL BE KEPT IN AN ENCLOSED CONTAINER, AND NOT DUMPED ON THE BEACH. THE CONTRACTOR SHALL PLACE THE BEDDING STONE ON THE SLOPE DIRECTLY FROM THE ENCLOSED CONTAINER.
- THE ARMOR STONE SHALL BE PLACED BY EQUIPMENT ONTO THE BANK. THE ROCK SHALL NOT BE DUMPED ONTO THE BANK. EACH STONE SHALL BE CHOSEN AND PLACED INTO POSITION BY EQUIPMENT IN ORDER TO INTERLOCK WITH ADJOINING STONES. PLACEMENT SHALL BE SUCH SO THAT THE END FACE OF THE LONGEST DIMENSION OF THE STONE SHALL FACE SEAWARD, THE ROCK THUS LAYING HORIZONTALLY. EACH STONE SHALL BE ADEQUATELY "TAPPED" AND "KEYED" INTO PROPER SEATING TO INSURE TIGHT FIT, BEFORE ANOTHER STONE IS ADDED. STONES NOT PROPERLY STACKED SO AS TO SECURELY INTERLOCK, UPON THE ENGINEER'S JUDGMENT, SHALL BE REMOVED AND REPLACED TO THE ENGINEER'S SATISFACTION.
- UPON COMPLETION OF THE REVETMENT, THE CONTRACTOR SHALL REPLACE THE BEACH ACCESS, INCLUDING COVER OVER THE BASE OF THE REVETMENT, TO MATCH THE ORIGINAL PROFILE.
- EXCESS SAND SHALL BE SPREAD EVENLY OVER THE FACE OF THE ROCK REVETMENT.
- THE REVETMENT AND BEACH SHALL BE INSPECTED BY THE ENGINEER APPROXIMATELY 28 DAYS (ONE MOON TIDE) AFTER CONSTRUCTION TO ENSURE THAT NO EXTRANEOUS CONSTRUCTION STONES REMAIN ON THE BEACH. ANY LOOSE CONSTRUCTION STONES ON THE BEACH SHALL BE REMOVED BY THE CONTRACTOR.

THE INSTALLER SHALL ASCERTAIN THE LOCATION OF EXISTING UNDERGROUND UTILITIES PRIOR TO EXCAVATION, AND SHALL PROTECT UTILITIES WITHIN THE WORK AREA DURING CONSTRUCTION.

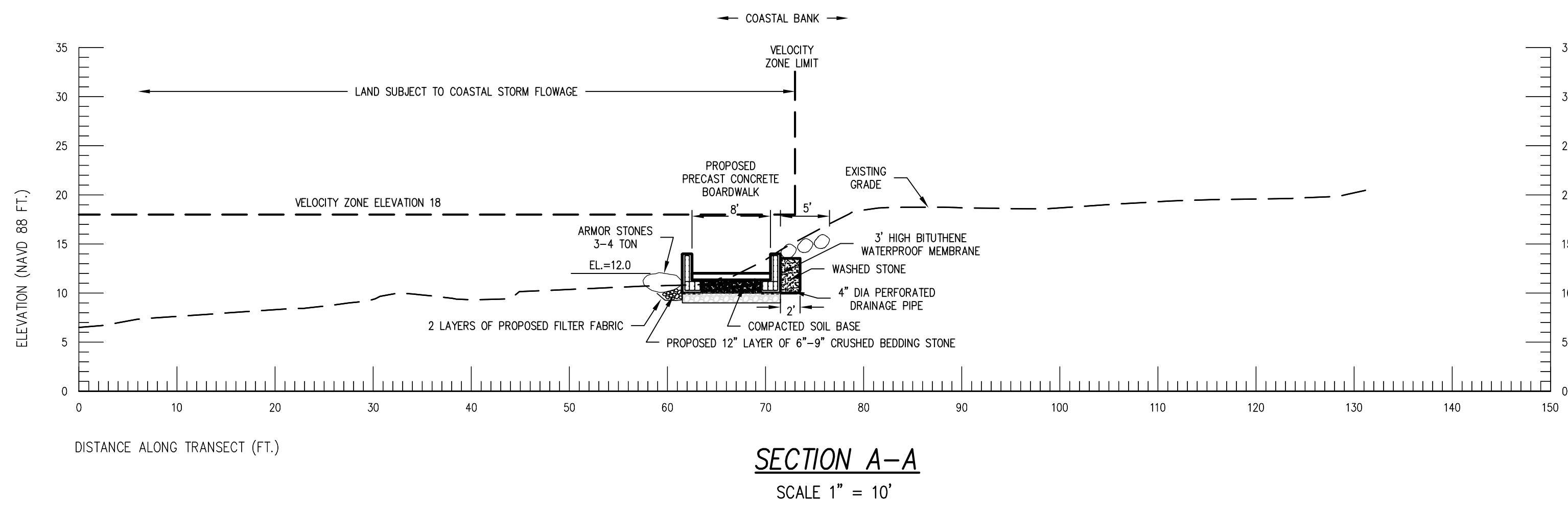
THIS DRAWING IS PREPARED FOR PERMITTING PURPOSES ONLY AND SHALL NOT BE USED FOR CONSTRUCTION. CONTRACTOR SHALL OBTAIN FINAL CONSTRUCTION DETAILS FROM THE ENGINEER PRIOR TO PREPARATION OF CONSTRUCTION BID AND BEFORE BEGINNING ANY WORK.

NO.	DATE	REVISION	BY
2	2019-04-19	REVISED PER CZM COMMENTS	KES
1	2019-04-16	REVISE LAYOUT AS PER REGULATORY COMMENTS	JRN

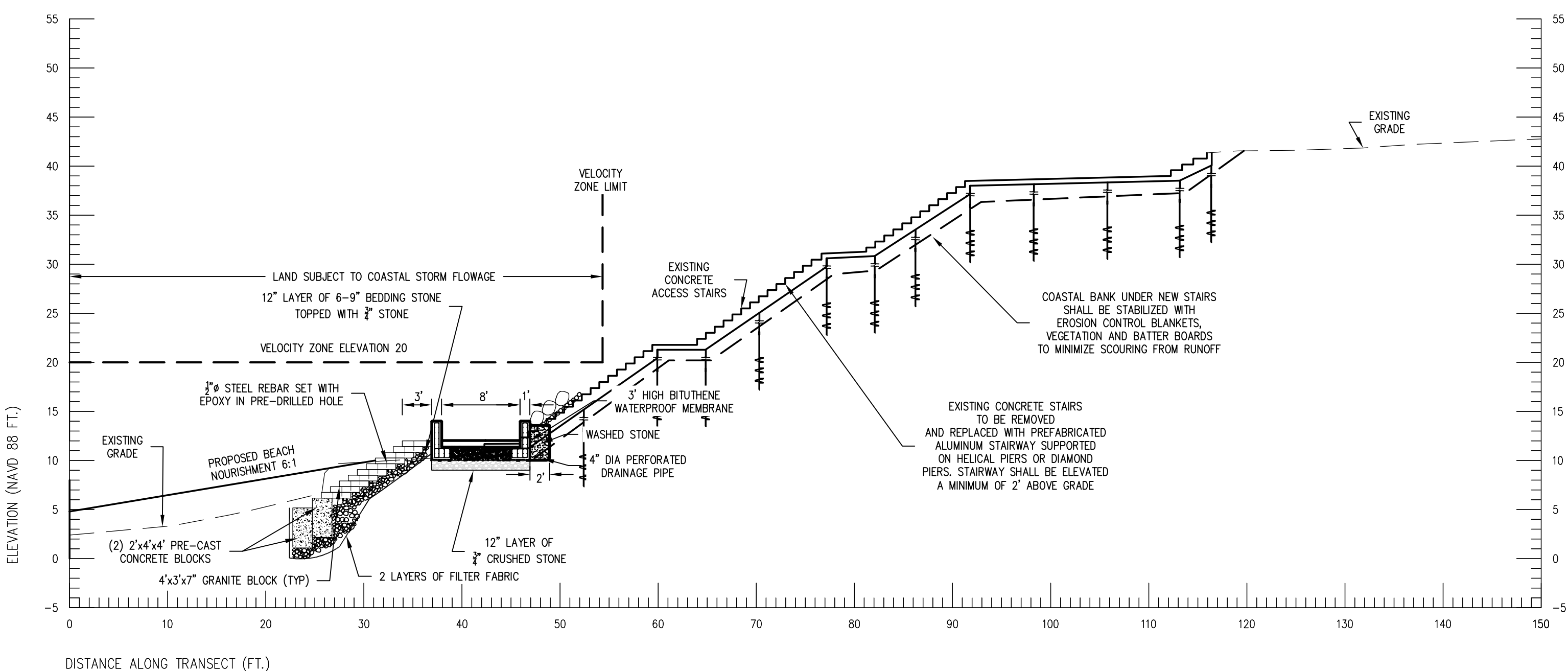
SEAL
ROGER PAUL MICHNIEWICZ
CIVIL ENGINEER
3045
4-19-19

PROJECT: NORTH WEYMOUTH BEACH CONNECTION PROJECT
WEYMOUTH, MA
REGATTA ROAD AND RIVER STREET
SHEET TITLE: PLAN SHOWING PROPOSED SITE IMPROVEMENT DETAILS

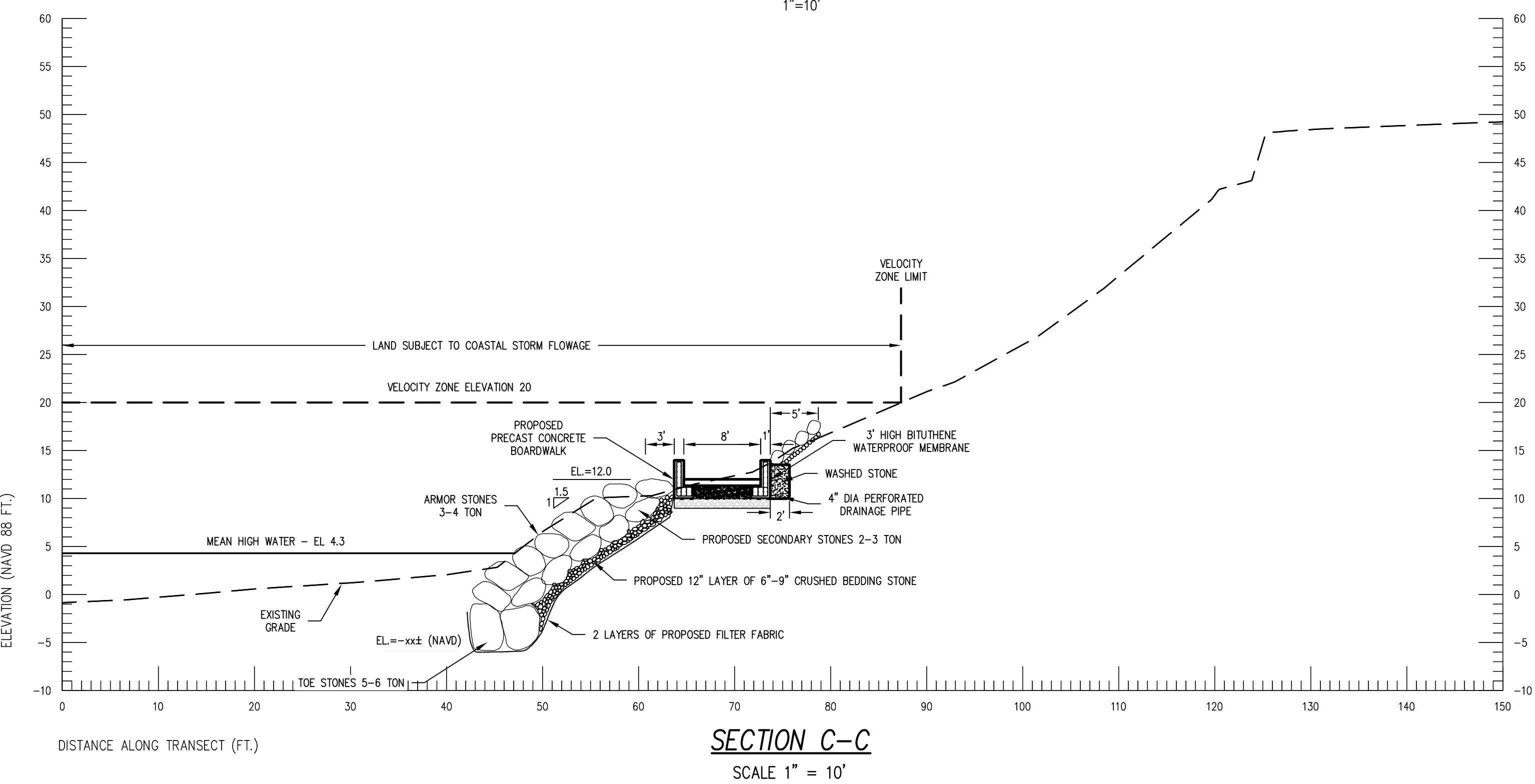
F:\SINK\PROJ\C1800\C18729\C18729-40\C18729-PROPOSED NOI 2019.dwg, Apr 22, 2019 - 11:44am



SECTION A-A
SCALE 1" = 10'



SECTION B-B
SCALE 1" = 10'



SECTION C-C
SCALE 1" = 10'



PHOTOS NEAR SECTION A-A



PHOTOS NEAR SECTION B-B



PHOTOS NEAR SECTION C-C

NO.	DATE	BY	REVISION
2	2019-04-19	KES	REVISED PER CZM COMMENTS
1	2019-04-16	JRN	REVISE LAYOUT AS PER REGULATORY COMMENTS

SEAL
ROGER PAUL MICHNIEWICZ
CIVIL ENGINEER
NO. 3046
4.19.19

PROJECT
NORTH WEYMOUTH BEACH CONNECTION PROJECT
WYOMOUTH, MA
REGATTA ROAD AND RIVER STREET
SHEET TITLE
SECTIONS AND PHOTOS

SCALE AS NOTED
DRAWING FILE C18729-PROPOSED NOI 2019.dwg
DATE 4-12-18
DRAWN BY KES
CHECKED BY JRN / RPM

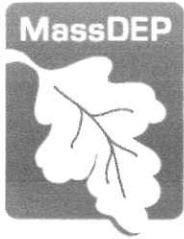
C3.2.8
2 OF 2 SHEETS
PROJECT NO. C18729.00

F:\SINK\PROJECT\C18729\C18729-PROPOSED NOI 2019.dwg, Apr 22, 2019 - 11:17am

Coastal Engineering Co.

**APPENDIX - Permits
MassDEP Chapter 91
Waterways License**





Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

One Winter Street Boston, MA 02108 • 617-292-5500

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Kathleen A. Theoharides
Secretary

Martin Suuberg
Commissioner

July 27, 2021

Town of Weymouth
c/o Sarah Cole – Coastal Engineering CO., Inc.
260 Cranberry Highway
Orleans, Massachusetts 02653

RE: ISSUANCE OF CHAPTER 91 WATERWAYS LICENSE No. 15271

278 Wessagussett Road & 20 River Street, Filled and Flowed Tidelands of the Weymouth Fore River, Weymouth, Norfolk County

Dear Ms. Cole,

The Department of Environmental Protection hereby issues the above-referenced Waterways License, enclosed, authorizing the Licensee to perform certain activities pursuant to M.G.L. c. 91, the Public Waterfront Act, and the Waterways Regulations at 310 CMR 9.00. Any change in use or alteration of any structure or fill not authorized by this License shall render this License void.

RECORDING OF THE LICENSE

This License must be recorded at the Norfolk County Registry of Deeds or, if registered land, with the Land Registration Office within sixty (60) days from the date of license issuance. In the case of recorded land, the License shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the project is located. In the case of the registered land, the License shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the project is located. Failure to record this License within sixty (60) days of the date of issuance will render this License void pursuant to 310 CMR 9.18.

A Waterways License Recordation Notice Form has been enclosed for your use in notifying the Department of the recording information for this License. Failure to notify the Department of the recording of this License is a violation of 310 CMR 9.00 and is subject to enforcement action by the Department.

CERTIFICATE OF COMPLIANCE

Pursuant to 310 CMR 9.19, once the licensed project is complete, the Licensee must file a Request for a Certificate of Compliance form, BRP WW05, within sixty (60) days of completion but in no event later than five (5) years from the License's issuance date, or any extension thereof, in accordance with 310 CMR 9.19(1). The license for any project for which such a request is not filed and certificate issued may be revoked pursuant to 310 CMR 9.26.

Please contact Ivan Morales-Parra at (617) 292-5621 or at ivan.morales@mass.gov, if you have any questions pertaining to the recording of your License.

Sincerely,



Daniel J. Padien
Program Chief
Waterways Regulation Program

Cc: Mayor Robert L. Hedlund, Town of Weymouth
Weymouth Planning Board
Weymouth Conservation Commission
Weymouth Harbormaster

Encl: Waterways License No. 15271
Notification of Waterways License Recordation Form

Program Coordinator
Department of Environmental Protection
Waterways Regulation Program
1 Winter Street, 5th Floor
Boston, Massachusetts 02108
dep.waterways@mass.gov

RE: NOTIFICATION OF RECORDING CHAPTER 91 WATERWAYS LICENSE/PERMIT #15271
Town of Weymouth, Weymouth Fore River, Weymouth, Norfolk County

To whom it may concern:

This is to notify you that the above referenced Waterways License was recorded with the appropriate Registry of Deeds/ Land Court for this project location and to provide your office with the following recordation information.

Date Recorded: _____

County Registry of Deeds/ Land Court: _____

Book Number _____, **Page Number(s)** _____ **and**

Plan Book Number _____, **Page Number(s)** _____

Sincerely,

Chapter 91 Waterways Licensee

LICENSE VOID IF NOT RECORDED WITHIN 60 DAYS OF ISSUANCE

The Commonwealth of Massachusetts



No. 15271

Whereas, Town of Weymouth

of -- Weymouth -- in the County of -- Norfolk -- and Commonwealth aforesaid, has applied to the Department of Environmental Protection for license/permit to -- dredge approximately 1,000 cubic yards of sediment; placement of 1,000-cubic yards of fill; reconstruct and extend an existing stone revetment and associated structures; install and maintain a pile-supported ADA wooden ramp; maintain two (2) existing stone groins; and remove remnants of two (2) bathhouse foundations, as further described below -----

and has submitted plans of the same; and whereas due notice of said application, ~~and of the time and place fixed for a hearing thereon~~, has been given, as required by law, to the -- Municipal Official -- of the -- Town of Weymouth; -----

Now, said Department, having heard all parties desiring to be heard, and having fully considered said application, hereby, subject to the approval of the Governor, authorizes and licenses the said -----

Town of Weymouth -- subject to the provisions of the ninety first chapter of the General Laws, and of all laws which are or may be in force applicable thereto, to -- dredge approximately 1,000-cubic yards of sediments over an area of approximate 3,000-square feet from a coastal beach; placement of approximately 1,000-cubic yards of sand for beach nourishment, placed at a 6:1 slope; reconstruct and extend the length (by approximately 500-feet) of an existing 500-linear feet stone revetment, consisting of 2- to 4-ton armor stones atop a 12-inch thick layer of 6- to 9-inch crushed bedding stone placed at 1.5:1 slope; construct and maintain an 8-foot wide by 67-foot long pile-supported ADA timber ramp, supported by ten (10) 4-inch by 6-inch timber posts connected to 1-inch diameter helical piles, with associated handrail, beams and decking; maintain two (2) existing stone groins (one 34-foot wide by 200-foot long and one 25-foot wide by 350-foot long); and remove remnants of two (2) bathhouse foundations -----

on filled and flowed tidelands of -- the Weymouth Fore River -- at 278 Wessagussett Road & 20 River Street -- in the -- Town of Weymouth -- and in accordance with the locations shown and details indicated on the accompanying License Plans No. 15271 (7 Sheets) prepared by Coastal Engineering Company, Inc., dated June 29, 2019 and last revised on August 6, 2020.

No Specific Legislative Authorizations and/or Licenses were previously issued for the project site.

The structures and/or fill authorized hereby shall be limited to the following uses: shoreline stabilization, placement of fill for beach nourishment, and public access to waterfront open space for passive recreational purposes.

The structures and/or fill authorized pursuant to this License are valid for an unlimited term, pursuant to 310 CMR 9.15(1)(c).

The Dredge Permit incorporated within this License is valid for a term of five (5) years subsequent to the date of issuance.

This License/Permit is subject to the following Special Conditions and Standard Conditions:

SPECIAL WATERWAYS LICENSE CONDITIONS

1. The Licensee shall maintain all structures/fill authorized herein in accordance with the terms and conditions specified herein or this License may expire, pursuant to 310 CMR 9.25(1).
2. Any structural alteration, change in use, or any other modification to that explicitly authorized herein and contained on said License Plans shall require prior review of the Department to determine whether additional licensing is required pursuant to M.G.L. Chapter 91 and the Waterways Regulations at 310 CMR 9.00.
3. All structures and fill authorized herein shall be constructed to meet the Engineering and Construction Standards pursuant to 310 CMR 9.37.
4. The Licensee shall allow agents of the Department to enter the project site to verify compliance with the terms and conditions of this License.
5. All work authorized herein shall be completed within five (5) years of the date of license issuance. The construction period may be extended by the Department for one (1) or more one (1) year periods without public notice, provided that the Applicant submits to the Department thirty (30)

days prior to the end of the construction period, a written request to extend the period and provides adequate justification for said extension.

6. Within sixty (60) days of completion of the licensed project, the Licensee shall request in writing that the Department issue a Certificate of Compliance in accordance with 310 CMR 9.19. The request shall be accompanied by a certification by a registered professional engineer licensed to do business in the Commonwealth that the project was completed in accordance with the plans, specifications, and conditions of this License.

SPECIAL WATERWAYS DREDGE PERMIT CONDITIONS

1. The Permittee shall perform all work authorized herein in strict conformance with all applicable requirements and authorizations of 401 Water Quality Certification No. X283696 issued by the Department on July 20, 2020, or as otherwise amended thereto.
2. The Permittee, or its contractor, shall not perform any in-water sediment producing work during the following time of year restrictions: from February 15th to June 30th of any year, as required by the Massachusetts Division of Marine Fisheries (MassDMF) in order to protect spawning and juvenile development of marine fisheries resources, diadromous fish, and shellfish without prior written authorization from MassDMF. Said authorization shall be submitted to the Department prior such sediment producing work.
3. The Permittee shall inform the Department in writing at least three (3) days before commencing any authorized dredging activities.
4. Dredging may be performed by hydraulic or mechanical means and conducted in a manner that will cause no unnecessary obstruction with vessel navigation in the Weymouth Fore River.
5. After completion of the dredging authorized herein, no maintenance dredging beyond the time authorized herein is permitted under this Permit.

Please see Page 4 for additional conditions to this License

Duplicate of said plan, License/Permit Number 15271 is on file in the office of said Department, and original of said plan accompanies this License/Permit and is to be referred to as a part hereof.

STANDARD WATERWAYS LICENSE CONDITIONS

1. Acceptance of this Waterways License shall constitute an agreement by the Licensee to conform with all terms and conditions stated herein.
2. This License is granted upon the express condition that any and all other applicable authorizations necessitated due to the provisions hereof shall be secured by the Licensee prior to the commencement of any activity or use authorized pursuant to this License.
3. Any change in use or any substantial structural alteration of any structure or fill authorized herein shall require the issuance by the Department of a new Waterways License in accordance with the provisions and procedures established in Chapter 91 of the Massachusetts General Laws. Any unauthorized substantial change in use or unauthorized substantial structural alteration of any structure or fill authorized herein shall render this Waterways License void.
4. This License shall be revocable by the Department for noncompliance with the terms and conditions set forth herein. This License may be revoked after the Department has given written notice of the alleged noncompliance to the Licensee and those persons who have filed a written request for such notice with the Department and afforded them a reasonable opportunity to correct said noncompliance. Failure to correct said noncompliance after the issuance of a written notice by the Department shall render this License void and the Commonwealth may proceed to remove or cause removal of any structure or fill authorized herein at the expense of the Licensee, its successors and assigns as an unauthorized and unlawful structure and/or fill.
5. The structures and/or fill authorized herein shall be maintained in good repair and in accordance with the terms and conditions stated herein and the details indicated on the accompanying license plans.
6. Nothing in this License shall be construed as authorizing encroachment in, on or over property not owned or controlled by the Licensee, except with the written consent of the owner or owners thereof. The Licensee stated that Town of Weymouth was the property owners at the time the application was submitted.
7. This License is granted subject to all applicable Federal, State, County, and Municipal laws, ordinances and regulations including but not limited to a valid final Order of Conditions issued pursuant to the Wetlands Protection Act, M.G.L. Chapter 131, §40.
8. This License is granted upon the express condition that the use of the structures and/or fill authorized hereby shall be in strict conformance with all applicable requirements and authorizations of the MassDEP.
9. This License authorizes structure(s) and/or fill on:

_____ Private Tidelands - In accordance with the public easement that exists by law on Private Tidelands, the Licensee shall allow the public to use and to pass freely upon the area of the subject property lying between the high and low water marks, for the purposes of fishing, fowling, navigation, and the natural derivatives thereof.

X _____ Commonwealth Tidelands - The Licensee shall not restrict the public's right to use and to pass freely, for any lawful purpose, upon lands lying seaward of the low water mark. Said lands are held in trust by the Commonwealth for the benefit of the public.

_____ Great Pond of the Commonwealth - The Licensee shall not restrict the public's right to use and to pass freely upon lands lying seaward of the high water mark for any lawful purpose.

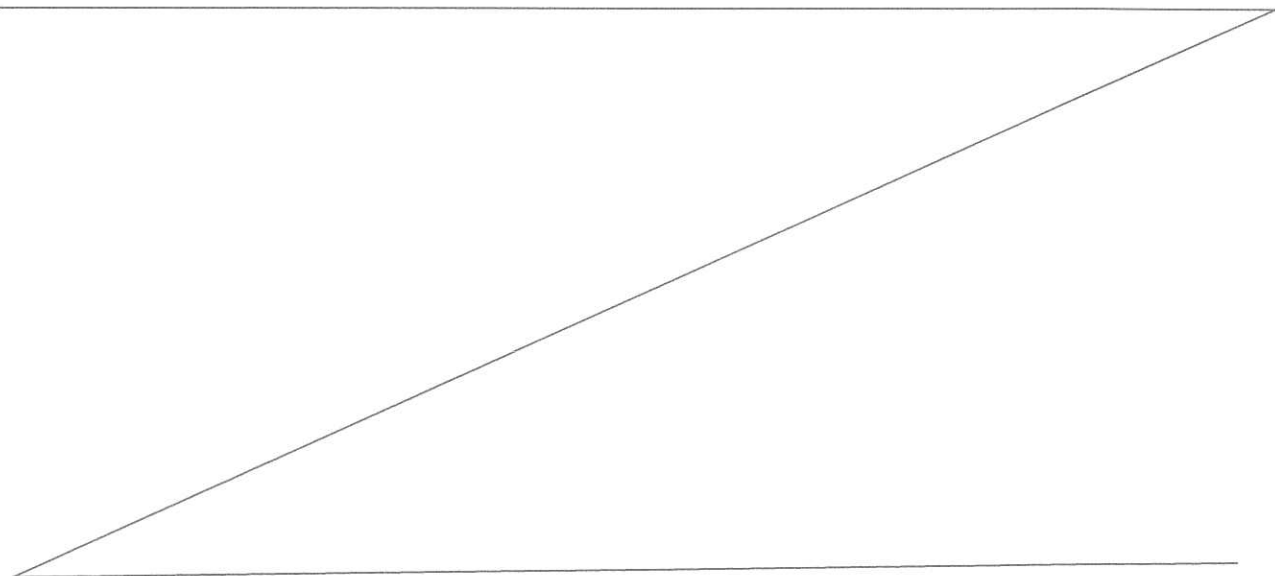
_____ Navigable River or Stream - The Licensee shall not restrict the public's right to use and to pass freely, for any lawful purpose, in the waterway.

No restriction on the exercise of these public rights shall be imposed unless otherwise expressly provided in this License.

10. Unless otherwise expressly provided by this License, the Licensee shall not limit the hours of availability of any areas of the subject property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.

STANDARD WATERWAYS DREDGE PERMIT CONDITIONS

1. This Waterways Permit is issued subject to all applicable federal, state, county, and municipal laws, ordinances, bylaws, and regulations including but not limited to a valid final Order of Conditions issued pursuant to the Wetlands Protection Act, M. G. L. Chapter 131, §. 40. In particular, this issuance is subject to the provisions of Sections 52 to 56, inclusive, of Chapter 91 of the Federal Laws, which provides, in part, that the transportation and dumping of the dredge material shall be done under the supervision of the Department, and, when required, the permittee shall provide at his/her expense a dredge inspector approved by the Department. When said inspector is required, a report certified by the dredge inspector shall be submitted to the Department within 30 days after the completion of the dredging. The report shall include daily logs of the dredging operation indicating volume of dredge material, point of origin, point of destination and other appropriate information.
2. This Permit is issued upon the express condition that the dredging and transport and disposal of dredged material shall be in strict conformance with the Water Quality Certificate No. X283696 issued by MassDEP on July 24, 2020.
3. All subsequent maintenance dredging and transport and disposal of this dredged material during the term of this Permit shall conform to all standards and conditions applied to the original dredging operation performed under this Permit.
4. The dredging under this Permit shall be conducted so as to cause no unnecessary obstruction of the free passage of vessels. In doing the dredging authorized, care shall be taken to cause no shoaling. If, however, any shoaling is caused, the Permittee shall, at his/her expense, remove the shoal areas. The Permittee shall pay all costs of supervision, and if at any time the Department deems necessary a survey or surveys of the area dredged, the permittee shall pay all costs associated with such work.
5. Nothing in this Permit shall be construed to impair the legal rights of any person, or to authorize dredging on land not owned by the Permittee without consent of the owner (s) of such property.
6. The Permittee shall include in any contract with any person or other legal entity to perform dredging services, a provision requiring said person or legal entity to assume and pay all claims and demands arising in any manner from the work authorized herein, and shall save harmless and indemnify the Commonwealth of Massachusetts, its officers, employees, and agents from all claims, suits, damages, costs and expenses incurred by reason thereof.
7. Whosoever violates any provision of this Permit shall be subject to a fine of up to \$25,000 per day for each day such violation occurs or continues, or by imprisonment for not more than one year, or both such fine and imprisonment; or shall be subject to civil penalty not to exceed \$25,000 per day for each day such violation occurs or continues.
8. After completion of the work hereby authorized, the Permittee shall furnish to the Department a suitable plan showing the depths at mean low water over the area dredged.



The amount of tidewater displaced by the work hereby authorized has been ascertained by said Department, and compensation thereof has been made by the said -- Town of Weymouth -- by paying into the treasury of the Commonwealth -- two dollars and zero cents (\$2.00) -- for each cubic yard so displaced, being the amount hereby assessed by said Department (1,255 cubic yards = *exempt pursuant 310 CMR 9.16(4)*).

Nothing in this License shall be so construed as to impair the legal rights of any person.

This License shall be void unless the same and the accompanying plan are recorded within sixty (60) days from the date hereof, in the Registry of Deeds for the -- County of -- Norfolk.

In witness whereas, said Department of Environmental Protection have hereunto set their hands this 22nd day of July in the year 2021.

Commissioner 

Program Chief 


*Department of
Environmental Protection*

THE COMMONWEALTH OF MASSACHUSETTS

This License is approved in consideration of the payment into the treasury of the Commonwealth by the said -- Town of Weymouth -- the further sum of -- (*Exempt pursuant 310 CMR 9.16(4)*) -- the amount determined by the Governor as a just and equitable charge for rights and privileges hereby granted in the land of the Commonwealth.

BOSTON,

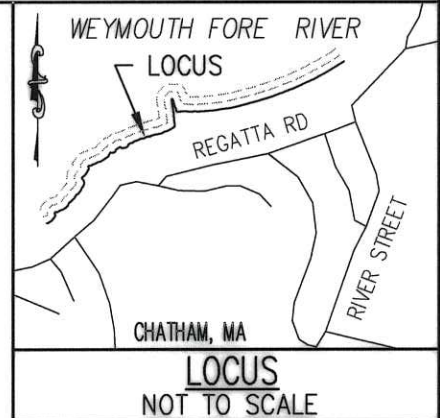
Approved by the Governor.


Governor

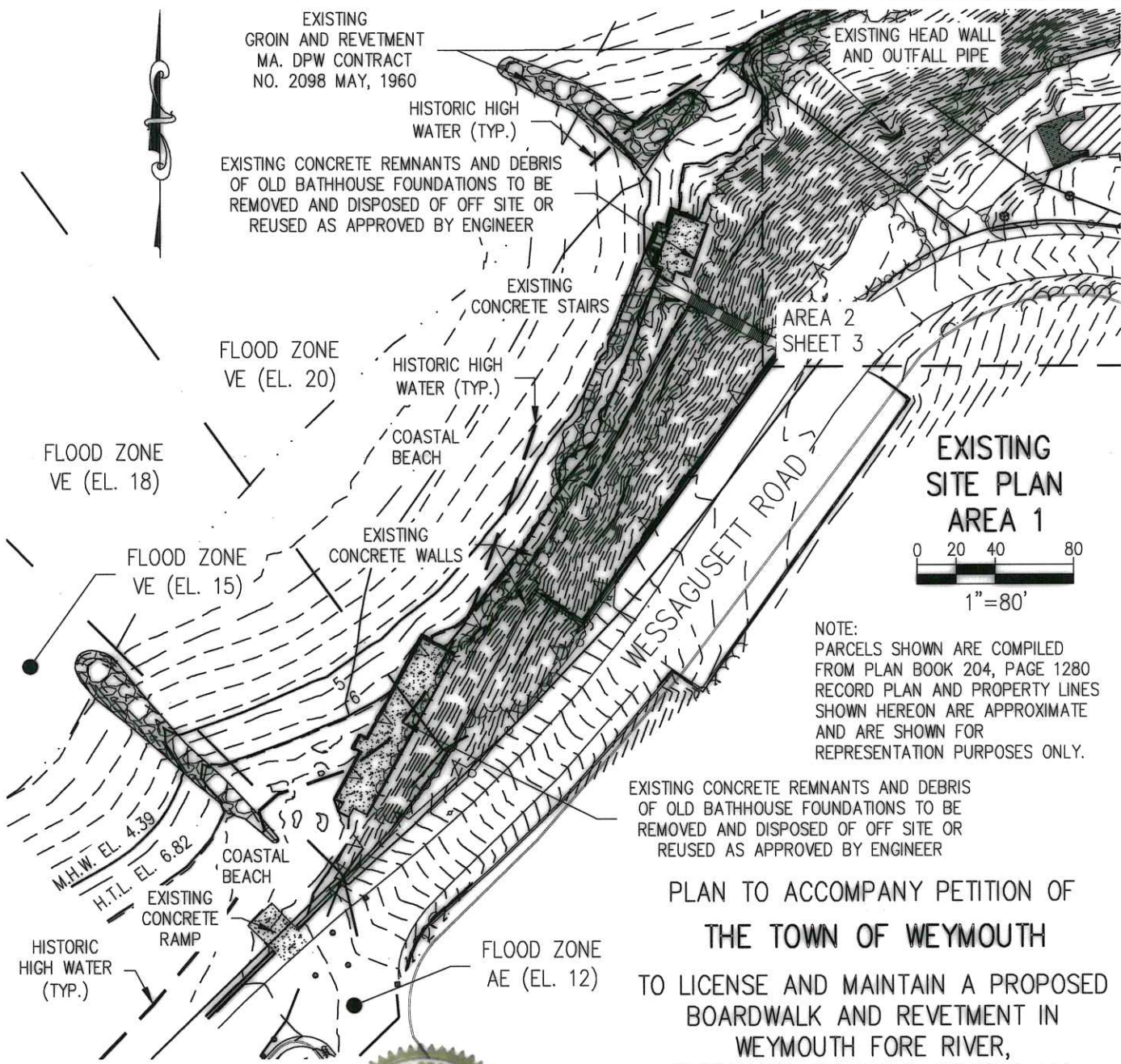
I CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN CONFORMITY WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS

Roger P. Michniewicz 4.26.21
 PROFESSIONAL ENGINEER

REFERENCE DATUM IS NAVD88
 REF: TOWN ASSESSOR'S PARCEL 2-12-10



NOTE:
 SEE SHEET 7 FOR TIDAL ELEVATION AND HHW SOURCES



PLAN TO ACCOMPANY PETITION OF
 THE TOWN OF WEYMOUTH
 TO LICENSE AND MAINTAIN A PROPOSED
 BOARDWALK AND REVETMENT IN
 WEYMOUTH FORE RIVER,
 WEYMOUTH, NORFOLK COUNTY, MA

PREPARED BY
 COASTAL ENGINEERING CO., INC.
 260 CRANBERRY HIGHWAY
 ORLEANS, MA 02653



04-26-21
 DRAWN BY: KES C18729 ACOE-CH-91 04-2019.dwg
 JOB #C18729.00 SHEET 1 OF 7

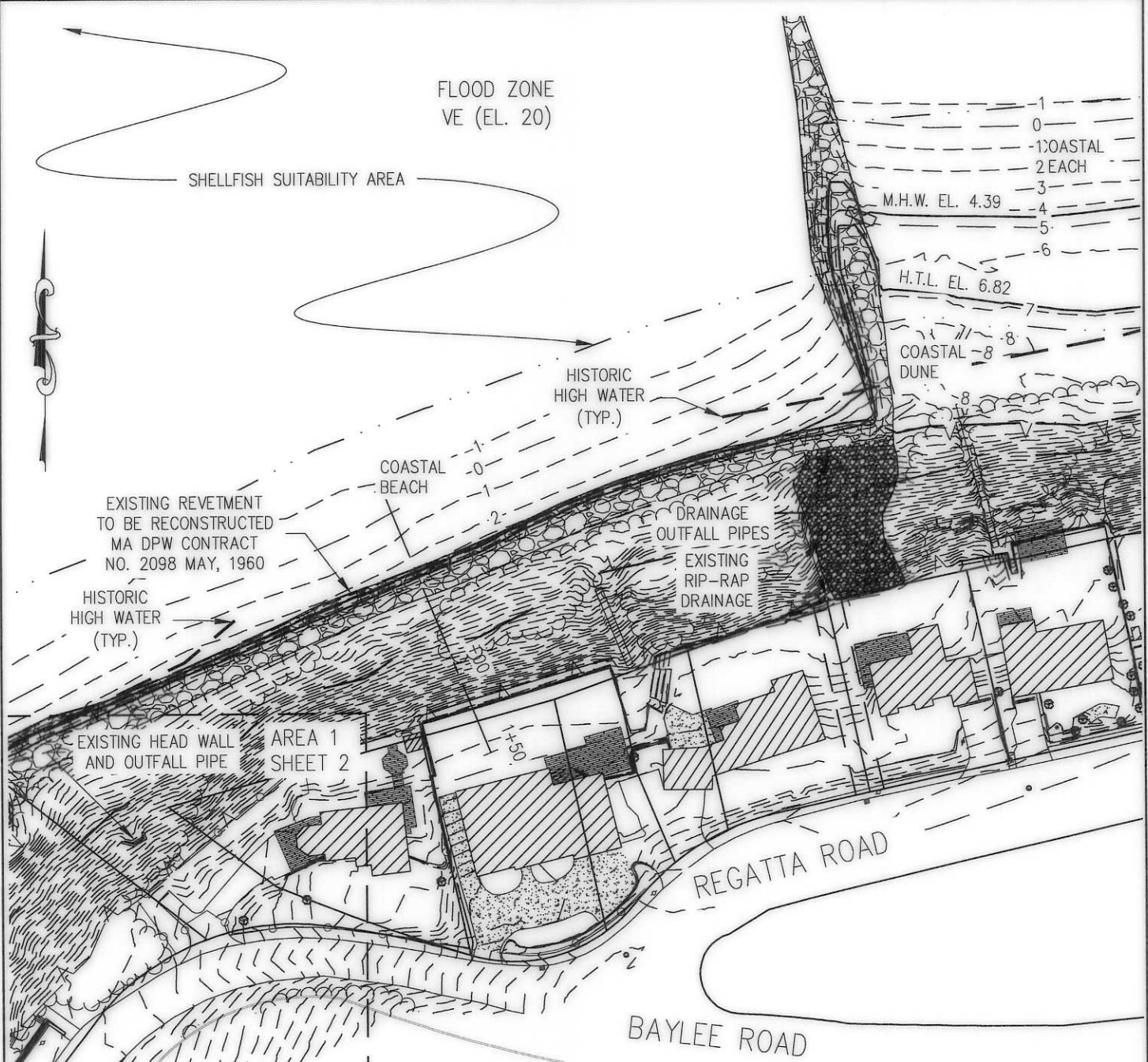
LICENSE PLAN NO. 15271

Approved by Department of Environmental Protection
 of Massachusetts July 22, 2021

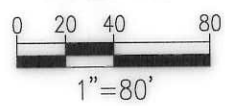
[Signatures]

I CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN CONFORMITY WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS

Roger P. Michniewicz 4.06.21
 PROFESSIONAL ENGINEER



EXISTING SITE PLAN
 AREA 2



PLAN TO ACCOMPANY PETITION OF
 THE TOWN OF WEYMOUTH
 TO LICENSE AND MAINTAIN A PROPOSED
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 WEYMOUTH, NORFOLK COUNTY, MA

PREPARED BY
 COASTAL ENGINEERING CO., INC.
 260 CRANBERRY HIGHWAY
 ORLEANS, MA 02653

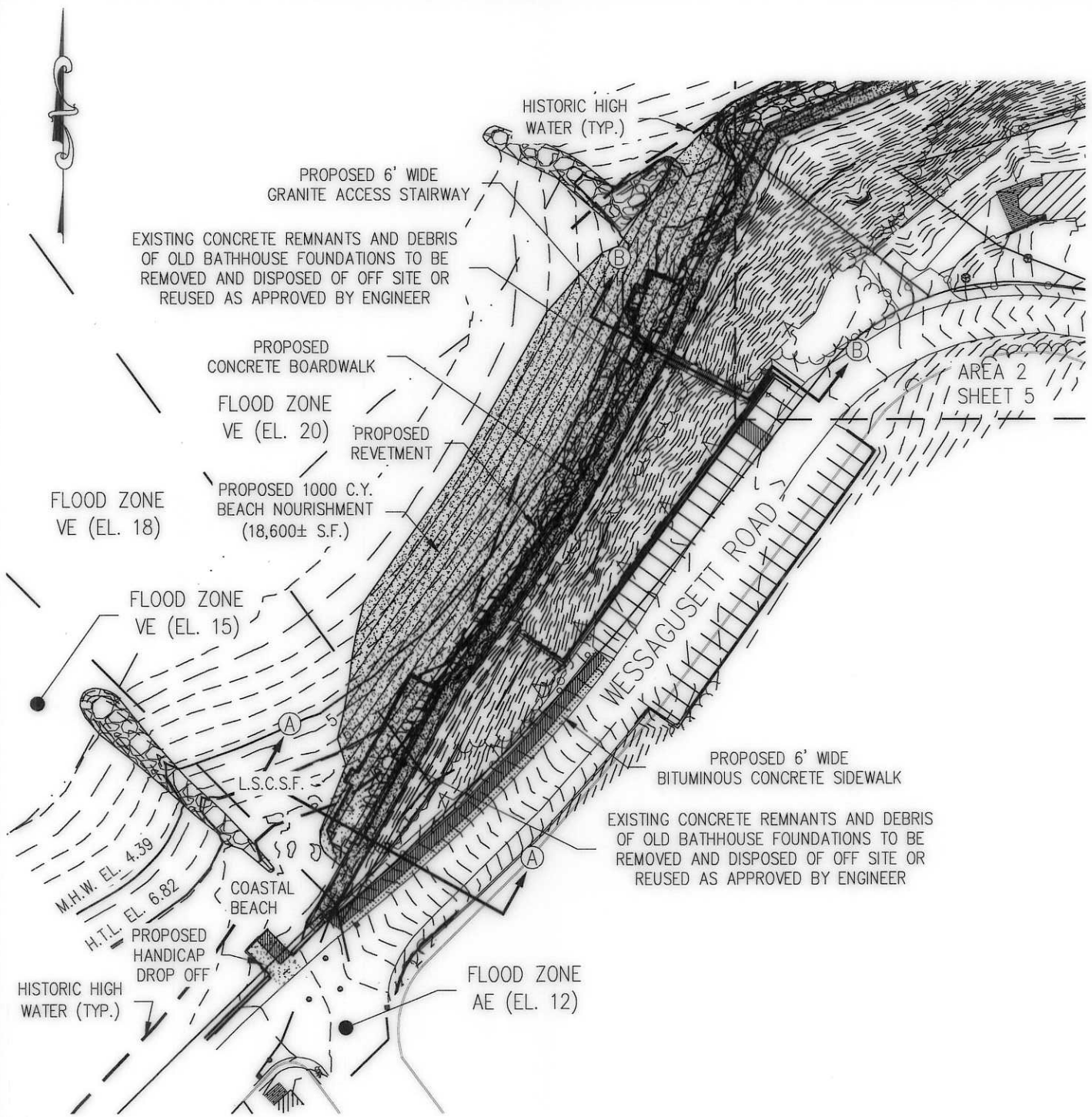
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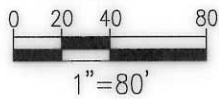
LICENSE PLAN NO. 15271
 Approved by Department of Environmental Protection
 Date: JULY 24, 2021

I CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN CONFORMITY WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS

Roger P. Michniewicz N.26.21
 PROFESSIONAL ENGINEER



PROPOSED SITE PLAN
 AREA 1



PLAN TO ACCOMPANY PETITION OF
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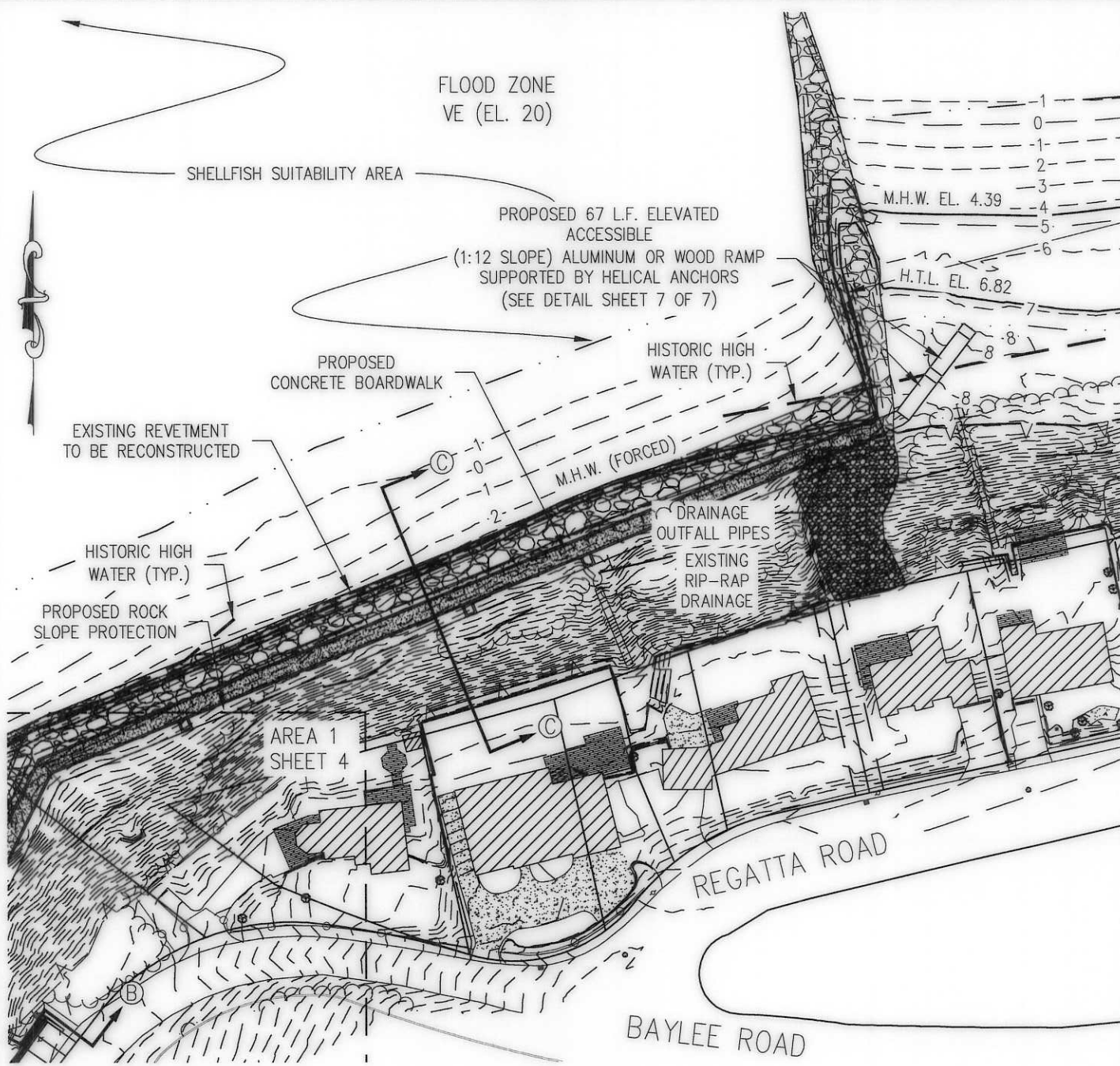


LICENSE PLAN NO. 15271
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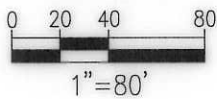
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Roger P. Michniewicz 4-26-21

PROFESSIONAL ENGINEER



PROPOSED SITE PLAN
AREA 2



LICENSE PLAN NO. 15271
Approved by Department of Environmental Protection
Date: July 22, 2021

PLAN TO ACCOMPANY PETITION OF
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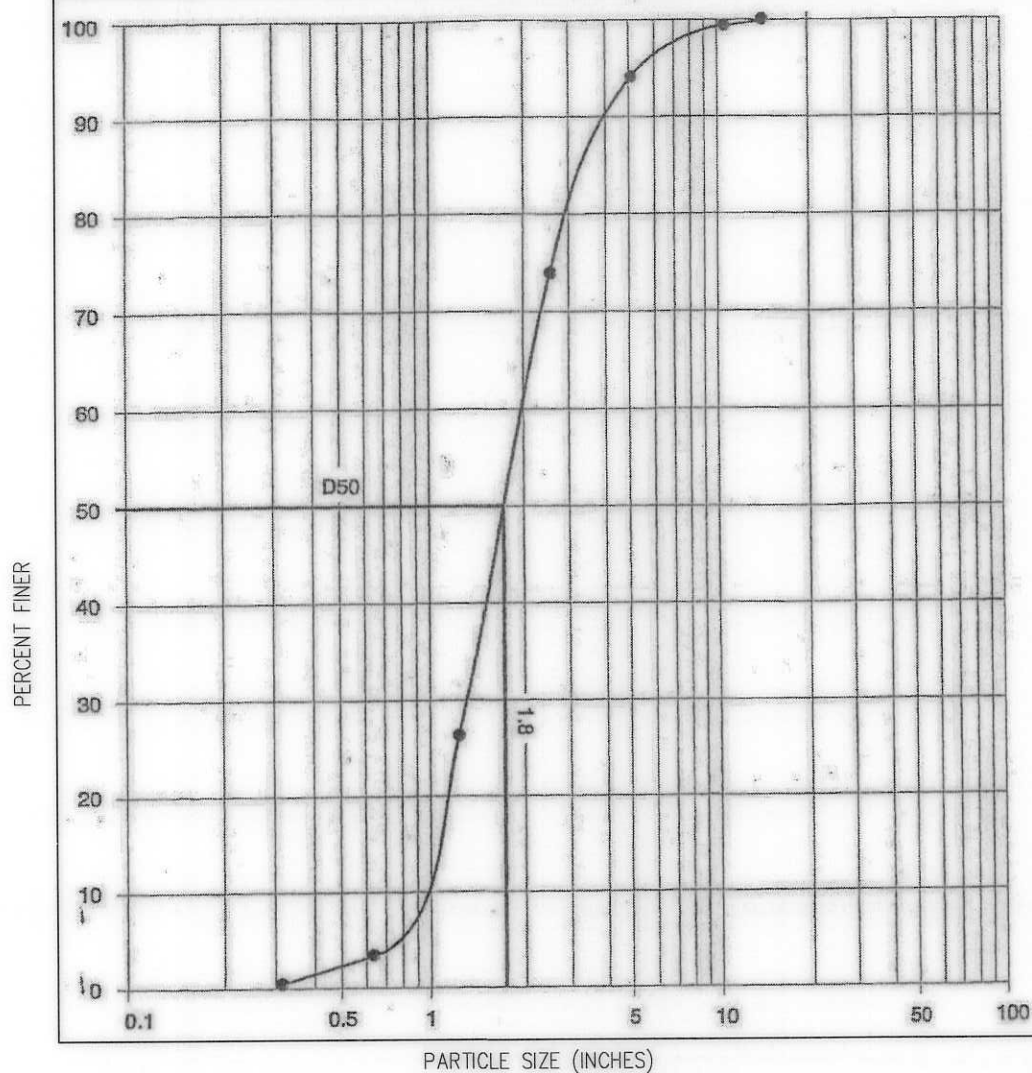


Roger P. Michniewicz 4-26-21

I CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN CONFORMITY WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS

Roger P. Michniewicz 4.26.21
 PROFESSIONAL ENGINEER

WESSAGUSSETT WALK
 PROPOSED BEACH NOURISHMENT GRADATION CURVE



NOTE:

1. APPROXIMATE 1000 CUBIC YARDS OF BEACH NOURISHMENT IS PROPOSED TO BE PLACED ON WESSAGUSSETT BEACH DIRECTLY ADJACENT TO AND ALONG ABOUT 400 LINEAR FEET OF THE PROPOSED ROCK REVETMENT/CONCRETE WALKWAY AT THE SITE.
2. DUE TO THE SAND SHOALING CONCERNS OF THE WESSAGUSSETT YACHT CLUB LOCATED DIRECTLY TO THE WEST OF WESSAGUSSETT BEACH, THE PROPOSED GRADATION OF BEACH NOURISHMENT SEDIMENT IS LIMITED TO A MINIMUM PARTICLE DIAMETER OF ABOUT 0.5 INCHES.
3. THE PROPOSED NOURISHMENT GRADATION CURVE REPRESENTS A WELL GRADED RANGE OF PARTICLE SIZES TO BETTER FACILITATE THE STABILITY OF THE BEACH NOURISHMENT DURING COASTAL STORM EVENTS.

PROPOSED BEACH
 NOURISHMENT
 GRADATION CURVE

PLAN TO ACCOMPANY PETITION OF
 THE TOWN OF WEYMOUTH

TO LICENSE AND MAINTAIN A PROPOSED
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 WEYMOUTH FORE RIVER,
 WEYMOUTH, NORFOLK COUNTY, MA

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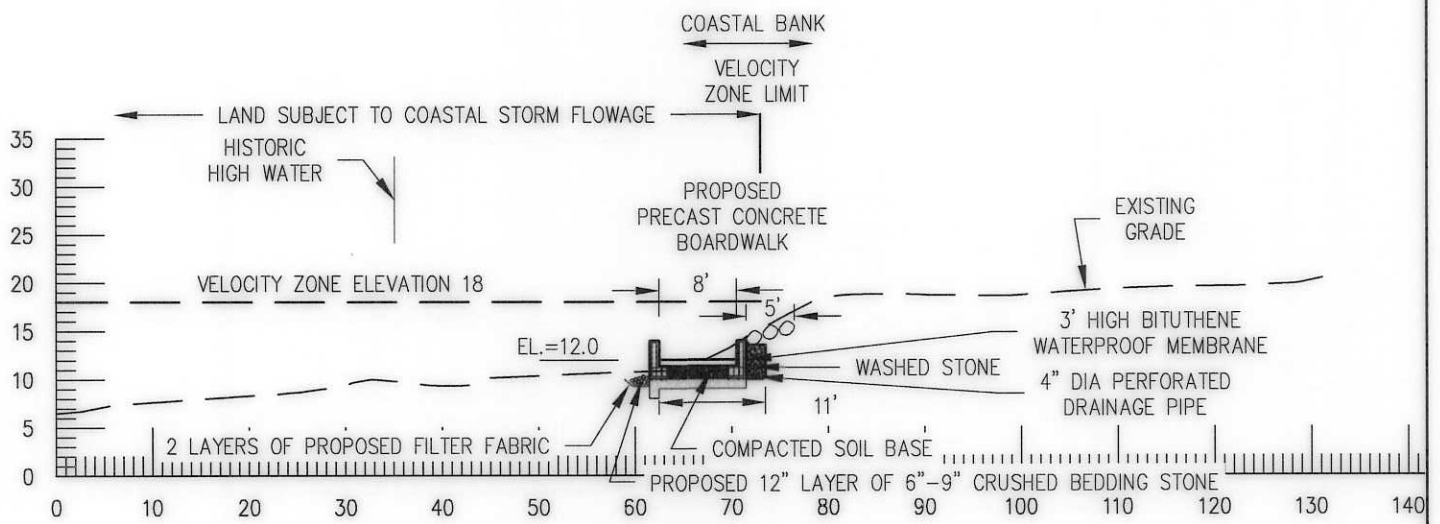
Roger P. Michniewicz
 4.26.21

LICENSE PLAN NO. 15271
 Approved by Department of Environmental Protection
 Date: JULY 24, 2021

I CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN CONFORMITY WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS

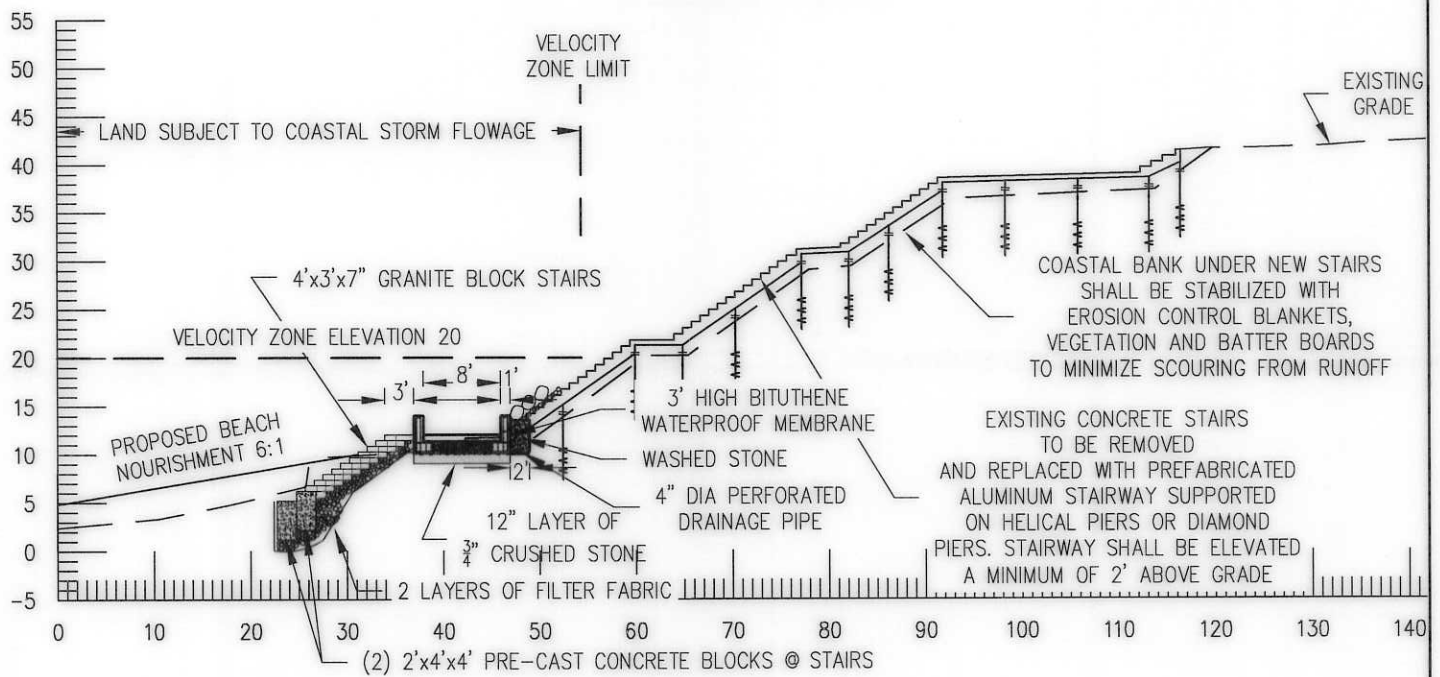
Roger P. Michniewicz 4.26.21

PROFESSIONAL ENGINEER



SECTION A-A

SCALE 1" = 10'



SECTION B-B

0 5 10
1"=10'

LICENSE PLAN NO. 15271
Approved by Department of Environmental Protection
Date: July 22, 2021

PLAN TO ACCOMPANY PETITION OF
THE TOWN OF WEYMOUTH
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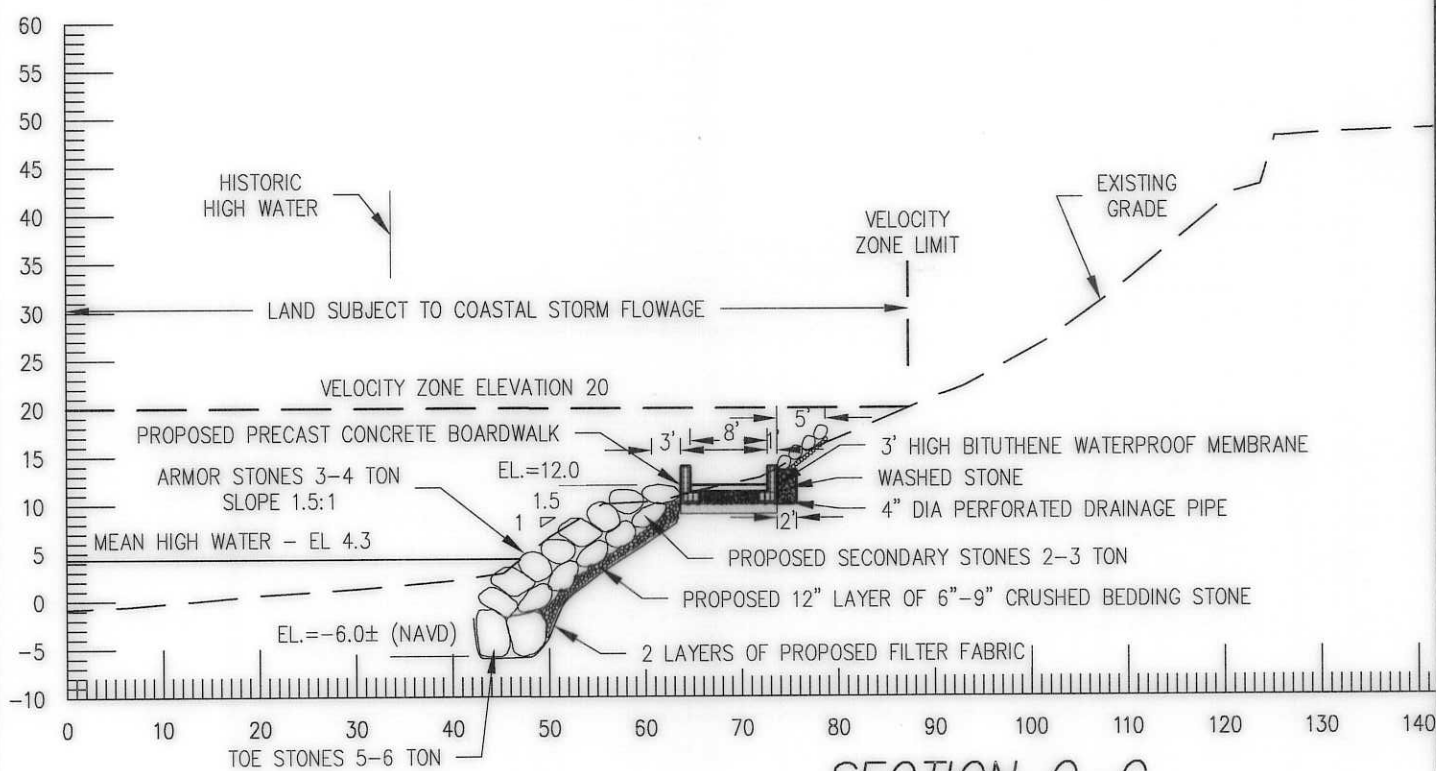
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Roger P. Michniewicz
4.26.21

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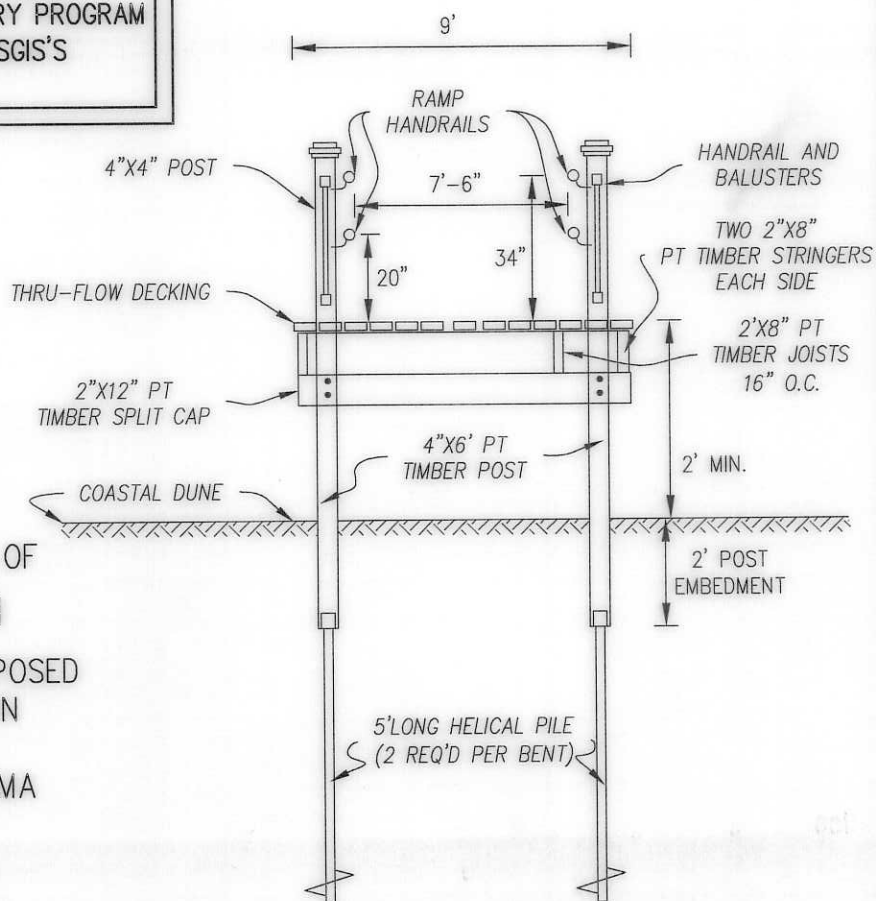
Roger P. Michniewicz 4-26-21
 PROFESSIONAL ENGINEER



SECTION C-C

SCALE 1" = 10'

MHW EL. 4.39 PER WEYMOUTH ENGINEERING DEPT.
 MHW TO MHHW = 0.44 PER NOAA STATIONS = 4.83
 FROM EMAIL BY MARY ELLEN SCHLOSS 4/11/18
 HTL EL. 6.82 PER BUZZARDS BAY ESTUARY PROGRAM
 HISTORIC HIGH WATER FROM OLIVER: MASSGIS'S
 ONLINE MAPPING TOOL



HELICAL PILE DETAIL

PROP. ELEVATED RAMP
 NTS

LICENSE PLAN NO. 15271
 Approved by Department of Environmental Protection
 Date: July 22, 2021



Roger P. Michniewicz
 4-26-21

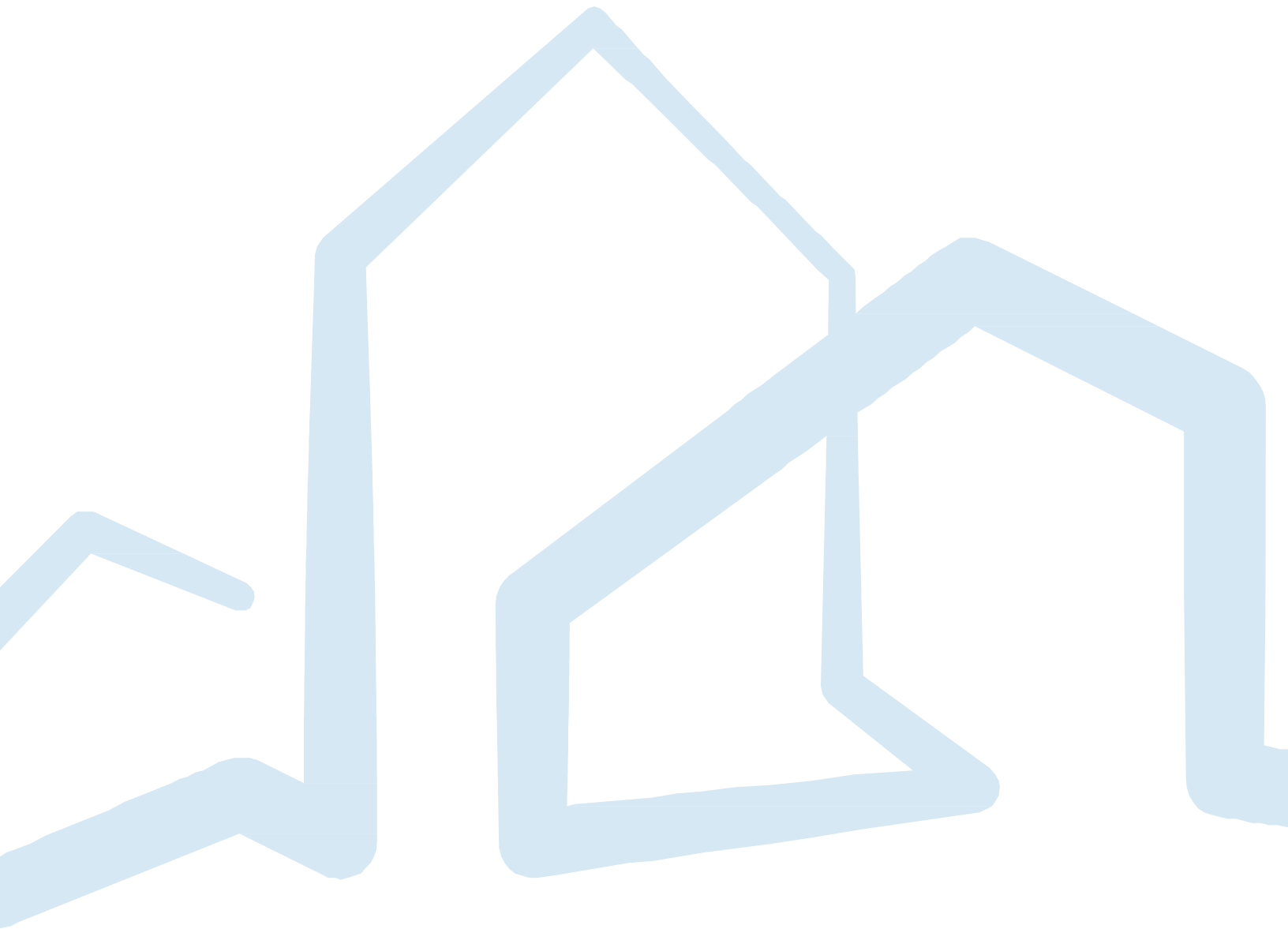
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 260 CRANBERRY HIGHWAY
 ORLEANS, MA 02653

DRAWN BY: KES C18729 ACOE-CH-91 04-2019.dwg

APPENDIX - Permits

USACE 404 Permit





DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

June 4, 2020

File Nos. NAE-2018-01520 and 408-NAE-2019-0014

Robert Luongo
Town of Weymouth
75 Middle Street
Weymouth, Massachusetts 02189

Dear Mr. Luongo:

Enclosed is your permission granted in accordance with Section 14 of the Rivers and Harbors Act of 1899, codified at 33 U.S.C. § 408 (commonly referred to as Section 408). In addition, please find your authorization pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899.

Please contact Kevin DiRocco, (978) 318-8396 or Katelyn Rainville, (978) 318-8677 as stated in the enclosed documents if you have any questions.

Sincerely,

William M Conde

William Conde
Colonel, Corps of Engineers
District Engineer

Enclosures:

Section 408 Permission Letter
Regulatory Section 10 & 404 Verification Letter

cc:

Roger Michniewicz, Coastal Engineering Company, Inc.,
rogerm@coastalengineeringcompany.com
Gregory Robbins, Division of Waterways, Department of Conservation and Recreation,
gregory.robbins@state.ma.us
Robert Hedlund, Mayor, Town of Weymouth, RHedlund@weymouth.ma.us
Ed Reiner, U.S. EPA, Region 1, Boston, Massachusetts, reiner.ed@epa.gov
Chris Boelke, NMFS, Gloucester, MA; christopher.boelke@noaa.gov

Robert Boeri, Coastal Zone Management, Boston, Massachusetts,
robert.boeri@mass.gov
DEP Southeast Region (SERO), SERO_NOI@state.ma.us
MassDEP-WRP, Boston, Massachusetts; dep.waterways@mass.gov
Mary Ellen Schloss, Weymouth Conservation Commission,
mschloss@weymouth.ma.us



DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

May 6, 2020

Engineering Division
Geotechnical/Water Resources Branch

Robert Luongo
Director of Planning
Town of Weymouth
Weymouth Town Hall
75 Middle Street
Weymouth, MA 02189

Dear Mr. Luongo:

This letter is regarding your request to construct the proposed Rock Revetment and Pedestrian Walkway project, which would alter portions of the federally cost-shared Wessagussett Beach Shore and Bank Protection Project (SBPP) in Weymouth, Massachusetts.

The New England District of the U.S. Army Corps of Engineers (USACE) has completed its review of your request to alter the Wessagussett SBPP under Section 14 of the Rivers and Harbors Act of 1899, 33 U.S.C. § 408 (Section 408). This evaluation was performed consistent with Engineer Circular (EC) 1165-2-220. Based on this evaluation, the New England District is granting permission to alter the Wessagussett Beach SBPP as specified in your request and subject to compliance with the terms and conditions below.

The Wessagussett Beach SBPP extends along approximately 3,100 feet of shoreline from the Wessagussett Yacht Club to Fort Point Road near the intersection of Fort Point Road and River Street, in Weymouth MA. The Wessagussett Beach SBPP is a federally cost-shared project that was constructed in an effort to stabilize the beach and adjacent bluff. The Wessagussett Beach SBPP is comprised of three sections, the Wessagussett Road Section, the Regatta Road Section, and the River Street Section. The Wessagussett Section construction consisted of widening about 1000 feet of beach and constructing a 375-foot-long stone groin with a drain pipe and tide gate. The Regatta Road and River Street Sections were constructed together and consisted of widening about 1,600 feet of beach, construction of a 350-foot-long stone groin, and construction of two 500-foot-long stone mounds. The Wessagussett Road Section was completed in 1959, and the Regatta Road and River Street Sections were completed in April 1969.

Based on U.S. Army Corps of Engineers (USACE) records, the Wessagusset Beach SBPP was cost-shared between USACE, the Commonwealth of Massachusetts, and the town of Weymouth. USACE's cooperation agreement for the project was with the Massachusetts Department of Public Works (MADPW), and USACE recognizes the Commonwealth of Massachusetts as the non-federal sponsor for the SBPP. As part of Commonwealth of Massachusetts government reorganization, we understand that the portion of MADPW responsible for the Wessagusset Beach SBPP became part of the Massachusetts Department of Conservation and Recreation (MADCR). The town of Weymouth has presented the proposed Rock Revetment and Pedestrian Walkway project to MADCR, and MADCR has provided as Statement of No Objection to USACE, indicating their support of the proposed project.

The proposed Rock Revetment and Pedestrian Walkway project consists of the construction of about a 1,000-foot-long rock revetment and walkway along the shoreline of Hingham Bay (Weymouth Fore River). About half of the proposed revetment and walkway is proposed along a previously developed area, near the Wessagusset Yacht Club, that consisted of a series of concrete bath houses and concrete seawalls situated at the toe of the coastal bank. The remaining half of the proposed revetment and walkway is located along an existing stone mound revetment constructed as part of the federally-funded Wessagusset Beach SBPP. In addition to the proposed walkway, the project includes replacement of a stone stairway on the adjacent bluff and partial nourishment of a portion of the federally-funded SBPP.

The proposed new walkway consists of an 8-foot-wide precast concrete walkway constructed on the top of the revetments to allow pedestrian access between two sandy town beaches. The federally-funded portion of the revetment will be reconstructed, with an extended toe that penetrates 3 to 4 feet into the glacial till foundation soils. The remaining revetment will be a new revetment and will generally be constructed outside of the limits of the federally-funded Wessagusset Beach SBPP.

The United States Army Corps of Engineers (USACE) New England District, in accordance with guidance and Title 33 United States Code Section 408 (33 USC 408) requirements, reviewed the information supplied in the following documents:

- Section 408 request letter and accompanying enclosures prepared by Coastal Engineering, Co., Inc. titled "ACOE Section 408 Process Request Application Filing, Proposed Rock Revetment & Pedestrian Walkway," dated September 17, 2019.
- Plan set prepared by Coastal Engineering, Co., Inc. titled "Proposed Site Development Plan, Wessagusset Walk," dated April 19, 2019. The plan set was transmitted via email October 30, 2019.
- Letter prepared by Coastal Engineering, Co., Inc. titled "ACOE Section 408 Process – Response to ACOE Review Comments dated 10/15/2019,

Proposed Rock Revetment & Pedestrian Walkway,” dated November 26, 2019.

- Statement of No Objection letter from MADCR titled “NAE-0218-0150 – Section 408 Process, Rock Revetment & Pedestrian Walkway, Weymouth, MA,” dated March 30, 2020.
- Specification Section 02300 “Earthwork,” dated March 30, 2020. The specification was transmitted via email from Coastal Engineering, Co., Inc. on April 1, 2020.

Based on the information supplied above, it is the opinion of USACE that the proposed Rock Revetment & Pedestrian Walkway, as currently presented, does not impair the usefulness of the Wessagussett Beach SBPP and is not injurious to the public interest, provided that no damage, collapse, or impacts to the structural integrity of the SBPP and the associated appurtenances occurs during the construction activities of the project. Any damages to the SBPP shall be immediately repaired to the satisfaction of USACE so as to not affect the safety of the public due to beach and bank erosion. All work shall be managed in accordance with the technical plans and specifications supplied in the information above.

This acceptance of the above-referenced project is contingent upon adhering to the attached Standard Terms and Conditions and the following Special Conditions:

- At least 14 days prior to the start of construction, provide a copy of the final plans and specifications for construction to USACE.
- Within 90 days of the completion of the project, town of Weymouth must submit an O&M Manual to USACE for the portion of the Rock Revetment & Pedestrian Walkway project within the limits of the Wessagussett Beach SBPP for review and approval.
- Within 180 days of the completion of the project, the town of Weymouth shall provide USACE a Completion of Work Report. This Completion of Work Report should be an electronic copy in “pdf” or other approved electronic format containing a copy of “As-Built” drawings, the associated material specifications/product data sheets for the materials used for final construction, and daily construction log reports. The report should be signed and sealed by a professional engineer.
- The town of Weymouth shall provide USACE with a copy of an Emergency Action Plan (EAP) for use during construction of the Rock Revetment & Pedestrian Walkway project. All construction work should be subject to the conditions of the EAP, such that the contractor is monitoring tides and weather

and is prepared to take precautionary or emergency measures to prevent erosion of the bluff landward of the existing stone revetment during a high water event.

- The reconstructed stone mound within the limits of the authorized Wessagussett Beach SBPP and portions of the original federally cost-shared project will remain eligible for repair in accordance with the Rehabilitation Program under Public Law 84-99, provided they meet the requirements of Engineering Regulation (ER) 500-1-1. The pedestrian walkway and the new revetments, stairway, and other project components that were not part of the original Wessagussett Beach SBPP are ineligible for repair under Public Law 84-99, and if the ineligible project components are damaged, the repair and restoration will be the sole responsibility of the town of Weymouth.
- All vertical data shall be in North American Vertical Datum of 1988 (NAVD88), which is the current orthometric vertical reference datum within the National Spatial Reference System. We also request that the vertical datum be referenced to the older, superseded Mean Low Water datum to establish the relationship with the original design reference datum.
- Any changes or amendments to the above referenced documents or drawings shall be submitted to USACE for acceptance prior to implementation.

USACE reserves the right and authority to request removal of any components of the Rock Revetment & Pedestrian Walkway project in accordance with the Standard Terms and Conditions. If a potential situation arises between the Rock Revetment & Pedestrian Walkway project and the SBPP, USACE will work with the town of Weymouth on potential solutions to address the concern.

Be assured that USACE holds life and public safety paramount with regards to protecting the residents behind the Wessagussett Beach SBPP. Should you have any further questions or concerns, please feel free to contact Kevin DiRocco, Levee Safety Program Manager, at (978) 318-8396.

Sincerely,

BACHAND.MICHA
E.L.L.1453980649

Digitally signed by
BACHAND.MICHAEL.L.1453980
649
Date: 2020.05.06 12:36:14
-04'00'

Enclosures

Michael Bachand, P.E.
Chief, Geotechnical/Water Resources Branch
Levee Safety Officer

Copy Furnished

Roger Michniewicz, PE
Coastal Engineering Company, Inc.
260 Cranberry Highway,
Orleans, MA 02653

Gregory Robbins, PE
Director
Division of Waterways
Department of Conservation and Recreation
251 Causeway Street, Suite 600
Boston, MA 02114-2119

Robert Hedlund
Mayor, Town of Weymouth
Weymouth Town Hall
75 Middle Street
Weymouth, MA 02189

Mary Ellen Schloss
Conservation Administrator
Weymouth Town Hall
75 Middle Street
Weymouth, MA 02189

**Attachment
Standard Terms and Conditions**

STANDARD TERMS AND CONDITIONS

LIMITS OF THE AUTHORIZATION

1. This permission only authorizes you, the requester, to undertake the activity described herein under the authority provided in Section 14 of the Rivers and Harbors Act of 1899, as amended (33 USC 408). This permission does not obviate the need to obtain other federal, state, or local authorizations required by law. This permission does not grant any property rights or exclusive privileges, and you must have appropriate real estate instruments in place prior to construction and/or installation.
2. The time limit for completing the work authorized ends on May 8, 2023. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.
3. Without prior written approval of the USACE, you must neither transfer nor assign this permission nor sublet the premises or any part thereof, nor grant any interest, privilege or license whatsoever in connection with this permission. Failure to comply with this condition will constitute noncompliance for which the permission may be revoked immediately by USACE.
4. The requester understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration of the work herein authorized, or if, in the opinion of the Secretary of the Army or an authorized representative, said work will cause unreasonable conditions and/or obstruction of USACE project authorized design, the requester will be required upon due notice from the USACE, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim can be made against the United States on account of any such removal or alteration.

INDEMNIFICATION AND HOLD HARMLESS

5. The United States will in no case be liable for:
 - a. any damage or injury to the structures or work authorized by this permission that may be caused or result from future operations undertaken by the United States, and no claim or right to compensation will accrue from any damage; or
 - b. damage claims associated with any future modification, suspension, or revocation of this permission.
6. The United States will not be responsible for damages or injuries which may arise from or be incident to the construction, maintenance, and use of the project requested by you, nor for damages to the property or injuries to your officers, agents, servants, or employees, or others who may be on your premises or project work areas or the federal project(s) rights-of-way. By accepting this permission, you hereby agree to fully defend, indemnify, and hold harmless the

United States and USACE from any and all such claims, subject to any limitations in law.

7. Any damage to the water resources development project or other portions of any federal project(s) resulting from your activities must be repaired at your expense.

REEVALUATION OF PERMISSION

8. The determination that the activity authorized by this permission would not impair the usefulness of the federal project and would not be injurious to the public interest was made in reliance on the information you provided.
9. This office, at its sole discretion, may reevaluate its decision to issue this permission at any time circumstances warrant, which may result in a determination that it is appropriate or necessary to modify or revoke this permission. Circumstances that could require a reevaluation include, but are not limited to, the following:
 - a. you fail to comply with the terms and conditions of this permission;
 - b. the information provided in support of your application for permission proves to have been inaccurate or incomplete; or
 - c. significant new information surfaces which this office did not consider in reaching the original decision that the activity would not impair the usefulness of the water resources development project and would not be injurious to the public interest.

CONDUCT OF WORK UNDER THIS PERMISSION

10. You are responsible for implementing any requirements for mitigation, reasonable and prudent alternatives, or other conditions or requirements imposed as a result of environmental compliance.
11. Work/usage allowed under this permission must proceed in a manner that avoids interference with the inspection, operation, and maintenance of the federal project.
12. In the event of any deficiency in the design or construction of the requested activity, you are solely responsible for taking remedial action to correct the deficiency.
13. The right is reserved to the USACE to enter upon the premises at any time and for any purpose necessary or convenient in connection with government purposes, to make inspections, to operate and/or to make any other use of the lands as may be necessary in connection with government purposes, and you will have no claim for damages on account thereof against the United States or any officer, agent or employee thereof.
14. You must provide copies of pertinent design, construction, and/or usage submittals/documents. USACE may request that survey and photographic documentation of the alteration work and the impacted project area be provided before, during, and after construction and/or installation.
15. You may be required to perform an inspection of the federal project with the USACE, prior to your use of the structure, to document existing conditions.

16. USACE shall not be responsible for the technical sufficiency of the alteration design nor for the construction and/or installation work.



DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

May 26, 2020

Regulatory Division
File Number: NAE-2018-01520

Robert Luongo
Town of Weymouth
75 Middle Street
Weymouth, Massachusetts 02189

Dear Mr. Luongo:

We have reviewed your application to construct a 1,000 linear foot concrete public access boardwalk/revetment, to complete 18,600 square feet of beach nourishment, and to remove concrete structures from Wessagussett Beach. The first 500 linear feet of revetment will be replaced within the footprint of the existing revetment. The remaining 500 linear feet of revetment will be newly constructed within areas below the HTL where the concrete retaining wall and sections of the bathhouse will be removed. A concrete boardwalk will be installed above the entire revetment to connect Wessagussett Beach to George E. Lane Beach. The revetment will have 2,500 square feet of impacts below the high tide line. The project also includes beach nourishment using 1,000 cubic yards of material sourced from uplands that will match the grain size of the existing beach. This project is located in the Weymouth Fore River at 278 Wessagussett Road, Weymouth, Massachusetts. The work is shown on the enclosed plans titled "VICINITY MAP", "EXISTING SITE PLAN AREA 1", "EXISTING SITE PLAN AREA 2", "PROPOSED SITE PLAN AREA 1", "PROPOSED SITE PLAN AREA 2", "PROPOSED BEACH NOURISHMENT GRADATION CURVE", "SECTION A-A & SECTION B-B", "SECTION C-C", on 8 sheets, and dated "JUNE 5, 2019".

Based on the information that you have provided, we verify that the activity is authorized under General Permit # 1, 5, and 7 of the enclosed April 16, 2018 Federal permit known as the Massachusetts General Permits (GPs).

Please review the enclosed GPs carefully, including the general conditions beginning on page 19, to be sure that you and whoever does the work understand its requirements. A copy of the GPs and this verification letter shall be available at the project site throughout the time the work is underway. Performing work within our jurisdiction that is not specifically authorized by this determination or failing to comply with any special condition(s) provided below or all of the terms and conditions of the GPs may subject you to the enforcement provisions of our regulations. You must perform this work in compliance with the terms and conditions of the GPs and also in compliance with the following special conditions:

1. Beach nourishment shall not be conducted during the time of year (TOY) restriction of February 15th to June 30th in order to minimize adverse impacts to the winter flounder.
2. The permittee shall remove any remnants of old structures located below the HTL on Wessagussett Beach. When removed, this material shall be disposed of at an upland location.
3. The beach nourishment material shall be sourced from an upland location and match the grain size of the receiving beach, as indicated on the above referenced project plans, on sheet 6 of 8.
4. You must complete and return the enclosed Work Start Notification Form to this office at least two weeks before the anticipated starting date.

This authorization presumes that the work as described above and as shown on your plans noted above is in waters of the U.S.

This authorization expires on April 5, 2023. You must commence or be under contract to commence the work authorized herein by April 5, 2023, and complete the work by April 5, 2024. If not, you must contact this office to determine the need for further authorization before beginning or continuing the activity. We recommend that you contact us *before* this authorization expires to discuss reissuance. Please contact us immediately if you change the plans or construction methods for work within our jurisdiction. We must approve any changes before you undertake them.

This authorization does not obviate the need to obtain other Federal, State, or local authorizations required by law.

Your project is located within, or may affect resources within the coastal zone. The Massachusetts Office of Coastal Zone Management (CZM) has already determined that no further Federal Consistency Review is required.

We continually strive to improve our customer service. In order for us to better serve you, we would appreciate your completing our Customer Service Survey located at http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey.

Please contact Katelyn Rainville of my staff by email at katelyn.m.rainville@usace.army.mil or by phone at (978) 318-8677 or (978) 318-8338 if you have any questions.

Sincerely,

Tammy R. Turley

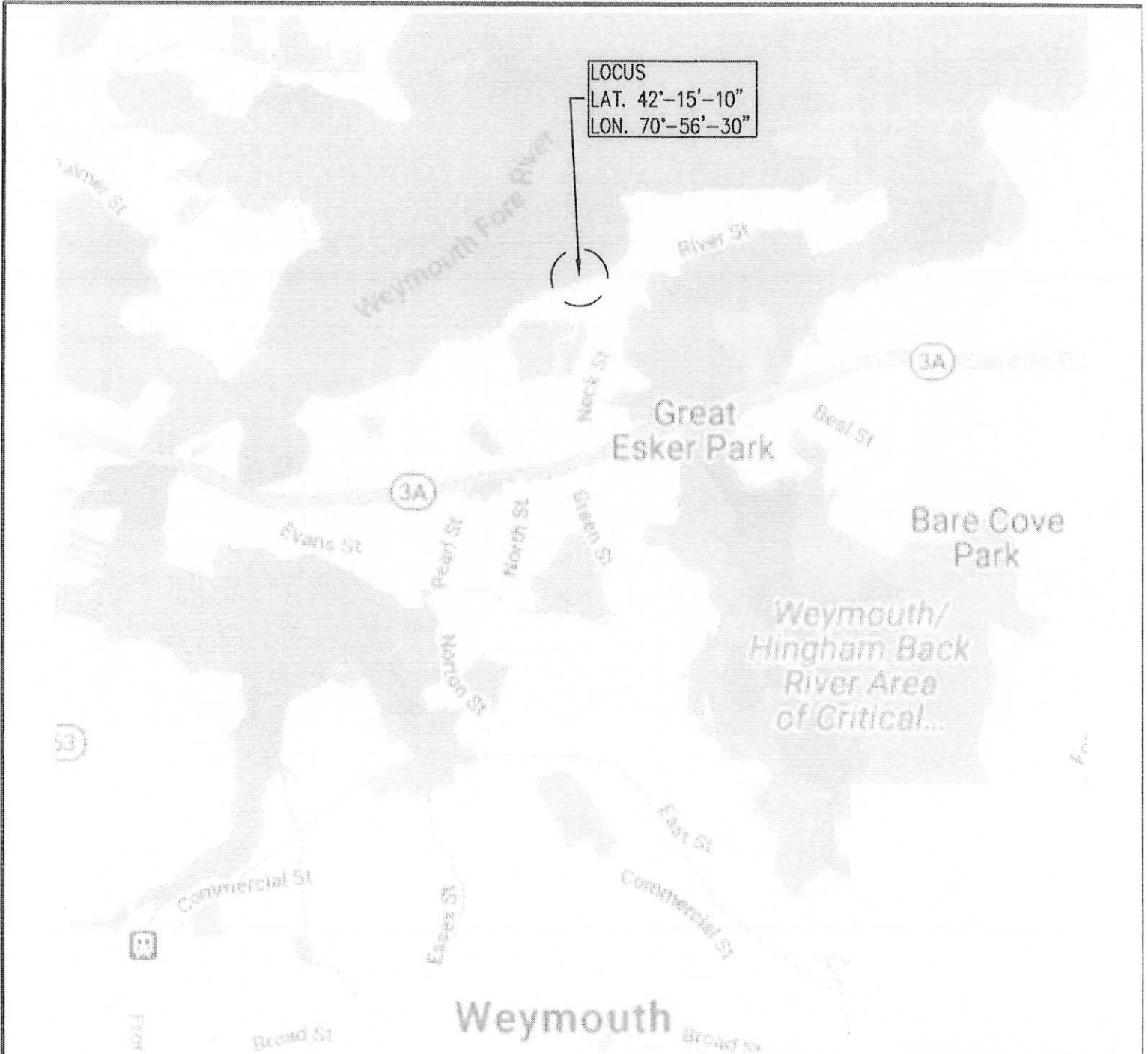
Digitally signed by Tammy R.
Turley
Date: 2020.06.03 22:42:41 -04'00'

Tammy Turley, Chief
Regulatory Division

Enclosures

cc:

Roger Michniewicz, Coastal Engineering Company, Inc.,
rogerm@coastalengineeringcompany.com
Ed Reiner, U.S. EPA, Region 1, Boston, Massachusetts,
reiner.ed@epa.gov Chris Boelke, NMFS, Gloucester, MA;
christopher.boelke@noaa.gov Robert Boeri, Coastal Zone Management,
Boston, Massachusetts,
robert.boeri@mass.gov
DEP Southeast Region (SERO), SERO_NOI@state.ma.us
MassDEP-WRP, Boston, Massachusetts; dep.waterways@mass.gov
Mary Ellen Schloss, Weymouth Conservation Commission,
mschloss@weymouth.ma.us



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SOURCE: U.S.G.S. QUADRANGLE "WEYMOUTH - MA."

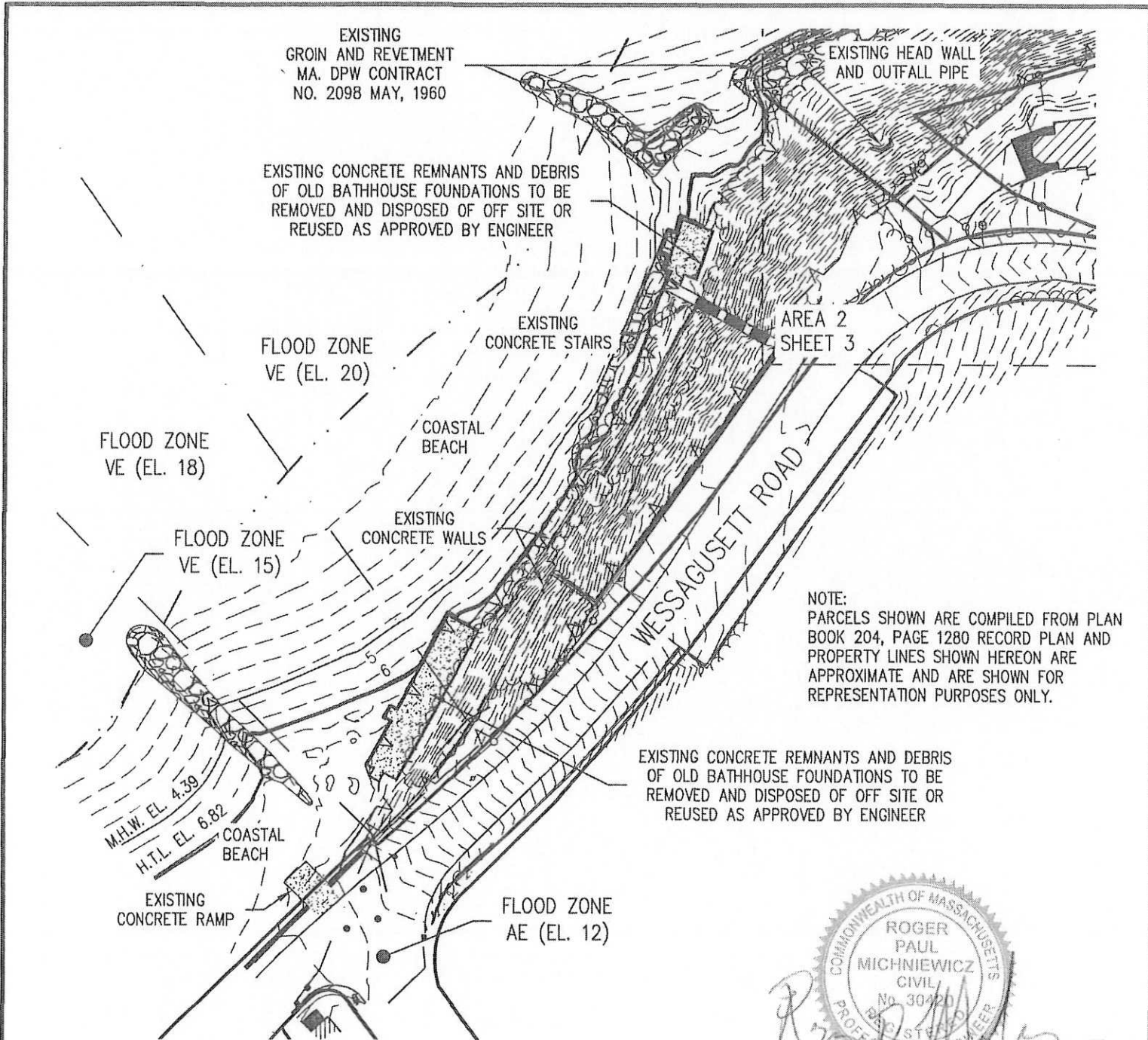
PURPOSE:
 TO LICENSE AND MAINTAIN A
 PROPOSED BOARDWALK AND
 REVETMENT IN WEYMOUTH FORE RIVER,
 WEYMOUTH, NORFOLK COUNTY, MA

VICINITY MAP

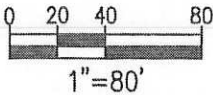
APPLICATION BY:
 THE TOWN OF WEYMOUTH

PREPARED BY
 COASTAL ENGINEERING CO., INC.
 260 CRANBERRY HIGHWAY
 ORLEANS, MA 02653

JUNE 5, 2019 SHEET 1 OF 8



NOTE:
 PARCELS SHOWN ARE COMPILED FROM PLAN BOOK 204, PAGE 1280 RECORD PLAN AND PROPERTY LINES SHOWN HEREON ARE APPROXIMATE AND ARE SHOWN FOR REPRESENTATION PURPOSES ONLY.



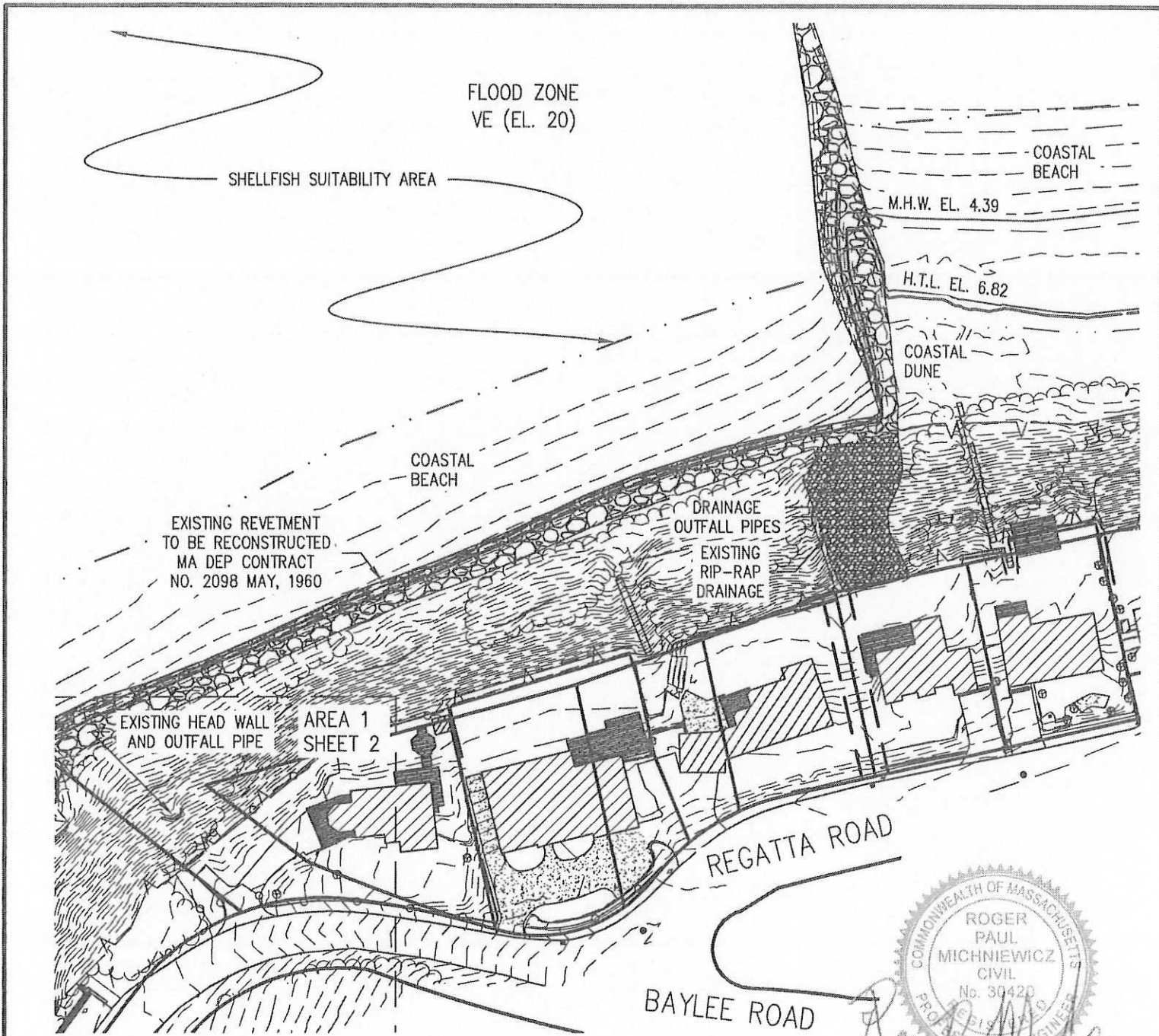
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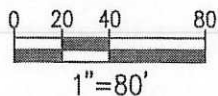
PURPOSE:
 TO LICENSE AND MAINTAIN A PROPOSED BOARDWALK AND REVETMENT IN WEYMOUTH FORE RIVER, WEYMOUTH, NORFOLK COUNTY, MA

**EXISTING SITE PLAN
 AREA 1**

APPLICATION BY:
 THE TOWN OF WEYMOUTH
 75 MIDDLE STREET
 PREPARED BY
 COASTAL ENGINEERING CO., INC.
 260 CRANBERRY HIGHWAY
 ORLEANS, MA 02653
 JUNE 5, 2019 SHEET 2 OF 8



REFERENCE DATUM IS NAVD88
 REF: TOWN ASSESSOR'S PARCEL 2-12-10

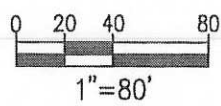
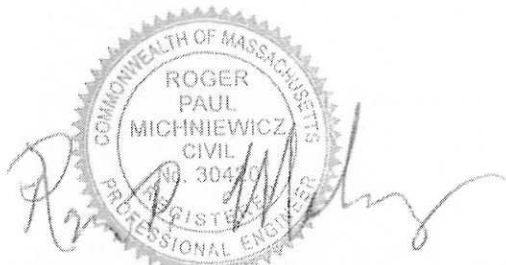
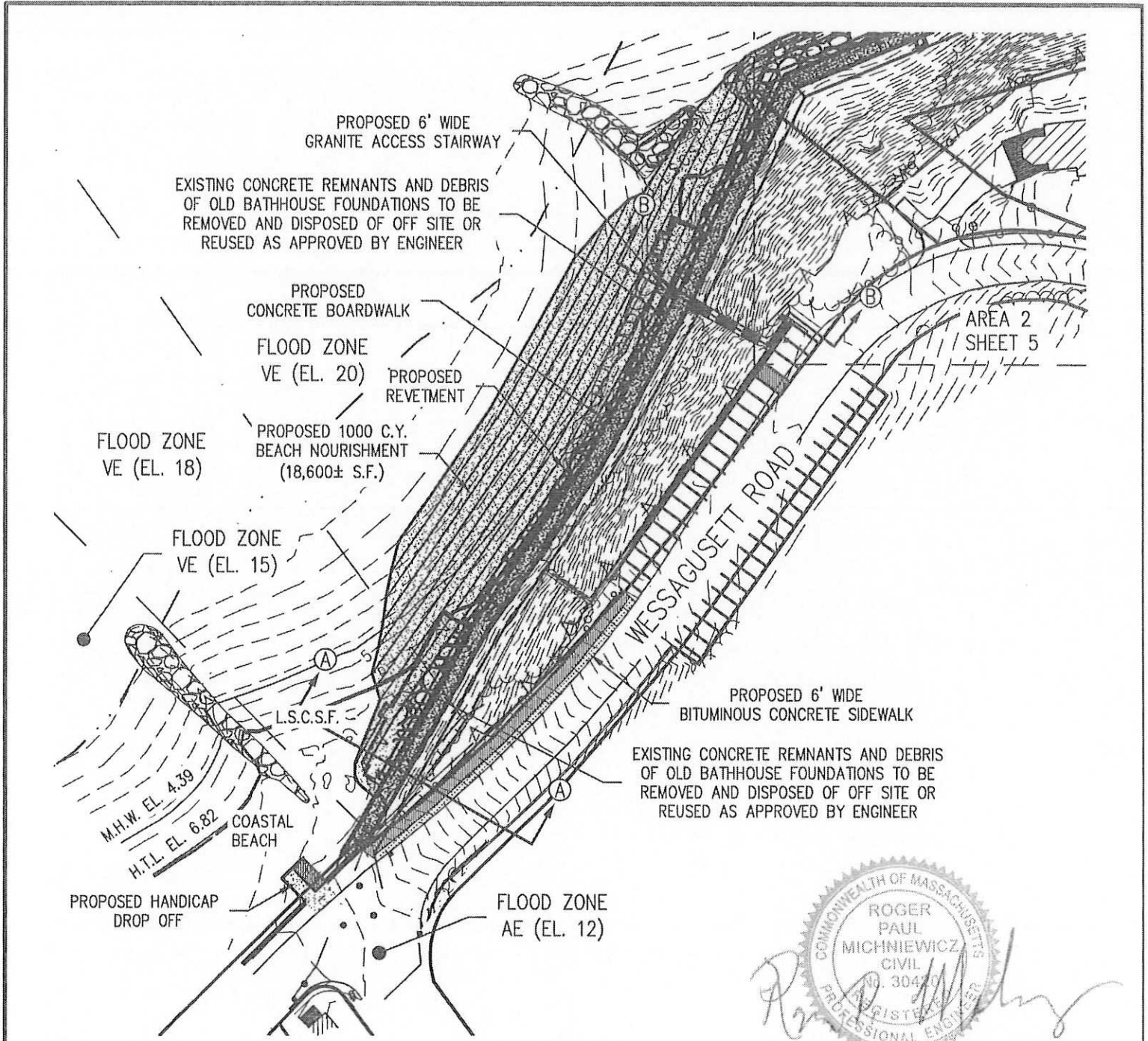


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PURPOSE:
 TO LICENSE AND MAINTAIN A
 PROPOSED BOARDWALK AND
 REVETMENT IN WEYMOUTH FORE RIVER,
 WEYMOUTH, NORFOLK COUNTY, MA

**EXISTING SITE PLAN
 AREA 2**

APPLICATION BY:
 THE TOWN OF WEYMOUTH
 75 MIDDLE STREET
 PREPARED BY
 COASTAL ENGINEERING CO., INC.
 260 CRANBERRY HIGHWAY
 ORLEANS, MA 02653



REFERENCE DATUM IS NAVD88
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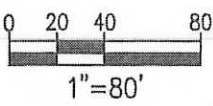
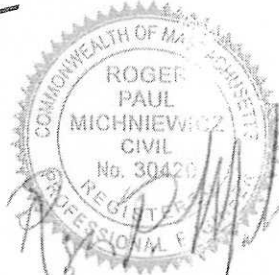
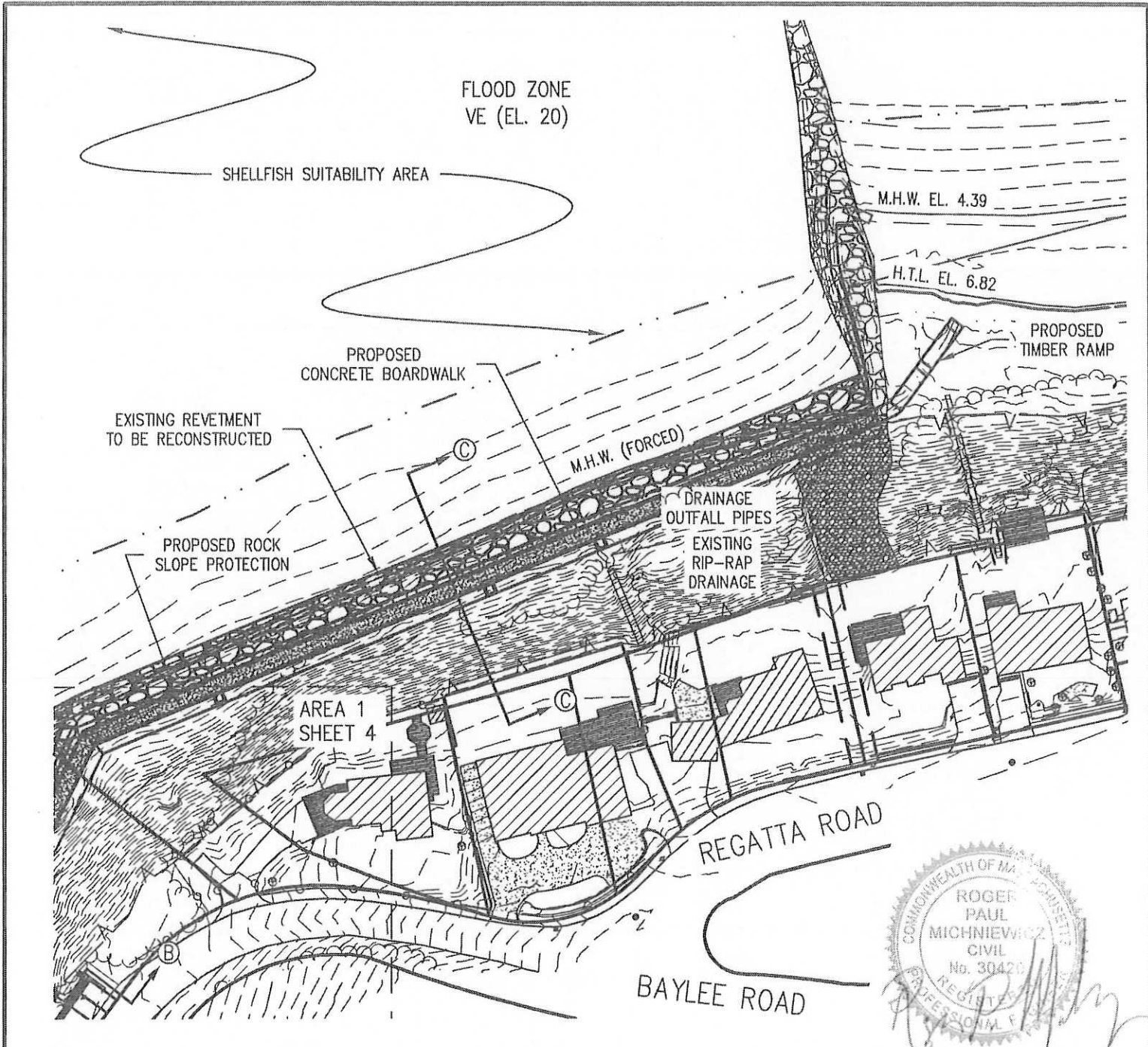
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PURPOSE:
 TO LICENSE AND MAINTAIN A
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 REVETMENT IN WEYMOUTH FORE RIVER,
 WEYMOUTH, NORFOLK COUNTY, MA

**PROPOSED SITE PLAN
 AREA 1**

APPLICATION BY:
 THE TOWN OF WEYMOUTH
 75 MIDDLE STREET

PREPARED BY
 COASTAL ENGINEERING CO., INC.
 260 CRANBERRY HIGHWAY
 ORLEANS, MA 02653



REFERENCE DATUM IS NAVD88
 REF: TOWN ASSESSOR'S PARCEL 2-12-10

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PURPOSE:
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 WEYMOUTH, NORFOLK COUNTY, MA

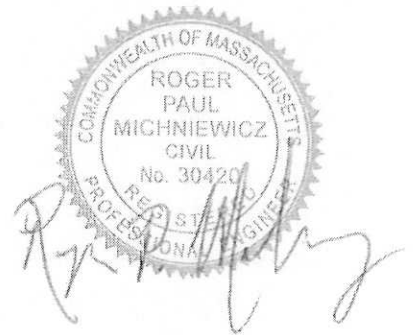
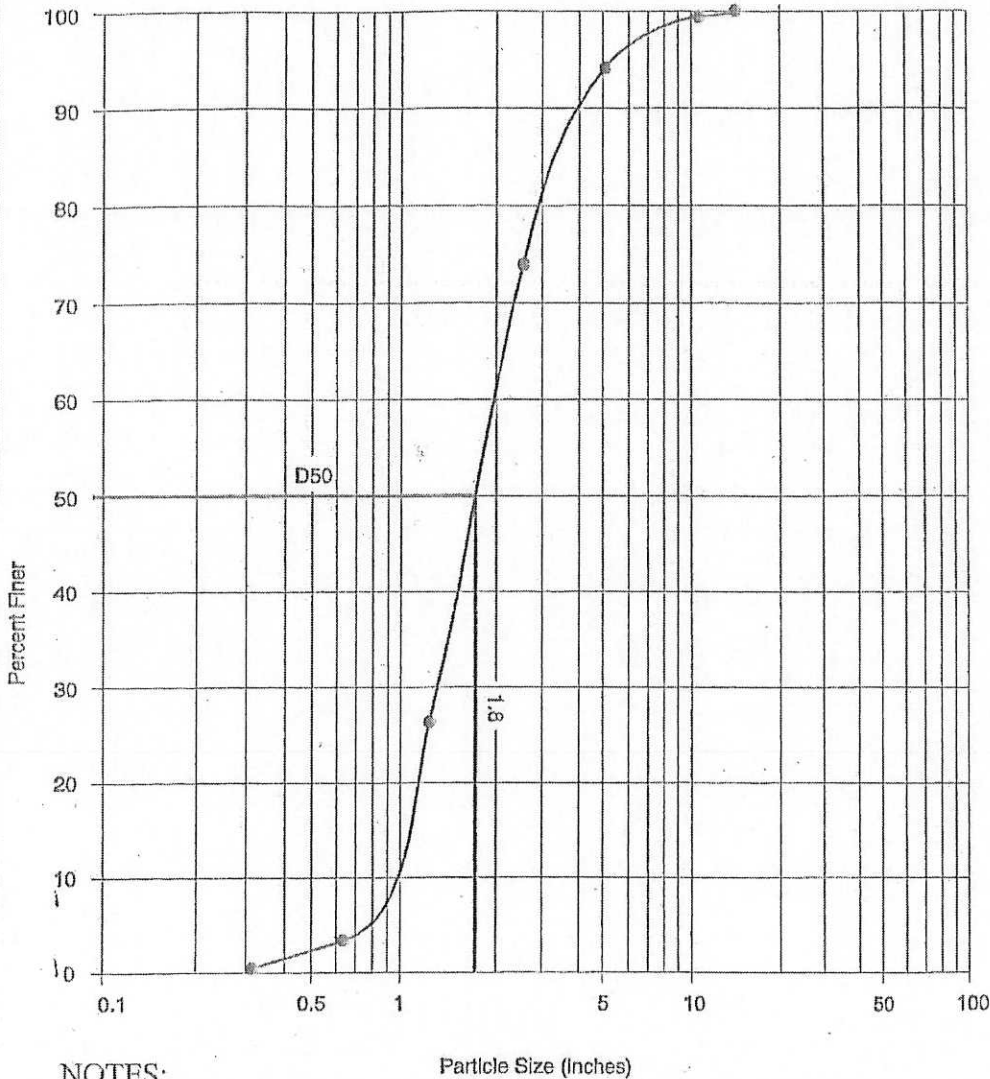
**PROPOSED SITE PLAN
 AREA 2**

APPLICATION BY:
 THE TOWN OF WEYMOUTH
 75 MIDDLE STREET
 PREPARED BY
 COASTAL ENGINEERING CO., INC.
 260 CRANBERRY HIGHWAY
 ORLEANS, MA 02653
 JUNE 5, 2019 SHEET 5 OF 8

WESSAGUSSETT WALK

PROPOSED BEACH NOURISHMENT GRADATION CURVE

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NOTES:

1. Approximately 1000 cubic yards of beach nourishment is proposed to be placed on Wessagussett Beach directly adjacent to and along about 400 linear feet of the proposed rock revetment/concrete walkway at the site.
2. Due to the sand shoaling concerns of the Wessagussett Yacht Club located directly to the west of Wessagussett Beach, the proposed gradation of beach nourishment sediment is limited to a minimum particle diameter of about 0.5 inches.
3. The proposed nourishment gradation curve represents a well graded range of particle sizes to better facilitate the stability of the beach nourishment during coastal storm events.

PURPOSE:
TO LICENSE AND MAINTAIN A
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REVETMENT IN WEYMOUTH FORE RIVER,
WEYMOUTH, NORFOLK COUNTY, MA

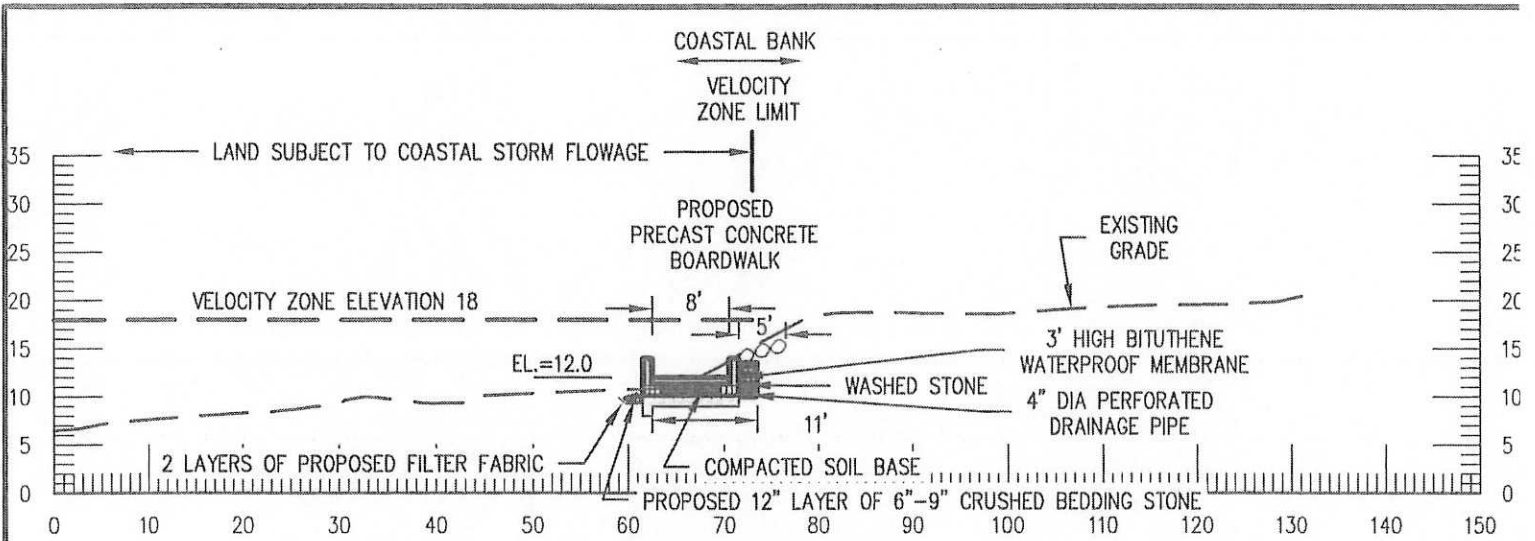
PROPOSED BEACH NOURISHMENT GRADATION CURVE

APPLICATION BY:
THE TOWN OF WEYMOUTH
75 MIDDLE STREET

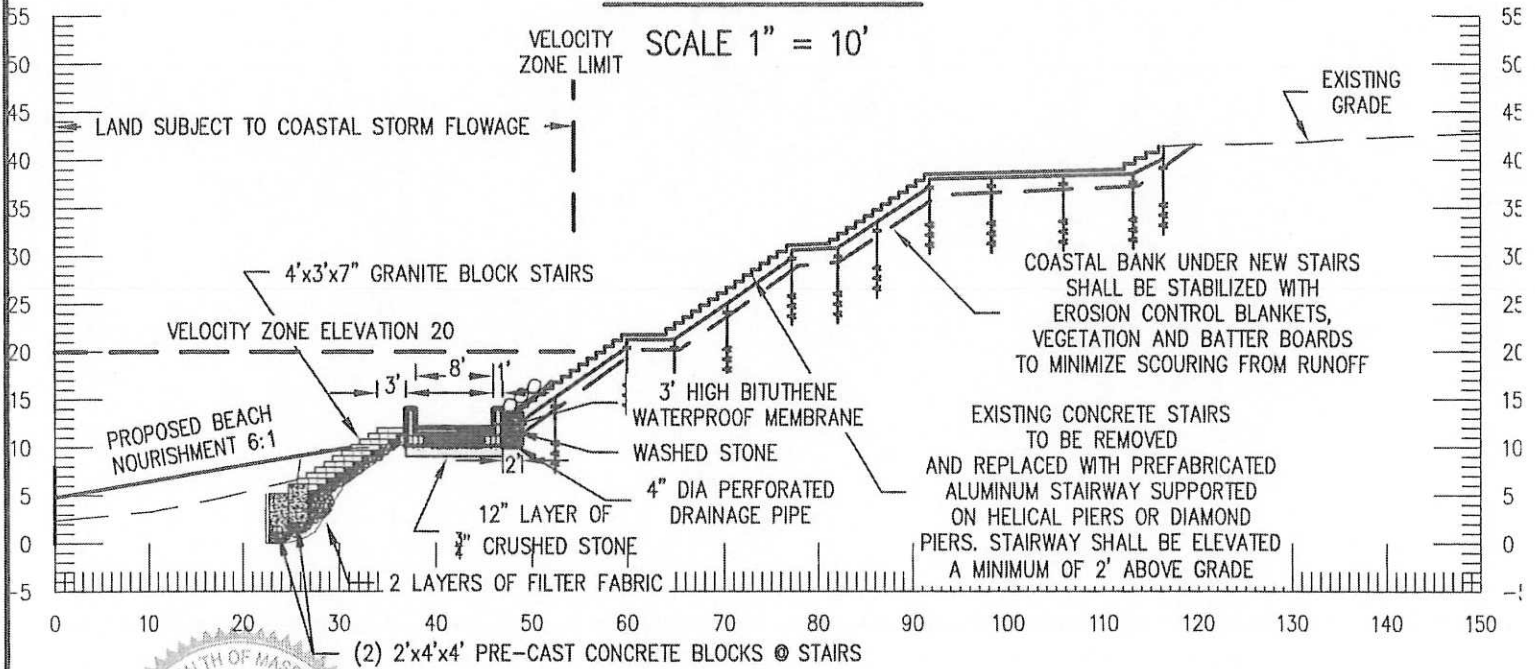
PREPARED BY
COASTAL ENGINEERING CO., INC.
260 CRANBERRY HIGHWAY
ORLEANS, MA 02653

JUNE 5, 2019

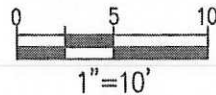
SHEET 6 OF 8



SECTION A-A



SECTION B-B



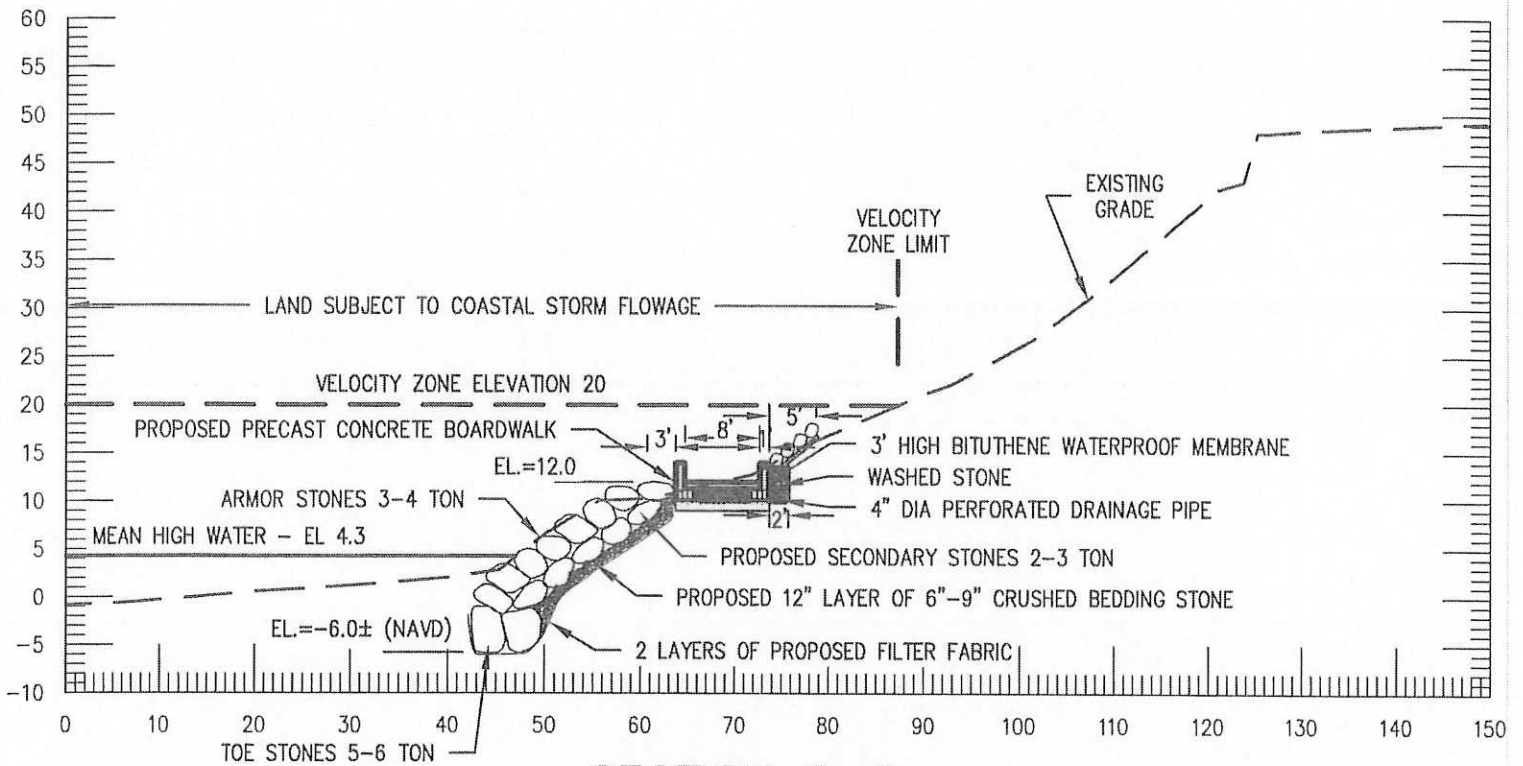
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COMMONWEALTH OF MASSACHUSETTS
 REGISTERED PROFESSIONAL ENGINEER
 ROGER PAUL MICHNIEWICZ
 CIVIL
 No. 30421
 REFERENCE DATUM IS NAVD88

PURPOSE:
 TO LICENSE AND MAINTAIN A
 PROPOSED BOARDWALK AND
 REVETMENT IN WEYMOUTH FORE RIVER,
 WEYMOUTH, NORFOLK COUNTY, MA

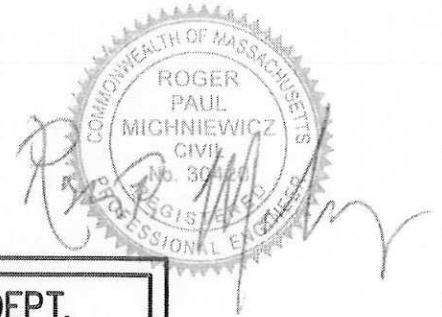
**SECTION A-A
 &
 SECTION B-B**

APPLICATION BY:
 THE TOWN OF WEYMOUTH
 75 MIDDLE STREET
 PREPARED BY
 COASTAL ENGINEERING CO., INC.
 260 CRANBERRY HIGHWAY
 ORLEANS, MA 02653



SECTION C-C

SCALE 1" = 10'



MHW EL. 4.39 PER WEYMOUTH ENGINEERING DEPT.
 MHW TO MHHW = 0.44 PER NOAA STATIONS = 4.83
 FROM EMAIL BY MARY ELLEN SCHLOSS 4/11/18
 HTL EL. 6.82 PER BUZZARDS BAY ESTUARY PROGRAM

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REFERENCE DATUM IS NAVD88

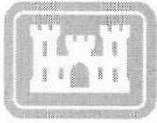
PURPOSE:
 TO LICENSE AND MAINTAIN A
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SECTION C-C

APPLICATION BY:
 THE TOWN OF WEYMOUTH
 75 MIDDLE STREET
 PREPARED BY
 COASTAL ENGINEERING CO., INC.
 260 CRANBERRY HIGHWAY
 ORLEANS, MA 02653

JUNE 5, 2019

SHEET 8 OF 8



**US Army Corps
of Engineers**®
New England District

WORK-START NOTIFICATION FORM
(Minimum Notice: Two weeks before work begins)

EMAIL TO: katelyn.m.rainville@usace.army.mil, cenae-r@usace.army.mil and
kevin.i.dirocco@usace.army.mil

or MAIL TO:

Katelyn Rainville
Permits and Enforcement Branch, Regulatory Division
U.S. Army Corps of Engineers, New England District
696 Virginia Road
Concord, Massachusetts 01742-2751

Kevin DiRocco
Levee Safety Program
U.S. Army Corps of Engineers, New England District
696 Virginia Road
Concord, Massachusetts 01742-2751

Also, if the work is in the Massachusetts Coastal Zone (<https://www.mass.gov/service-details/czm-regions-coastal-communities-and-coastal-zone-boundary>), email this form to robert.boeri@mass.gov or mail it to: The Massachusetts Office of Coastal Zone Management, Project Review Coordinator, Suite 800, 251 Causeway Street, Boston, MA 02114.

Corps of Engineers Permit No. NAE-2018-01520 was issued to the Town of Weymouth. This work is located in the Weymouth Fore River and authorized the construction of a 1,000 linear foot concrete public access boardwalk/revetment, the completion of 18,600 square feet of beach nourishment, and the removal of concrete structures from Wessagussett Beach. The first 500 linear feet of revetment will be replaced within the footprint of the existing revetment. The remaining 500 linear feet of revetment will be newly constructed where the existing concrete retaining wall and bathhouse will be removed. A concrete boardwalk will be installed above the entire revetment to connect Wessagussett Beach to George E. Lane Beach. The revetment will have 2,500 square feet of impacts below the high tide line. The project also includes beach nourishment using 1,000 cubic yards of material sourced from uplands that will match the grain size of the existing beach.

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: May 26, 2020 Date Permit Expires: April 5, 2023

FOR USE BY THE CORPS OF ENGINEERS

PM: Katelyn Rainville Submittals Required: N/A

Inspection Recommendation: _____

**APPENDIX
ALPHA LABS
SEDIMENT ANALYSIS REPORT**





ANALYTICAL REPORT

Lab Number:	L2008948
Client:	Coastal Engineering Company 260 Cranberry Highway Route 6A Orleans, MA 02653
ATTN:	Chad Simmons
Phone:	(508) 255-6511
Project Name:	WESSAGUSSET WALK
Project Number:	C18729.00
Report Date:	03/12/20

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: WESSAGUSSET WALK
Project Number: C18729.00

Lab Number: L2008948
Report Date: 03/12/20

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2008948-01	S1	SOIL	WESSAGUSSET BEACH, WEYMOUTH, MA	02/28/20 07:45	02/28/20
L2008948-02	S2	SOIL	WESSAGUSSET BEACH, WEYMOUTH, MA	02/28/20 08:00	02/28/20
L2008948-03	S3	SOIL	WESSAGUSSET BEACH, WEYMOUTH, MA	02/28/20 08:15	02/28/20

Project Name: WESSAGUSSET WALK
Project Number: C18729.00

Lab Number: L2008948
Report Date: 03/12/20

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: WESSAGUSSET WALK
Project Number: C18729.00

Lab Number: L2008948
Report Date: 03/12/20

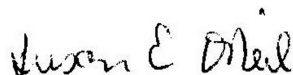
Case Narrative (continued)

Grain Size Analysis

The WG1346789-1 Laboratory Duplicate RPDs for % coarse gravel (26%), % fine gravel (25%), % total gravel (26%), % coarse sand (36%), % medium sand (29%) and % total sand (28%), performed on L2008948-01, are outside the acceptance criteria. The elevated RPDs have been attributed to the non-homogeneous nature of the native sample.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:



Susan O'Neil

Title: Technical Director/Representative

Date: 03/12/20

INORGANICS & MISCELLANEOUS

Project Name: WESSAGUSSET WALK
Project Number: C18729.00

Lab Number: L2008948
Report Date: 03/12/20

SAMPLE RESULTS

Lab ID: L2008948-01
Client ID: S1
Sample Location: WESSAGUSSET BEACH, WEYMOUTH, MA

Date Collected: 02/28/20 07:45
Date Received: 02/28/20
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Grain Size Analysis - Mansfield Lab										
Cobbles	ND		%	0.100	NA	1	-	03/03/20 20:53	12,D6913/D7928	MC
% Coarse Gravel	25.4		%	0.100	NA	1	-	03/03/20 20:53	12,D6913/D7928	MC
% Fine Gravel	19.0		%	0.100	NA	1	-	03/03/20 20:53	12,D6913/D7928	MC
% Total Gravel	44.4		%	0.100	NA	1	-	03/03/20 20:53	12,D6913/D7928	MC
% Coarse Sand	9.20		%	0.100	NA	1	-	03/03/20 20:53	12,D6913/D7928	MC
% Medium Sand	29.3		%	0.100	NA	1	-	03/03/20 20:53	12,D6913/D7928	MC
% Fine Sand	10.4		%	0.100	NA	1	-	03/03/20 20:53	12,D6913/D7928	MC
% Total Sand	48.9		%	0.100	NA	1	-	03/03/20 20:53	12,D6913/D7928	MC
% Total Fines	6.70		%	0.100	NA	1	-	03/03/20 20:53	12,D6913/D7928	MC



Project Name: WESSAGUSSET WALK
Project Number: C18729.00

Lab Number: L2008948
Report Date: 03/12/20

SAMPLE RESULTS

Lab ID: L2008948-02
Client ID: S2
Sample Location: WESSAGUSSET BEACH, WEYMOUTH, MA

Date Collected: 02/28/20 08:00
Date Received: 02/28/20
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Grain Size Analysis - Mansfield Lab										
Cobbles	ND		%	0.100	NA	1	-	03/03/20 20:53	12,D6913/D7928	MC
% Coarse Gravel	57.6		%	0.100	NA	1	-	03/03/20 20:53	12,D6913/D7928	MC
% Fine Gravel	11.7		%	0.100	NA	1	-	03/03/20 20:53	12,D6913/D7928	MC
% Total Gravel	69.3		%	0.100	NA	1	-	03/03/20 20:53	12,D6913/D7928	MC
% Coarse Sand	7.40		%	0.100	NA	1	-	03/03/20 20:53	12,D6913/D7928	MC
% Medium Sand	14.2		%	0.100	NA	1	-	03/03/20 20:53	12,D6913/D7928	MC
% Fine Sand	3.60		%	0.100	NA	1	-	03/03/20 20:53	12,D6913/D7928	MC
% Total Sand	25.2		%	0.100	NA	1	-	03/03/20 20:53	12,D6913/D7928	MC
% Total Fines	5.50		%	0.100	NA	1	-	03/03/20 20:53	12,D6913/D7928	MC



Project Name: WESSAGUSSET WALK
Project Number: C18729.00

Lab Number: L2008948
Report Date: 03/12/20

SAMPLE RESULTS

Lab ID: L2008948-03
Client ID: S3
Sample Location: WESSAGUSSET BEACH, WEYMOUTH, MA

Date Collected: 02/28/20 08:15
Date Received: 02/28/20
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Grain Size Analysis - Mansfield Lab										
Cobbles	ND		%	0.100	NA	1	-	03/03/20 20:53	12,D6913/D7928	MC
% Coarse Gravel	16.1		%	0.100	NA	1	-	03/03/20 20:53	12,D6913/D7928	MC
% Fine Gravel	25.0		%	0.100	NA	1	-	03/03/20 20:53	12,D6913/D7928	MC
% Total Gravel	41.1		%	0.100	NA	1	-	03/03/20 20:53	12,D6913/D7928	MC
% Coarse Sand	13.5		%	0.100	NA	1	-	03/03/20 20:53	12,D6913/D7928	MC
% Medium Sand	21.2		%	0.100	NA	1	-	03/03/20 20:53	12,D6913/D7928	MC
% Fine Sand	12.6		%	0.100	NA	1	-	03/03/20 20:53	12,D6913/D7928	MC
% Total Sand	47.3		%	0.100	NA	1	-	03/03/20 20:53	12,D6913/D7928	MC
% Total Fines	11.6		%	0.100	NA	1	-	03/03/20 20:53	12,D6913/D7928	MC



Lab Duplicate Analysis

Batch Quality Control

Project Name: WESSAGUSSET WALK

Project Number: C18729.00

Lab Number: L2008948

Report Date: 03/12/20

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Grain Size Analysis - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1346789-1 QC Sample: L2008948-01 Client ID: S1						
Cobbles	ND	ND	%	NC		20
% Coarse Gravel	25.4	32.9	%	26	Q	20
% Fine Gravel	19.0	24.5	%	25	Q	20
% Total Gravel	44.4	57.4	%	26	Q	20
% Coarse Sand	9.20	6.40	%	36	Q	20
% Medium Sand	29.3	21.8	%	29	Q	20
% Fine Sand	10.4	8.60	%	19		20
% Total Sand	48.9	36.8	%	28	Q	20
% Total Fines	6.70	5.80	%	14		20

Project Name: WESSAGUSSET WALK**Lab Number:** L2008948**Project Number:** C18729.00**Report Date:** 03/12/20**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2008948-01A	Bag	A	NA		4.5	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-CGRAVEL(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND(),A2-HYDRO-TSAND(),A2-HYDRO-COBBLER(),A2-HYDRO-FGRAVEL()
L2008948-02A	Bag	A	NA		4.5	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-CGRAVEL(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND(),A2-HYDRO-TSAND(),A2-HYDRO-COBBLER(),A2-HYDRO-FGRAVEL()
L2008948-03A	Bag	A	NA		4.5	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-CGRAVEL(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND(),A2-HYDRO-TSAND(),A2-HYDRO-COBBLER(),A2-HYDRO-FGRAVEL()

Project Name: WESSAGUSSET WALK
Project Number: C18729.00

Lab Number: L2008948
Report Date: 03/12/20

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

Report Format: Data Usability Report



Project Name: WESSAGUSSET WALK
Project Number: C18729.00

Lab Number: L2008948
Report Date: 03/12/20

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less

Report Format: Data Usability Report



Project Name: WESSAGUSSET WALK
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Data Qualifiers

than 5x the RL. (Metals only.)

- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.

Project Name: WESSAGUSSET WALK
Project Number: C18729.00

Lab Number: L2008948
Report Date: 03/12/20

REFERENCES

- 12 Annual Book of ASTM Standards. (American Society for Testing and Materials) ASTM International.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

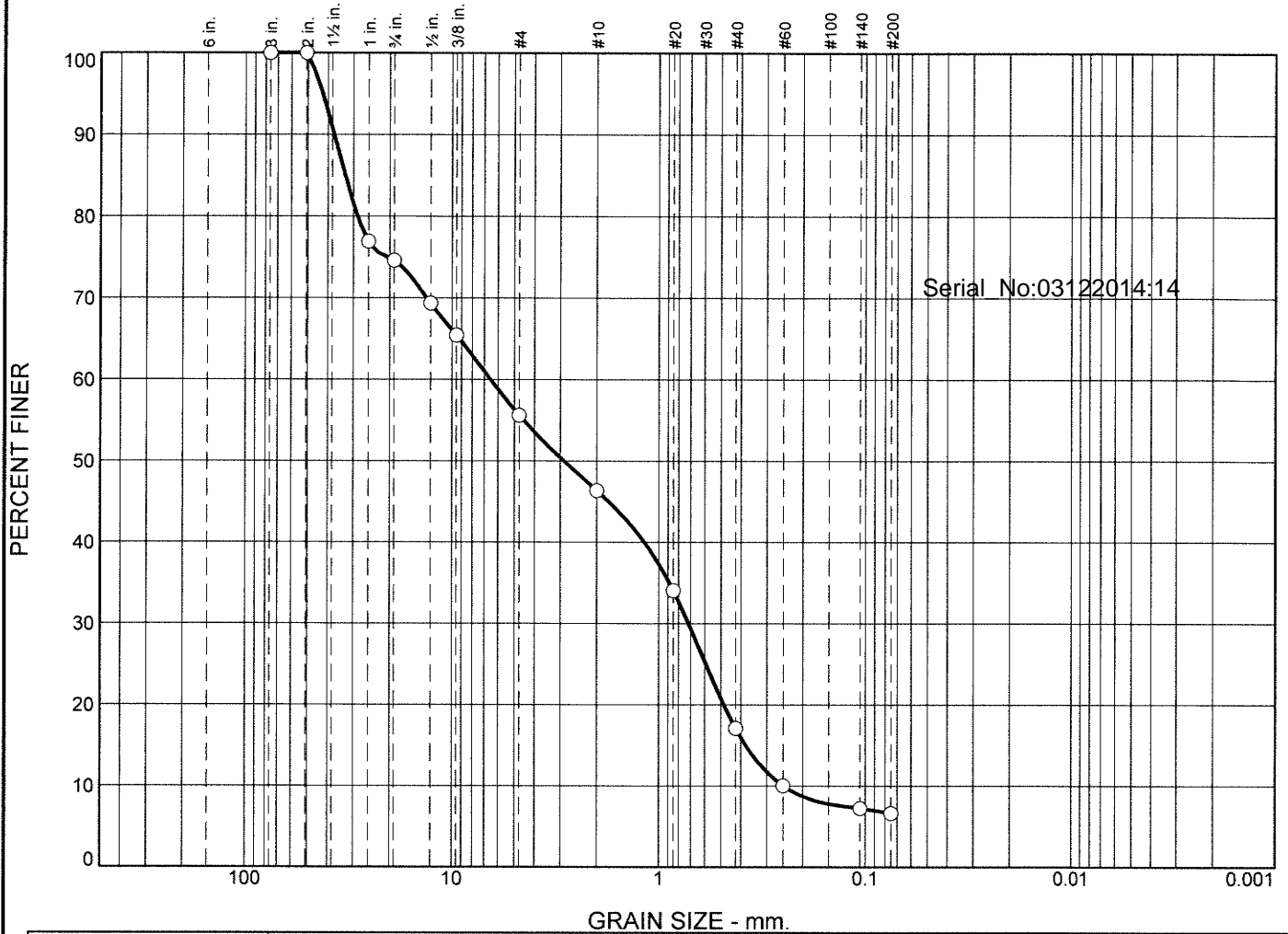
We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Serial_No:03122014:14

ASTM D6913/D7928
GRAIN SIZE ANALYSIS

Particle Size Distribution Report



GRAIN SIZE - mm.

%	+3"	% Gravel		% Sand			% Fines				
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay			
○	0.0	25.4	19.0	9.2	29.3	10.4	6.7				
X	Colloids	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
○				32.9859	6.5188	2.8816	0.7166	0.3792	0.2482	0.32	26.27

Material Description	USCS	AASHTO
○		

Project No. ○	Client:	
Project:		
○ Source of Sample: S1	Sample Number: L2008948-01	
Date: ○		
Alpha Analytical		
Mansfield, MA		

Remarks: ○ Sampled and Tested by MCH
Figure

GRAIN SIZE DISTRIBUTION TEST DATA

3/10/2020

Location: S1

Sample Number: L2008948-01

Testing Remarks: Sampled and Tested by MCH

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare =984.50

Tare Wt. = 0.00

Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
984.50	0.00	3	0.00	0.00	100.0
		2	0.00	0.00	100.0
		1	227.50	0.00	76.9
		0.75	22.50	0.00	74.6
		.5	52.00	0.00	69.3
		.375	38.50	0.00	65.4
		#4	96.50	0.00	55.6
		#10	91.00	0.00	46.4
		#20	121.00	0.00	34.1
		#40	167.00	0.00	17.1
		#60	69.50	0.00	10.1
		#140	27.50	0.00	7.3
		#200	6.00	0.00	6.7

Serial_No:03122014:14

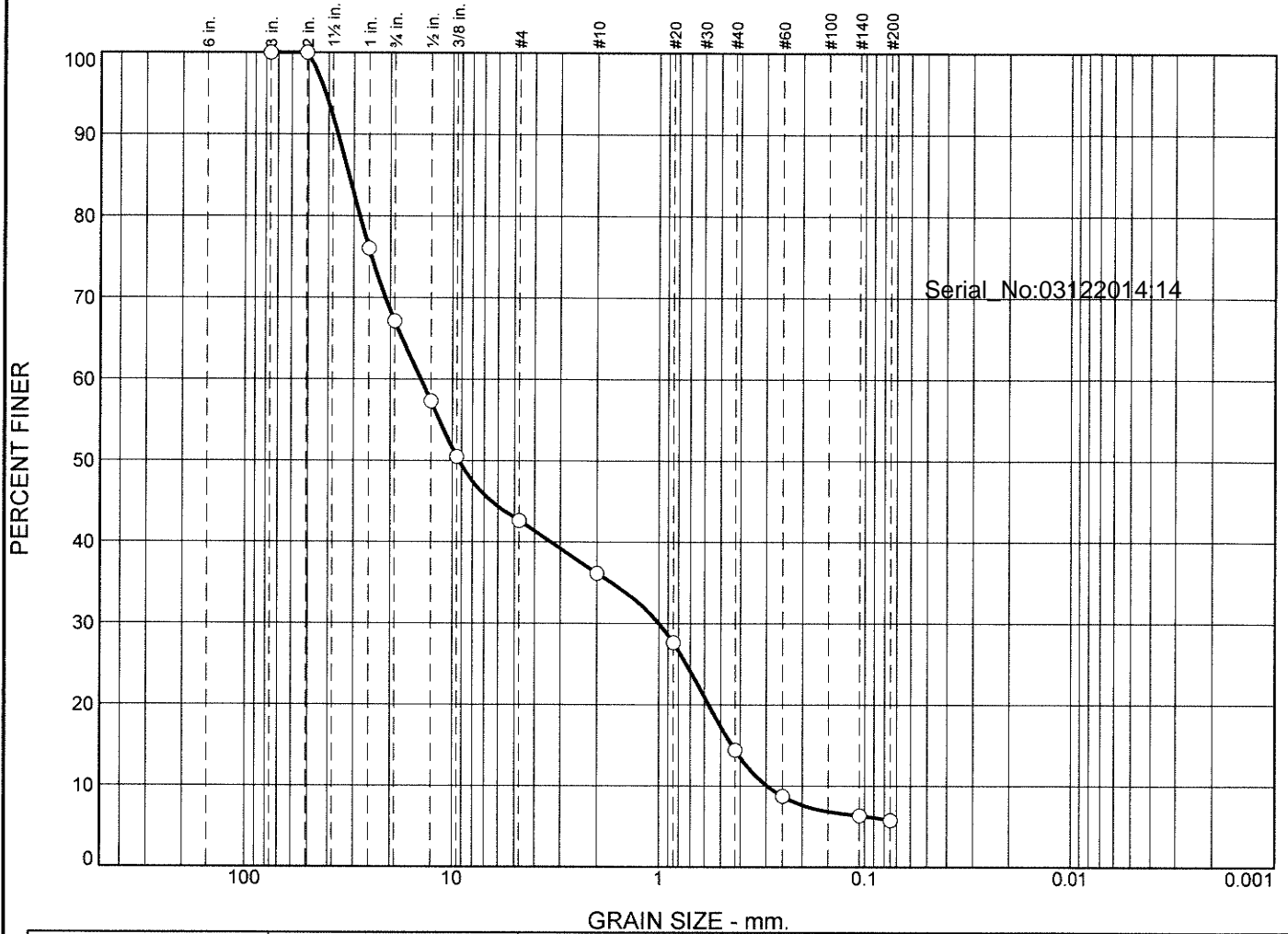
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	25.4	19.0	44.4	9.2	29.3	10.4	48.9			6.7

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
	0.2482	0.3792	0.4843	0.7166	1.1733	2.8816	6.5188	28.7262	32.9859	37.3026	42.4453

Fineness Modulus	C _u	C _c
4.80	26.27	0.32

Particle Size Distribution Report



% +3"		% Gravel		% Sand			% Fines				
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay			
<input type="radio"/>	0.0	32.9	24.5	6.4	21.8	8.6	5.8				
<input checked="" type="checkbox"/>	Colloids	LL	PL	D85	D60	D50	D30	D15	D10	Cc	Cu
<input type="radio"/>				31.8046	14.2226	9.2851	0.9964	0.4402	0.2964	0.24	47.99

Material Description	USCS	AASHTO
<input type="radio"/>		

Project No. _____	Client: _____	Remarks:
Project: _____		
<input type="radio"/> Source of Sample: S1	Sample Number: WG1346789-1	
Date: <input type="radio"/>		
Alpha Analytical		Figure
Mansfield, MA		

GRAIN SIZE DISTRIBUTION TEST DATA

3/10/2020

Location: S1

Sample Number: WG1346789-1

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare =985.00
 Tare Wt. =0.00
 Minus #200 from wash =0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
985.00	0.00	3	0.00	0.00	100.0
		2	0.00	0.00	100.0
		1	236.00	0.00	76.0
		0.75	88.00	0.00	67.1
		.5	96.50	0.00	57.3
		.375	67.00	0.00	50.5
		#4	77.50	0.00	42.6
		#10	63.50	0.00	36.2
		#20	84.00	0.00	27.7
		#40	130.50	0.00	14.4
		#60	56.00	0.00	8.7
		#140	23.50	0.00	6.3
		#200	5.50	0.00	5.8

Serial_No:03122014:14

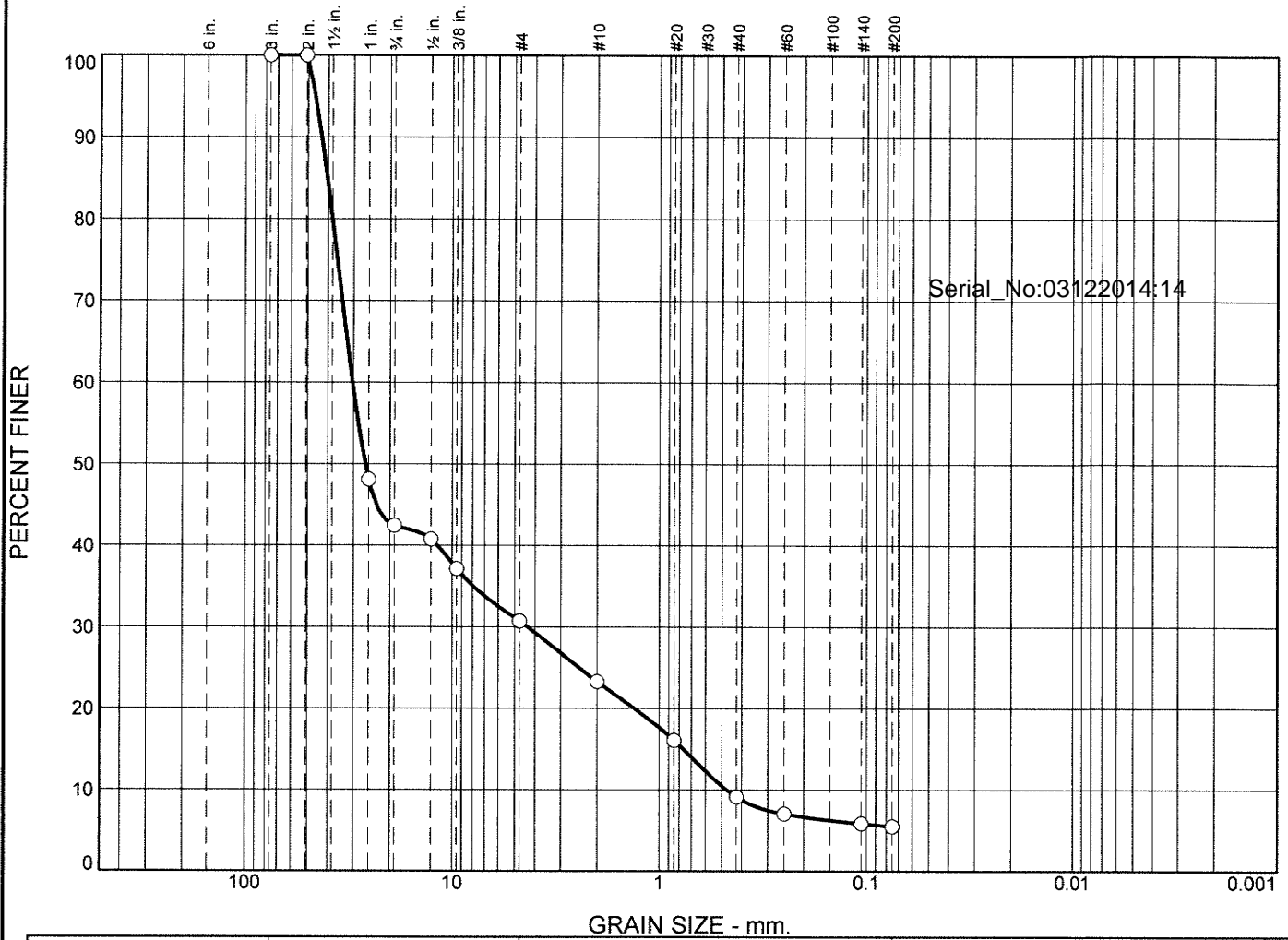
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	32.9	24.5	57.4	6.4	21.8	8.6	36.8			5.8

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
	0.2964	0.4402	0.5719	0.9964	3.3267	9.2851	14.2226	28.1479	31.8046	35.9977	41.3585

Fineness Modulus	C _u	C _c
5.40	47.99	0.24

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	57.6	11.7	7.4	14.2	3.6	5.5	

Colloids	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
0.0			40.3515	30.3951	26.3511	4.3388	0.7647	0.4736	1.31	64.17

Material Description	USCS	AASHTO

Project No. _____	Client: _____	Remarks:
Project: _____		
Source of Sample: S2	Sample Number: L2008948-02	
Date: _____		
Alpha Analytical		Figure
Mansfield, MA		

GRAIN SIZE DISTRIBUTION TEST DATA

3/10/2020

Location: S2

Sample Number: L2008948-02

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare =1498.50
 Tare Wt. =0.00
 Minus #200 from wash =0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
1498.50	0.00	3	0.00	0.00	100.0
		2	0.00	0.00	100.0
		1	777.50	0.00	48.1
		0.75	85.00	0.00	42.4
		.5	25.00	0.00	40.8
		.375	54.50	0.00	37.1
		#4	96.00	0.00	30.7
		#10	111.00	0.00	23.3
		#20	108.00	0.00	16.1
		#40	104.50	0.00	9.1
		#60	31.00	0.00	7.1
		#140	18.00	0.00	5.9
		#200	5.50	0.00	5.5

Serial_No:03122014:14

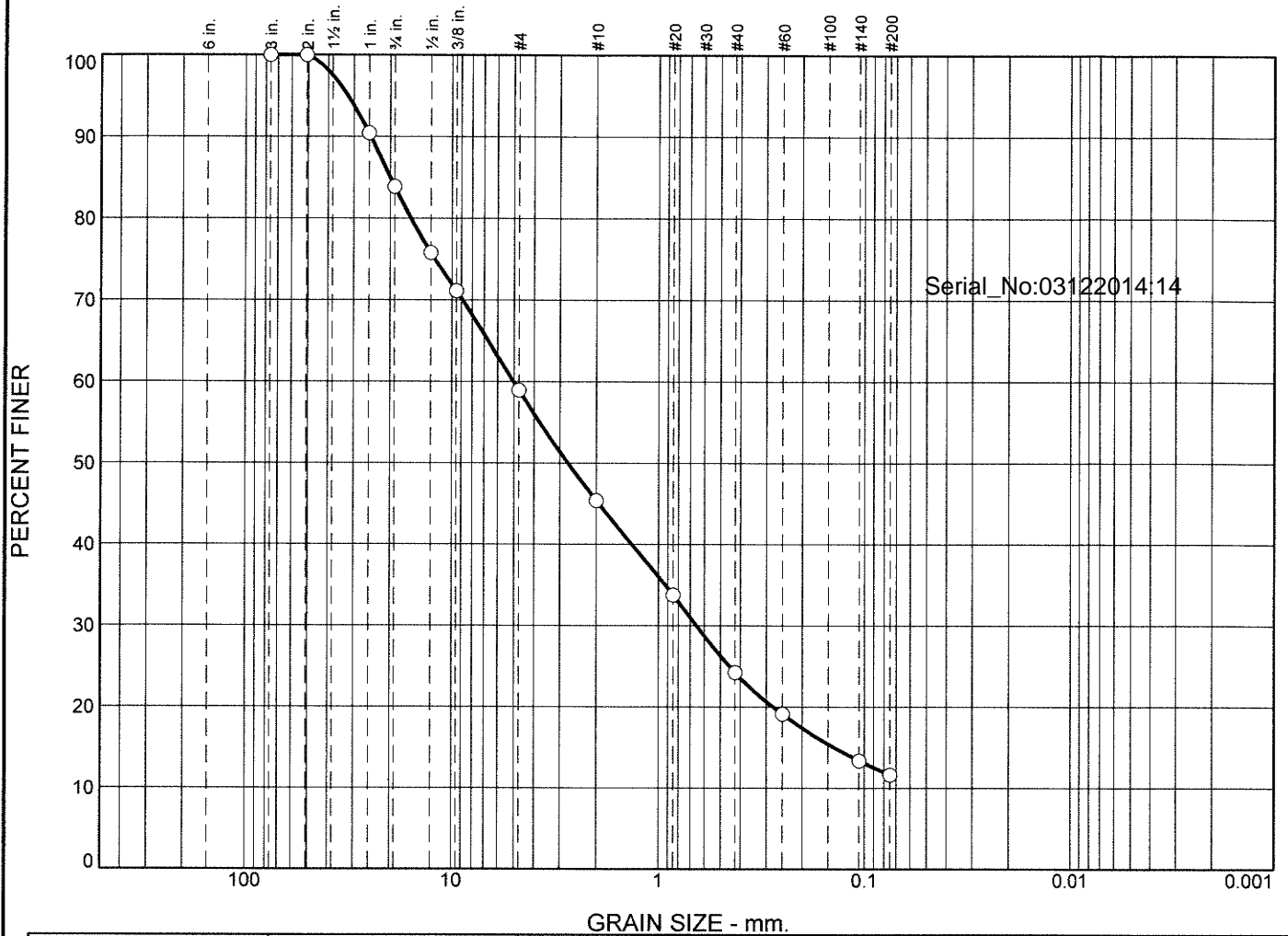
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	57.6	11.7	69.3	7.4	14.2	3.6	25.2			5.5

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
	0.4736	0.7647	1.3148	4.3388	11.7953	26.3511	30.3951	38.0918	40.3515	42.9388	46.1174

Fineness Modulus	C _u	C _c
6.40	64.17	1.31

Particle Size Distribution Report



%	+3"	% Gravel		% Sand			% Fines				
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay			
○	0.0	16.1	25.0	13.5	21.2	12.6	11.6				
⊗	Colloids	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
○				20.0290	5.0498	2.7419	0.6529	0.1400			

Material Description	USCS	AASHTO
○		

<p>Project No. Client:</p> <p>Project:</p> <p>○ Source of Sample: S3 Sample Number: L2008948-03</p> <p>Date: ○</p> <p style="text-align: center;">Alpha Analytical</p> <p style="text-align: center;">Mansfield, MA</p>	<p>Remarks:</p> <p style="text-align: right;">Figure</p>
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GRAIN SIZE DISTRIBUTION TEST DATA

3/10/2020

Location: S3

Sample Number: L2008948-03

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare =1456.00
 Tare Wt. =0.00
 Minus #200 from wash =0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
1456.00	0.00	3	0.00	0.00	100.0
		2	0.00	0.00	100.0
		1	139.50	0.00	90.4
		0.75	95.50	0.00	83.9
		.5	117.50	0.00	75.8
		.375	68.00	0.00	71.1
		#4	177.50	0.00	58.9
		#10	197.00	0.00	45.4
		#20	169.00	0.00	33.8
		#40	139.00	0.00	24.2
		#60	74.50	0.00	19.1
		#140	83.50	0.00	13.4
		#200	25.50	0.00	11.6

Serial_No:03122014:14

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	16.1	25.0	41.1	13.5	21.2	12.6	47.3			11.6

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
		0.1400	0.2777	0.6529	1.3431	2.7419	5.0498	15.9013	20.0290	24.9172	32.1818

Fineness Modulus
4.38

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene

EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

EPA TO-12 Non-methane organics

EPA 3C Fixed gases

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:** Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.

EPA 522.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

