Town of Yarmouth, Massachusetts

1146 Route 28

South Yarmouth MA 02664

(508) 398-2231

PROJECT MANUAL

Riverwalk Park, Boardwalk Loop, & Event Space

PHASE 1

April 2024

BETA Group Inc.
89 Shrewsbury St. Ste 300
Worcester Ma. 01604
508.756.1600

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE PHASE -1

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INVITATION TO BID

The Town of Yarmouth (Owner) acting through its Department of Public Works is seeking bids for the Riverwalk Park, Boardwalk Loop & Event Space Project, Located at 669 Rte. 28 West Yarmouth, MA, 02673.

1.1 GENERAL BIDS

A. Sealed General Bids for the Riverwalk Park, Boardwalk Loop & Event Space Project will be received at the Yarmouth Department of Public Works, located at 74 Town Brook Road, West Yarmouth, MA 02673, until 2:00 pm on Friday, April 26, 2024, at which time and place said General Bids will be publicly opened and read aloud. The Bids shall be submitted in a sealed envelope, clearly marked to indicate the contents.

1.2 ALTERNATES

A. Additive Alternates are included in this project as listed below.

1. Additive Alternate No.1 Kayak Launch Facility
2. Additive Alternate No. 2 Shade Structure, Park Benches.

1.3 DESCRIPTION OF WORK:

A. The project purpose is to construct a public park served by new water, sewer, and electric utilities. The park includes the construction of a park driveway and parking areas, an elevated boardwalk loop, a nature-based play area, walking paths, landscape plantings and site lighting. Site work includes clearing and grubbing, pulverizing asphalt, debris removal, as well as grading, shaping excavating, filling, setting curbing, forming, pouring and placing concrete, installing conventional and porous HMA pavements, stabilized aggregate pathways, as well as electric utility installation inclusive of electrical wiring and conduit, electric manholes and pull boxes, electric transformers, and load centers, as well as ornamental site lighting, as well as loaming, seeding, planting of perennials, shrubs and trees, and installation of site amenities, play equipment, surfacing and signage. Work also includes the installation of helical anchor piles, wood framing and decking and related railing carpentry work for the installation of a 1,400 linear foot elevated boardwalk loop with pedestrian bridge. Additive alternate work includes another elevated boardwalk with to gangways to access a kayak launch float, which requires the installation of driven wood piles and river-bottom mooring anchors to secure the float. Additional additive alternate work includes furnishing and installing a shade structure and park benches.

1.4 PROJECT ESTIMATE

A. The project estimate is $ 8,870,000.00.

1.5 TIME OF YEAR RESTRICTIONS

The project has specific site access and regulatory requirements regarding the work in environmentally sensitive areas, such as on the Lewis Pond Saltmarsh and in the Parkers River. Refer to Attachment E Project Permits for regulatory requirements. Bidder shall be familiar with all permit requirements and take note of specific requirements regarding time-of-year restrictions for construction operations.

1. All In-water work shall be prohibited between February 15,2025 and June 15, 2025.This includes work on the surface of the marsh specifically shown to occur below M.H.W. Refer to Chapter 91 License Agreement and other related documents in Attachment E.
2. All work on the surface of the salt marsh shall avoid impacts to the salt marsh during growing season. Work on the surface of the marsh shall be conducted between October 15,2024 and April 1, 2025. This requirement is a restriction to protect marsh vegetation and for foraging bids and does not exclude work above the marsh as may occur on top of helical piles/bents/boardwalk.
3. Work on Route 28 is subject to regulation by MassDOT. Due to heavy summer traffic volumes, work is prohibited between Memorial Day and Labor Day of any year without prior approval from the MassDOT District Director. Additional date, day, and time restrictions along with equipment operation requirements apply. Refer to MassDOT SHAP under attachment E.

1.6 PROJECT MILESTONES

A. The Owner has received financial support for the construction of the Project from various state and federal grant programs. Compliance with the completion dates for grant compliance is required to ensure the Owner receives funding reimbursement.

B. Land & Water Conservation Fund (LWCF) Grant: For underground utility and site improvements generally occurring from Rte. 28 to the Northern Cul-De Sac.

1. Improvements within the identified as the Land & Water Conservation Grant Area limits are as shown on the Construction Sequencing Plans. Work shall consist of the following:
    a. Site Preparation & Excavation
    b. Sitework/Grading for Park Access Drive
    c. Stormwater Drainage
    d. Force Main Sewer
    e. Electrical Service
    f. Site Lighting
    g. Paving of park entrance drive
    h. Signage & Pavement Markings
    i. Shared-Use-Pathway
    j. Plantings
2. Work in the delineated LWCF Area must be completed by February 28, 2025.

3. As-Built Documentation of the improvements constructed within park entrance drive as defined per the delineated LWCF Area shall be provided to the Engineer by March 15, 2025.

C. Parkland Acquisitions and Renovations for Communities (PARC) Grant: For the construction of specific park improvements. Area limits are shown on the Construction Sequencing Plans.

1. The Bidder shall make note the grant applies to the nature-based play area as well as adjacent perimeter improvements consisting of the following:

   a. Earthwork and Landscape Boulders

   b. Stabilized Aggregate Walkways

   c. Picnic Tables & Benches

   d. Nature-Based Play Equipment

   e. Porous Pavement Parking areas inclusive of the Reservoir Course

   f. Site lighting adjacent to the parking lot.

   g. Tree Plantings (Project Wide)

   h. This work shall be completed by April 30, 2025, for inclusion in May 2025 Contractor's Application for Payment. Third party compliance inspection of the completed work will occur prior to June 2, 2025.

D. Massachusetts Seaport Economic Council Grant For the construction of general park improvements. Completion of park elements aligned with the grant value shall occur by June 30, 2025.

E. Contract Substantial Completion shall be reached on or before July 12, 2025.

1.7 PROJECT SCHEDULE

A. Contract Final Completion shall be on-or-before August 9, 2025. Duration shall be four-hundred and thirty-four (434) calendar days commencing ten (10) calendar days from the date of Notice to Proceed. Liquidated damages for each calendar day of delay shall be Five-Hundred Dollars and Zero Cents ($500.00) as stipulated in the Contract Documents.

1.8 PRE-BID MEETING

A. A non-mandatory pre-bid meeting will be held on **Thursday April 11,2024** at 11:00 am at the Yarmouth Department of Public Works located at 74 Town Brook Road, West Yarmouth, MA 02673. A walk at the Project Site will follow. All interested Contractors are urged to attend. Transportation to the site will not be provided.

1.9 ELIGIBILITY

A. This project is a site work project. Bidder qualifications to perform the required work shall be furnished.

1.10 BID SECURITY REQUIREMENTS

A. Each General bid shall be accompanied by a Bid Security in the form of a certified, treasurer's or cashier's check, bid bond or cash in the amount of five percent (5%) of the value of the Bid.

B. Every bid bond, every performance bond and every payment bond issued for any construction work in the Commonwealth of Massachusetts shall be the bond of a surety company organized pursuant to section 105 of chapter 175 or of a surety company authorized to do business in the Commonwealth under the provisions of section 106 of said chapter 175 and be approved by the U.S. Department of Treasury and are acceptable as sureties and reinsurers on federal bonds under Title 31 of the United States Code, sections 9304 to 9308.

C. To be considered a responsive Bidder, the Contractor shall have obtained at least one set of Bidding Documents from the Owner or Engineer. The Bid will not be awarded unless a record of obtaining at least one set of Bidding Documents exists.

1.11 CONTRACT DOCUMENTS

A. Bid Documents shall be available after 1:00 PM on **Friday April 5, 2024.**

B. Bid Documents may be obtained on-line at the Town's website below.

https://www.yarmouth.ma.us/bids.aspx

C. The Contract Documents may be examined at the Yarmouth Department of Public Works located at 74 Town Brook Road, West Yarmouth, MA 02673.

1.12 BONDING REQUIREMENTS

A. Successful bidder must furnish 100 percent (100%) Construction Performance Bond, and 100 percent Construction Payment Bond with a surety company determined to be acceptable to the Owner.

1.13 WAGE RATES

A. Minimum wage rates as determined by the Department of Workforce Development under the provisions of Massachusetts General Law (M.G.L.) Chapter 149, Section 26-27H.

B. It is the responsibility of the Contractor, before bid opening to request, if necessary, any additional information on Prevailing Wage Rates for those trades people who may be employed for the proposed work under this contract. Federal Minimum Wage Rates as determined by the United States Department of Labor under the Davis-Bacon Act also apply to this project.

C. Federal Minimum Wage Rates as determined by the United States Department of Labor under the Davis-Bacon Act also apply to this project.

1.14 DISADVANTAGED BUSINESS ENTERPRISE (MBE/WBE) GOALS

A. Bidders shall demonstrate compliance with the Code of Federal Regulations (CRF) regarding 2 CFR Part 200, Section 200.321, concerning non-federal entity contracting with small and minority businesses (MBE) and women's business enterprises (WBE) and labor surplus area firms.

B. The Bidder shall demonstrate affirmative steps as outlined in 2 CFR Part 200, Section 200.321 and shall provide evidence of affirmative steps for MBE/WBE inclusion which shall include:

1. Solicitation of qualified small and minority businesses and women's business enterprises.
2. Demonstration that small and minority businesses, and women's business enterprises were solicited whenever they are potential sources.
3. Demonstration of that when economically feasible, the project was structured with divisions into smaller tasks or quantities to permit maximum participation by small and minority businesses, and women's business enterprises.
4. Demonstration that delivery schedules, where the project requirement permits, encourage participation by small and minority businesses, and women's business enterprises.
5. Demonstration of use of the services and assistance, as appropriate, of such organizations as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce.

1.15 CONTRACT PROVISIONS UNDER FEDERAL AWARDS

A. Bidders shall adhere to the contract provisions required under 2 CFR Part 200 Appendix II to Part 200 – Contract Provisions for Non-Federal Entity Contracts Under Federal Awards.

1.16 CERTIFIED PAYROLL

A. A weekly submittal of the certified payroll is required of the successful Bidder in accordance with M.G.L. Chapter 149, Section 27B. No payments will be made by the Town until all payroll information necessary for Owner to determine compliance with prevailing wage requirements for the time of the payment request has been submitted. The successful Bidder shall not discriminate with regard to personnel employed this project based on race, color, creed national origin, gender, sexual preference, handicap or age.

1.17 TAXES

A. Materials and supplies used or incorporated in the performance of this contract for improvements to property owned by the Town of Yarmouth are exempt from sales tax.

1.18 WITHDRAWLS

A. No Bidder may withdraw his Bid for a period of sixty (60) days, excluding Saturdays, Sundays, and legal holidays, after the actual date of the opening of the Bids.

1.19 AWARD

A. Bidding & Award: The bidding and award of the Contract shall be in full compliance with the most current version of Massachusetts General Law Chapter 30, Section 39B of the Massachusetts General Laws to the extent applicable.

B. The Owner reserves the right to reject any or all General Bids if shown to be in the public's best interest to do so.

C. The Owner reserves the right to waive any informalities in bids and reject any or all bids or waive any informalities that appear to the in the best interest of the Owner.

END OF SECTION

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INSTRUCTIONS FOR BIDDERS FOR CONSTRUCTION CONTRACT

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INSTRUCTIONS TO BIDDERS FOR CONSTRUCTION CONTRACT

ARTICLE 1—DEFINED TERMS

1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:

A. Issuing Office—The office from which the Bidding Documents are to be issued, and which registers plan holders.

ARTICLE 2—BIDDING DOCUMENTS

2.01 Bidding Documents are made available for the sole purpose of obtaining Bids for completion of the Project and permission to download or distribution of the Bidding Documents does not confer a license or grant permission or authorization for any other use. Authorization to download documents, or other distribution, includes the right for plan holders to print documents solely for their use, and the use of their prospective Subcontractors and Suppliers, provided the plan holder pays all costs associated with printing or reproduction. Printed documents may not be re-sold under any circumstances.

2.02 Owner has established a procurement website as indicated in the Advertisement or invitation to bid. Owner recommends that Bidder register as a plan holder with the Issuing Office at such website and obtain a complete set of the Bidding Documents from such website. Bidding Documents obtained from the procurement website may be considered to be complete unless an omission is blatant. Registered plan holders will receive Addenda issued by Owner.

2.03 Bidders must register as a plan holder and obtain complete sets of Bidding Documents, in the number and format stated in the Advertisement or invitation to bid, from the Issuing Office. Bidding Documents obtained from the Issuing Office may be considered to be complete unless an omission is blatant. Registered plan holders will receive Addenda issued by Owner.

2.04 3Rd Party Plan rooms (including construction information subscription services, and electronic and virtual plan rooms) may distribute the Bidding Documents or make them available for examination. Those prospective bidders that obtain a copy of the Bidding Documents from a plan room are encouraged to register as plan holders from the procurement website or Issuing Office. Owner is not responsible for omissions in Bidding Documents or other documents obtained from plan rooms, or for a Bidder's failure to obtain Addenda from a plan room.

2.05 Electronic Documents

A. When the Bidding Requirements indicate that electronic copies of the Bidding Documents are available, such documents will be made available to the Bidders as Electronic Documents in the manner specified.

1. Bidding Documents will be provided in Adobe PDF (Portable Document Format) (.pdf). It is the intent that such Electronic Documents are to be exactly representative of the paper copies of the documents. However, because the Owner, Construction Manager

and Engineer cannot totally control the transmission and receipt of Electronic Documents nor the Contractor's means of reproduction of such documents, the Owner, Construction Manager and Engineer cannot and do not guarantee that Electronic Documents and reproductions prepared from those versions are identical in every manner to the paper copies.

B. Unless otherwise stated in the Bidding Documents, the Bidder may use and rely upon complete sets of Electronic Documents of the Bidding Documents, described in Paragraph 2.06.A above. However, Bidder assumes all risks associated with differences arising from transmission/receipt of electronic versions of Bidding Documents and reproductions prepared from those versions and, further, assumes all risks, costs, and responsibility associated with use of the Electronic Documents versions to derive information that is not explicitly contained in printed versions of the documents, and for Bidder's reliance upon such derived information.

C. After the Contract is awarded, the Owner may provide or direct the Construction Manager to provide, for the use of the Contractor, documents that were developed by Construction Manager and Engineer as part of the Project design process, as Electronic Documents in native file formats.

1. Electronic Documents that are available in native file format include:

a. Site Survey prepared by Alpha Group, Surveyors

b. Riverwalk Park, Boardwalk Loop and Event Space Site Layout & Grading Plans prepared by BETA Group Inc.

2. Release of such documents will be solely for the convenience of the Contractor. No such document is a Contract Document.

3. Unless the Contract Documents explicitly identify that such information will be available to the Successful Bidder (Contractor), nothing herein will create an obligation on the part of the Owner, Construction Manager, or Engineer to provide or create such information, and the Contractor is not entitled to rely on the availability of such information in the preparation of its Bid or pricing of the Work. In all cases, the Contractor shall take appropriate measures to verify that any electronic information provided in Electronic Documents is appropriate and adequate for the Contractor's specific purposes.

4. In no case will the Contractor be entitled to additional compensation or time for completion due to any differences between the actual Contract Documents and any related document in native file format.

ARTICLE 3—QUALIFICATIONS OF BIDDERS

3.01 Bidder must submit the following information with its Bid to demonstrate Bidder's qualifications to perform the Work:

A. Written evidence establishing Bidder firm, qualifications, financial data, previous experience, and present commitments.

B. A written statement that Bidder is authorized to do business in the state where the Project is located, or a written certification that Bidder will obtain such authority prior to the Effective Date of the Contract.

C. Bidder's state or other contractor license number, if applicable.

D. Subcontractor and Supplier qualification information.

E. Other required information regarding qualifications.

3.02 A Bidder's failure to submit required qualification information as described herein and the Bidder Qualification statement per Section 00 45 13 within the times indicated may disqualify Bidder from receiving an award of the Contract.

3.03 No requirement in this Article 3 to submit information will prejudice the right of Owner to seek additional pertinent information regarding Bidder's qualifications.

ARTICLE 4—PRE-BID CONFERENCE

4.01 A non-mandatory pre-bid conference will be held at the time and location indicated in the Advertisement or Invitation to Bid. Representatives from the Owner, Construction Manager and Engineer will be present to discuss the Project. Bidders are encouraged to attend and participate in the conference; however, attendance at this conference is not required to submit a Bid.

4.02 Information presented at the pre-Bid conference does not alter the Contract Documents. Owner will issue Addenda to make any changes to the Contract Documents that result from discussions at the pre-Bid conference. Information presented, and statements made at the pre-bid conference will not be binding or legally effective unless incorporated in an Addendum.

ARTICLE 5—SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER'S SAFETY PROGRAM; OTHER WORK AT THE SITE

5.01 Site and Other Areas

A. The Project will occur on the former Drive-In-Site property owned by the Town of Yarmouth, with limited work in the Rte. 28 Mass DOT Right of Way. Further information is provided in the Bidding Documents.

B. Work within the Rte. 28 ROW includes communications utility work, curb-cut, and park access driveway and sidewalk improvements. Eversource will construct improvements to bring power across Rte. 28 and into the site. Any additional lands required for temporary construction facilities, construction equipment, or storage of materials and equipment, and any access needed for such additional lands, shall be obtained, and paid for by Contractor.

5.02 Existing Site Conditions

A. Subsurface and Physical Conditions

1. A Geotechnical Report has been prepared and is included in the Attachments. The Geotechnical Report is a Contract Document.

a. The report depicts site explorations in the form of geo-probes, test pits and borings, with corresponding findings and technical data that form the basis of design.

2. As set forth in the Geotechnical Report, the document describes certain subsurface conditions that are anticipated to be encountered by Contractor during construction in specified locations

    a. The Baseline Conditions in the report are intended to reduce uncertainty and the degree of contingency in submitted Bids. However, Bidders cannot rely solely on the Geotechnical Report and the conditions described therein. Bids should be based on a comprehensive approach that includes an independent review and analysis of the Geotechnical Report all other Contract Documents, Technical Data, other available information, and observable surface conditions. Not all potential subsurface conditions are identified.

    b. Nothing in the Geotechnical Report is intended to relieve Bidders of the responsibility to make their own determinations regarding construction costs, bidding strategies, and Bid prices, nor of the responsibility to select and be responsible for the means, methods, techniques, sequences, and procedures of construction, and for safety precautions and programs incident thereto.

B. Underground Facilities—Any information regarding Underground Facilities is shown or indicated on the Drawings, pursuant to Paragraph 5.05 of the General Conditions, and not in the drawings referred to in Paragraph 5.02.A of these Instructions to Bidders. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

5.03 Other Site-related Documents

A. The Successful Bidder is required to conform to the Project Permit documents and the requirements of each as stated therein. The following permits have been obtained by the Owner and are included in Attachment E.

- MEPA Certifícate EEA No. 16623, June 10, 2023
- Town of Yarmouth Conservation Commission Order of Conditions:
    - DEP File No.083-2372 December 1, 2022, No. 083-237. February 3,2023.
    - DEP File No.083-2773 December 1, 2023, No. 083-237. February 3, 2023.
- Town of Yarmouth Stormwater Permit No. SW2023-001. February 2023
- Town of Yarmouth Planning Board Petition No. VCOD 2023-1. February 6, 2023.
- Town of Yarmouth Zoning Board of Appeals Petition No 5003. March 10, 2023.
- Town of Yarmouth Health Inspector Disposal System approval. June 6, 2023.
- Cape Cod Commission Development of Regional Impact # 22031. Nov. 14, 2023.
- Massachusetts DEP Water Quality Certificate No. WW10-0000042. Nov.11,2023.
- Massachusetts DEP Chapter 91 License WW01-0000271. Dec. 15,2023.
- Massachusetts DOT State Highway Access Permit # 5-2023-0263. February 27,2024.

5.04 Site Visit and Testing by Bidders

A. It is suggested the Bidder visit the Site and conduct a thorough visual examination of the Site and adjacent areas. During any visitation the Bidder must not disturb any ongoing Owner operations at the Site.

B. A Site visit is scheduled following the pre-bid conference.

C. Bidders visiting the Site after the pre-bid conference are required to arrange their own transportation to the Site.

D. All access to the Site other than during a regularly scheduled Site visit shall be coordinated through the following Owner contact for visiting the Site: Amanda Lima PE, email alima@yarmouth.ma.us. Bidder shall conduct any Site visit during normal working hours.

E. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.

5.05 Owner's Safety Program

A. Site visits and work at the Site may be governed by an Owner safety program. If an Owner safety program exists, it will be noted in the Supplementary Conditions.

5.06 Other Work at the Site

A. Reference is made to Article 8 of the Supplementary Conditions for the identification of the general nature of other work performed at the site of which Owner is aware (if any) that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) and relates to the Work contemplated by these Bidding Documents. If Owner is party to a written contract for such other work, then on request, Owner will provide to each Bidder access to examine such contracts (other than portions thereof related to price and other confidential matters), if any.

ARTICLE 6—BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.01 Express Representations and Certifications in Bid Form, Agreement

A. The Bid Form that each Bidder will submit contains express representations regarding the Bidder's examination of Project documentation, Site visit, and preparation of the Bid, and certifications regarding lack of collusion or fraud in connection with the Bid. Bidder should review these representations and certifications and assure that Bidder can make the representations and certifications in good faith, before executing and submitting its Bid.

B. If Bidder is awarded the Contract, Bidder (as Contractor) will make similar express representations and certifications when it executes the Agreement.

ARTICLE 7—INTERPRETATIONS AND ADDENDA

7.01 The Owner on its own initiative may issue Addenda to clarify, correct, supplement, or change the Bidding Documents.

7.02 Bidder shall submit all questions about the meaning or intent of the Bidding Documents to the Owner in writing. Contact information and submittal procedures for such questions are as follows:

A. **Email addressed to: SSalemme@yarmouth.ma.us**

B. **Email Subject Line shall read: Riverwalk Park, Boardwalk Loop & Event Space-Phase 1-Bidder Question**

7.03 Interpretations or clarifications considered necessary by the Owner or Engineer in response to such questions will be issued by Addenda delivered to all registered plan holders. Questions received less than 7 days prior to the date for opening of Bids may not be answered.

7.04 Only responses set forth in an Addendum will be binding. Oral and other interpretations or clarifications will be without legal effect. Responses to questions are not part of the Contract Documents unless set forth in an Addendum that expressly modifies or supplements the Contract Documents.

ARTICLE 8—BID SECURITY

8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of five (**5%)** percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a Bid bond issued by a surety meeting the requirements of Paragraph 6.01 of the General Conditions. Such Bid bond will be issued in the form included in the Bidding Documents.

8.02 The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract, furnished the required Contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract and furnish the required Contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited, in whole in the case of a penal sum bid bond, and to the extent of Owner's damages in the case of a damages-form bond. Such forfeiture will be Owner's exclusive remedy if Bidder defaults.

8.03 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of 7 days after the Effective Date of the Contract or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.

8.04 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within 7 days after the Bid opening.

ARTICLE 9—CONTRACT TIMES

9.01 The number of days within which, or the dates by which, the Work is to be (a) substantially completed and (b) ready for final payment, and (c) Milestones (if any) are to be achieved, are set forth in the Agreement.

9.02 Bidder must comply with Time-of-Year Restrictions set forth for work within specific areas.

9.03 Bidder must comply with the Time for Completion as set forth in the Information for Bidders and Article 4 of the Bid Form. It will be necessary for the apparent Successful Bidder to satisfy Owner that it will be able to achieve Substantial Completion within the time such Bidder has designated in the Bid. The Bidder must also set forth in the Bid commitments regarding the achievement of Milestones and readiness for final payment**.** The Successful Bidder's time commitments will be entered into the Agreement or incorporated in the Agreement by reference to the specific terms of the Bid.

9.04 Provisions for Liquidated Damages, if any, for failure to timely attain a Milestone, Substantial Completion, or Final Completion of the Work in readiness for final payment, are set forth in the Agreement.

ARTICLE 10—SUBSTITUTE AND "OR EQUAL" ITEMS

10.01 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration during the bidding and Contract award process of possible substitute or "or-equal" items. In cases in which the Contract allows the Contractor to request that Construction Manager authorize the use of a substitute or "or-equal" item of material or equipment, application for such acceptance may not be made to and will not be considered by Construction Manager until after the Effective Date of the Contract.

10.02 All prices that Bidder sets forth in its Bid will be based on the presumption that the Contractor will furnish the materials and equipment specified or described in the Bidding Documents, as supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of "or-equal" or substitution requests are made at Bidder's sole risk.

ARTICLE 11—SUBCONTRACTORS, SUPPLIERS, AND OTHERS

11.01 A Bidder must be prepared to retain specific Subcontractors and Suppliers for the performance of the Work if required to do so by the Bidding Documents or in the Specifications. If a prospective Bidder objects to retaining any such Subcontractor or Supplier and the concern is not relieved by an Addendum, then the prospective Bidder should refrain from submitting a Bid.

11.02 The apparent Successful Bidder, and any other Bidder so requested, must submit to Owner a list of the Subcontractors and/or Suppliers proposed for the following portions of the Work within five (5) days after Bid opening:

a. Electrical Work

b. Helical Anchor System

c. Elevated Boardwalk Carpentry

d. Play Equipment

e. PIP Surfacing

f. Landscape Plantings

g. Invasive Plant Management

h. Kayak Launch Facility: Piles, gangways, moorings, and float system.

11.03 If requested by Owner, such list must be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor or Supplier. If Owner, Construction Manager, or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor or Supplier, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder will submit a substitute, Bidder's Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.

11.04 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors and Suppliers. Declining to make requested substitutions will constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor or Supplier, so listed and against which Owner, Construction Manager, or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner, Construction Manager, and Engineer subject to subsequent revocation of such acceptance as provided in Paragraph 7.07 of the General Conditions.

ARTICLE 12—PREPARATION OF BID

12.01 —The Bid Form is included with the Bidding Documents.

A. All blanks on the Bid Form must be completed, and the Bid Form must be duly signed. Erasures or alterations must be initialed in ink by the person signing the Bid Form. A Bid price must be indicated for each section, Bid Item, Alternate, and Unit Price Item listed therein.

B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words "No Bid" or "Not Applicable."

12.02 If Bidder has obtained the Bidding Documents as Electronic Documents, then Bidder shall submit its Bid on a paper copy of the Bid Form printed from the Electronic Document version of the Bidding Documents. The printed copy of the Bid Form must be clearly legible.

12.03 A Bid by a corporation must be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation must be shown.

12.04 A Bid by a partnership must be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership must be shown.

12.05 A Bid by a limited liability company must be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm must be shown.

12.06 A Bid by an individual must show the Bidder's name and official address.

12.07 A Bid by a joint venture must be executed by an authorized representative of each joint ventures in the manner indicated on the Bid Form. The joint venture must have been formally established prior to submittal of a Bid, and the official address of the joint venture must be shown.

12.08 All names must be printed in ink below the signatures.

12.09 The Bid must contain an acknowledgment of receipt of all Addenda, the numbers of which must be filled in on the Bid Form.

12.10 Postal and e-mail addresses and telephone number for communications regarding the Bid must be shown.

12.11 The Bid must contain evidence of Bidder's authority to do business in the state where the Project is located, or Bidder must certify in writing that it will obtain such authority within the time for acceptance of Bids and attach such certification to the Bid.

ARTICLE 13—BASIS OF BID

13.01 Base Bid with Alternates

A. Bidders must submit a Bid for the Base Bid and include a separate price for each Alternate described in the Bidding Documents and as provided for in the Bid Form. The price for each Alternate will be the amount added to the base Bid if Owner selects the Alternate.

B. In the comparison of Bids, Alternates will be applied in the same order of priority as listed in the Bid Form.

C. Bidders must submit a Bid as set forth in the Bid Form.

1. The Bid Form includes both Unit Price and Lump Sum Items.

a. Unit Prices

1) Bidders must submit a Bid on a unit price basis for each item of Work listed in the unit price section of the Bid Form. The "Bid Price" (sometimes referred to as the extended price) for each unit price Bid item will be the product of the "Estimated Quantity", which Owner or its representative has set forth in the Bid Form, for the item and the corresponding "Bid Unit Price" offered by the Bidder. The total of all unit price Bid items will be the sum of these "Bid Prices"; such total will be used by Owner for Bid comparison purposes. The final quantities and Contract Price will be determined in accordance with Paragraph 13.03 of the General Conditions.

2) Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

b. Lump Sum Prices

1) Bidders must submit Lump Sum prices as indicated. Lump Sum item pricing shall be inclusive of furnishing and installing the work as well as any and all incidentals per Section 01 10 10 Price and Payment.

c. Additive Alternate

1) Bidders must provide a Lump Sum price for the Additive Alternates indicated.

ARTICLE 14—SUBMITTAL OF BID

14.01 The Bidding Documents contain the Bid Form, and, if required, the Bid Bond Form. An unbound copy of the Bid Form is to be completed and submitted with the Bid Bond Form (Bid Security) and the other documents required to be submitted under the terms of Article 2 of the Bid Form.

14.02 A Bid must be received no later than the date and time prescribed and at the place indicated in the Advertisement or invitation to bid and must be enclosed in a plainly marked package with the Project title, and, if applicable, the designated portion of the Project for which the Bid is submitted, the name and address of Bidder, and must be accompanied by the Bid security (Bid Bond) and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid must be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED." A mailed Bid must be addressed to the location designated in the Advertisement.

14.03 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

ARTICLE 15—MODIFICATION AND WITHDRAWAL OF BID

15.01 Upon proper, written notification, an unopened Bid may be withdrawn prior to the designated time of the opening of the Bids. The Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.

15.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 15.01 and submit a new Bid prior to the date and time for the opening of Bids.

15.03 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, the Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, the Bidder will be disqualified from further bidding on the Work.

ARTICLE 16—OPENING OF BIDS

16.01 Bids will be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

ARTICLE 17—REDUCTION IN SCOPE OF WORK

17.01 The Owner reserves the right to decrease the scope of the work to be done under this Contract and to omit any work in order to bring the cost within available funds. To this end, the Owner reserves the right to reduce the quantity of any items or omit all of any as set forth in the BID, either prior to executing the Contract or at any time during the progress of the Work. The Owner further reserves the right, at any time during the progress of the Work, to restore all or part of any items previously omitted or reduced. Exercise by the Owner of the above rights shall not constitute any ground or basis of claim for damages or for anticipated profits on the work omitted.

ARTICLE 18—BIDS TO REMAIN SUBJECT TO ACCEPTANCE

18.01 —All Bids will remain subject to acceptance for the period of time stated in the Invitation to Bid, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 19—EVALUATION OF BIDS AND AWARD OF CONTRACT

19.01 —Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner also reserves the right to waive all minor Bid informalities not involving price, time, or changes in the Work.

19.02 Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible.

19.03 If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, whether in the Bid itself or in a separate communication to Owner or Construction Manager, then Owner will reject the Bid as nonresponsive.

19.04 If Owner awards the contract for the Work, such award will be to the responsible Bidder submitting the lowest responsive Bid.

19.05 Evaluation of Bids

A. In evaluating Bids, Owner will consider whether the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.

B. For the determination of the apparent low Bidder when unit price bids are submitted, Bids will be compared on the basis of the total of the products of the estimated quantity of each item and unit price Bid for that item, together with any lump sum items comprising a total Lump Sum Bid.

C. In the comparison of Bids, any Alternates will be applied in the same order of priority as listed in the Bid Form. To determine the Bid prices for purposes of comparison, Owner may elect to announce to all bidders a "Base Bid plus Alternates" after receiving all Bids. For comparison purposes Alternates will be accepted, following the order of priority established

in the Bid Form, until doing so would cause the budget to be exceeded. After determination of the Successful Bidder based on this comparative process and on the responsiveness, responsibility, and other factors set forth in these Instructions, the award may be made to said Successful Bidder on its base Bid and any combination of its additive alternate Bids for which Owner determines funds will be available at the time of award.

19.06 In evaluating whether a Bidder is responsible, Owner will consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.

19.07 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers.

ARTICLE 20—BONDS AND INSURANCE

20.01 Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds, other required bonds (if any), and insurance. When the Successful Bidder delivers the executed Agreement to Owner, it must be accompanied by required bonds and insurance documentation.

20.02 Article 8, Bid Security, of these Instructions, addresses any requirements for providing bid bonds as part of the bidding process.

ARTICLE 21—SIGNING OF AGREEMENT

21.01 When Owner issues a Notice of Award to the Successful Bidder, it will be accompanied by the unexecuted counterparts of the Owner-Contractor Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder must execute and deliver the required number of counterparts of the Agreement and any bonds and insurance documentation required to be delivered by the Contract Documents to Owner. Within 10 days thereafter, Owner will deliver one fully executed counterpart of the Agreement to Successful Bidder, together with printed or electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.

ARTICLE 22—SALES AND USE TAXES

22.01 —Owner is exempt from Massachusetts state sales and use taxes on materials and equipment to be incorporated in the Work. The exemption certificate will be furnished to the Successful Bidder. Said taxes must not be included in the Bid and each bidder shall take this exemption into account when calculating the bid for the work. Refer to Paragraph SC-7.10a of the Supplementary Conditions for additional information.

ARTICLE 23—WAGE RATES

23.01 Federal Wage Rates Apply per Davis Bacon Act

23.02 Massachusetts Wage Rates as established pursuant to the provisions of M.G.L. Chapter 149 Sections 26-27H apply to this project. The Massachusetts Wage Determination is furnished in these specifications. It is the responsibility of the Contractor, before bid opening, to request, if necessary, any clarification or additional information on Massachusetts Wage Rates for any tradespeople who are not covered by the applicable Massachusetts Wage Decision, but who may be employed for the proposed work under this contract.

ARTICLE 24 - APLICABLE PROVISONS OF STATE LAWS AND FEDERAL REGULATIONS

24.01 Applicable revisions of Massachusetts General Laws and Regulations and /or the United States Code and Code of Federal Regulations govern this Contract and any provision in violation of the foregoing shall be deemed null and void and of no effect. Where conflict exists between the Code of Federal Regulations and State Laws and Regulations exist, the more stringent requirements apply.

24.02 Contractors and Subcontractors, by submitting a bid, certify that they do not unlawfully misclassify workers as self-employed or as independent contractors, and will certify compliance with applicable state and federal employment laws and regulations, including but not limited to minimum wages, unemployment insurance, workers' compensation, child labor, and the Massachusetts Health Care Reform Law, Chapter 58 of the Acts of 2006, as amended.

24.03 Contractors and Subcontractors, by submitting a bid, certify that within the past five years, no officers, directors, employees, agents, or subcontractors of which the contractor has knowledge, been the subject of (a) an indictment, judgment, conviction, or grant of immunity, including pending actions, for any business-related conduct constituting a crime under state or federal law; or (b) a government suspension or debarment, rejection of any bid or disapproval of any proposed contract subcontract, including pending actions, for lack of responsibility, denial or revocation of prequalification or a voluntary exclusion agreement; or any governmental determination of a violation of any public works law or regulation, or labor law or regulation or any OSHA violation deemed "serious or willful."

24.04 In accordance with Executive Order 481 and under the pains and penalties of perjury, Contractors and Subcontractors, by submitting a bid, certify that they shall not knowingly allow the use of undocumented workers in connection with the performance of the contract; that pursuant to federal requirements, the Contractors and Subcontractors shall verify the immigration status of all workers assigned to the contract without engaging in unlawful discrimination; and that the it shall not knowingly or recklessly alter, falsify, or accept altered or falsified documents from any such worker(s).

ARTICLE 25 COMPETITIVE BIDDING

25.01 The Bidding and Award of the Contract and Sub-Contracts shall be in full compliance with Section 39M of Chapter 30 and Chapters 30B of the Massachusetts General Laws, to the extent applicable. Bids from General Contractors shall be for the complete project as specified. Qualifications shall carry the names of Subcontractors as indicated.

Each General Bid shall be divided into two parts.

a. Part I - The work of the General Contractor being all work for the Base-Bid Project.

b. Part II – The work of the General Contractor to perform the work described in the Add Alternates.

ARTICLE 26 CONTRACTORS GUARANTEE

26.01 The Contractor guarantees the work under this contract and the materials furnished by him for use in connection therewith to be free from defects or flaws for one (1) year after the completion of the contract, and guarantees for a term of one (1) year from the date of substantial completion of the work to maintain the stability of all materials, equipment or workmanship, except that due to normal wear and tear, at his/her own expense when notified in writing to do so by the Engineer and such work shall be performed to the satisfaction of the Engineer. Paving shall be guaranteed for one year. If at any time within said guarantee period, any part of the work constructed under the terms of this contract shall in the opinion of the Engineer require repair or replacement due to defective work or materials furnished by the Contractor and any related work required to make said repair or replacement, he/she may notify the Contractor in writing to make the required work and repairs (including all labor and materials) at no additional costs to the Owner. The Contractor shall perform the same within 10 days. If he/she shall not do so, the Owner may have the work performed by others and charge the Contractor.

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

32.03 The Contractor shall not participate in or cooperate with an international boycott, as defined in Section 999 (b) (3) and (4) of the Internal Revenue code of 1954, as amended, or engage in conduct declared to be unlawful by Section 2 of Chapter 151E of the Massachusetts General laws.

ARTICLE 27. THIRD PARTY WORK

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

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

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

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

C. In the case of inadequately secured worksites necessitating extra or increased police details or other public safety personnel, the following procedures will be followed.

The Contractor (if available) will be notified that the worksite needs to be secured in order to prevent the need for weekend/night police coverage. If the area is not immediately secured and made reasonably safe as determined by the Owner or Engineer, Police, Fire, or Department of Public Works, a Work Detail shall be used, and the Contractor will be charged for the costs incurred. It is understood that in some instances worksites cannot be secured to a point where police or other public safety personnel are not needed. In these instances, the Owner will continue to pay for the coverage if determined necessary.

END OF SECTION

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BID BOND

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

BIDDER *(Name and Address)*:

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

OWNER:

Town of Yarmouth, MA

BID

Bid Due Date: _____

Description:

Riverwalk Park, Boardwalk Loop & Event Space-Phase 1

BOND

Bond Number:

Date *(Not earlier than Bid due date)*:

Penal sum _____(Words) $_____(Figures)

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

BIDDER	**SURETY**
_____	_____
Bidder's Name and Corporate Seal	Surety's Name and Corporate Seal
By: _____	By: _____
Signature	Signature (Attach Power of Attorney)
Print Name _____	Print Name _____
Title _____	Title _____
Attest: _____	Attest: _____
Signature	Signature
Title_____	Title _____

Note: Above addresses are to be used for giving any required notice. Provide execution by any additional parties, such as joint venturers, if necessary

y.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond shall be Owner's sole and exclusive remedy upon default of Bidder.

2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.

3. This obligation shall be null and void if:

3.1 Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or

3.2 All Bids are rejected by Owner, or

3.3 Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).

4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.

5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.

6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after Bid due date.

7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.

8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.

9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.

10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.

11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

SECTION 00 41 10

BID FORM FOR CONSTRUCTION CONTRACT

The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 1—OWNER AND BIDDER

1.01 This Bid is submitted to: **Yarmouth Department of Public Works, 74 Town Brook Road, West Yarmouth, MA 02673**.

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2—ATTACHMENTS TO THIS BID

2.01 The following documents shall be submitted with and made a condition of this Bid:

A. This document, the **Bid Form for Construction Contract**, complete, including:

1. Executed Bidder Certification & Executed Combined Certificate of Compliance

B. Required Bid Security.

C. List of Proposed Subcontractors and qualifications

D. List of Proposed Suppliers and qualifications.

E. Contractors License number as evidence of Bidder's State Contractor's License or a covenant by the Bidder to obtain said license within the time frame for acceptance of the Bids.

F. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such authority within the time frame for acceptance of the Bids.

G. Bidder Qualification Statement with supporting data per Specification Section 00 45 13.

H. Byrd Anti-Lobbying Amendment Certification.

ARTICLE 3—BASIS OF BID—LUMP SUM BID AND UNIT PRICES

3.01 The Project includes both Unit Price and Lump Sum items.

A. Bidder acknowledges that:

Each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item, and Estimated quantities are not guaranteed and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Work will be based on actual quantities, determined as provided in the Contract Documents.

3.02 Unit Price Bid Items

A. The Bidder will perform the Work listed on the following pages at the indicated Unit Prices.

B. For all Unit Price Work, the Bidder shall list the amount equal to the sum of the extended prices (established for each separately identified item of Unit Price Work by multiplying the Unit Price times the actual quantity of that item) and Bidder shall enter all pricing information and complete all open line items in this document.

3.03 RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE -PHASE-1 BID FORM – PART I

Bid Item	Item Description	QTY	UNIT	UNIT PRICE	EXTENDED PRICE
1	PROJECT MOBILIZATION AND DEMOBILIZATION	1	LS	$	$
2	SITE PREPARATION, EROSION AND SEDIMENT CONTROLS	1	LS	$	$
3	INVASIVE PLANT MANAGEMENT PLAN	1	LS	$	$
4	EARTHWORK	1	LS	$	$
5	IMPORTED ORDINARY FILL	10000	CY	$	$
6	GRAVEL BORROW	3400	CY		
7	CRUSHED STONE - ALL TYPES	4160	TON	$	$
8	GEOTEXTILE FABRIC FOR SUBSURFACE DRAINAGE	3100	SY	$	$
9	STONE FOR PIPE ENDS & CHECK DAMS	30	SY	$	$
10	AREA DRAIN - TYPE I & II	3	EA	$	$
11	CURB INLET, FRAME AND GRATE	3	EA	$	$
12	SANITARY SEWER MANHOLE	2	EA	$	$
13	2 INCH DIA. HDPE FORCE MAIN SEWER PIPE	625	LF	$	$
14	4 INCH DIA. SOLID & PERFORATED HDPE DRAIN PIPE	1240	LF	$	$
15	6 INCH DIA. SOLID HDPE DRAIN PIPE	65	LF	$	$

Bid Item	Item Description	QTY	UNIT	UNIT PRICE	EXTENDED PRICE
16	12 INCH DIA. SOLID HDPE DRAIN PIPE	370	LF	$	$
17	TIDE GATE FOR HDPE DRAIN PIPE	2	EA	$	$
18	HDPE FLARED END	8	EA	$	$
19	8" DIA. DUCTILE IRON PIPE - SHALLOW DRAIN	140	LF	$	$
20	SANITARY SEWER TIGHT TANK & VALVE PIT	1	LS	$	$
21	DRAINAGE OUTLET CONTROL STRUCTURE	2	EA	$	$
22	STORM WATER INFILTRATION SYSTEM NO.1	1	LS	$	$
23	STORM WATER INFILTRATION SYSTEM NO. 2	1	LS	$	$
24	2 INCH WATER SUPPLY LINE	160	LF	$	$
25	3/4 INCH HDPE WATER LINE	1560	LF	$	$
26	2 INCH HDPE WATER LINE	15	LF	$	$
27	6 INCH DUCTILE IRON WATER PIPE	20	LF	$	$
28	8 INCH DUCTILE IRON WATER PIPE	555	LF	$	$
29	6 INCH GATE VALVE & BOX	2	EA	$	$
30	8 INCH GATE VALVE & BOX	1	EA	$	$
31	WATER VALVE BOX ASSEMBLY	1	EA	$	$
32	YARD HYDRANT	5	EA	$	$
33	FLUSH MOUNT YARD HYDRANT	9	EA	$	$

Bid Item	Item Description	QTY	UNIT	UNIT PRICE	EXTENDED PRICE
34	FIRE HYDRANT	2	EA	$	$
35	HMA/SUPERPAVE SURFACE COURSE	670	TON	$	$
36	HMA/SUPERPAVE INTERMEDIATE COURSE	1110	TON	$	$
37	HOT MIX ASPHALT PAVEMENT - POROUS PAVEMENT	470	TON	$	$
38	HOT MIX ASPHALT BERM	645	LF	$	$
39	GRANITE CURB - TYPE 1	790	LF	$	$
40	GRANITE CURB - TYPE 2	80	LF	$	$
41	STABILIZED AGGREGATE	360	TON	$	$
42	COBBLESTONE PAVERS	40	SF	$	$
43	INSTALL STONE SLABS FROM STOCKPILE	810	LF	$	$
44	LANDSCAPE BOULDER GROUPING	650	LF	$	$
45	CONCRETE PAVEMENT - TYPE A (EXPOSED AGGREGATE)	275	SY	$	$
46	CEMENT CONCRETE PAD FOR ARTIST SHANTY/KAYAK RENTAL KIOSK	140	SY	$	$
47	CEMENT CONCRETE UTILITY PAD	10	CY	$	$
48	CEMENT CONCRETE TRANSFORMER SLAB & OIL CONTAINMENT CURB	1	LS	$	$
49	CEMENT CONCRETE PEDESTRIAN CURB RAMP 1 & 2 WITH DETECTABLE WARNING PANELS	4	SY	$	$

Bid Item	Item Description	QTY	UNIT	UNIT PRICE	EXTENDED PRICE
50	DETECTABLE WARNING PANELS	200	SF	$	$
51	END BENT ASSEMBLY AT BOARDWALK LOOP	2	EA	$	$
52	HELICAL PILES AT BOARDWALK LOOP	309	EA	$	$
53	HELICAL PILES AT PEDESTRIAN BRIDGE	10	EA	$	$
54	HELICAL PILE TEST	3	EA	$	$
55	BOARDWALK LOOP	7820	SF	$	$
56	BOARDWALK PLANK ENGRAVING	200	EA	$	$
57	BOARDWALK BENCH	8	EA	$	$
58	PEDESTRIAN BRIDGE	1	LS	$	$
59	BOARDWALK RAILING - TYPE W (WOOD)	2260	LF	$	$
60	BOARDWALK RAILING - TYPE C (CABLE)	192	LF	$	$
61	REINFORCED TURFGRASS SYSTEM	525	SY	$	$
62	LANDSCAPE STAIRS – LS-1 TO LS-6	148	SF	$	$
63	REGULATORY & PARK SIGNAGE - ALL TYPES	70	SF	$	$
64	REGULATORY & PARK SIGN POST - 2 1/2" STEEL	28	EA	$	$
65	PARK ENTRANCE SIGN	1	EA	$	$
66	INTERPRETIVE GRAPHIC PANEL - TYPE GP-BW	**3**	EA	$	$
67	INTERPRETIVE GRAPHIC PANEL - TYPE GP-S	4	EA	$	$

Bid Item	Item Description	QTY	UNIT	UNIT PRICE	EXTENDED PRICE
68	PAVEMENT MARKINGS - YELLOW AND WHITE EPOXY RESIN	2300	LF	$	$
69	PAVEMENT MARKINGS - CROSSWALK - ALL TYPES - EPOXY RESIN	820	LF	$	$
70	WOOD SPLIT RAIL FENCE	25	LF	$	$
71	WOOD RUSTIC POST FENCE	35	LF	$	$
72	BOLLARD - TYPE 1 (WOOD)	81	EA	$	$
73	BOLLARD - TYPE 2 (REMOVABLE)	12	EA	$	$
74	CCTV SITE CAMERA POLE & FOUNDATION	3	EA	$	$
75	SITE LIGHT, TYPE S1 - POLE, LIGHT & FOUNDATION	33	EA	$	$
76	SITE LIGHT, TYPE S2 - BOLLARD, LIGHT & FOUNDATION	12	EA	$	$
77	SITE LIGHT, TYPE S3 - POLE, LIGHT & FOUNDATION	12	EA	$	$
78	BIKE RACK - TYPE 1	1	EA	$	$
79	BIKE RACK - TYPE 2	2	EA	$	$
80	BIKE RACK - TYPE 3	1	EA	$	$
81	ACCESSIBLE PICNIC TABLES	2	EA	$	$
82	PARK BENCH	2	EA	$	$
83	BARRIER GATE	2	EA	$	$
84	NATURE BASED PLAY AREA	1	LS	$	$
85	LOAM FOR SEEDED AREAS - 6" DEEP	33,760	SY	$	$

Bid Item	Item Description	QTY	UNIT	UNIT PRICE	EXTENDED PRICE
86	LOAM FOR PLANTING	2000	CY	$	$
87	MODIFIED LOAM FOR EVENT SPACE	800	CY	$	$
88	DECIDUOUS TREE – 3 - 3.5" CAL.	69	EA	$	$
89	DECIDUOUS TREE – 10 - 12' HEIGHT	10	EA	$	$
90	DECIDUOUS TREE – 12 - 14' HEIGHT	19	EA	$	$
91	DECIDUOUS TREE – #2 CONT.	35	EA	$	$
92	EVERGREEN TREE – 5 - 6' HEIGHT	6	EA	$	$
93	EVERGREEN TREE – 7 - 8' HEIGHT	36	EA	$	$
94	EVERGREEN TREE – #15 CONT.	31	EA	$	$
95	SHRUB - #1 CONT.	109	EA	$	$
96	SHRUB - #2 CONT.	82	EA	$	$
97	SHRUB - #3 CONT.	244	EA	$	$
98	SHRUB – 18 - 24" HEIGHT	14	EA	$	$
99	SHRUB – 24 - 30" HEIGHT	31	EA	$	$
100	SHRUB - 3' HEIGHT	30	EA	$	$
101	SHRUB - 5 - 7' HEIGHT	53	EA	$	$
102	PERENNIALS / GRASSES – 4" CONT.	815	EA	$	$
103	PERENNIALS / GRASSES – #1 CONT.	1292	EA	$	$

Bid Item	Item Description	QTY	UNIT	UNIT PRICE	EXTENDED PRICE
104	SEED MIX - TYPE A	27027	SY	$	$
105	SEED MIX - TYPE B	1995	SY	$	$
106	SEED MIX - TYPE C	5000	SY	$	$
107	SEED MIX - TYPE D	1530	SY	$	$
108	SEED MIX - TYPE E	195	SY	$	$
109	PARK ELECTRICAL SYSTEM	1	LS	$	$

3.04 PART I TOTAL PROJECT BASE BID PRICE

(Figures) $_____

(Words) _____

3.05 PART II ADDITIVE ALTERNATES

A. Additive Alternate 1 - Kayak Launch Facility

(Figures)……$ _____

(Words)_____

B. Additive Alternate 2 - Shade Structure & Ornamental Benches

(Figures)……$ _____

(Words)_____

3.06 TOTAL PROJECT BID PRICE – BID FORM PART I AND ADD ALTERNATE 1

(Figures)……$ _____

(Words)_____

3.07 TOTAL PROJECT BID PRICE – BID FORM PART I AND ADD ALTERNATES 1 AND 2

(Figures)……$ _____

(Words)_____

ARTICLE 4—TIME OF COMPLETION

4.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates or within the number of days indicated in the Agreement.

4.02 Bidder agrees that the Work will be substantially complete on or before June 30,2025 and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions **on or before August 29, 2025.**

4.03 Bidder agrees that the Work will be substantially complete within **365 calendar days** after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions, and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within **425 calendar days** after the date when the Contract Times commence to run.

4.04 Bidder accepts the provisions of the Agreement regarding payment of Liquidated Damages.

ARTICLE 5—BIDDER'S ACKNOWLEDGEMENTS—ACCEPTANCE PERIOD, INSTRUCTIONS, AND RECEIPT OF ADDENDA

5.01 The Owner has obtained funding for this project from multiple sources as identified within Supplementary Conditions 007300. These sources include:

A. Commonwealth of Massachusetts Seaport Economic Council Grant.

B. U.S. Department of the Interior Land and Water Conservation Fund.

C. U.S. Department of the Interior Parkland Acquisitions & Renovations for Communities (PARC) Grant.

5.02 Bid Acceptance Period

A. This Bid will remain subject to acceptance for Sixty (60) days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

5.03 Instructions to Bidders

A. Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security.

5.04 Receipt of Addenda

A. Bidder hereby acknowledges receipt of the following Addenda

Addendum Number	Addendum Date

ARTICLE 6—BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.01 Bidder's Representations

A. In submitting this Bid, Bidder represents the following:

1. Bidder has examined and carefully studied the Bidding Documents, including Addenda.
2. Bidder has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
3. Bidder is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.
4. Bidder has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.
5. Bidder has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.
6. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, if selected as Contractor; and (c) Bidder's (Contractor's) safety precautions and programs.
7. Based on the information and observations referred to in the preceding paragraph, Bidder agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.

8. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.

9. Bidder has given Construction Manager written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Construction Manager is acceptable to Contractor.

10. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

11. The submission of this Bid constitutes an incontrovertible representation by Bidder that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

6.02 Bidder's Certifications

A. The Bidder certifies the following:

1. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.

2. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.

3. Bidder has not solicited or induced any individual or entity to refrain from bidding.

4. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 602.A:

   a. Corrupt practice means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process.

   b. Fraudulent practice means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition.

   c. Collusive practice means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels.

   d. Coercive practice means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

5. The Bidder has the ability to assume the maximum amount of work for the Project which includes the value of the Base Bid and all Additive Alternates identified within this contract should they be selected.

REQUIRED BID SUBMITTAL FORM

BIDDER hereby submits this Bid as set forth above:

Bidder:

_____
(typed or printed name of organization)

By: _____
(individual's signature)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Date: _____
(typed or printed)

If Bidder is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.

Attest: _____
(individual's signature)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Date: _____
(typed or printed)

Address for giving notices:

_____

_____

Bidder's Contact:

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Phone: _____

Email: _____

Address:

_____

_____

_____

REQUIRED BID SUBMITTAL FORM
COMBINED CERTIFICATE OF COMPLIANCE

CERTIFICATIONS REQUIRED BY LAW FOR PUBLIC CONSTRUCTION CONTRACTS

BIDDER 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 certification, the word ''person'' shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.

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 M.G.L. Chapter. 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.

REGISTRATION WITH THE MASSACHUSETTS SECRETARY OF STATE

If the undersigned is a Foreign Corporation (located outside of Massachusetts), I hereby certify that I comply with the provisions of Massachusetts General Laws, Chapter 30, Section 39L and Chapter 156D as they relate to Foreign Corporations and am registered and in good standing with the Massachusetts Secretary of State.

_____ _____

Authorized Person's Signature **Date**

_____

Print Name & Title of Signatory

_____

Name of Contractor

END OF SECTION

SECTION 00 45 13
BIDDER QUALIFICATIONS

1.01 QUALIFICATIONS

A. Bidders are required to supply information regarding qualifications to perform the work described in the Contract Documents. Complete the items listed below.

B. Identify Business Name _____

C. State number of years in business. _____

D. If in-business prior -to-present under another company / name, please list. _____

E. Is your firm a sole proprietorship doing business under a different name?

1. ____Yes _____ No

F. If yes, please indicate sole proprietorship, a name, and the name you are doing business under.

_____
_____
_____

G. Is your firm incorporated? ____Yes _____ No

H. Have you or your firm been subject to suspension, debarment or criminal conviction by the Town of Yarmouth, Commonwealth of Massachusetts, or any other jurisdiction?

1. Yes: _____No:_____

I. Has the Town of Yarmouth and/or the Commonwealth of Massachusetts ever terminated contracts with your firm for cause?

1. Yes:_____No:_____

J. Has your firm ever withdrawn from a contract with the Town of Yarmouth or the Commonwealth of Massachusetts during the performance of a contract?

1. Yes:_____No:_____

K. Have you or your firm been involved in litigation against the Town of Yarmouth or the Commonwealth of Massachusetts?

1. Yes:_____No:_____

L. If Bidder responded yes to any of the foregoing, please explain the circumstances below. If you or your firm has been involved in litigation against the Town of Yarmouth and /or the Commonwealth of Massachusetts. Include the case caption, case number and status. (Provide additional pages if necessary.)

_____
_____
_____
_____
_____

M. Has the Bidder ever been cited by the Massachusetts Department of Environmental Protection for a Notice of Violation (NOV)? If yes provide the details.

_____
_____
_____
_____

N. Will any of the work spelled out in this Bid be outsourced? _____Yes _____ No

If so, please identify work/provide detail below:

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

O. Identify the party responsible for the installation of the helical pile support system for the elevated boardwalk. _____

P. Identify the party responsible for the carpentry associated with the elevated boardwalk. _____

Q. Identify and provide the qualifications for the on-site Project Foreman/Superintendent to oversee the Project if so awarded. State the years of employment with the Bidder. Provide relevant years of experience and any related training, licenses or certifications. The person identified shall be on the Project site on a daily basis and shall be responsible for the Bidder's execution of this Project.

Project Foreman Superintendent

_____

_____

_____

R. Provide a minimum of (4) entities with whom you have contracted to provide similar services within the last five (5) years. These references should be municipalities which are approximately the same size as the Town of Yarmouth and projects that are of a similar scope and cost.

REFERENCE #1

Client Name:_____

Contact Person:_____Telephone #: _____

Email_____

Description of Project _____

_____

_____

Value_____

Contract Dates: _____ To _____

Project Superintendent_____

REFERENCE #2

Client Name:_____

Contact Person:_____Telephone #: _____

Email_____

Description of Project _____

_____

_____

Value_____

Contract Dates: _____ To _____

Project Superintendent_____

REFERENCE #3

Client Name:_____

Contact Person:_____Telephone #: _____

Email_____

Description of Project _____

_____

_____

Value_____

Contract Dates: _____ To _____

Project Superintendent_____

REFERENCE #4

Client Name:_____

Contact Person:_____Telephone #: _____

Email_____

Description of Project _____

_____

_____

Value_____

Contract Dates: _____ To _____

Project Superintendent_____

S. The Bidder may furnish any additional Bidder qualifications that illustrate experience and capability to perform the work. If the Bidder has been responsible for constructing a project that has been recognized by the building or construction industry and has received acknowledgements, awards, or other types of recognition regarding standards of excellence and quality please identify the nature of the recognition and provide any related details. (provide additional pages if necessary)

END OF SECTION

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00 45 00 BIDDERS QUALIFICATIONS

ATTACHMENT

BYRD ANTI LOBBYING

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BYRD ANTI-LOBBYING AMENDMENT CERTIFICATION

(To be submitted with each proposal or offer exceeding $100,000)

The undersigned, [Company] _____ certifies, to the best of his or her knowledge, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

3. The language of this certification is included in the Contract Documents and shall be included in all subcontracts. The Contractor and all subcontractors shall certify and disclose accordingly .

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31, U.S.C. § 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

The Contractor, [Company] _____, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. § 3801 et seq., apply to this certification and disclosure, if any.

_____

Signature of Contractor's Authorized Official

_____

Name and Title of Contractor's Authorized Official

_____

Date

00 50 00

OWNER-CONTRACTOR AGREEMENT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE -PHASE 1

TOWN OF YARMOUTH
STANDARD HORIZONTAL CONSTRUCTION CONTRACT
For Projects Subject to M.G.L. c. 30, § 39M

This agreement **("Contract")** is made as of the __ day of _____**, 2024,** by and between the Town of Yarmouth with a principal place of business at 1146 Route 28, South Yarmouth, MA 02664 hereinafter referred to as the **"Owner"** and _____ with a principal place of business at _____, hereinafter referred to as the **"Contractor."**

Terms used in this Owner-Contractor Agreement, which are defined in the General Conditions of the Contract, shall have the meanings designated therein.

The Owner and the Contractor agree as follows:

ARTICLE 1. WORK.

The Contractor shall fully execute the work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 2. ENGINEER.

The Project has been designed by BETA Group Inc., 89 Shrewsbury St., Suite 300, Worcester, MA 01604 who is hereinafter called Engineer and who is to act as Owner's representative and have the rights and authority assigned to Engineer in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

ARTICLE 3. TIME FOR COMPLETION.

3.1 The Work will be substantially completed within 406 calendar days after the date when the Contract Times commence to run as provided in the General Conditions, as amended by the Supplemental Conditions, and completed and ready for final payment in accordance with the General Conditions, as amended by the Supplemental Conditions, within 434 calendar days after the date when the Contract Times commence to run.

3.2 The Contractor shall also adhere to the deadlines and requirements outlined in Paragraph 1.06 Project Milestones in Section 001116, Invitation to Bid.

ARTICLE 4. CONTRACT PRICE.

The Owner shall pay the Contractor, in current funds, for the performance of the Work, subject to additions and deductions by Approved Change Order(s), the Contract Price of $_____**.** Unit

Prices, if any, approved by the Owner are those included in the Contractor's Bid form. The following alternates have been accepted, and their costs are included in the contract Price:

Alternate No(s):_____

Minimum Wage Rates as determined by the Commissioner of Department of Labor and Industries under the provision of the Massachusetts General Laws, Chapter 149, Sections 26 to 27H, as amended, apply to this project. It is the responsibility of the Contractor, before bid opening, to request if necessary any additional information on Minimum Wage Rates for those trades people who may be employed for the proposed work under this contract. Federal Minimum Wage Rates as determined by the United States Department of Labor under the Davis-Bacon Act also apply to this project.

ARTICLE 5. APPROVED SUBCONTRACTORS.

The Contractor shall only use Subcontractors approved by the Town of Yarmouth for the performance of the specified portions of the Work. No other Subcontractors shall be used for these or any other portions of the Work without the prior written approval of the Owner.

ARTICLE 6. CERTIFICATIONS.

Tax Compliance: Pursuant to the Massachusetts General Laws (M.G.L.) c. 62C, § 49A, the individual signing this Contract on behalf of the Contractor hereby certifies, under the penalties of perjury, that to the best of his or her knowledge and belief, the Contractor has complied with any and all applicable state and federal tax laws.

Public Contractor Debarment: The individual signing this Contract on behalf of the Contractor further certifies under penalties of perjury that the Contractor is not presently debarred from doing public construction work in the Commonwealth under the provisions of M.G.L. c. 29, § 29F, or any other applicable debarment provisions of any other chapter of the General Laws or any rule or regulation promulgated thereunder and is not presently debarred from doing public construction work by any agency of the United States.

Non-Collusion: The individual signing this Contract on behalf of the Contractor certifies under pains and penalties of perjury that this contract has been obtained in good faith and without collusion or fraud with any other person. As used in this certification, the word “person” shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.

OSHA Training: Pursuant to M.G.L. Chapter. 30, §39S, the individual signing this Contract on behalf of the Contractor hereby certifies under penalties of perjury the following:

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.

Registration with the Massachusetts Secretary of State: If the undersigned is a Foreign Corporation (located outside of Massachusetts), the individual signing this Contract on behalf of the Contractor certifies that they will comply with the provisions of Massachusetts General Laws, Chapter 30, Section 39L and Chapter 156D as they relate to Foreign Corporations and that they are registered and in good standing with the Massachusetts Secretary of State.

Byrd Anti-Lobbying Amendment Certification: The individual signing this Contract on behalf of the Contractor hereby certifies under penalties of perjury the following:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
3. The language of this certification is included in the Contract Documents and shall be included in all subcontracts. The Contractor and all subcontractors shall certify and disclose accordingly.

ARTICLE 7. CONTRACT DOCUMENTS.

The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. This Agreement is comprised of the following documents:

1. Invitation for Bids.
2. Instructions to Bidders.
3. Contractor's Bid, including certifications.
4. This Agreement.
5. Performance, Payment, and Other Bonds.
6. General Conditions.
7. Supplementary Conditions.
8. Wage Rate Requirements
9. Drawings.
10. Specifications.
11. Addenda , if any.
12. The following, which may be delivered or issued after the Effective Date of the Agreement and are not attached hereto: All Written Amendments and other documents amending, modifying, or supplementing the Contract Documents pursuant to the General Conditions, including but not limited to certificates of insurance.

ARTICLE 8. PAYMENTS.

Payments shall be made as provided in Article 15.00 of the General Conditions, as amended by the Supplemental Conditions.

ARTICLE 9. FINAL ACCEPTANCE AND FINAL PAYMENT.

See Articles 15.05 and 15.06 respectively, of the General Conditions, as amended by the Supplemental Conditions.

ARTICLE 10. LIQUIDATED DAMAGES.

The Contractor and Owner recognize that time is of the essence and that the Owner will suffer financial loss if the Work is not completed within the times specified in the Contract, plus any extensions thereof allowed in accordance with the General Conditions and this Contract. The parties also recognize the delays, expenses, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as damages for delay (but not as a penalty), Contractor shall pay the Owner $ 500.00 for each day that expires after the time specified in the Contract for Substantial Completion until the Work is substantially complete unless otherwise extended per an agreed and approved change order for work that was not included in the original bid. After Substantial Completion, if the Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by the Owner, the Contractor shall pay the Owner $500.00 for each day that expires after the time specified in the Contract for completion and readiness for final payment until the Work is completed and ready for final payment.

ARTICLE 11. TERMINATION OF CONTRACT

If the Contractor shall violate any of the covenants, conditions, or stipulations of this Contract, the Town may terminate this Contract in accordance with Article 16, Suspension of Work and Termination of Contract, of the General Conditions, as amended by the Supplemental Conditions.

ARTICLE 12. ADDITIONAL INSURANCE PROVISIONS.

The insurance requirements set forth in Article 6 Bonds and Insurace, of the General Conditions of the Contract and are supplemented by the provisions, appearing in the Supplemental Conditions and incorporated herein.

ARTICLE 13. MISCELLANEOUS.

Terms used in this Agreement which are defined in Article 1 of the General Conditions will have the meanings indicated in the General Conditions, as amended by the Supplemental Conditions.

IN WITNESS WHEREOF, the Owner and the Contractor have signed this Agreement in triplicate. One counterpart each has been delivered to the Owner, the Contractor, and the Engineer. All portions of the Contract Documents have been signed, initialed or identified by the Owner and the Contractor or identified by the Engineer on their behalf.

This Agreement will be effective on _____, 20_____ (which is the Effective Date of the Agreement).

FOR THE TOWN OF YARMOUTH
Acknowledged:

Department/Division Head Date

Approved as to Procurement:

Chief Procurement Officer Date

Pursuant to M.G.L. c.44, s.31C, I certify that an appropriation has been made in the total amount of the contract:

Town Accountant Date

Contract Approval:

Town Administrator Date

FOR THE CONTRACTOR

Name of Company

Authorized Signature Date

Print Name & Title

FOR INTERNAL USE ONLY		
Appropriation Account(s)		
Purchase Order #		
Contract #		
Contract Documents	**Contract Documents Received (Y) Yes, (N) No, N/A**	
Combined Certification Form (Not Public Construction)		
Combined Certification Form (Public Construction)		
Contractor W9 Form		
EFT Authorization Form		
Insurance Certificate		
ADDITIONAL INFORMATION		

EXAMPLE CLERK'S CERTIFICATE

_____
Action of Shareholders
Written Consent

(Date)

The undersigned, being the Shareholders of _____, a Massachusetts Corporation (the "Corporation") entitled to vote on the action, hereby consent to the adoption of the following votes:

VOTED: That the [President and/or the Vice President or named individual], each of them acting singly is, authorized to execute any and all Contract Documents and to enter into and negotiate the terms of all contracts and to accomplish same and to execute any and all documents, instruments, and agreements in order to effectuate the transaction and that said transaction shall be valid, binding, effective, and legally enforceable.

VOTED: That the officers are, and each of them acting singly is, authorized, from time to time, in the name and on behalf of the Corporation to take or cause to be taken all such action(s) as s/he or they, as the case may be, deem necessary, appropriate or advisable to effect the foregoing votes, as may be shown by the officer or officers execution or performance which shall be conclusive evidence that the same is authorized by the directors of this Corporation.

VOTED: That the officers are, and each of them acting singly is, authorized, from time to time, in the name and on behalf of this Corporation, under its corporate seal, if desired, attested by an appropriate officer, if desired, to execute, make oath to, acknowledge, deliver and file any and all of the agreements, instruments, certificates and documents referred to or related to the foregoing votes.

VOTED: That the officers are, and each of them acting singly is, authorized, from time to time and on behalf of this Corporation, under its corporate seal, if desired, to execute, acknowledge and deliver any and all agreements, instruments, certificates and documents referred to or related to the foregoing votes, with such changes as the officer or officers so acting may deem necessary or desirable, and the signature of such officer or officers to be conclusive evidence that the same is authorized by the directors of this Corporation.

Clerk of Corporation Certificate

I, _____ the Clerk of the foregoing corporation, do hereby certify that the above vote was taken at a duly called meeting of the shareholders of the Corporation on _____, 20__.

_____
Clerk of Corporation
SEAL

00 51 00
NOTICE OF AWARD

Date: _____ 20____.

Contract: _____

Owner: _____

_____

_____

Bidder: _____

Name

_____

Address

_____

You are hereby notified that your Bid dated _____ 20____ for the above referenced Contract has been evaluated and it has been determined you are the successful bidder.
The Contract Price for the Contract is:
$_____Dollars ($_____).
The total Price includes the base bid *and alternate numbers* _____.

_____Copies of the proposed Contract Documents *(less Drawings)* are included with this Notice of Award.
_____*Sets of Contract Drawings will be provided separately.*

You must comply with the following conditions within ten (10) days of the date of this Notice to Award.

1. Deliver to the Owner _____fully executed copies of the Contract Documents.
2. Provide Contract Surety Bonds as specified in Section 00 61 00 of the Contract Documents.
3. *Other,* _____.

Failure to comply with these conditions entitles the Owner to consider you in default and subject to the terms of the Contract.

Owner: _____

_____

By _____

Title _____

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00 55 00

Notice to Proceed

Date: _____

Project: Riverwalk Park, Boardwalk Loop and Event Space – Phase 1

Owner: Town of Yarmouth, MA Owner's Contract No.:_____

Contract: Engineer's Project No.: 10056

Contractor:

Contractor's Address: *[send Certified Mail, Return Receipt Requested]*

Notification: You are notified that the Contract Times under the above Contract will commence to run on
On or before that date, you are to start performing your obligations under the Contract Documents. In accordance with Article 4 of the Agreement, the date of Substantial Completion is, and the date of readiness for final payment is [(or) the number of days to achieve Substantial Completion is, and the number of days to achieve readiness for final payment shall be as stated in the Supplementary Conditions].

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

Also, before you may start any Work at the Site, you must:

_____*[Additional Requirements].*

Owner

Given by: _____

Authorized Signature

Title _____

Date _____

Copy to Engineer

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00 61 00 PERFORMANCE BOND

Contractor Name: {_____} Address *(principal place of business)*: _____	**Surety** Name: {_____} Address *(principal place of business)*: {_____}
Owner Name: **Town of Yarmouth** **1146 Route 28, South Yarmouth MA. 02664**	**Contract** Project Description **Riverwalk Park, Boardwalk Loop & Event Space Phase1** **669 Rte. 28, West Yarmouth Ma.** Contract Price: {_____} Effective Date of Contract: {_____}

Bond

Bond Amount: {_____}

Date of Bond: {_____}

(Date of Bond cannot be earlier than Effective Date of Contract)

Modifications to this Bond form:

☐ None ☐ See Paragraph 16

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

Contractor as Principal	Surety
_____ *(Full formal name of Contractor)*	_____ *(Full formal name of Surety) (corporate seal)*
By: _____ *(Signature)*	By: _____ *(Signature)(Attach Power of Attorney)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____
Attest: _____ *(Signature)*	Attest: _____ *(Signature)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
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 is 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 will 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 may 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 will 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 does 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 does 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 will not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety will 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 will not be reduced or set off on account of any such unrelated obligations. No right of action will 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 must be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and must 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 will be applicable.

12. Notice to the Surety, the Owner, or the Contractor must 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 will be deemed deleted therefrom and provisions conforming to such

statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will 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 will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.

16. Modifications to this Bond are as follows:

    16.1. NONE.

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

00 62 00 PAYMENT BOND

Contractor Name: **[_____]** Address *(principal place of business)*: **[_____]** **{_____}**	**Surety** Name: **[_____]** Address *(principal place of business)*: **[_____]** **{_____}**
Owner Name: **Town of Yarmouth** **1146 Route 28, South Yarmouth MA. 02664**	**Contract** Project **Riverwalk Park, Boardwalk Loop & Event Space Phase 1** **669 Route 28, West Yarmouth MA. 02673** Contract Price: **[_____]** Effective Date of Contract: **[_____]**

Bond

Bond Amount: **[_____]**

Date of Bond: **{_____]**

(Date of Bond cannot be earlier than Effective Date of Contract)

Modifications to this Bond form:

☐ None ☐ See Paragraph 18

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

Contractor as Principal	Surety
_____ *(Full formal name of Contractor)*	_____ *(Full formal name of Surety) (corporate seal)*
By: _____ *(Signature)*	By: _____ *(Signature)(Attach Power of Attorney)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____
Attest: _____ *(Signature)*	Attest: _____ *(Signature)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
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 is 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 will 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 will 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 will 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 will 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 will 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 will 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 satisfying 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 will 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 will be applicable.

13. Notice and Claims to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, will 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 will be deemed deleted here from and provisions conforming to such statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will 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:

        16.1.1. The name of the Claimant.

        16.1.2. The name of the person for whom the labor was done, or materials or equipment furnished.

        16.1.3. 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.

        16.1.4. A brief description of the labor, materials, or equipment furnished.

16.1.5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract.

16.1.6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim.

16.1.7. The total amount of previous payments received by the Claimant; and

16.1.8. 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 is 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 will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.

18. Modifications to this Bond are as follows:

18.1. None

00 62 50

CERTIFICATE OF SUBSTANTIAL COMPLETION

		Project No.
Owner:	Town of Yarmouth	
Construction Manager:		
Engineer:		
Contractor:		
Project:	Riverwalk Park, Boardwalk Loop and Event Space – Phase 1	
Contract Name:		

This ☐ Preliminary ☐ Final Certificate of Substantial Completion applies to:

☐ All Work ☐ The following specified portions of the Work:

_____

_____

Description of the portion of the work for which Certificate of Substantial Completion is issued

Date of Substantial Completion: _____**(Date)**

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, Construction Manager, and Engineer, and found to be substantially complete. The Date of Substantial Completion of the Work or portion thereof designated above is hereby established, subject to the provisions of the Contract pertaining to Substantial Completion. The date of Substantial Completion in the final Certificate of Substantial Completion marks the commencement of the contractual correction period and applicable warranties required by the Contract.

A punch list of items to be completed or corrected is attached to this Certificate. This list may not be all-inclusive, and the failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

Amendments of contractual responsibilities recorded in this Certificate should be the product of mutual agreement of Owner and Contractor; see Paragraph 15.03.D of the General Conditions.

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance, and warranties upon Owner's use or occupancy of the Work must be as provided in the Contract, except as amended as follows:

Amendments to Owner's Responsibilities: ☐ None ☐ As follows:

_____

_____

_____

_____

_____

Amendments to Contractor's Responsibilities: ☐ None ☐ As follows:

_____

_____

_____

_____

The following documents are attached to and made a part of this Certificate:

Punch List Dated:

_____
_____
_____
_____
_____

This Certificate does not constitute an acceptance of Work not in accordance with the Contract Documents, nor is it a release of Contractor's obligation to complete the Work in accordance with the Contract Documents.

	Approved by Engineer	Issued by Construction Manager
By (signature):	_____	_____
Name (printed):	_____	_____
Title:	_____	_____
	_____	_____
	_____	_____

SECTION 00 70 00
STANDARD GENERAL CONDITIONS
OF THE CONSTRUCTION CONTRACT

TABLE OF CONTENTS

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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 document prepared by Contractor, in a form acceptable to Engineer, to request 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; 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; 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.

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.

c. A demand or assertion by Owner or Contractor, duly submitted in compliance with the procedural requirements set forth herein, made pursuant to Paragraph 12.01.A.4, concerning disputes arising after Engineer has issued a recommendation of final payment.

d. 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), lead-based paint (as defined by the HUD/EPA standard), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to Laws and Regulations 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 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. *Electronic Document*—Any Project-related correspondence, attachments to correspondence, data, documents, drawings, information, or graphics, including but not limited to Shop Drawings and other Submittals, that are in an electronic or digital format.

21. *Electronic Means*—Electronic mail (email), upload/download from a secure Project website, or other communications methods that allow: (a) the transmission or communication of Electronic Documents; (b) the documentation of transmissions, including sending and receipt; (c) printing of the transmitted Electronic Document by the

recipient; (d) the storage and archiving of the Electronic Document by sender and recipient; and (e) the use by recipient of the Electronic Document for purposes permitted by this Contract. Electronic Means does not include the use of text messaging, or of Facebook, Twitter, Instagram, or similar social media services for transmission of Electronic Documents.

22. *Engineer*—The individual or entity named as such in the Agreement.

23. *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.

24. *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.

    a. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated into the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, is not a Hazardous Environmental Condition.

    b. The presence of Constituents of Concern that are to be removed or remediated as part of the Work is not a Hazardous Environmental Condition.

    c. The presence of Constituents of Concern as part of the routine, anticipated, and obvious working conditions at the Site, is not a Hazardous Environmental Condition.

25. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and binding decrees, resolutions, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

26. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.

27. *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.

28. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.

29. *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.

30. *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.

31. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising Contractor's plan to accomplish the Work within the Contract Times.

32. *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.

33. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative (RPR) includes any assistants or field staff of Resident Project Representative.

34. *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.

35. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals.

36. *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.

37. *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.

38. *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 or areas furnished by Owner which are designated for the use of Contractor.

39. *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.

40. *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.

41. *Submittal*—A written or graphic document, prepared by or for Contractor, which the Contract Documents require Contractor to submit to Engineer, or that is indicated as a Submittal in the Schedule of Submittals accepted by Engineer. Submittals may include Shop Drawings and Samples; schedules; product data; Owner-delegated designs; sustainable design information; information on special procedures; testing plans; results of tests and evaluations, source quality-control testing and inspections, and field or Site quality-control testing and inspections; warranties and certifications; Suppliers' instructions and reports; records of delivery of spare parts and tools; operations and maintenance data; Project photographic documentation; record documents; and other such documents required by the Contract Documents. Submittals, whether or not approved or accepted by Engineer, are not Contract Documents. Change Proposals, Change Orders, Claims, notices, Applications for Payment, and requests for interpretation or clarification are not Submittals.

42. *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 of such Work.

43. *Successful Bidder*—The Bidder to which the Owner makes an award of contract.

44. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.

45. *Supplier*—A manufacturer, fabricator, supplier, distributor, 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.

46. *Technical Data*

    a. Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (1) existing subsurface conditions at or adjacent to the Site, or existing physical conditions at or adjacent to the Site including existing surface or subsurface structures (except Underground Facilities) or (2) Hazardous Environmental Conditions at the Site.

    b. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then Technical Data is defined, with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06, as the data contained in boring logs, recorded measurements of subsurface water levels, assessments of the condition of subsurface facilities, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical, environmental, or other Site or facilities conditions report prepared for the Project and made available to Contractor.

    c. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data, and instead Underground Facilities are shown or indicated on the Drawings.

47. *Underground Facilities*—All active or not-in-service underground lines, pipelines, conduits, ducts, encasements, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or systems at the Site, including but not limited to those facilities or systems that produce, transmit, distribute, or convey telephone or other communications, cable television, fiber optic transmissions, power, electricity, light, heat, gases, oil, crude oil products, liquid petroleum products, water, steam, waste, wastewater, storm water, other liquids or chemicals, or traffic or other control systems. An abandoned facility or system is not an Underground Facility.

48. *Unit Price Work*—Work to be paid for on the basis of unit prices.

49. *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.

50. *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 Paragraphs 1.02.B, C, D, and E are not defined terms that require initial capital letters, but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

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

C. *Day*: The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective*: The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

1. does not conform to the Contract Documents;

2. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or

3. 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 Paragraph 15.04).

E. *Furnish, Install, Perform, Provide*

1. The word "furnish," when used in connection with services, materials, or equipment, means 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, means 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, means 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. *Contract Price or Contract Times*: References to a change in "Contract Price or Contract Times" or "Contract Times or Contract Price" or similar, indicate that such change applies to (1) Contract Price, (2) Contract Times, or (3) both Contract Price and Contract Times, as warranted, even if the term "or both" is not expressed.

G. 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 Performance and Payment Bonds; Evidence of Insurance*

A. *Performance and Payment Bonds*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner the performance bond and payment bond (if the Contract requires Contractor to furnish such bonds).

B. *Evidence of Contractor's Insurance*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each additional insured (as identified in the Contract), the certificates, endorsements, and other evidence of insurance required to be provided by Contractor in accordance with Article 6, except to the extent the Supplementary Conditions expressly establish other dates for delivery of specific insurance policies.

C. *Evidence of Owner's Insurance*: After receipt of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each additional insured (as identified in the Contract), 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 signed 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 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 *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 the schedules submitted in accordance with Paragraph 2.03.A. No progress payment will 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.

4. If a schedule is not acceptable, Contractor will have an additional 10 days to revise and resubmit the schedule.

2.06 *Electronic Transmittals*

A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may send, and shall accept, Electronic Documents transmitted by Electronic Means.

B. If the Contract does not establish protocols for Electronic Means, then Owner, Engineer, and Contractor shall jointly develop such protocols.

C. Subject to any governing protocols for Electronic Means, when transmitting Electronic Documents by Electronic Means, the transmitting party makes no representations as to long-term compatibility, usability, or readability of the Electronic Documents 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 Electronic Documents.

ARTICLE 3—CONTRACT DOCUMENTS : INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is required by one Contract Document 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 versions of the Contract Documents (including any printed copies derived from such electronic versions) and the printed record version, the printed record version will 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.

F. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation will be deemed stricken, and all remaining provisions will continue to be valid and binding upon Owner and Contractor, which agree that the Contract Documents will be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

G. Nothing in the Contract Documents creates:

1. any contractual relationship between Owner or Engineer and any Subcontractor, Supplier, or other individual or entity performing or furnishing any of the Work, for the benefit of such Subcontractor, Supplier, or other individual or entity; or

2. 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.

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, means 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, and no instruction of a Supplier, will be effective to change the duties or responsibilities of Owner, Contractor, or Engineer 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 or Engineer 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 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 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 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 in writing 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.

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 notify Owner and Contractor in writing 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 versions, 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 precludes 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 30th 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 60th day after the day of Bid opening or the 30th 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 may be done at the Site prior to such date.

4.03 *Reference Points*

A. Owner shall provide engineering surveys indicating reference points or property monuments 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/or 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 must 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 will 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 Contract Price or 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. Such an adjustment will 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 third-party utility owners or other third-party entities (other than those third-party utility owners or other third-party entities performing other work at or adjacent to the Site as arranged by or under contract with Owner, as contemplated in Article 8); and

4. Acts of war or terrorism.

D. Contractor's entitlement to an adjustment of Contract Times or Contract Price is limited as follows:

1. Contractor's entitlement to an adjustment of the Contract Times is conditioned on the delay, disruption, or interference adversely affecting an activity on the critical path to completion of the Work, as of the time of the delay, disruption, or interference.

2. Contractor shall not be entitled to an adjustment in Contract Price 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. Such a concurrent delay by Contractor shall not preclude an adjustment of Contract Times to which Contractor is otherwise entitled.

3. Adjustments of Contract Times or Contract Price are subject to the provisions of Article 11.

E. Each Contractor request or Change Proposal seeking an increase in Contract Times or Contract Price must be supplemented by supporting data that sets forth in detail the following:

1. The circumstances that form the basis for the requested adjustment;

2. The date upon which each cause of delay, disruption, or interference began to affect the progress of the Work;

3. The date upon which each cause of delay, disruption, or interference ceased to affect the progress of the Work;

4. The number of days' increase in Contract Times claimed as a consequence of each such cause of delay, disruption, or interference; and

5. The impact on Contract Price, in accordance with the provisions of Paragraph 11.07.

Contractor shall also furnish such additional supporting documentation as Owner or Engineer may require including, where appropriate, a revised progress schedule indicating all the activities affected by the delay, disruption, or interference, and an explanation of the effect of the delay, disruption, or interference on the critical path to completion of the Work.

F. 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, together with the provisions of Paragraphs 4.05.D and 4.05.E.

G. Paragraph 8.03 addresses 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.

ARTICLE 5—SITE; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor in writing 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, or to improvements, structures, utilities, or similar facilities located at such adjacent lands 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 7.13, 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 in a court of competent jurisdiction; 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 will 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 of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data;

2. Those drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data; and

3. Technical Data contained in such reports and drawings.

B. *Underground Facilities*: Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05, and not in the drawings referred to in Paragraph 5.03.A. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

C. *Reliance by Contractor on Technical Data*: 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 Paragraph 1.01.A.46.b.

D. *Limitations of Other Data and Documents*: 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.

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings;

3. the contents of other Site-related documents made available to Contractor, such as record drawings from other projects at or adjacent to the Site, or Owner's archival documents concerning the Site; or

4. 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:

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.

2. is of such a nature as to require a change in the Drawings or Specifications;

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 whether it is necessary for Owner to obtain 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; 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. *Early Resumption of Work*: If at any time Engineer determines that Work in connection with the subsurface or physical condition in question may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the condition in question has been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.

E. *Possible Price and Times Adjustments*

1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, 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 subject to the provisions of Paragraphs 4.05.D and 4.05.E.

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;

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 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, then any such adjustment will 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, 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.

F. *Underground Facilities; Hazardous Environmental Conditions*: Paragraph 5.05 governs rights and responsibilities regarding the presence or location of Underground Facilities. Paragraph 5.06 governs rights and responsibilities regarding Hazardous Environmental Conditions. The provisions of Paragraphs 5.03 and 5.04 are not applicable to the presence or location of Underground Facilities, or to Hazardous Environmental Conditions.

5.05 *Underground Facilities*

A. *Contractor's Responsibilities*: Unless it is otherwise expressly provided in the Supplementary Conditions, the cost of all of the following are included in the Contract Price, and Contractor shall have full responsibility for:

1. reviewing and checking all information and data regarding existing Underground Facilities at the Site;

2. complying with applicable state and local utility damage prevention Laws and Regulations;

3. verifying the actual location of those Underground Facilities shown or indicated in the Contract Documents as being within the area affected by the Work, by exposing such Underground Facilities during the course of construction;

4. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and

5. 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 on the Drawings, or was not shown or indicated on the Drawings 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), notify Owner and Engineer in writing regarding such Underground Facility.

C. *Engineer's Review*: Engineer will:

1. promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy;

2. identify and communicate with the owner of the Underground Facility; prepare recommendations to Owner (and if necessary, issue any preliminary instructions to Contractor) regarding the Contractor's resumption of Work in connection with the Underground Facility in question;

3. obtain any pertinent cost or schedule information from Contractor; 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

4. 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. *Early Resumption of Work*: If at any time Engineer determines that Work in connection with the Underground Facility may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the Underground Facility in question and conditions affected by its presence have been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.

F. *Possible Price and Times Adjustments*

1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, to the extent that any existing Underground Facility at the Site that was not shown

or indicated on the Drawings, 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. 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;

b. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E; and

c. 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, then any such adjustment will 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, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

4. The information and data shown or indicated on the Drawings with respect to existing Underground Facilities at the Site is based on information and data (a) furnished by the owners of such Underground Facilities, or by others, (b) obtained from available records, or (c) gathered in an investigation conducted in accordance with the current edition of ASCE 38, Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data, by the American Society of Civil Engineers. If such information or data is incorrect or incomplete, Contractor's remedies are limited to those set forth in this Paragraph 5.05.F.

5.06 *Hazardous Environmental Conditions at Site*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. Reports known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site;

2 Drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; 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 on the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b. 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;

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, as a result of such Work stoppage, such special conditions under which Work is agreed to be resumed by Contractor, or any costs or expenses incurred in response to the Hazardous Environmental Condition, 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. Entitlement to any such adjustment is subject to the provisions of Paragraphs 4.05.D, 4.05.E, 11.07, and 11.08.

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, 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.I obligates 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 obligates 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 Contractor's obligations under the Contract. These bonds must 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 terms of a prescribed bond form, the Supplementary Conditions, or other provisions of the Contract.

B. Contractor shall also furnish such other bonds (if any) as are required by the Supplementary Conditions or other provisions of the Contract.

C. All bonds must be in the form included in the Bidding Documents or otherwise specified by Owner prior to execution of the Contract, except as provided otherwise by Laws or

Regulations, and must be issued and signed by a surety named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Department Circular 570 (as amended and supplemented) by the Bureau of the Fiscal Service, 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 must show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

D. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue bonds in the required amounts.

E. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer in writing and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which must comply with the bond and surety requirements above.

F. 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.

G. Upon request to Owner from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Owner shall provide a copy of the payment bond to such person or entity.

H. Upon request to Contractor from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Contractor shall provide a copy of the payment bond to such person or entity.

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. Alternative forms of insurance coverage, including but not limited to self-insurance and "Occupational Accident and Excess Employer's Indemnity Policies," are not sufficient to meet the insurance requirements of this Contract, unless expressly allowed in the Supplementary Conditions.

D. Contractor shall deliver to Owner, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Contractor has obtained and is maintaining the policies and coverages 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, documentation of applicable self-insured retentions (if allowed) and deductibles, full disclosure of all relevant exclusions, and evidence of insurance required to be purchased and maintained by

Subcontractors or Suppliers. In any documentation furnished under this provision, Contractor, Subcontractors, and Suppliers may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those applicable to this Contract.

E. Owner shall deliver to Contractor, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Owner has obtained and is maintaining the policies and coverages 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, documentation of applicable self-insured retentions (if allowed) and deductibles, and full disclosure of all relevant exclusions. In any documentation furnished under this provision, Owner may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those relevant to this Contract.

F. 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, will not be construed as a waiver of the other party's obligation to obtain, and maintain such insurance.

G. In addition to the liability insurance required to be provided by Contractor, the Owner, at Owner's option, may purchase and maintain Owner's own liability insurance. 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.

H. Contractor shall require:

1. Subcontractors to purchase and maintain worker's compensation, commercial general liability, and other insurance that is appropriate for their participation in the Project, and to name as additional insureds Owner and Engineer (and any other individuals or entities identified in the Supplementary Conditions as additional insureds on Contractor's liability policies) on each Subcontractor's commercial general liability insurance policy; and

2. Suppliers to purchase and maintain insurance that is appropriate for their participation in the Project.

I. If either party does not purchase or maintain 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.

J. If Contractor has failed to obtain and maintain required insurance, Contractor's entitlement to enter or remain at the Site will end immediately, and Owner may impose an appropriate set-off against payment for any associated costs (including but not limited to the cost of purchasing necessary insurance coverage), and exercise Owner's termination rights under Article 16.

K. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect (but is in no way obligated) 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 will be adjusted accordingly.

L. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests. Contractor is responsible for determining whether such coverage and limits are adequate to protect its interests, and for obtaining and maintaining any additional insurance that Contractor deems necessary.

M. The insurance and insurance limits required herein will not be deemed as a limitation on Contractor's liability, or that of its Subcontractors or Suppliers, under the indemnities granted to Owner and other individuals and entities in the Contract or otherwise.

N. All the policies of insurance required to be purchased and maintained under this Contract will contain a provision or endorsement that the coverage afforded will not be canceled, 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 and Engineer.

6.03 *Contractor's Insurance*

A. *Required Insurance*: Contractor shall purchase and maintain Worker's Compensation, Commercial General Liability, and other insurance pursuant to the specific requirements of the Supplementary Conditions.

B. *General Provisions*: The policies of insurance required by this Paragraph 6.03 as supplemented must:

1. include at least the specific coverages required;

2. be written for not less than the limits provided, or those required by Laws or Regulations, whichever is greater;

3. remain in effect at least until the Work is complete (as set forth in Paragraph 15.06.D), and longer if expressly required elsewhere in this Contract, 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;

4. apply with respect to the performance of the Work, whether such performance is 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; and

5. include all necessary endorsements to support the stated requirements.

C. *Additional Insureds*: The Contractor's commercial general liability, automobile liability, employer's liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies, if required by this Contract, must:

1. include and list as additional insureds Owner and Engineer, and any individuals or entities identified as additional insureds in the Supplementary Conditions;

2. include coverage for the respective officers, directors, members, partners, employees, and consultants of all such additional insureds;

3. afford primary coverage to these additional insureds for all claims covered thereby (including as applicable those arising from both ongoing and completed operations);

4. not seek contribution from insurance maintained by the additional insured; and

5. as to commercial general liability insurance, apply to additional insureds with respect to liability caused in whole or in part by Contractor's acts or omissions, or the acts and omissions of those working on Contractor's behalf, in the performance of Contractor's operations.

6.04 *Builder's Risk and Other 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 Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). The specific requirements applicable to the builder's risk insurance are set forth in the Supplementary Conditions.

B. *Property Insurance for Facilities of Owner Where Work Will Occur*: Owner is responsible for obtaining and maintaining property insurance covering each existing structure, building, or facility in which any part of the Work will occur, or to which any part of the Work will attach or be adjoined. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, providing coverage consistent with that required for the builder's risk insurance, and will be maintained until the Work is complete, as set forth in Paragraph 15.06.D.

C. *Property Insurance for Substantially Complete Facilities*: Promptly after Substantial Completion, and before actual occupancy or use of the substantially completed Work, Owner will obtain property insurance for such substantially completed Work and maintain such property insurance at least until the Work is complete, as set forth in Paragraph 15.06.D. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, and provide coverage consistent with that required for the builder's risk insurance. The builder's risk insurance may terminate upon written confirmation of Owner's procurement of such property insurance.

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 advance notice of such occupancy or use to the builder's risk insurer, and obtain an endorsement consenting to the continuation of coverage prior to commencing such partial occupancy or use.

E. *Insurance of Other Property; Additional Insurance*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, then the entity or individual owning such property item will be responsible for insuring it. 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 6.04, it may do so at Contractor's expense.

6.05 *Property Losses; Subrogation*

A. The builder's risk insurance policy purchased and maintained in accordance with Paragraph 6.04 (or an installation floater policy if authorized by the Supplementary Conditions), will contain provisions to the effect that in the event of payment of any loss or damage the insurer 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.

1. 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, risks, 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 individuals or entities identified in the Supplementary Conditions as builder's risk or installation floater 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.
2. None of the above waivers extends 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. Any property insurance policy maintained by Owner covering any loss, damage, or consequential loss to Owner's existing structures, buildings, or facilities in which any part of the Work will occur, or to which any part of the Work will attach or adjoin; to adjacent structures, buildings, or facilities of Owner; or to part or all of the completed or substantially completed Work, 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, will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them, and that the insured is allowed to waive the insurer's rights of subrogation in a written contract executed prior to the loss, damage, or consequential loss.

1. 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 all losses and damages caused by, arising out of, or resulting from fire or any of the perils, risks, or causes of loss covered by such policies.

C. The waivers in this Paragraph 6.05 include the waiver of rights 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 insured peril, risk, or cause of loss.

D. Contractor shall be responsible for assuring that each Subcontract 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 fire or other peril, risk, or cause of loss covered by builder's risk insurance, installation floater, and any other property insurance applicable to the Work.

6.06 *Receipt and Application of Property Insurance Proceeds*

A. Any insured loss under the builder's risk and other policies of property insurance required by Paragraph 6.04 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 6.04 shall maintain such proceeds in a segregated account and 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, Contractor shall repair or replace the damaged Work, using allocated insurance proceeds.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.01 *Contractor's Means and Methods of Construction*

A. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.

B. If the Contract Documents note, or Contractor determines, that professional engineering or other design services are needed to carry out Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures, or for Site safety, then Contractor shall cause such services to be provided by a properly licensed design professional, at Contractor's expense. Such services are not Owner-delegated professional design services under this Contract, and neither Owner nor Engineer has any responsibility with respect to (1) Contractor's determination of the need for such services, (2) the qualifications or licensing of the design professionals retained or employed by Contractor, (3) the performance of such services, or (4) any errors, omissions, or defects in such services.

7.02 *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.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who will not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.03 *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 maintain good discipline and order at the Site.

B. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of Contractor's employees; of Suppliers and Subcontractors, and their employees; and of any other individuals or entities performing or furnishing any of the Work, just as Contractor is responsible for Contractor's own acts and omissions.

C. 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 will 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.

7.04 *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 must be new and of good quality, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications will 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 must 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.

7.05 *"Or Equals"*

A. *Contractor's Request; Governing Criteria*: Whenever an item of equipment or material is specified or described in the Contract Documents by using the names of one or more proprietary items or specific Suppliers, 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 equipment or material, or items from other proposed Suppliers, under the circumstances described below.

1. If Engineer in its sole discretion determines that an item of equipment or material proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer will deem it an "or equal" item. For the purposes of this paragraph, a proposed item of equipment or material will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment Engineer determines that the proposed item:

1) is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

2) 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) has a proven record of performance and availability of responsive service; and

4) is not objectionable to Owner.

b. Contractor certifies that if the proposed item is approved and incorporated into the Work:

1) there will be no increase in cost to the Owner or increase in Contract Times; and

2) the item 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 will result in any change in Contract Price. The Engineer's denial of an "or-equal" request will be final and binding and may not be reversed through an appeal under any provision of the Contract.

E. *Treatment as a Substitution Request*: If Engineer determines that an item of equipment or material proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the item a proposed substitute pursuant to Paragraph 7.06.

7.06 *Substitutes*

A. *Contractor's Request; Governing Criteria*: Unless the specification or description of an item of equipment or material 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 equipment or material under the circumstances described below. To the extent possible such requests must 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 equipment or material from anyone other than Contractor.

2. The requirements for review by Engineer will be as set forth in Paragraph 7.06.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 equipment or material that Contractor seeks to furnish or use. The application:

    a. will 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 the item specified; and

        3) be suited to the same use as the item 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 the item specified; and

        2) available engineering, sales, maintenance, repair, and replacement services.

    d. will 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 will be final and binding and may not be reversed through an appeal under any provision of the Contract. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.06.D, by timely submittal of a Change Proposal.

7.07 *Concerning Subcontractors and Suppliers*

A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner. The Contractor's retention of a Subcontractor or Supplier for the performance of parts of the Work will not relieve Contractor's obligation to Owner to perform and complete the Work in accordance with the Contract Documents.

B. Contractor shall retain specific Subcontractors and Suppliers 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 or Supplier 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 5 days.

E. Owner may require the replacement of any Subcontractor or Supplier. 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 or Suppliers 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 or Supplier so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor or Supplier.

F. If Owner requires the replacement of any Subcontractor or Supplier retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, 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 or Supplier, whether initially or as a replacement, will 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 solely responsible for scheduling and coordinating the work of Subcontractors and Suppliers.

J. The divisions and sections of the Specifications and the identifications of any Drawings do not control Contractor in dividing the Work among Subcontractors or Suppliers, or in delineating the Work to be performed by any specific trade.

K. All Work performed for Contractor by a Subcontractor or Supplier must be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract for the benefit of Owner and Engineer.

L. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor for Work performed for Contractor by the Subcontractor or Supplier.

M. Contractor shall restrict all Subcontractors and Suppliers from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed in this Contract.

7.08 *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 an 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 will be disclosed 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.

7.09 *Permits*

A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits, licenses, and certificates of occupancy. 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.

7.10 *Taxes*

A. All materials and supplies are tax exempt.

7.11 *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. 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 is not Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this does not relieve Contractor of its obligations under Paragraph 3.03.

C. Owner or Contractor may give written 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 written notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.12 *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.

7.13 *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.

B. Contractor shall designate a qualified and experienced safety representative whose duties and responsibilities are the prevention of Work-related accidents and the maintenance and supervision of safety precautions and programs.

C. 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.

D. All damage, injury, or loss to any property referred to in Paragraph 7.13.C.2 or 7.13.C.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).

E. 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.

F. Contractor shall notify Owner; the owners of adjacent property; the owners of Underground Facilities and other utilities (if the identity of such owners is known to Contractor); and other contractors and utility owners performing work at or adjacent to the Site, in writing, when Contractor knows that 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.

G. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. Any Owner's safety programs that are applicable to the Work are identified or included in the Supplementary Conditions or Specifications.

H. 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.

I. Contractor's duties and responsibilities for safety and protection will continue until all the Work is completed, Engineer has issued a written notice to Owner and Contractor in accordance with Paragraph 15.06.C that the Work is acceptable, and Contractor has left the Site (except as otherwise expressly provided in connection with Substantial Completion).

J. Contractor's duties and responsibilities for safety and protection will 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.

7.14 *Hazard Communication Programs*

A. Contractor shall be responsible for coordinating any exchange of safety data sheets (formerly known as 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 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 by an emergency, or are required as a result of Contractor's response to an emergency. If Engineer determines that a change in the Contract Documents is required because of an emergency or Contractor's response, a Work Change Directive or Change Order will be issued.

7.16 *Submittals*

A. *Shop Drawing and Sample Requirements*

1. Before submitting a Shop Drawing or Sample, Contractor shall:

a. review and coordinate the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;

b. determine and verify:

1) all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect to the Submittal;

2) 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

3) all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto;

c. confirm that the Submittal is complete with respect to all related data included in the Submittal.

2. Each Shop Drawing or Sample must 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 Shop Drawing or Sample, Contractor shall give Engineer specific written notice of any variations that the Submittal may have from the requirements of the Contract Documents. This notice must be set forth in a written communication separate from the Submittal; and, in addition, in the case of a Shop Drawing by a specific notation made on the Shop Drawing itself.

B. *Submittal Procedures for Shop Drawings and Samples*: Contractor shall label and submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals.

1. *Shop Drawings*

a. Contractor shall submit the number of copies required in the Specifications.

b. Data shown on the Shop Drawings must 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.C.

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.C.

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. *Engineer's Review of Shop Drawings and Samples*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the accepted Schedule of Submittals. 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, comply with the requirements of 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 will 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 or other appropriate Contract modification.

5. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for complying with the requirements of Paragraphs 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, will 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 or Sample will 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.C.4.

D. *Resubmittal Procedures for Shop Drawings and Samples*

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 Shop Drawing and Sample submittals with sufficient information and accuracy to obtain required approval of an item with no more than two resubmittals. Engineer will record Engineer's time for reviewing a third or subsequent resubmittal of a Shop Drawing or Sample, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges.

3. If Contractor requests a change of a previously approved Shop Drawing or Sample, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

E. *Submittals Other than Shop Drawings, Samples, and Owner-Delegated Designs*

1. The following provisions apply to all Submittals other than Shop Drawings, Samples, and Owner-delegated designs:

   a. Contractor shall submit all such Submittals to the Engineer in accordance with the Schedule of Submittals and pursuant to the applicable terms of the Contract Documents.

   b. Engineer will provide timely review of all such Submittals in accordance with the Schedule of Submittals and return such Submittals with a notation of either Accepted or Not Accepted. Any such Submittal that is not returned within the time established in the Schedule of Submittals will be deemed accepted.

   c. Engineer's review will be only to determine if the Submittal is acceptable under the requirements of the Contract Documents as to general form and content of the Submittal.

d. If any such Submittal is not accepted, Contractor shall confer with Engineer regarding the reason for the non-acceptance, and resubmit an acceptable document.

2. Procedures for the submittal and acceptance of the Progress Schedule, the Schedule of Submittals, and the Schedule of Values are set forth in Paragraphs 2.03. 2.04, and 2.05.

F. Owner-delegated Designs: Submittals pursuant to Owner-delegated designs are governed by the provisions of Paragraph 7.19.

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 is entitled to rely on Contractor's warranty and guarantee.

B. Owner's rights under this warranty and guarantee are in addition to, and are not limited by, Owner's rights under the correction period provisions of Paragraph 15.08. The time in which Owner may enforce its warranty and guarantee rights under this Paragraph 7.17 is limited only by applicable Laws and Regulations restricting actions to enforce such rights; provided, however, that after the end of the correction period under Paragraph 15.08:

1. Owner shall give Contractor written notice of any defective Work within 60 days of the discovery that such Work is defective; and

2. Such notice will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the notice.

C. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, or improper modification, 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.

D. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents is absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents, a release of Contractor's obligation to perform the Work in accordance with the Contract Documents, or a release of Owner's warranty and guarantee rights under this Paragraph 7.17:

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. The end of the correction period established in Paragraph 15.08;

8. Any inspection, test, or approval by others; or

9. Any correction of defective Work by Owner.

E. 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 will 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 losses, damages, costs, and judgments (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 from third-party claims or actions relating to or resulting from the performance or furnishing of the Work, provided that any such claim, action, loss, cost, judgment or damage is attributable to bodily injury, sickness, disease, or death, or to damage 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 will 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.

7.19 *Delegation of Professional Design Services*

A. Owner may require Contractor to provide professional design services for a portion of the Work by express delegation in the Contract Documents. Such delegation will specify the performance and design criteria that such services must satisfy, and the Submittals that Contractor must furnish to Engineer with respect to the Owner-delegated design.

B. Contractor shall cause such Owner-delegated professional design services to be provided pursuant to the professional standard of care by a properly licensed design professional, whose signature and seal must appear on all drawings, calculations, specifications, certifications, and Submittals prepared by such design professional. Such design professional must issue all certifications of design required by Laws and Regulations.

C. If a Shop Drawing or other Submittal related to the Owner-delegated design is prepared by Contractor, a Subcontractor, or others for submittal to Engineer, then such Shop Drawing or other Submittal must bear the written approval of Contractor's design professional when submitted by Contractor to Engineer.

D. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, and approvals performed or provided by the design professionals retained or employed by Contractor under an Owner-delegated design, subject to the professional standard of care and the performance and design criteria stated in the Contract Documents.

E. Pursuant to this Paragraph 7.19, Engineer's review, approval, and other determinations regarding design drawings, calculations, specifications, certifications, and other Submittals furnished by Contractor pursuant to an Owner-delegated design will be only for the following limited purposes:

1. Checking for conformance with the requirements of this Paragraph 7.19;

2. Confirming that Contractor (through its design professionals) has used the performance and design criteria specified in the Contract Documents; and

3. Establishing that the design furnished by Contractor is consistent with the design concept expressed in the Contract Documents.

F. Contractor shall not be responsible for the adequacy of performance or design criteria specified by Owner or Engineer.

G. Contractor is not required to provide professional services in violation of applicable Laws and Regulations.

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 third-party utility work that Owner has arranged to take place at or adjacent to the Site, Owner shall provide such information to Contractor.

C. Contractor shall afford proper and safe access to the Site to each contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work.

D. 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.

E. If the proper execution or results of any part of Contractor's Work depends upon work performed by others, 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.

F. The provisions of this article are not applicable to work that is performed by third-party utilities or other third-party entities without a contract with Owner, or that is performed without having been arranged by Owner. If such work occurs, then any related delay, disruption, or interference incurred by Contractor is governed by the provisions of Paragraph 4.05.C.3.

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 for Owner at or adjacent to the Site, the Owner's employees, any other contractor working for Owner, or any utility owner that Owner has arranged to perform work, 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. 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 will 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, and any remedies available to Contractor under Laws or Regulations concerning utility action or inaction. When applicable, any such equitable adjustment in Contract Price will 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 or Contract Price is subject to the provisions of Paragraphs 4.05.D and 4.05.E.

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.

1. 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 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 8.03.B.

2. 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 Contractor.

C. 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 will 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 (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 10.07. 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 *Resident 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 the Supplementary Conditions and in Paragraph 10.07.

B. If Owner designates an individual or entity who is not Engineer's consultant, agent, or employee to represent Owner at the Site, then the responsibilities and authority of such individual or entity will be as provided in the Supplementary Conditions.

10.04 *Engineer's Authority*

A. Engineer has the authority to reject Work in accordance with Article 14.

B. Engineer's authority as to Submittals is set forth in Paragraph 7.16.

C. Engineer's authority as to design drawings, calculations, specifications, certifications and other Submittals from Contractor in response to Owner's delegation (if any) to Contractor of professional design services, is set forth in Paragraph 7.19.

D. Engineer's authority as to changes in the Work is set forth in Article 11.

E. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.05 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor only for Work the Engineer has observed or can reasonably be measured after completion of the Work as set forth in Paragraph 13.03.

10.06 *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.

10.07 *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, will 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 Contractor under 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 10.07 also apply to the Resident Project Representative, if any.

10.08 *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 of which Engineer has been informed.

ARTICLE 11—CHANGES TO THE CONTRACT

11.01 *Amending and Supplementing the Contract*

A. The Contract may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.

B. If an amendment or supplement to the Contract includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order.

C. All changes to the Contract that 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, must be supported by Engineer's recommendation. Owner and Contractor may amend other terms and conditions of the Contract without the recommendation of the Engineer.

11.02 *Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders covering:

1. Changes in 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 11.05, (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 that embody the substance of any final and binding results under: Paragraph 11.03.B, resolving the impact of a Work Change Directive; Paragraph 11.09, concerning Change Proposals; Article 12, Claims; Paragraph 13.02.D, final adjustments resulting from allowances; Paragraph 13.03.D, final adjustments relating to determination of quantities for Unit Price Work; and similar provisions.

B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of Paragraph 11.02.A, it will be deemed to be of full force and effect, as if fully executed.

11.03 *Work Change Directives*

A. 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 11.07 regarding change of Contract Price.

B. If Owner has issued a Work Change Directive and:

1. Contractor believes that an adjustment in Contract Times or Contract Price is necessary, then Contractor shall submit any Change Proposal seeking such an adjustment no later than 30 days after the completion of the Work set out in the Work Change Directive.

2. Owner believes that an adjustment in Contract Times or Contract Price is necessary, then Owner shall submit any Claim seeking such an adjustment no later than 60 days after issuance of the Work Change Directive.

11.04 *Field Orders*

A. 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.

B. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.05 *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. Changes involving the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters will be supported by Engineer's recommendation.

B. Such changes in the Work 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 must be performed under the applicable conditions of the Contract Documents.

C. Nothing in this Paragraph 11.05 obligates 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.

11.06 *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.C.2.

11.07 *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 must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment of Contract Price must 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);
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 11.07.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 11.07.C).

C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit will 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 will be 15 percent;
      b. For costs incurred under Paragraph 13.01.B.3, the Contractor's fee will be 5 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 11.07.C.2.a and 11.07.C.2.b is that the Contractor's fee will be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.B.1 and 13.01.B.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 5 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 will be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the Work;
      d. No fee will 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 of the Work will be the amount of the actual net decrease in Cost of the Work and a deduction of an additional amount equal to 5 percent of such actual net decrease in Cost of the Work; and
      f. When both additions and credits are involved in any one change or Change Proposal, the adjustment in Contractor's fee will be computed by determining the sum of the costs in each of the cost categories in Paragraph 13.01.B (specifically, payroll costs, Paragraph 13.01.B.1; incorporated materials and equipment costs, Paragraph 13.01.B.2; Subcontract costs, Paragraph 13.01.B.3; special consultants costs, Paragraph 13.01.B.4; and other costs, Paragraph 13.01.B.5) and applying to each such cost category sum the appropriate fee from Paragraphs 11.07.C.2.a through 11.07.C.2.e, inclusive.

11.08 *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 must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment in the Contract Times must comply with the provisions of Article 12.

B. Delay, disruption, and interference in the Work, and any related changes in Contract Times, are addressed in and governed by Paragraph 4.05.

11.09 *Change Proposals*

A. *Purpose and Content*: Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; contest an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; challenge a set-off against payment due; or seek other relief under the Contract. The Change Proposal will specify any proposed change in Contract Times or Contract Price, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents. Each Change Proposal will address only one issue, or a set of closely related issues.

B. *Change Proposal Procedures*

1. *Submittal*: Contractor shall submit each Change Proposal to Engineer within 30 days after the start of the event giving rise thereto, or after such initial decision.

2. *Supporting Data*: 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.

    a. Change Proposals based on or related to delay, interruption, or interference must comply with the provisions of Paragraphs 4.05.D and 4.05.E.

    b. Change proposals related to a change of Contract Price must include full and detailed accounts of materials incorporated into the Work and labor and equipment used for the subject Work.

    The supporting data must 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.

3. *Engineer's Initial Review*: Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal. If in its discretion Engineer concludes that additional supporting data is needed before conducting a full review and making a decision regarding the Change Proposal, then Engineer may request that Contractor submit such additional supporting data by a date specified by Engineer, prior to Engineer beginning its full review of the Change Proposal.

4. *Engineer's Full Review and Action on the Change Proposal*: Upon receipt of Contractor's supporting data (including any additional data requested by Engineer), Engineer will conduct a full review of each Change Proposal and, within 30 days after such receipt of the Contractor's supporting data, either approve the Change Proposal in whole, deny it in whole, or approve it in part and deny it in part. Such actions must 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.

5. *Binding Decision*: Engineer's decision is final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.

C. *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 in writing that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice will be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

D. *Post-Completion*: Contractor shall not submit any Change Proposals after Engineer issues a written recommendation of final payment pursuant to Paragraph 15.06.B.

11.10 *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 are subject 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;

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; and

4. Subject to the waiver provisions of Paragraph 15.07, any dispute arising after Engineer has issued a written recommendation of final payment pursuant to Paragraph 15.06.B.

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 rests with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, 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 will 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 will 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 will 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 will 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 will 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 will 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 will be incorporated in a Change Order or other written document 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. When needed 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 will be in amounts no higher than those commonly incurred in the locality of the Project, will not include any of the costs itemized in Paragraph 13.01.C, and will 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 in advance of the subject Work. Such employees include, without limitation, superintendents, foremen, safety managers, safety representatives, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work will be apportioned on the basis of their time spent on the Work. Payroll costs include, but are not limited to, salaries and wages plus the cost of fringe benefits, which include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, 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, will 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 accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts will accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment will 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, which 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 will 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 or retained for services specifically related to the Work.

5. Other costs consisting of 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, 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.

1) In establishing included costs for materials such as scaffolding, plating, or sheeting, consideration will be given to the actual or the estimated life of the material for use on other projects; or rental rates may be established on the basis of purchase or salvage value of such items, whichever is less. Contractor will not be eligible for compensation for such items in an amount that exceeds the purchase cost of such item.

c. *Construction Equipment Rental*

1) Rentals of all construction equipment and machinery, and the parts thereof, in accordance with rental agreements approved by Owner as to price (including any surcharge or special rates applicable to overtime use of the construction equipment or machinery), and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs will be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts must cease when the use thereof is no longer necessary for the Work.

2) Costs for equipment and machinery owned by Contractor or a Contractor-related entity will be paid at a rate shown for such equipment in the equipment rental rate book specified in the Supplementary Conditions. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs.

3) With respect to Work that is the result of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price ("changed Work"), included costs will be based on the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, must cease to accrue when the use thereof is no longer necessary for the changed 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 builder's risk or other property insurance established in accordance with Paragraph 6.04), 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 include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses will 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 does not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals, general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.

2. The cost of purchasing, renting, or furnishing small tools and hand tools.

3. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

4. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

5. 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.

6. Expenses incurred in preparing and advancing Claims.

7. 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*

1. When the Work as a whole is performed on the basis of cost-plus-a-fee, then:

a. Contractor's fee for the Work set forth in the Contract Documents as of the Effective Date of the Contract will be determined as set forth in the Agreement.

b. for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work, Contractor's fee will be determined as follows:

1) When the fee for the Work as a whole is a percentage of the Cost of the Work, the fee will automatically adjust as the Cost of the Work changes.

2) When the fee for the Work as a whole is a fixed fee, the fee for any additions or deletions will be determined in accordance with Paragraph 11.07.C.2.

2. When the Work as a whole is performed on the basis of a stipulated sum, or any other basis other than cost-plus-a-fee, then Contractor's fee for any Work covered by a Change

Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work will be determined in accordance with Paragraph 11.07.C.2.

E. *Documentation and Audit*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor and pertinent Subcontractors will establish and maintain records of the costs in accordance with generally accepted accounting practices. Subject to prior written notice, Owner will be afforded reasonable access, during normal business hours, to all Contractor's accounts, records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda, and similar data relating to the Cost of the Work and Contractor's fee. Contractor shall preserve all such documents for a period of three years after the final payment by Owner. Pertinent Subcontractors will afford such access to Owner, and preserve such documents, to the same extent required of Contractor.

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 for any of the foregoing will be valid.

C. *Owner's Contingency Allowance*: Contractor agrees that an Owner's 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 for Work covered by allowances, and the Contract Price will 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 for Work the Engineer has observed or as can reasonably be measured after completion. The 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, and the final adjustment of Contract Price will be set forth in a Change Order, subject to the provisions of the following paragraph.

E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:

a. the quantity of the item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and

b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.

2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.

3. Adjusted unit prices will apply to all units of that item.

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 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 with such procedures and programs 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 will 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 will 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 will 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 written 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 will 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 additional 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, 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 will 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 defective Work as required by Engineer, then Owner may, after 7 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 for 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.

2. 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 must also be accompanied by: (a) a bill of sale, invoice, copies of subcontract or purchase order payments, or other documentation

establishing full payment by Contractor for the materials and equipment; (b) at Owner's request, documentation warranting that Owner has received the materials and equipment free and clear of all Liens; and (c) 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.

3. Beginning with the second Application for Payment, each Application must include an affidavit of Contractor stating that all previous progress payments received by Contractor have been applied to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

4. 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;

    b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto;

    c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work;

    d. to make any examination to ascertain how or for what purposes Contractor has used the money paid by Owner; 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 based on Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages resulting from 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 has occurred that would constitute a default by Contractor and therefore justify a termination for cause;

j. Liquidated or other 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; or

l. Other items entitle 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 will 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 will be treated as an amount due as determined by Paragraph 15.01.D.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 7 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 will 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 7 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 15.03.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 6.04 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 7.12), and other documents, Contractor may make application for final payment.
2. The final Application for Payment must 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 duly pending Change Proposals and Claims; 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 Final Application and Recommendation of Payment*: 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 10 days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the final Application for Payment to Owner for payment. Such recommendation will 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. 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. *Notice of Acceptability*: In support of its recommendation of payment of the final Application for Payment, Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to stated limitations in the notice and to the provisions of Paragraph 15.07.

D. *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 and issuance of notice of the acceptability of the Work.

E. *Final Payment Becomes Due*: Upon receipt from Engineer of the final Application for Payment and accompanying documentation, Owner shall set off against the amount recommended by Engineer for final payment any further sum to which Owner is entitled, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions of this Contract with respect to progress payments. Owner shall pay the resulting balance due to Contractor within 30 days of Owner's receipt of the final Application for Payment from Engineer.

15.07 *Waiver of Claims*

A. By making final payment, Owner waives its claim or right to liquidated damages or other damages for late completion by Contractor, except as set forth in an outstanding Claim,

appeal under the provisions of Article 17, set-off, or express reservation of rights by Owner. Owner reserves all other claims or rights after final payment.

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 as a Claim, 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 Supplementary Conditions or the terms of any applicable special guarantee required by the Contract Documents), Owner gives Contractor written notice that any Work has been found to be defective, or that Contractor's repair of any damages to the Site or adjacent areas has been found to be defective, then after receipt of such notice of defect 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 adjacent areas;
2. correct such defective Work;
3. remove the defective Work from the Project and replace it with Work that is not defective, if the defective Work has been rejected by Owner, 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 from the corrective measures.

B. Owner shall give any such notice of defect within 60 days of the discovery that such Work or repairs is defective. If such notice is given within such 60 days but after the end of the correction period, the notice will be deemed a notice of defective Work under Paragraph 7.17.B.

C. If, after receipt of a notice of defect within 60 days and within the correction period, 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 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). Contractor's failure to pay such costs, losses, and damages within 10 days of invoice from Owner will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the failure to pay.

D. 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.

E. 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.

F. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph are not to 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 directly attributable to any such suspension. Any Change Proposal seeking such adjustments must 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) 10 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) written 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 7 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 will govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate for Convenience*

A. Upon 7 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 for any loss of anticipated profits or revenue, post-termination overhead costs, 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 7 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, 7 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, pursuant to Article 12; and

2. Disputes between Owner and Contractor concerning the Work, or obligations under the Contract Documents, that arise 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;

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 requires the giving of written notice to Owner, Engineer, or Contractor, it will be deemed to have been validly given only if delivered:

1. in person, by a commercial courier service or otherwise, to the recipient's place of business;

2. by registered or certified mail, postage prepaid, to the recipient's place of business; or

3. by e-mail to the recipient, with the words "Formal Notice" or similar in the e-mail's subject line.

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 will not constitute a waiver of that provision, nor will 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 of the Contract or 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 *Assignment of Contract*

A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party to this Contract of any rights under or interests in the Contract will be binding on the other party without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract.

18.09 *Successors and Assigns*

A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

18.10 *Headings*

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

END OF SECTION

SECTION 00 73 00

SUPPLEMENTARY CONDITIONS

1.01 PART I - AMENDMENTS TO GENERAL CONDITIONS

A. These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract (EJCDC Document No. C-700, 2018 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.

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

SC-1.01A.30.

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

The "Owner" shall mean the Town of Yarmouth, Massachusetts.

SC-1.01A.39.

A. Delete paragraph 1.01A.39. of the General Conditions in its entirety and replace with the following:

39. Specifications – This includes Specification Sections under Division 01 through Division 35 of the Project Manual.

SC-1.01A.42.

A. Insert the following at the beginning of the definition after the words "*The time at……*"

which the Work required by the Contract has been completed except for work having a Contract Price of less than one per cent of the then adjusted total contract price, or

ARTICLE 3 - DOCUMENTS: INTENT, REQUIREMENTS, REUSE

SC-3.01A.

A. Delete Paragraph 3.01A. of the General Conditions in its entirety and replace with the following:

A. The Contract Documents are complementary, and what is called for by any one document shall be as binding as if called for by all. In the event of any conflict or inconsistency between the provisions of the AGREEMENT and the provisions of any of the other Contract Documents, the provisions of the AGREEMENT shall prevail.

SC-3.01G.

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

H. 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-4.03A.

A. Add the following new paragraph immediately after Paragraph 4.03A. of the General Conditions which is to read as follows:

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

SC-4.01.

A. Add the following new paragraph immediately after Paragraph 4.01A. to read as follows:

4.01B. The Effective Date of the Contract shall be June 1, 2024.

SC-4.04A.2.

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

4.04A.3. The Contractor's resident superintendent shall attend monthly progress meetings at the site of the work with the Engineer and others as appropriate to review schedule status and such other pertinent subjects as may be listed on the agenda by the Engineer."

SC- 4.05A.

A. Delete Paragraph 4.05A. of the General Conditions in its entirety.

ARTICLE 5 - SITE; SUBSURFACE AND PHYSICAL CONDITIONSHAZARDOUS ENVIRONMENTAL CONDITIONS

SC-5.01C.

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

D. Should the Owner be prevented or enjoined from proceeding with the Work, or from authorizing its prosecution, either before or after the commencement, by reason of any litigation, or by reason of its inability to procure any lands or rights-of-way for the Work, Contractor shall not be entitled to make or assert claim for damage by reason of said delay, or to withdraw from the Agreement except by consent of Owner. Time for completion of the Work will be extended as provided in Article 11, to such a time as Owner determines will compensate for the time lost by such delay.

SC-5.01B.

A. Delete Paragraph 5.01B. of the General Conditions in its entirety.

SC-5.03A.1.

A. Delete Paragraph 5.03A.1. of the General Conditions in its entirety and replace with:

1. Geotechnical Report as included in the Attachments.

SC-5.03A.2. and A.3.

A. No other reports or drawings are known to exist. Delete paragraphs 5.03A.2. and A.3. of the General Conditions in their entirety.

SC-5.04E.4.

A. Add the following new paragraph immediately after paragraph 5.04E.4. of the General Conditions which is to read as follows:

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

SC-5.05B.

A. Delete the following phrase in paragraph 5.05B. of the General Conditions following the words "*indicated on the Drawings,*":

"or was not shown or indicated with reasonable accuracy,"

SC-5.06A

A. Delete paragraph 5.06A.1, 5.06A.2, 5.06A.3.

Add 5.06A 1. There are no hazardous environmental reports that are known to the Owner. SC-5.06B

A. Delete paragraph 5.06B in its entirety.

SC-5.06C.

A. Add the following at the end of Paragraph 5.06C. of the General Conditions:

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

SC-5.06E.

A. Delete the second and third sentences of Paragraph 5.06E. of the General Conditions.

SC-5.06I.

A. Delete Paragraph 5.06I. of the General Conditions in its entirety.

ARTICLE 6 - BONDS AND INSURANCE

SC-6.02D.

A. Add the following paragraphs immediately after Paragraph 6.02D. of the General Conditions which are to read as follows:

E. Contractor shall provide evidence of its insurance coverage on the ACORD certificate of insurance form and shall include the following statement in its entirety in the section of the form entitled "Description of Operations/Locations/Vehicles/Special Items".

The Town of Yarmouth, Massachusetts and BETA Group, Inc., and their officers, directors, partners, employees and other consultants and subcontractors are named as additional insureds with respect to the insured's Commercial General Liability, Automobile Liability and Pollution Liability Insurance Policies. All insurers waive all rights of subrogation against the Town of Yarmouth, Massachusetts and BETA Group, Inc., their officers, directors, partners, employees and other consultants and subcontractors. All insurance is primary for all claims covered thereby. Commercial General Liability Insurance includes contractual liability coverage.

B. Renumber Paragraphs E through N accordingly.

SC-6.02E.

A. Delete original Paragraph 6.02E. of the General Conditions in its entirety.

SC-6.02N.

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

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

SC-6.03C.

A. Add the following paragraphs immediately after paragraph 6.03C. of the General Conditions.

a. 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 the law:

1. *Workers' Compensation and related coverages: In accordance with the Workers Compensation Laws that are applicable to the employees engaged in the Work. Employers Liability Insurance shall not be less than $500,000 each occurrence.*

2. *Comprehensive commercial general liability insurance with limits of at least $1 Million per occurrence and $3 Million annual aggregate for property damage and $1 Million per person and $3 Million per occurrence for bodily injury, which shall cover bodily injury, sickness or disease, or death of any person including employees and those persons other than the Contractor's employees, and claims insured by usual personal liability coverage, death, or property damage arising out of the Work including injury or destruction of tangible property, including loss of use resulting therefrom.*

3. *Comprehensive Automobile Liability Motor vehicle insurance for any motor vehicles used in performing the Work, with limits of at least $500,000 per person, and $1 Million per accident.*

4. *Professional Liability Insurance of $1 million per claim and $3 million aggregate.*

5. *Umbrella or Excess Liability: Contractor shall provide an Umbrella insurance policy for at least $3,000,000 per occurrence and $3,000,000 aggregate.*

ARTICLE 7 - CONTRACTOR'S RESPONSIBILITIES

SC-7.03C.

A. Add the following new paragraphs immediately after Paragraph 7.03C. of the General Conditions which are to read as follows:

A. Regular working hours are defined as 8 hours per day, Monday through Friday, excluding holidays, between the hours of 7:00 AM and 4:00 PM. Requests to work other than regular working hours shall be submitted to Engineer not less than 48 hours prior to any proposed weekend work or scheduled extended work weeks. Occasional unscheduled overtime on weekdays may be permitted provided two hours' notice is given to Engineer.

B. Contractor shall reimburse the Owner for additional engineering and/or inspection costs incurred as a result of overtime work in excess of the regular working hours stipulated in Paragraph SC-7.02C. At Owner's option, overtime costs may either be deducted from the Contractor's monthly payment request or deducted from the Contractor's retention prior to release of final payment. Overtime costs for the Owner's personnel shall be based on the individual's current overtime wage rate. Overtime costs for personnel employed by the Engineer or Owner's independent testing laboratory shall be calculated in accordance with the terms of their respective contracts with the Owner.

C. This Agreement is subject to the applicable provisions of the Contract Work Hours and Safety Standards Act, Public Law 87-581, 87th Congress. No Contractor or Subcontractor contracting for any part of the Work shall require or permit any laborer or mechanic to be employed on the Work in excess of forty hours in any work week unless such laborer or mechanic receives compensation at a rate not less than one and one-half times that person's basic rate of pay for all hours worked in excess of forty hours in such work week.

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

E. Contractor and Subcontractors shall, insofar as practicable, give preference in the hiring of workers for the Project to qualified local residents with first preference being given to citizens of the United States who have served in the armed forces of the United States and have been honorably discharged therefrom or released from active duty therein.

F. Contractor and all subcontractors shall comply with the Commonwealth of Massachusetts Prevailing Wage laws.

SC-7.05A.

A. Insert the following at the end of the third sentence of Paragraph 7.05A. of the General Conditions:

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

B. Add a new paragraph SC-7.05A.1.c immediately after paragraph 7.05A.1.b of the General Conditions, which is to read as follows:

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

SC-7.06A.

A. Add the following to Paragraph 7.06A. of the General Conditions:

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

SC-7.07I.

A. Add the following new sentence at the end of Paragraph 7.07I. of the General Conditions to read as follows:

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

SC-7.08B.

A. Delete Paragraph 7.08B. of the General Conditions in its entirety.

SC-7.10A.

A. Add the following new sentences at the end of Paragraph 7.10A. of the General Conditions to read as follows:

The materials and supplies to be used in the Work of this Contract are exempt from the Sales and Use Tax of the Commonwealth of Massachusetts. Contractor shall obtain the proper certificates, maintain the necessary records, and otherwise comply with the requirements of Chapter 14 of the Acts of 1966 and any amendments thereto.

SC-7.11C.

A. Delete the last sentence of Paragraph 7.11C. of the General Conditions in its entirety.

SC-7.12A.

A. Insert the following new paragraphs immediately after Paragraph 7.12A. of the General Conditions:

A. The Contractor shall return to the Engineer one set of the Contract Drawings marked in colored pencil, as Record Drawings, showing all changes made during construction and including the location, by dimensions and elevations, of installed equipment, and underground facilities that will become concealed or buried by the construction. This shall include ties to all concealed work, etc. measured from permanent structures. Additionally, the Contractor shall be required to keep these marked-up drawings current and on site and shall provide mark-ups to the Owner on a monthly basis.

B. Interim As-Built documentation (Record Drawings) of the improvements constructed within the park entrance drive as defined per the delineated Land & Water Conservation Fund (LWCF) Area shall be provided to the Engineer by March 15, 2025.

C. The CONTRACTOR shall comply with all applicable provisions of Chapter 30, Section 39R of the Massachusetts General Laws regarding Contractor's records."

SC-7.15A.

A. Delete the last sentence in Paragraph 7.15A. of the General Conditions in its entirety and replace with the following:

If Engineer determines that the incident giving rise to the emergency action was not the responsibility of the Contractor and that a change in the Contract Document is required because of the action taken by the Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

SC 7.16A.3.

A. Add the following new paragraph immediately after Paragraph 7.16A.3. of the General Conditions which is to read as follows:

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

SC-7.17A.

A. Add the following new paragraph immediately after Paragraph 7.17A. of the General Conditions which is to read as follows:

The Contractor guarantees that the Work and Services to be performed under the Contract, and all workmanship, materials and equipment performed, furnished, used or installed in

the construction of the same shall be free from defects and flaws, and shall be performed and furnished in strict accordance with the Drawings, Specifications, and other Contract Documents, that the strength of all parts of all manufactured equipment shall be adequate and as specified and that the performance test requirements of the Contract shall be fulfilled. This guarantee shall be for a period of one year from and after the date of substantial completion. If part of the Work is accepted in accordance with Paragraph 15.04 of the General Conditions, the guarantee for that part of the Work shall be for a period of one year from the date fixed for such acceptance.

If at any time within the said period of guarantee any part of the Work requires repairing, correction or replacement, the Owner may notify the Contractor in writing to make the required repairs, correction, or replacements. If the Contractor neglects to commence making such repairs, corrections, or replacements to the satisfaction of the Owner within seven (7) days from the date of receipt of such notice or having commenced fails to prosecute such Work with diligence, the Owner may employ other persons to make said repairs, correction or replacements, and charge the costs, including compensation for additional professional services, to the Contractor.

The Contractor's guarantee under Paragraphs 7.17A. and 7.17B., is in addition to the Contractor's express or implied warranties under this Contract and State law and in no way diminish any other rights that the Owner may have against the Contractor.

SC-7.17B., C., D. and E.

A. Renumber Paragraphs 7.17B., 7.17C, 7.17D. and 7.17E of the General Conditions to read 7.17C., 7.17D., 7.17E. and 7.17F.

SC-7.17F.

A. Add the following new paragraph immediately after Paragraph 7.17F. of the General Conditions which is to read as follows:

A. Manufacturer's Guaranty/Warranty

The Contractor shall obtain the following guaranty/warranty from the manufacturer of all major pieces of equipment furnished and installed on this Project. Such guaranty/warranty shall be for the benefit of Owner and be furnished in writing by the manufacturer. The Contractor's and manufacturer's obligations under this provision are in addition to other express or implied warranties under the Contract Documents and under the law and in no way diminish any other right that the Owner may have against the Contractor or manufacturer for faulty material, equipment, or work. The warranty period shall not be interpreted as a limitation on the time in which the Owner can enforce such other duties, obligations, rights, or remedies.

The manufacturer warrants and guarantees for a period of one year from the date of Substantial Completion, or such longer period that may be specified in the Contract Documents, that all materials and equipment furnished and installed shall be free from flaws, defects in material and workmanship and shall be in conformance with the Contract Documents.

SC-7.18A.

A. Delete Paragraph 7.18A. of the General Conditions in its entirety and replace with the following:

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 defend, indemnify and hold harmless Owner, 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 or 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; and is caused in whole or in part by any 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, regardless of whether or not caused in part by any negligence or omission of an individual or entity indemnified hereunder or whether liability is imposed upon such indemnified party by Laws and Regulations regardless of the negligence of any such indemnified party unless caused by the sole negligence of a party indemnified hereunder. If through the 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 and/or Engineer, or the officers, directors, members, partners, employees, agents, consultants and subcontractors of each on account of any damage alleged to have been sustained, Owner shall notify Contractor, who shall defend, indemnify and save harmless Owner, Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each against any such claims.

SC-7.19G.

A. Add the following new paragraph immediately after Paragraph 7.19G. of the General Conditions which is to read as follows:

A. Contractor shall comply with all applicable provisions of Chapter 30, Section 39R of the Massachusetts General Laws regarding Contractor's records which is included in PART II of the Supplementary Conditions.

ARTICLE 8 OTHER WORK PERFORMED AT THE SITE

A. Add the following at the end of Paragraph 8.01A of the General Conditions :

1. The Owner will be moving forward in the fall of 2024 with the construction of a wastewater Pump Station at the northern end of the park, east of the entrance drive and adjacent to Rte. 28. The Bidder shall meet regularly and coordinate site work, site access and deliveries, and trucking of materials into and out of the site as well as utility, stormwater, site lighting and landscape improvements in this area with the Town's selected Contractor.

2. The Owner operates a shellfish upweller adjacent to the Parkers River. Access to the upweller via pickup truck is required yearly from May to November to allow for the care and development of the shellfish. Electric power and water shall be supplied at all times during this same period. Interruptions not exceeding an hour in duration may be allowable with prior written notice. Short-term restriction of access may be allowed under the same conditions.

3. The Owner anticipates bidding Phase 2, consisting of the construction of a park restroom facility with limited site improvements in 2024. This phase of work will occur within the footprint of Phase 1 as indicated in the plans. The Contractor shall coordinate the improvements and provide the Contractor responsible for the construction of Phase 2 the necessary site access during construction and not restrict Phase 2 work from proceeding.

4. The Contractor shall coordinate with third party utility Eversource Energy. Eversource will bring primary electrical power service across Route 28 into the site. The Contractor will install on-site conduits, electrical manholes, handholes, conduits, with primary conductor wiring and new transformer to be furnished and installed by Eversource) mounted on Contractor furnished and installed transformer pad. The Contractor shall coordinate, furnish and install the adjacent communications conduits with pull cords for use by others.

ARTICLE 9. OWNER'S RESPONSIBILITIES

SC-9.06

A. Delete Paragraph 9.06 of the General Conditions in its entirety.

ARTICLE 10 - ENGINEER'S STATUS DURING CONSTRUCTION

SC-10.03B.

A. Add the following new paragraph immediately after Paragraph 10.03B. of the General Conditions which is to read as follows:

B. *10.03C. The Owner shall appoint a Project Representative to facilitate review of the Project, working with the Engineer at the Site and or assisting the Engineer in observing the progress and quality of the Work.*

SC 10.04

A. Add the following new paragraph immediately after 10.04 E.

B. *10.04F.The Owner may designate a Owner's Representative to make visits to the site to familiarize the Town generally with the progress and quality of the work, and to determine in general if the work is proceeding in accordance with the Contract Documents. The Owner's Representative will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the work and will not be responsible for the Contractor's failure to carry out the construction work in accordance with the Contract Documents. During such visits and on the basis of these observations while at the site, the Owner's Representative will keep the Town informed on the progress of the work, will endeavor to guard the Town against defects and deficiencies in the work of contractors, and may condemn structural work as failing to conform to the Contract Documents. The Owner's Representative shall have authority to act on behalf of the Town only to the extent expressly delegated by the Town, which shall be shown to the Contractor, and shall have authority acting in the capacity of the Owner to stop the work whenever such stoppage may reasonably be necessary to insure the proper execution of the Contract.*

SC 10.08

A. Add the following new paragraph after 10.08.A

B. *10.08B. Neither the Engineer or the Project Representative shall not be responsible for construction methods, means, techniques, sequences, or procedures employed by the Contractor or the Contractor's safety programs, requirements, regulations, or precautions.*

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

SC-13.01B.1.

A. Delete the second sentence in paragraph 13.01B.1. of the General Conditions in its entirety and replace with the following:

Such employees shall include foremen at the site.

SC-13.02

A. Delete Paragraph 13.02 of the General Conditions in its entirety.

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

SC-14.06A.

A. Add the following new paragraph immediately after Paragraph 14.06A. of the General Conditions which is to read as follows:

1. If Owner stops Work under Paragraph 14.06A. Contractor shall not be entitled to any extension of Contract Time or increase in Contract Price.

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

SC-15.01B.4.

A. Add the following new paragraph immediately after paragraph 15.01B.4 of the General Conditions which is to read as follows:

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

SC-15.01C.1.

A. Delete paragraph 15.01C.1. of the General Conditions in its entirety and replace with the following:

1. Progress Payments will be made in accordance with Massachusetts General Law Chapter 30, Section 39K, which is included in PART II of these Supplementary Conditions.

SC-15.02A.

A. Add the following new paragraphs immediately after Paragraph 15.02A. of the General Conditions which are to read as follows:

1. No materials or supplies for the Work shall be purchased by Contractor or Subcontractor subject to any chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller. Contractor warrants that Contractor has good title to all materials and supplies used by Contractor in the Work, free from all liens, claims or encumbrances.

2. Contractor shall defend, indemnify, and save Owner and Engineer harmless from all claims growing out of the lawful demands of Subcontractors, laborers, workmen, mechanics, materialmen, and furnishers of machinery and parts thereof, equipment, power tools, and all supplies, including commissary, incurred in the furtherance of the performance of this Contract. Contractor shall at Owner's request, furnish satisfactory evidence that all obligations of nature hereinabove designated have been paid, discharged, or waived. If Contractor fails to do so, then Owner may, after having served written notice on the said Contractor either pay unpaid bills, of which Owner has written notice, direct, or withhold from the Contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to Contractor shall be resumed, in accordance with the terms of this Contract, but in no event shall the provisions of this sentence be construed to impose any obligations upon Owner to either Contractor or Contractor's Surety. In paying any unpaid bills of the Contractor, Owner shall be deemed the agent of Contractor and any payment so made by Owner shall be considered as payment made under the Contract by Owner to Contractor and Owner shall not be liable to Contractor for any such payment made in good faith.

SC-15.03F.

A. Add the following new paragraph after paragraph 15.03F. of the General Conditions.:

The following Milestone dates apply to this Contract, in addition to the Final Completion:

1. *Work below the Mean High-Water Mark (MHW) on the surface of the salt marsh shall be conducted between October 15, 2024, and February 14, 2025.*

2. *Work below the Mean High-Water Mark within the Parker's River may be conducted between June 15, 2024 and February 15, 2025. Work may resume after June 15, 2024 and is allowed to project completion but may be no later than February 15, 2025.*

3. *All work on the surface of the salt marsh must be completed between October 15, 2024 and April 1, 2025.*

4. *Land & Water Conservation Fund (LWCF) Grant: For underground utility and site improvements generally occurring from Rte. 28 to the Northern Cul-De Sac. Improvements within the identified as the Land & Water Conservation Grant Area limits are as shown on the Construction Sequencing Plans. Work in the delineated LWCF Area must be completed by February 28, 2025.*

5. *Parkland Acquisitions and Renovations for Communities (PARC) Grant: For the construction of specific park improvements. Area limits are shown on the Construction Sequencing Plans. The Bidder shall make note the grant applies to the nature-based play area as well as adjacent perimeter improvements consisting of porous pavement parking areas inclusive of the reservoir course, site lighting adjacent to the parking lot, and tree plantings (Project Wide).*
   The work associated with the PARC Grant shall be completed by April 30, 2025, for inclusion in May 2025 Contractor's Application for Payment. Third party compliance inspection of the completed work will occur prior to June 2, 2025.

6 Massachusetts Seaport Economic Council Grant For the construction of general park improvements. Completion of park elements aligned with the grant value shall occur by June 30, 2025.

SC-15.06B.

A. Delete paragraph 15.06B. of the General Conditions in its entirety and replace with the following:

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 - all as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will indicate in writing Engineer's recommendation of payment and present the Application to Owner for payment. Thereupon Engineer will give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of

paragraph 15.07. Otherwise, Engineer will return the Application 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. If the Application and accompanying documentation are appropriate as to form and substance, Owner shall in accordance with the applicable Massachusetts General Law, pay Contractor the amount recommended by Engineer.

ARTICLE 16 - SUSPENSION OF WORK AND TERMINATION

SC-16.01A.

A. Delete Paragraph 16.01A. of the General Conditions in its entirety and replace with the following:

1. 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 included in PART II of the Supplementary Conditions.

SC-16.02A.4.

A. Add the following new paragraph immediately after paragraph 16.02.A.4 of the General Conditions which is to read as follows:

1. 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-17.01B.1.

A. Delete paragraph 17.01B.1. of the General Conditions in its entirety and replace with the following:

1. All claims, disputes and other matters in question arising out of, or relating to, the Contract Documents or the breach thereof, except for claims that have been waived by the making and acceptance of final payment as provided in Article 15, shall be entered into a court of competent jurisdiction with the Commonwealth of Massachusetts.

SC-17.01B.3.

A. Add a new paragraph immediately after paragraph 17.01B.3. of the General Conditions which is to read as follows:

1. Contractor shall carry on the Work and maintain the progress schedule during any disputes and other matters in question arising out of, or relating to, the Contract Documents or the breach thereof, unless otherwise mutually agreed in writing.

ARTICLE 18 - MISCELLANEOUS

SC-18.01A.

A. Add the following new paragraph immediately after Paragraph 18.01A. of the General Conditions which are to read as follows:

1. Addresses: Both the address given in the Bid Form upon which this Agreement is founded, and Contractor's office at or near the site of the Work are hereby designated as places to either of which notices, letters, and other communications to Contractor shall be certified, mailed, or delivered. The delivering at the above-named place or depositing in a postpaid wrapper directed to the first-named place, in any post office box regularly maintained by the post office department, of any notice, letter or other communication to Contractor shall be deemed sufficient service thereof upon Contractor; and the date of said service shall be the date of such delivery or mailing. The first-named address may be changed at any time by an instrument in writing, executed and acknowledged by Contractor, and delivered to Owner and Engineer. Nothing herein contained shall be deemed to preclude or render inoperative the service of any notice, letter, or other communication upon Contractor personally.

SC-18.10

A. Add the following new paragraphs after 18.10 as follows:

18.11. Wage Rates:

A. 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. A copy of the wage rate schedule is included in PART II of these Supplementary Conditions. If, after the Notice of Award, it becomes necessary to employ any person in a trade or occupation not classified in the wage determinations, such person shall be paid at not less than such rates as shall be determined by the officials administrating 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. Contractor shall notify Owner of Contractor's intention to employ persons in trades or occupations not classified in sufficient time for Owner to obtain approved rates for such trades or occupations.

B. The schedule 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 between Contractor and employees of Contractor in regard to the payment of wages in excess of these specified in the schedule shall be resolved by Contractor.

C. The said schedule of wages shall continue to be the minimum rates to be paid during the life of this Agreement and a legible copy of said schedule shall be kept posted in a conspicuous place at the site of the work.

SC-18.12

A. Add the following paragraphs after Article 18 of the General Conditions as follows:

PART II – STATE, LOCAL AND OTHER GOVERNMENT PROVISIONS

ARTICLE 19 – State and Local Government Provisions

A. *State and Local Government Provisions 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 3.01F of the Supplementary General Conditions.*

B. *1.0. COMMONWEALTH OF MASSACHUSETTS PROVISIONS*

1.1. 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.

1.2. Massachusetts General Laws

1.2.1. Chapter 30, Section 39F

1.2.2. Chapter 30, Section 39I

1.2.3. Chapter 30, Section 39J

1.2.4. Chapter 30, Section 39K

1.2.5. Chapter 30, Section 39L

1.2.6. Chapter 30, Section 39M

1.2.7. Chapter 30, Section 39N

1.2.8. Chapter 30, Section 39O

1.2.9. Chapter 30, Section 39P

1.2.10. Chapter 30, Section 39Q

1.2.11. Chapter 30, Section 39R

1.2.12. Chapter 30, Section 39S

1.2.13. Chapter 82, Sections 40 and 40A through 40E

1.2.14. Chapter 82A, Section 1

1.3. State Wage Rates

ARTICLE 20 – Federal Government Provisions

A. **Federal Government Provisions 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 3.01F of the General Conditions**

B. **Owner and Contractor agree that the following Federal Provisions apply to the work to be performed under this Contract.**

1. **Federal Minimum Wage Rates as determined by the United States Department of Labor under the Davis-Bacon Act also apply to this project.**

2. **Disadvantaged Business Enterprise (MBE/WBE): Bidders shall demonstrate compliance with the Code of Federal Regulations (CRF) regarding 2 CFR Part 200, Section 200.321, regarding non-federal entity contracting with small and minority businesses (MBE) and women's business enterprises (WBE) and labor surplus area firms. The Bidder shall demonstrate affirmative steps as outlined in CFR 200.321 and shall provide evidence of affirmative steps for MBE/WBE inclusion which must include:**
    a. **Solicitation of qualified small and minority businesses and women's business enterprises.**
    b. **Demonstration that small and minority businesses, and women's business enterprises were solicited whenever they are potential sources.**
    c. **Demonstration of that when economically feasible, the project was structured with divisions into smaller tasks or quantities to permit maximum participation by small and minority businesses, and women's business enterprises.**
    d. **Demonstration that delivery schedules, where the project requirement permits, encourage participation by small and minority businesses, and women's business enterprises.**
    e. **Demonstration of use of the services and assistance, as appropriate, of such organizations as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce**
3. **The Apparent Low Bidder shall provide written documentation of affirmative steps regarding outreach efforts and the inclusion of Disadvantaged Enterprises per 2 CRF Part 200, Section 200.321 within the project. Such documentation shall be furnished to the Owner within five (5) days of the bid opening.**

4. **Bidders shall adhere to the contract provisions required under 2 CFR Part 200 Appendix II to Part 200 – Contract Provisions for Non-Federal Entity Contracts Under Federal Awards, including compliance with the provisions of 2 CFR § 200.322 through 200.323 which requires, to the greatest extent practicable, a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products) and compliance with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. The requirements of Section 6002 include procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the**

purchase price of the item exceeds $10,000 or the value of the quantity acquired during the preceding fiscal year exceeded $10,000; procuring solid waste management services in a manner that maximizes energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.

5. **Contractor's attention is called to the need to adhere to the requirements of the Coronavirus State Fiscal Recovery Fund (FRF) Contract Addendum to the Supplemental Conditions**, as attached to these Supplemental Conditions.

END OF SECTION 00 73 00

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00 73 00 SUPPLEMENTARY CONDITIONS

ATTACHMENT

FRF CONTRACT ADDENDUM

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Coronavirus State Fiscal Recovery Fund (FRF) Contract Addendum

(Assistance Listing Number 21.027)

Notice: The contract, agreement, statement of work, or purchase order ("Contract") between the TOWN OF YARMOUTH ("Contractor") and the Executive Office of Energy and Environmental Affairs to which this addendum is attached or otherwise incorporated is funded, in whole or in part, using federal assistance provided to the Commonwealth of Massachusetts by the U.S. Department of the Treasury under Section 9901 of the American Rescue Plan Act of 2021 ("ARPA"), which established the Coronavirus State Fiscal Recovery Fund ("FRF").

In accordance with ARPA, the U.S. Department of the Treasury's regulations implementing the FRF (31 CFR Part 35), the Award Terms and Conditions, and the Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards, 2 C.F.R. Part 200, the following terms and conditions apply to the Contractor in connection with its performance of the Contract.

These terms and conditions are in addition to, and in no way limit or alter, the other terms, conditions, rights, and remedies set forth in or applicable to the Contract, including those set forth in the Commonwealth of Massachusetts Standard Contract Form and Commonwealth Terms and Conditions. In the event of any conflict among the requirements applicable to the Contract, the most stringent requirements will apply.

1. **Eligible Costs.**
    a. The Contractor agrees to incur only those costs that are necessary, reasonable, and directly allocable for the purpose of completing the contracted project or program.
    b. Indirect costs are not an eligible use of funds received under this Contract.
    c. Costs may be incurred only during the period of this Contract.

2. **Financial Management.**
    a. Contractor may not deviate significantly from its established policies and practices regarding the incurrence of costs.

3. **Suspension and Debarment (Executive Orders 12549 and 12689).**
    a. This Contract is funded through payments received by the Commonwealth of Massachusetts from the FRF. FRF funds are subject to 2 CFR Part 200 and U.S. Department of the Treasury's implementing regulations at 31 CFR Part 19. The Contract is a covered transaction for purposes of such regulations.
    b. As such, the Contractor is required to verify, and by executing this Contract the Contractor hereby certifies, that neither it nor any of the Contractor's principals are excluded, disqualified, or otherwise ineligible (as such terms are defined at 31 CFR Part 19, Subpart I) for participation in a covered transaction. Such parties are ineligible if listed on the government-wide Excluded Parties List System in the System for Award Management (SAM) in accordance with 2 CFR Part 180 and U.S. Department of the Treasury's implementing regulations at 31 CFR Part 19 that implement Executive Orders 12549 and 12689, "Debarment and Suspension."

c. The Contractor must comply with 31 CFR Part 19, subpart C, and shall include a requirement to comply with these requirements in any lower tier covered transaction it enters into under this award.
d. The Contractor shall have an ongoing duty during the term of this Contract to disclose to the Executive Office of Energy and Environmental Affairs on an ongoing basis any occurrence that would prevent the Contractor from making the certifications contained in this Section 1. Such disclosure shall be made in writing to the Executive Office of Energy and Environmental Affairs within five (5) business days of when the Contractor discovers or reasonably believes there is a likelihood of such occurrence. This certification is a material representation of fact relied upon by the Executive Office of Energy and Environmental Affairs. If it is later determined that the Contractor did not comply with 31 CFR Part 19, subpart C, in addition to remedies available to the Executive Office of Energy and Environmental Affairs, the Federal government may pursue available remedies, including but not limited to suspension and/or debarment.

4. Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment (2 CFR § 200.216).

a. Pursuant to 2 CFR §200.216, the Executive Office of Energy and Environmental Affairs is prohibited from using FRF funds to procure, obtain, or enter into a contract (or extend or renew a contract) to procure or obtain equipment, services, or systems that use covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system.
b. As described in Public Law 115-232, section 889, "Covered telecommunications equipment or services" is:
    i. Telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities);
    ii. For the purpose of public safety, security of government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities);
    iii. Telecommunications or video surveillance services provided by such entities or using such equipment; and
    iv. Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country.
c. The Contractor agrees that it shall not provide covered telecommunications equipment or services in the performance of this Contract.

d. A compilation of prohibited telecommunications and video surveillance equipment and services entities may be found in the System for Award Management (SAM) excluded parties list.

5. Reporting Program Performance

a. Contractor is responsible for the collection of performance information for services under this Contract in a format and using metrics defined by the Executive Office of Energy and Environmental Affairs.
b. Contractor is responsible for the submission of such performance reports to the Executive Office of Energy and Environmental Affairs as required by the federal government.
c. Contractor is responsible for the submission of such performance reports to the Executive Office of Energy and Environmental Affairs as required by the Commonwealth of Massachusetts, the Federal Funds Equity and Accountability Review Panel, the Massachusetts State Auditor, and the Massachusetts Inspector General.
d. Contractor acknowledges that performance information for services under this Contract will be displayed publicly on a website published by the Commonwealth as required by Chapter 288 of the Acts of 2020, Chapter 102 of the Acts of 2021, and other related laws.
e. Contractor shall take all reasonable steps necessary to protect personally identifiable information collected during the performance of services required by this Contract and prevent the submission or publication of such information.

6. Remedies for Contract Violation. Should the Contractor violate of any of the terms of the Contract, the Executive Office of Energy and Environmental Affairs may pursue all available administrative, contractual, or legal remedies, as well as any applicable sanctions and penalties.

7. Contract Work Hours and Safety Standards Act (40 U.S.C. 3701-3708). *[* To the extent the Contract involves the employment of mechanics or laborers (as defined in 29 CFR Part 5 and including watchmen and guards) for any part of the contract work, the Contractor agrees to the following terms:

a. *Overtime requirements*. The Contractor shall not require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.
b. *Violation; liability for unpaid wages; liquidated damages*. In the event of any violation of the clause set forth in paragraph (a) of this section, the Contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, the Contractor and any such subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards,

employed in violation of the clause set forth in paragraph (a) of this section, in the sum of $29 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (a) of this section.

c. *Withholding for unpaid wages and liquidated damages*. the Executive Office of Energy and Environmental Affairs shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b) of this section.

d. *Records*. The Contractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract for all laborers and mechanics, including guards and watchmen, working on the Contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. The records to be maintained under this paragraph shall be made available by the Contractor for inspection, copying, or transcription by authorized representatives of the Executive Office of Energy and Environmental Affairs and the Department of Labor, and the Contractor will permit such representatives to interview employees during working hours on the job.

e. *Subcontracts*. The Contractor shall insert in any subcontracts the clauses set forth in paragraph (a) through (d) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (a) through (d) of this section.

8. The Clean Air Act (42 U.S.C. 7401-7671q.) and the Federal Water Pollution Control Act (33 U.S.C. 1251-1387), as amended.

a. The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387).

b. The Contractor agrees to report each violation to the Executive Office of Energy and Environmental Affairs and understands and agrees that the Executive Office of Energy and Environmental Affairs will, in turn, report each violation as required to assure notification to the U.S. Department of the Treasury and the appropriate Environmental Protection Agency Regional Office.

c. The Contractor agrees to include the above requirements in each subcontract financed in whole or in part with FRF funds.

9. **Other Federal Environmental Laws and Regulations**. The Contractor shall comply with all other applicable federal environmental laws and regulations.

10. **Byrd Anti-Lobbying Amendment (31 U.S.C. 1352).** The Contractor certifies that:
    a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
    b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the Contractor shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
    c. To the extent the Contractor is permitted and intends to utilize subcontractors under the Contract, the Contractor shall require that the language of this certification be included in all subcontracts and that all subcontractors shall certify and disclose accordingly.
    d. This certification is a material representation of fact upon which reliance was placed when this Contract was entered into or amended. The making of this certification is a prerequisite for entering into or amending this Contract imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

11. **Non-Discrimination.** The Contractor shall comply with all applicable federal laws and regulations prohibiting discrimination including, without limitation, the following:
    a. Title VI of the Civil Rights Act of 1964 (42 U.S.C. §§ 2000d et seq.) and U.S. Department of the Treasury's implementing regulations at 31 C.F.R. Part 22, which prohibit discrimination on the basis of race, color, or national origin under programs or activities receiving federal financial assistance;
    b. The Fair Housing Act, Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§ 3601 et seq.), which prohibits discrimination in housing on the basis of race, color, religion, national origin, sex, familial status, or disability;
    c. Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. § 794), which prohibits discrimination on the basis of disability under any program or activity receiving federal financial assistance;

d. The Age Discrimination Act of 1975, as amended (42 U.S.C. §§ 6101 et seq.), and U.S. Department of the Treasury's implementing regulations at 31 C.F.R. Part 23, which prohibit discrimination on the basis of age in programs or activities receiving federal financial assistance; and
e. Title II of the Americans with Disabilities Act of 1990, as amended (42 U.S.C. §§ 12101 et seq.), which prohibits discrimination on the basis of disability under programs, activities, and services provided or made available by state and local governments or instrumentalities or agencies thereto.

12. **Publications**. To the extent the Contractor is authorized or directed to produce publications pursuant to this Contract, any such publications produced with FRF funds must display the following language: "This project [is being] [was] supported, in whole or in part, by federal award number [enter project FAIN] awarded to the Commonwealth of Massachusetts by the U.S. Department of the Treasury."

13. **Maintenance of and Access to Records.**
    a. The Contractor shall maintain records pertinent to the Contract in a manner consistent with 2 C.F.R. § 200.334.
    b. The Contractor shall make available to the Executive Office of Energy and Environmental Affairs, the U. S. Department of the Treasury, the Treasury Office of Inspector General, the Government Accountability Office, or any of their authorized representatives any documents, papers, or other records, including electronic records, of the Contractor that are pertinent to the Contract, in order to make audits, investigations, examinations, excerpts, transcripts, and copies of such documents. This right also includes timely and reasonable access to the Contractor's personnel for the purpose of interview and discussion related to such documents. This right of access shall continue as long as records are retained.

14. **Increasing Seat Belt Use in the United States.** Pursuant to Executive Order 13043, 62 FR 19217 (Apr. 18, 1997), the Contractor is encouraged to adopt and enforce on-the job seat belt policies and programs for their employees when operating company-owned, rented or personally owned vehicles.

15. **Reducing Text Messaging While Driving.** Pursuant to Executive Order 13513, 74 FR 51225 (Oct. 6, 2009), the Contractor is encouraged to adopt and enforce policies that ban text messaging while driving and should establish workplace safety policies to decrease accidents caused by distracted drivers.

16. **Subcontractors.** To the extent the Contractor is permitted and intends to utilize subcontractors under the Contract, the Contractor agrees to incorporate all relevant provisions of this addendum into its written agreement with the subcontractor.

On behalf of the TOWN OF YARMOUTH ("Contractor"), I certify that I am an authorized signatory for the contractor and that I have read, understood, and will comply with requirements set forth in this contract addendum:

Authorized signatory signature: _____ Date _____

Print name: Robert L. Whritenour Jr.

Print title: Yarmouth Town Administrator

ATTACHMENT A

DAVIS BACON ACT WAGE RATES AND REQUIREMENTS

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"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).

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:	. 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.
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:	. 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, Westrwood, 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, Darmouth, 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

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* 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

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* CARP0339-002 03/01/2024

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

	Rates	Fringes
CARPENTER	$ 46.86	30.94

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* 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

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* 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

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* 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

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* 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, Frankloin, 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)

IRON0007-001 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, Wilminton)

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

IRON0007-010 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

IRONWORKER.....$ 40.00 32.58

LABO0022-006 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

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LABO0022-012 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

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LABO0022-013 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

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LABO1421-001 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, Sommerville)
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

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* 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

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* 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

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* 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

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* 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 Wrenthan); PLYMOUTH (Hingham, Hull, Scituate); ESSEX (Ames, Andover, Beverly, Boxford, Byfield, Danvers, Essex, Georgetown, Gloucester, Groveland, Hamilton, Haverhill, Ipswich, Lawrence,Lynn, Lynnfield, Manchester, Marblehead, Merrimac, Methuem, Middleton, Nahant, Newbury, Newburyport, North Andover, Peabody, Rockport, Rowley, Salem, Salisbury, Saugus, Swampscott, Topsfieild, 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

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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"

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ATTACHMENT B

MASSACHUSETTS STATE PREVAILING WAGE RATES

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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: Yarmouth Department of Public Works

Contract Number:

City/Town: YARMOUTH

Description of Work: New Park which includes earthwork, utilities, curb, pavement systems, elevated boardwalk and helical piles, landscaping, kayak float & gangway, utility work including electrical, plumbing and sewer.

Job Location: 669 MA-28, West Yarmouth, MA

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.

Issue Date: 03/26/2024 **Wage Request Number:** 20240326-055

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Construction						
(2 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2024	$38.95	$15.07	$18.67	$0.00	$72.69
	06/01/2024	$39.95	$15.07	$18.67	$0.00	$73.69
	12/01/2024	$39.95	$15.07	$20.17	$0.00	$75.19
	01/01/2025	$39.95	$15.57	$20.17	$0.00	$75.69
	06/01/2025	$40.95	$15.57	$20.17	$0.00	$76.69
	12/01/2025	$40.95	$15.57	$21.78	$0.00	$78.30
	01/01/2026	$40.95	$16.17	$21.78	$0.00	$78.90
	06/01/2026	$41.95	$16.17	$21.78	$0.00	$79.90
	12/01/2026	$41.95	$16.17	$23.52	$0.00	$81.64
	01/01/2027	$41.95	$16.77	$23.52	$0.00	$82.24
(3 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2024	$39.02	$15.07	$18.67	$0.00	$72.76
	06/01/2024	$40.02	$15.07	$18.67	$0.00	$73.76
	12/01/2024	$40.02	$15.07	$20.17	$0.00	$75.26
	01/01/2025	$40.02	$15.57	$20.17	$0.00	$75.76
	06/01/2025	$41.02	$15.57	$20.17	$0.00	$76.76
	12/01/2025	$41.02	$15.57	$21.78	$0.00	$78.37
	01/01/2026	$41.02	$16.17	$21.78	$0.00	$78.97
	06/01/2026	$42.02	$16.17	$21.78	$0.00	$79.97
	12/01/2026	$42.02	$16.17	$23.52	$0.00	$81.71
	01/01/2027	$42.02	$16.77	$23.52	$0.00	$82.31
(4 & 5 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2024	$39.14	$15.07	$18.67	$0.00	$72.88
	06/01/2024	$40.14	$15.07	$18.67	$0.00	$73.88
	12/01/2024	$40.14	$15.07	$20.17	$0.00	$75.38
	01/01/2025	$40.14	$15.57	$20.17	$0.00	$75.88
	06/01/2025	$41.14	$15.57	$20.17	$0.00	$76.88
	12/01/2025	$41.14	$15.57	$21.78	$0.00	$78.49
	01/01/2026	$41.14	$16.17	$21.78	$0.00	$79.09
	06/01/2026	$42.14	$16.17	$21.78	$0.00	$80.09
	12/01/2026	$42.14	$16.17	$23.52	$0.00	$81.83
	01/01/2027	$42.14	$16.77	$23.52	$0.00	$82.43
ADS/SUBMERSIBLE PILOT *PILE DRIVER LOCAL 56 (ZONE 2)*	08/01/2020	$103.05	$9.40	$23.12	$0.00	$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR *LABORERS - ZONE 2*	12/01/2023	$38.61	$9.65	$17.14	$0.00	$65.40
For apprentice rates see "Apprentice- LABORER"						
AIR TRACK OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2023	$38.61	$9.65	$17.14	$0.00	$65.40
	06/01/2024	$39.94	$9.65	$17.14	$0.00	$66.73
	12/01/2024	$41.27	$9.65	$17.14	$0.00	$68.06
	06/01/2025	$42.66	$9.65	$17.14	$0.00	$69.45
	12/01/2025	$44.04	$9.65	$17.14	$0.00	$70.83
	06/01/2026	$45.48	$9.65	$17.14	$0.00	$72.27
	12/01/2026	$46.92	$9.65	$17.14	$0.00	$73.71
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. *HEAT & FROST INSULATORS LOCAL 6 (BOSTON)*	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 *LABORERS - ZONE 2*	12/01/2023	$38.11	$9.65	$17.14	$0.00	$64.90
For apprentice rates see "Apprentice- LABORER"						
ASPHALT RAKER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2023	$38.11	$9.65	$17.14	$0.00	$64.90
	06/01/2024	$39.44	$9.65	$17.14	$0.00	$66.23
	12/01/2024	$40.77	$9.65	$17.14	$0.00	$67.56
	06/01/2025	$42.16	$9.65	$17.14	$0.00	$68.95
	12/01/2025	$43.54	$9.65	$17.14	$0.00	$70.33
	06/01/2026	$44.98	$9.65	$17.14	$0.00	$71.77
	12/01/2026	$46.42	$9.65	$17.14	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE *OPERATING ENGINEERS LOCAL 4*	12/01/2023	$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 *OPERATING ENGINEERS LOCAL 4*	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 *LABORERS - ZONE 2*	12/01/2023	$38.11	$9.65	$17.14	$0.00	$64.90
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER *LABORERS - ZONE 2*	12/01/2023	$38.61	$9.65	$17.14	$0.00	$65.40
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2023	$38.61	$9.65	$17.14	$0.00	$65.40
	06/01/2024	$39.94	$9.65	$17.14	$0.00	$66.73
	12/01/2024	$41.27	$9.65	$17.14	$0.00	$68.06
	06/01/2025	$42.66	$9.65	$17.14	$0.00	$69.45
	12/01/2025	$44.04	$9.65	$17.14	$0.00	$70.83
	06/01/2026	$45.48	$9.65	$17.14	$0.00	$72.27
	12/01/2026	$46.92	$9.65	$17.14	$0.00	$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
BOILER MAKER *BOILERMAKERS LOCAL 29*	01/01/2024	$48.12	$7.07	$20.60	$0.00	$75.79

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) *BRICKLAYERS LOCAL 3 (NEW BEDFORD)*	02/01/2024	$62.40	$11.49	$23.59	$0.00	$97.48
	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 New Bedford*

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 *OPERATING ENGINEERS LOCAL 4*	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"						
CAISSON & UNDERPINNING BOTTOM MAN *LABORERS - FOUNDATION AND MARINE*	12/01/2023	$45.48	$9.65	$18.22	$0.00	$73.35
	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 *LABORERS - FOUNDATION AND MARINE*	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
CAISSON & UNDERPINNING TOP MAN *LABORERS - FOUNDATION AND MARINE*	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 *LABORERS - ZONE 2*	12/01/2023	$38.11	$9.65	$17.14	$0.00	$64.90
For apprentice rates see "Apprentice- LABORER"						
CARPENTER *CARPENTERS -ZONE 2 (Eastern Massachusetts)*	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 *CARPENTERS-ZONE 3 (Wood Frame)*	10/01/2023	$25.55	$7.02	$4.80	$0.00	$37.37
	10/01/2024	$26.65	$7.02	$4.80	$0.00	$38.47
	10/01/2025	$27.75	$7.02	$4.80	$0.00	$39.57
	10/01/2026	$28.85	$7.02	$4.80	$0.00	$40.67

All Aspects of New Wood Frame Work

Apprentice - *CARPENTER (Wood Frame) - Zone 3*

Effective Date - 10/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$15.33	$7.02	$0.00	$0.00	$22.35
2	60	$15.33	$7.02	$0.00	$0.00	$22.35
3	65	$16.61	$7.02	$1.00	$0.00	$24.63
4	70	$17.89	$7.02	$1.00	$0.00	$25.91
5	75	$19.16	$7.02	$4.80	$0.00	$30.98
6	80	$20.44	$7.02	$4.80	$0.00	$32.26
7	85	$21.72	$7.02	$4.80	$0.00	$33.54
8	90	$23.00	$7.02	$4.80	$0.00	$34.82

Effective Date - 10/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$15.99	$7.02	$0.00	$0.00	$23.01
2	60	$15.99	$7.02	$0.00	$0.00	$23.01
3	65	$17.32	$7.02	$1.00	$0.00	$25.34
4	70	$18.66	$7.02	$1.00	$0.00	$26.68
5	75	$19.99	$7.02	$4.80	$0.00	$31.81
6	80	$21.32	$7.02	$4.80	$0.00	$33.14
7	85	$22.65	$7.02	$4.80	$0.00	$34.47
8	90	$23.99	$7.02	$4.80	$0.00	$35.81

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
Step 1&2 $18.52/ 3&4 $21.07/ 5&6 $28.70/ 7&8 $31.26

Apprentice to Journeyworker Ratio:1:5

CEMENT MASONRY/PLASTERING *BRICKLAYERS LOCAL 3 (NEW BEDFORD)*	01/01/2024	$49.33	$13.00	$23.57	$1.30	$87.20

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *CEMENT MASONRY/PLASTERING - Eastern Mass (New Bedford)*

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 *LABORERS - ZONE 2*	12/01/2023	$38.11	$9.65	$17.14	$0.00	$64.90
For apprentice rates see "Apprentice- LABORER"						
CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES *OPERATING ENGINEERS LOCAL 4*	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 *OPERATING ENGINEERS LOCAL 4*	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) *PAINTERS LOCAL 35 - ZONE 2*	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

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

DEMO: ADZEMAN *LABORERS - ZONE 2*	12/01/2023	$44.48	$9.65	$18.07	$0.00	$72.20

For apprentice rates see "Apprentice- LABORER"

DEMO: BACKHOE/LOADER/HAMMER OPERATOR *LABORERS - ZONE 2*	12/01/2023	$45.48	$9.65	$18.07	$0.00	$73.20

For apprentice rates see "Apprentice- LABORER"

DEMO: BURNERS *LABORERS - ZONE 2*	12/01/2023	$45.23	$9.65	$18.07	$0.00	$72.95

For apprentice rates see "Apprentice- LABORER"

DEMO: CONCRETE CUTTER/SAWYER *LABORERS - ZONE 2*	12/01/2023	$45.48	$9.65	$18.07	$0.00	$73.20

For apprentice rates see "Apprentice- LABORER"

DEMO: JACKHAMMER OPERATOR *LABORERS - ZONE 2*	12/01/2023	$45.23	$9.65	$18.07	$0.00	$72.95

For apprentice rates see "Apprentice- LABORER"

DEMO: WRECKING LABORER *LABORERS - ZONE 2*	12/01/2023	$44.48	$9.65	$18.07	$0.00	$72.20

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DIRECTIONAL DRILL MACHINE OPERATOR *OPERATING ENGINEERS LOCAL 4*	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 *PILE DRIVER LOCAL 56 (ZONE 2)*	08/01/2020	$68.70	$9.40	$23.12	$0.00	$101.22
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER *PILE DRIVER LOCAL 56 (ZONE 2)*	08/01/2020	$49.07	$9.40	$23.12	$0.00	$81.59
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER (EFFLUENT) *PILE DRIVER LOCAL 56 (ZONE 2)*	08/01/2020	$73.60	$9.40	$23.12	$0.00	$106.12
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER/SLURRY (EFFLUENT) *PILE DRIVER LOCAL 56 (ZONE 2)*	08/01/2020	$103.05	$9.40	$23.12	$0.00	$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
DRAWBRIDGE OPERATOR (Construction) *DRAWBRIDGE - SEIU LOCAL 888*	07/01/2020	$26.77	$6.67	$3.93	$0.16	$37.53
ELECTRICIAN *ELECTRICIANS LOCAL 223*	09/01/2023	$47.87	$11.75	$16.86	$0.00	$76.48

Apprentice - *ELECTRICIAN - Local 223*

Effective Date - 09/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$19.15	$11.75	$0.57	$0.00	$31.47
2	45	$21.54	$11.75	$0.65	$0.00	$33.94
3	50	$23.94	$11.75	$0.72	$0.00	$36.41
4	55	$26.33	$11.75	$7.79	$0.00	$45.87
5	60	$28.72	$11.75	$8.31	$0.00	$48.78
6	65	$31.12	$11.75	$8.65	$0.00	$51.52
7	70	$33.51	$11.75	$9.38	$0.00	$54.64
8	75	$35.90	$11.75	$9.90	$0.00	$57.55

Notes:

Apprentice to Journeyworker Ratio:2:3***

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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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 *ELEVATOR CONSTRUCTORS LOCAL 4*	01/01/2022	$45.93	$16.03	$20.21	$0.00	$82.17
For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"						
FENCE & GUARD RAIL ERECTOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2023	$38.11	$9.65	$17.14	$0.00	$64.90
	06/01/2024	$39.44	$9.65	$17.14	$0.00	$66.23
	12/01/2024	$40.77	$9.65	$17.14	$0.00	$67.56
	06/01/2025	$42.16	$9.65	$17.14	$0.00	$68.95
	12/01/2025	$43.54	$9.65	$17.14	$0.00	$70.33
	06/01/2026	$44.98	$9.65	$17.14	$0.00	$71.77
	12/01/2026	$46.42	$9.65	$17.14	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	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 *OPERATING ENGINEERS LOCAL 4*	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 *OPERATING ENGINEERS LOCAL 4*	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 *ELECTRICIANS LOCAL 223*	09/01/2020	$43.66	$10.90	$14.66	$0.00	$69.22
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING*ELECTRICIANS LOCAL 223*	09/01/2020	$36.86	$10.90	$12.45	$0.00	$60.21
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						
FIREMAN (ASST. ENGINEER) *OPERATING ENGINEERS LOCAL 4*	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) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2023	$25.48	$9.65	$17.14	$0.00	$52.27
	06/01/2024	$26.51	$9.65	$17.14	$0.00	$53.30
	12/01/2024	$26.51	$9.65	$17.14	$0.00	$53.30
	06/01/2025	$27.59	$9.65	$17.14	$0.00	$54.38
	12/01/2025	$27.59	$9.65	$17.14	$0.00	$54.38
	06/01/2026	$28.71	$9.65	$17.14	$0.00	$55.50
	12/01/2026	$28.71	$9.65	$17.14	$0.00	$55.50
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
FLOORCOVERER *FLOORCOVERERS LOCAL 2168 ZONE II*	03/01/2024	$49.47	$8.83	$20.27	$0.00	$78.57

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *FLOORCOVERER - Local 2168 Zone II*

Effective Date - 03/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.74	$8.83	$1.76	$0.00	$35.33
2	55	$27.21	$8.83	$1.76	$0.00	$37.80
3	60	$29.68	$8.83	$3.52	$0.00	$42.03
4	65	$32.16	$8.83	$3.52	$0.00	$44.51
5	70	$34.63	$8.83	$16.75	$0.00	$60.21
6	75	$37.10	$8.83	$16.75	$0.00	$62.68
7	80	$39.58	$8.83	$18.51	$0.00	$66.92
8	85	$42.05	$8.83	$18.51	$0.00	$69.39

Notes: Steps are 750 hrs.
% After 10/1/17; 45/45/55/55/70/70/80/80 (1500hr Steps)
Step 1&2 $32.63/ 3&4 $39.28/ 5&6 $59.86/ 7&8 $66.52

Apprentice to Journeyworker Ratio:1:1

FORK LIFT/CHERRY PICKER *OPERATING ENGINEERS LOCAL 4*	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"						
GENERATOR/LIGHTING PLANT/HEATERS *OPERATING ENGINEERS LOCAL 4*	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) *GLAZIERS LOCAL 1333*	06/01/2020	$39.18	$10.80	$10.45	$0.00	$60.43

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *GLAZIER - Local 1333*

Effective Date - 06/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$19.59	$10.80	$1.80	$0.00	$32.19
2	56	$22.04	$10.80	$1.80	$0.00	$34.64
3	63	$24.49	$10.80	$2.45	$0.00	$37.74
4	69	$26.94	$10.80	$2.45	$0.00	$40.19
5	75	$29.39	$10.80	$3.15	$0.00	$43.34
6	81	$31.83	$10.80	$3.15	$0.00	$45.78
7	88	$34.28	$10.80	$10.45	$0.00	$55.53
8	94	$36.73	$10.80	$10.45	$0.00	$57.98

Notes:

Apprentice to Journeyworker Ratio:1:3

HOISTING ENGINEER/CRANES/GRADALLS *OPERATING ENGINEERS LOCAL 4*	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 - B*	10/01/2023	$39.74	$14.43	$19.04	$2.20	$75.41
	04/01/2024	$41.24	$14.43	$19.04	$2.20	$76.91
	10/01/2024	$42.49	$14.43	$19.04	$2.20	$78.16
	04/01/2025	$43.99	$14.43	$19.04	$2.20	$79.66
	10/01/2025	$45.24	$14.43	$19.04	$2.20	$80.91
	04/01/2026	$46.74	$14.43	$19.04	$2.20	$82.41
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (ELECTRICAL CONTROLS) *ELECTRICIANS LOCAL 223*	09/01/2020	$43.66	$10.90	$14.66	$0.00	$69.22
For apprentice rates see "Apprentice- ELECTRICIAN"						
HVAC (TESTING AND BALANCING - AIR) *SHEETMETAL WORKERS LOCAL 17 - B*	10/01/2023	$39.74	$14.43	$19.04	$2.20	$75.41
	04/01/2024	$41.24	$14.43	$19.04	$2.20	$76.91
	10/01/2024	$42.49	$14.43	$19.04	$2.20	$78.16
	04/01/2025	$43.99	$14.43	$19.04	$2.20	$79.66
	10/01/2025	$45.24	$14.43	$19.04	$2.20	$80.91
	04/01/2026	$46.74	$14.43	$19.04	$2.20	$82.41
For apprentice rates see "Apprentice- SHEET METAL WORKER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HVAC (TESTING AND BALANCING -WATER) *PLUMBERS & PIPEFITTERS LOCAL 51*	08/28/2023	$51.99	$10.15	$19.95	$0.00	$82.09
	08/26/2024	$54.74	$10.15	$19.95	$0.00	$84.84
	08/25/2025	$57.49	$10.15	$19.95	$0.00	$87.59
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HVAC MECHANIC *PLUMBERS & PIPEFITTERS LOCAL 51*	08/28/2023	$51.99	$10.15	$19.95	$0.00	$82.09
	08/26/2024	$54.74	$10.15	$19.95	$0.00	$84.84
	08/25/2025	$57.49	$10.15	$19.95	$0.00	$87.59
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HYDRAULIC DRILLS *LABORERS - ZONE 2*	12/01/2023	$38.61	$9.65	$17.14	$0.00	$65.40
For apprentice rates see "Apprentice- LABORER"						
HYDRAULIC DRILLS (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2023	$38.61	$9.65	$17.14	$0.00	$65.40
	06/01/2024	$39.94	$9.65	$17.14	$0.00	$66.73
	12/01/2024	$41.27	$9.65	$17.14	$0.00	$68.06
	06/01/2025	$42.66	$9.65	$17.14	$0.00	$69.45
	12/01/2025	$44.04	$9.65	$17.14	$0.00	$70.83
	06/01/2026	$45.48	$9.65	$17.14	$0.00	$72.27
	12/01/2026	$46.92	$9.65	$17.14	$0.00	$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
INSULATOR (PIPES & TANKS) *HEAT & FROST INSULATORS LOCAL 6 (BOSTON)*	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

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 37*	03/16/2021	$42.46	$7.70	$17.10	$0.00	$67.26

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *IRONWORKER - Local 37*

Effective Date - 03/16/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	70	$29.72	$7.70	$17.10	$0.00	$54.52
2	75	$31.85	$7.70	$17.10	$0.00	$56.65
3	80	$33.97	$7.70	$17.10	$0.00	$58.77
4	85	$36.09	$7.70	$17.10	$0.00	$60.89
5	90	$38.21	$7.70	$17.10	$0.00	$63.01
6	95	$40.34	$7.70	$17.10	$0.00	$65.14

Notes:

Apprentice to Journeyworker Ratio:1:4

JACKHAMMER & PAVING BREAKER OPERATOR *LABORERS - ZONE 2*	12/01/2023	$38.11	$9.65	$17.14	$0.00	$64.90
For apprentice rates see "Apprentice- LABORER"						
LABORER *LABORERS - ZONE 2*	12/01/2023	$37.86	$9.65	$17.14	$0.00	$64.65

Apprentice - *LABORER - Zone 2*

Effective Date - 12/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$22.72	$9.65	$16.89	$0.00	$49.26
2	70	$26.50	$9.65	$16.89	$0.00	$53.04
3	80	$30.29	$9.65	$16.89	$0.00	$56.83
4	90	$34.07	$9.65	$16.89	$0.00	$60.61

Notes:

Apprentice to Journeyworker Ratio:1:5

LABORER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2023	$37.86	$9.65	$17.14	$0.00	$64.65
	06/01/2024	$39.19	$9.65	$17.14	$0.00	$65.98
	12/01/2024	$40.52	$9.65	$17.14	$0.00	$67.31
	06/01/2025	$41.91	$9.65	$17.14	$0.00	$68.70
	12/01/2025	$43.29	$9.65	$17.14	$0.00	$70.08
	06/01/2026	$44.73	$9.65	$17.14	$0.00	$71.52
	12/01/2026	$46.17	$9.65	$17.14	$0.00	$72.96

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *LABORER (Heavy & Highway) - Zone 2*

Effective Date - 12/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$22.72	$9.65	$17.14	$0.00	$49.51
2	70	$26.50	$9.65	$17.14	$0.00	$53.29
3	80	$30.29	$9.65	$17.14	$0.00	$57.08
4	90	$34.07	$9.65	$17.14	$0.00	$60.86

Effective Date - 06/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$23.51	$9.00	$16.89	$0.00	$49.40
2	70	$27.43	$9.00	$16.89	$0.00	$53.32
3	80	$31.35	$9.00	$16.89	$0.00	$57.24
4	90	$35.27	$9.00	$16.89	$0.00	$61.16

Notes:

Apprentice to Journeyworker Ratio:1:5

LABORER: CARPENTER TENDER *LABORERS - ZONE 2*	12/01/2023	$37.86	$9.65	$17.14	$0.00	$64.65
For apprentice rates see "Apprentice- LABORER"						
LABORER: CEMENT FINISHER TENDER *LABORERS - ZONE 2*	12/01/2023	$38.36	$9.40	$16.89	$0.00	$64.65
For apprentice rates see "Apprentice- LABORER"						
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER *LABORERS - ZONE 2*	12/01/2023	$37.95	$9.65	$17.20	$0.00	$64.80
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER *LABORERS - ZONE 2*	12/01/2023	$38.11	$9.65	$17.14	$0.00	$64.90
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2023	$38.11	$9.65	$17.14	$0.00	$64.90
	06/01/2024	$39.44	$9.65	$17.14	$0.00	$66.23
	12/01/2024	$40.77	$9.65	$17.14	$0.00	$67.56
	06/01/2025	$42.16	$9.65	$17.14	$0.00	$68.95
	12/01/2025	$43.54	$9.65	$17.14	$0.00	$70.33
	06/01/2026	$44.98	$9.65	$17.14	$0.00	$71.77
	12/01/2026	$46.42	$9.65	$17.14	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
LABORER: MULTI-TRADE TENDER *LABORERS - ZONE 2*	12/01/2023	$37.86	$9.65	$17.14	$0.00	$64.65
For apprentice rates see "Apprentice- LABORER"						
LABORER: TREE REMOVER *LABORERS - ZONE 2*	12/01/2023	$37.86	$9.65	$17.14	$0.00	$64.65
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 *LABORERS - ZONE 2*	12/01/2023	$38.11	$9.65	$17.14	$0.00	$64.90

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2023	$38.11	$9.65	$17.14	$0.00	$64.90
	06/01/2024	$39.44	$9.65	$17.14	$0.00	$66.23
	12/01/2024	$40.77	$9.65	$17.14	$0.00	$67.56
	06/01/2025	$42.16	$9.65	$17.14	$0.00	$68.95
	12/01/2025	$43.54	$9.65	$17.14	$0.00	$70.33
	06/01/2026	$44.98	$9.65	$17.14	$0.00	$71.77
	12/01/2026	$46.42	$9.65	$17.14	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
MARBLE & TILE FINISHERS *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	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

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 *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	02/01/2024	$62.42	$11.49	$23.56	$0.00	$97.47
	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) *OPERATING ENGINEERS LOCAL 4*	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 *OPERATING ENGINEERS LOCAL 4*	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 2) *MILLWRIGHTS LOCAL 1121 - Zone 2*	01/01/2024	$42.76	$10.08	$21.47	$0.00	$74.31
	01/06/2025	$45.09	$10.08	$21.47	$0.00	$76.64
	01/05/2026	$47.42	$10.08	$21.47	$0.00	$78.97

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *MILLWRIGHT - Local 1121 Zone 2*

Effective Date - 01/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$23.52	$10.08	$5.50	$0.00	$39.10
2	65	$27.79	$10.08	$6.50	$0.00	$44.37
3	75	$32.07	$10.08	$18.97	$0.00	$61.12
4	85	$36.35	$10.08	$19.97	$0.00	$66.40

Effective Date - 01/06/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$24.80	$10.08	$5.50	$0.00	$40.38
2	65	$29.31	$10.08	$6.50	$0.00	$45.89
3	75	$33.82	$10.08	$18.97	$0.00	$62.87
4	85	$38.33	$10.08	$19.97	$0.00	$68.38

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 *LABORERS - ZONE 2*	12/01/2023	$38.11	$9.65	$17.14	$0.00	$64.90
For apprentice rates see "Apprentice- LABORER"						
OILER (OTHER THAN TRUCK CRANES,GRADALLS) *OPERATING ENGINEERS LOCAL 4*	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) *OPERATING ENGINEERS LOCAL 4*	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 *OPERATING ENGINEERS LOCAL 4*	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) *PAINTERS LOCAL 35 - ZONE 2*	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) * * If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.*PAINTERS LOCAL 35 - ZONE 2*	01/01/2024	$46.96	$9.95	$23.95	$0.00	$80.86
	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) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2024	$45.02	$9.95	$23.95	$0.00	$78.92
	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) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2024	$43.62	$9.95	$23.95	$0.00	$77.52
	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) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2023	$37.86	$9.65	$17.14	$0.00	$64.65
	06/01/2024	$39.19	$9.65	$17.14	$0.00	$65.98
	12/01/2024	$40.52	$9.65	$17.14	$0.00	$67.31
	06/01/2025	$41.91	$9.65	$17.14	$0.00	$68.70
	12/01/2025	$43.29	$9.65	$17.14	$0.00	$70.08
	06/01/2026	$44.73	$9.65	$17.14	$0.00	$71.52
	12/01/2026	$46.17	$9.65	$17.14	$0.00	$72.96
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
PANEL & PICKUP TRUCKS DRIVER *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2024	$38.78	$15.07	$18.67	$0.00	$72.52
	06/01/2024	$39.78	$15.07	$18.67	$0.00	$73.52
	12/01/2024	$39.78	$15.07	$20.17	$0.00	$75.02
	01/01/2025	$39.78	$15.57	$20.17	$0.00	$75.52
	06/01/2025	$40.78	$15.57	$20.17	$0.00	$76.52
	12/01/2025	$40.78	$15.57	$21.78	$0.00	$78.13
	01/01/2026	$40.78	$16.17	$21.78	$0.00	$78.73
	06/01/2026	$41.78	$16.17	$21.78	$0.00	$79.73
	12/01/2026	$41.78	$16.17	$23.52	$0.00	$81.47
	01/01/2027	$41.78	$16.77	$23.52	$0.00	$82.07

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) *PILE DRIVER LOCAL 56 (ZONE 2)* For apprentice rates see "Apprentice- PILE DRIVER"	08/01/2020	$46.11	$9.40	$23.12	$0.00	$78.63
PILE DRIVER *PILE DRIVER LOCAL 56 (ZONE 2)*	08/01/2020	$46.11	$9.40	$23.12	$0.00	$78.63

Apprentice - *PILE DRIVER - Local 56 Zone 2*

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	0	$0.00	$0.00	$0.00	$0.00	$0.00

Notes: Apprentice wages shall be no less than the following Steps;
(Same as set in Zone 1)
1$57.06/2$61.96/3$66.87/4$69.32/5$71.78/6$71.78/7$76.68/8$76.68

Apprentice to Journeyworker Ratio:1:5

PIPELAYER *LABORERS - ZONE 2* For apprentice rates see "Apprentice- LABORER"	12/01/2023	$38.11	$9.65	$17.14	$0.00	$64.90
PIPELAYER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2023	$38.11	$9.65	$17.14	$0.00	$64.90
	06/01/2024	$39.44	$9.65	$17.14	$0.00	$66.23
	12/01/2024	$40.77	$9.65	$17.14	$0.00	$67.56
	06/01/2025	$42.16	$9.65	$17.14	$0.00	$68.95
	12/01/2025	$43.54	$9.65	$17.14	$0.00	$70.33
	06/01/2026	$44.98	$9.65	$17.14	$0.00	$71.77
	12/01/2026	$46.42	$9.65	$17.14	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
PLUMBER & PIPEFITTER *PLUMBERS & PIPEFITTERS LOCAL 51*	08/28/2023	$51.99	$10.15	$19.95	$0.00	$82.09
	08/26/2024	$54.74	$10.15	$19.95	$0.00	$84.84
	08/25/2025	$57.49	$10.15	$19.95	$0.00	$87.59

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PLUMBER/PIPEFITTER - Local 51*

Effective Date - 08/28/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$20.80	$10.15	$2.50	$0.00	$33.45
2	50	$26.00	$10.15	$2.50	$0.00	$38.65
3	60	$31.19	$10.15	$8.80	$0.00	$50.14
4	70	$36.39	$10.15	$14.08	$0.00	$60.62
5	80	$41.59	$10.15	$17.60	$0.00	$69.34

Effective Date - 08/26/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$21.90	$10.15	$2.50	$0.00	$34.55
2	50	$27.37	$10.15	$2.50	$0.00	$40.02
3	60	$32.84	$10.15	$8.80	$0.00	$51.79
4	70	$38.32	$10.15	$14.08	$0.00	$62.55
5	80	$43.79	$10.15	$17.60	$0.00	$71.54

Notes:
Steps 2000hrs. Prior 9/1/05; 40/40/45/50/55/60/65/75/80/85

Apprentice to Journeyworker Ratio:1:3

PNEUMATIC CONTROLS (TEMP.) *PLUMBERS & PIPEFITTERS LOCAL 51*	08/28/2023	$51.99	$10.15	$19.95	$0.00	$82.09
	08/26/2024	$54.74	$10.15	$19.95	$0.00	$84.84
	08/25/2025	$57.49	$10.15	$19.95	$0.00	$87.59
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
PNEUMATIC DRILL/TOOL OPERATOR *LABORERS - ZONE 2*	12/01/2023	$38.11	$9.65	$17.14	$0.00	$64.90
For apprentice rates see "Apprentice- LABORER"						
PNEUMATIC DRILL/TOOL OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2023	$38.11	$9.65	$17.14	$0.00	$64.90
	06/01/2024	$39.44	$9.65	$17.14	$0.00	$66.23
	12/01/2024	$40.77	$9.65	$17.14	$0.00	$67.56
	06/01/2025	$42.16	$9.65	$17.14	$0.00	$68.95
	12/01/2025	$43.54	$9.65	$17.14	$0.00	$70.33
	06/01/2026	$44.98	$9.65	$17.14	$0.00	$71.77
	12/01/2026	$46.42	$9.65	$17.14	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
POWDERMAN & BLASTER *LABORERS - ZONE 2*	12/01/2023	$38.86	$9.65	$17.14	$0.00	$65.65
For apprentice rates see "Apprentice- LABORER"						
POWDERMAN & BLASTER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2023	$39.36	$9.40	$16.89	$0.00	$65.65
	06/01/2024	$40.69	$9.40	$16.89	$0.00	$66.98
	12/01/2024	$42.02	$9.40	$16.89	$0.00	$68.31
	06/01/2025	$43.41	$9.40	$16.89	$0.00	$69.70
	12/01/2025	$44.79	$9.40	$16.89	$0.00	$71.08
	06/01/2026	$46.23	$9.40	$16.89	$0.00	$72.52
	12/01/2026	$47.67	$9.40	$16.89	$0.00	$73.96

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 *OPERATING ENGINEERS LOCAL 4*	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) *OPERATING ENGINEERS LOCAL 4*	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) *OPERATING ENGINEERS LOCAL 4*	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 *TEAMSTERS 653 - Southeastern Concrete (Weymouth)*	08/01/2023	$25.00	$13.91	$6.90	$0.00	$45.81
RECLAIMERS *OPERATING ENGINEERS LOCAL 4*	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 *LABORERS - ZONE 2*	12/01/2023	$38.11	$9.65	$17.14	$0.00	$64.90
For apprentice rates see "Apprentice- LABORER"						
ROLLER/SPREADER/MULCHING MACHINE *OPERATING ENGINEERS LOCAL 4*	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 Waterproofng &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 - B*	10/01/2023	$39.74	$14.43	$19.04	$2.20	$75.41
	04/01/2024	$41.24	$14.43	$19.04	$2.20	$76.91
	10/01/2024	$42.49	$14.43	$19.04	$2.20	$78.16
	04/01/2025	$43.99	$14.43	$19.04	$2.20	$79.66
	10/01/2025	$45.24	$14.43	$19.04	$2.20	$80.91
	04/01/2026	$46.74	$14.43	$19.04	$2.20	$82.41

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *SHEET METAL WORKER - Local 17-B*

Effective Date - 10/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$15.90	$14.43	$4.18	$1.07	$35.58
2	45	$17.88	$14.43	$4.71	$1.15	$38.17
3	50	$19.87	$14.43	$11.84	$1.42	$47.56
4	55	$21.86	$14.43	$11.84	$1.49	$49.62
5	60	$23.84	$14.43	$15.53	$1.61	$55.41
6	65	$25.83	$14.43	$15.84	$1.68	$57.78
7	70	$27.82	$14.43	$16.15	$1.75	$60.15
8	75	$29.81	$14.43	$16.45	$1.82	$62.51
9	80	$31.79	$14.43	$16.76	$1.89	$64.87
10	85	$33.78	$14.43	$17.07	$1.96	$67.24

Effective Date - 04/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$16.50	$14.43	$4.18	$1.07	$36.18
2	45	$18.56	$14.43	$4.71	$1.15	$38.85
3	50	$20.62	$14.43	$11.84	$1.42	$48.31
4	55	$22.68	$14.43	$11.84	$1.49	$50.44
5	60	$24.74	$14.43	$15.53	$1.61	$56.31
6	65	$26.81	$14.43	$15.84	$1.68	$58.76
7	70	$28.87	$14.43	$16.15	$1.75	$61.20
8	75	$30.93	$14.43	$16.45	$1.82	$63.63
9	80	$32.99	$14.43	$16.76	$1.89	$66.07
10	85	$35.05	$14.43	$17.07	$1.96	$68.51

Notes:

Apprentice to Journeyworker Ratio:1:3

SPECIALIZED EARTH MOVING EQUIP < 35 TONS *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2024	$39.24	$15.07	$18.67	$0.00	$72.98
	06/01/2024	$40.24	$15.07	$18.67	$0.00	$73.98
	12/01/2024	$40.24	$15.07	$20.17	$0.00	$75.48
	01/01/2025	$40.24	$15.57	$20.17	$0.00	$75.98
	06/01/2025	$41.24	$15.57	$20.17	$0.00	$76.98
	12/01/2025	$41.24	$15.57	$21.78	$0.00	$78.59
	01/01/2026	$41.24	$16.17	$21.78	$0.00	$79.19
	06/01/2026	$42.24	$16.17	$21.78	$0.00	$80.19
	12/01/2026	$42.24	$16.17	$23.52	$0.00	$81.93
	01/01/2027	$42.24	$16.77	$23.52	$0.00	$82.53

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SPECIALIZED EARTH MOVING EQUIP > 35 TONS *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2024	$39.53	$15.07	$18.67	$0.00	$73.27
	06/01/2024	$40.53	$15.07	$18.67	$0.00	$74.27
	12/01/2024	$40.53	$15.07	$20.17	$0.00	$75.77
	01/01/2025	$40.53	$15.57	$20.17	$0.00	$76.27
	06/01/2025	$41.53	$15.57	$20.17	$0.00	$77.27
	12/01/2025	$41.53	$15.57	$21.78	$0.00	$78.88
	01/01/2026	$41.53	$16.17	$21.78	$0.00	$79.48
	06/01/2026	$42.53	$16.17	$21.78	$0.00	$80.48
	12/01/2026	$42.53	$16.17	$23.52	$0.00	$82.22
	01/01/2027	$42.53	$16.77	$23.52	$0.00	$82.82
SPRINKLER FITTER *SPRINKLER FITTERS LOCAL 550 - (Section B) Zone 2*	03/01/2024	$62.78	$10.90	$23.20	$0.00	$96.88
	10/01/2024	$64.40	$10.90	$23.20	$0.00	$98.50
	03/01/2025	$66.02	$10.90	$23.20	$0.00	$100.12

Apprentice - *SPRINKLER FITTER - Local 550 (Section B) Zone 2*

Effective Date - 03/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	$21.97	$10.90	$12.80	$0.00	$45.67
2	40	$25.11	$10.90	$13.60	$0.00	$49.61
3	45	$28.25	$10.90	$14.40	$0.00	$53.55
4	50	$31.39	$10.90	$15.20	$0.00	$57.49
5	55	$34.53	$10.90	$16.00	$0.00	$61.43
6	60	$37.67	$10.90	$16.80	$0.00	$65.37
7	65	$40.81	$10.90	$17.60	$0.00	$69.31
8	70	$43.95	$10.90	$18.40	$0.00	$73.25
9	75	$47.09	$10.90	$19.20	$0.00	$77.19
10	80	$50.22	$10.90	$20.00	$0.00	$81.12

Effective Date - 10/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	$22.54	$10.90	$12.80	$0.00	$46.24
2	40	$25.76	$10.90	$13.60	$0.00	$50.26
3	45	$28.98	$10.90	$14.40	$0.00	$54.28
4	50	$32.20	$10.90	$15.20	$0.00	$58.30
5	55	$35.42	$10.90	$16.00	$0.00	$62.32
6	60	$38.64	$10.90	$16.80	$0.00	$66.34
7	65	$41.86	$10.90	$17.60	$0.00	$70.36
8	70	$45.08	$10.90	$18.40	$0.00	$74.38
9	75	$48.30	$10.90	$19.20	$0.00	$78.40
10	80	$51.52	$10.90	$20.00	$0.00	$82.42

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 *OPERATING ENGINEERS LOCAL 4*	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 *OPERATING ENGINEERS LOCAL 4*	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 *ELECTRICIANS LOCAL 223*	09/01/2023	$39.40	$11.50	$13.91	$0.00	$64.81
	09/01/2024	$40.69	$11.75	$14.53	$0.00	$66.97

Apprentice - *TELECOMMUNICATION TECHNICIAN - Local 223*

Effective Date - 09/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	0	$0.00	$0.00	$0.00	$0.00	$0.00

Notes: See Electrician Apprentice Wages

Telecom Apprentice Wages shall be the same as the Electrician Apprentice Wages

Apprentice to Journeyworker Ratio:2:3***

TERRAZZO FINISHERS *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	02/01/2024	$61.34	$11.49	$23.59	$0.00	$96.42
	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 *LABORERS - FOUNDATION AND MARINE*	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 *LABORERS - FOUNDATION AND MARINE*	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 *LABORERS - FOUNDATION AND MARINE*	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 *OPERATING ENGINEERS LOCAL 4*	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 *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2024	$39.82	$15.07	$18.67	$0.00	$73.56
	06/01/2024	$40.82	$15.07	$18.67	$0.00	$74.56
	12/01/2024	$40.82	$15.07	$20.17	$0.00	$76.06
	01/01/2025	$40.82	$15.57	$20.17	$0.00	$76.56
	06/01/2025	$41.82	$15.57	$20.17	$0.00	$77.56
	12/01/2025	$41.82	$15.57	$21.78	$0.00	$79.17
	01/01/2026	$41.82	$16.17	$21.78	$0.00	$79.77
	06/01/2026	$42.82	$16.17	$21.78	$0.00	$80.77
	12/01/2026	$42.82	$16.17	$23.52	$0.00	$82.51
	01/01/2027	$42.82	$16.77	$23.52	$0.00	$83.11
TUNNEL WORK - COMPRESSED AIR *LABORERS (COMPRESSED AIR)*	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) *LABORERS (COMPRESSED AIR)*	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 *LABORERS (FREE AIR TUNNEL)*	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) *LABORERS (FREE AIR TUNNEL)*	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 *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2024	$39.24	$15.07	$18.67	$0.00	$72.98
	06/01/2024	$40.24	$15.07	$18.67	$0.00	$73.98
	12/01/2024	$40.24	$15.07	$20.17	$0.00	$75.48
	01/01/2025	$40.24	$15.57	$20.17	$0.00	$75.98
	06/01/2025	$41.24	$15.57	$20.17	$0.00	$76.98
	12/01/2025	$41.24	$15.57	$21.78	$0.00	$78.59
	01/01/2026	$41.24	$16.17	$21.78	$0.00	$79.19
	06/01/2026	$42.24	$16.17	$21.78	$0.00	$80.19
	12/01/2026	$42.24	$16.17	$23.52	$0.00	$81.93
	01/01/2027	$42.24	$16.77	$23.52	$0.00	$82.53
WAGON DRILL OPERATOR *LABORERS - ZONE 2*	12/01/2023	$38.11	$9.65	$17.14	$0.00	$64.90
For apprentice rates see "Apprentice- LABORER"						
WAGON DRILL OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2023	$38.11	$9.65	$17.14	$0.00	$64.90
	06/01/2024	$39.44	$9.65	$17.14	$0.00	$66.23
	12/01/2024	$40.77	$9.65	$17.14	$0.00	$67.56
	06/01/2025	$42.16	$9.65	$17.14	$0.00	$68.95
	12/01/2025	$43.54	$9.65	$17.14	$0.00	$70.33
	06/01/2026	$44.98	$9.65	$17.14	$0.00	$71.77
	12/01/2026	$46.42	$9.65	$17.14	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
WASTE WATER PUMP OPERATOR *OPERATING ENGINEERS LOCAL 4*	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 *PLUMBERS & PIPEFITTERS LOCAL 51*	08/28/2023	$51.99	$10.15	$19.95	$0.00	$82.09
	08/26/2024	$54.74	$10.15	$19.95	$0.00	$84.84
	08/25/2025	$57.49	$10.15	$19.95	$0.00	$87.59
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						
Outside Electrical - East						
CABLE TECHNICIAN (Power Zone) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	08/30/2020	$29.67	$9.25	$1.89	$0.00	$40.81
For apprentice rates see "Apprentice- LINEMAN"						
CABLEMAN (Underground Ducts & Cables) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	08/30/2020	$42.03	$9.25	$10.27	$0.00	$61.55
For apprentice rates see "Apprentice- LINEMAN"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DRIVER / GROUNDMAN CDL *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104* For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	$34.62	$9.25	$10.07	$0.00	$53.94
DRIVER / GROUNDMAN -Inexperienced (<2000 Hrs) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104* For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	$27.20	$9.25	$1.82	$0.00	$38.27
EQUIPMENT OPERATOR (Class A CDL) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104* For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	$42.03	$9.25	$14.35	$0.00	$65.63
EQUIPMENT OPERATOR (Class B CDL) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104* For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	$37.09	$9.25	$10.87	$0.00	$57.21
GROUNDMAN *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104* For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	$27.20	$9.25	$1.82	$0.00	$38.27
GROUNDMAN -Inexperienced (<2000 Hrs.) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104* For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	$22.25	$9.25	$1.82	$0.00	$33.32
JOURNEYMAN LINEMAN *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	08/30/2020	$49.45	$9.25	$17.48	$0.00	$76.18

Apprentice - *LINEMAN (Outside Electrical) - East Local 104*

Effective Date - 08/30/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$29.67	$9.25	$3.39	$0.00	$42.31
2	65	$32.14	$9.25	$3.46	$0.00	$44.85
3	70	$34.62	$9.25	$3.54	$0.00	$47.41
4	75	$37.09	$9.25	$5.11	$0.00	$51.45
5	80	$39.56	$9.25	$5.19	$0.00	$54.00
6	85	$42.03	$9.25	$5.26	$0.00	$56.54
7	90	$44.51	$9.25	$7.34	$0.00	$61.10

Notes:

Apprentice to Journeyworker Ratio:1:2

TELEDATA CABLE SPLICER *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	02/04/2019	$30.73	$4.70	$3.17	$0.00	$38.60
TELEDATA LINEMAN/EQUIPMENT OPERATOR *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	02/04/2019	$28.93	$4.70	$3.14	$0.00	$36.77
TELEDATA WIREMAN/INSTALLER/TECHNICIAN *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	02/04/2019	$28.93	$4.70	$3.14	$0.00	$36.77

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Additional Apprentice 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. Apprentice 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.

ATTACHMENT C

GEOTECHNICAL REPORT

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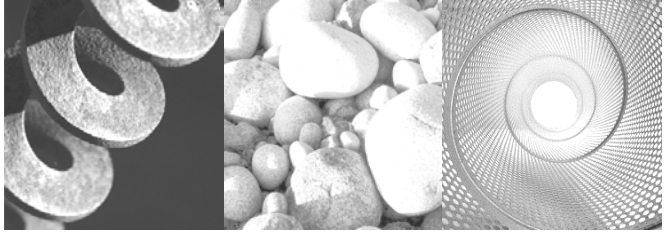

GEI Consultants

Consulting
Engineers and
Scientists

Geotechnical Report

Riverwalk Park, Boardwalk Loop, and Event Space

699 Route 28
Yarmouth, Massachusetts

Submitted to:
BETA Group, Inc.
315 Norwood Park South
Norwood, MA 02062

Submitted by:
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801
781-721-4000

August 2023

Project 2102949

Stephen J. Sarandis, P.E.
Project Manager

Michael Paster, P.E.
Senior Geotechnical Engineer

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Executive Summary

This report presents the results of the subsurface explorations and our geotechnical recommendations for the proposed Riverwalk Park and Boardwalk Project located in Yarmouth, Massachusetts.

We understand the project will consist of a small park office and restroom building, up to nine artist shanties, landscaped areas, a kayak launch, site amenities, and parking areas. The project will also include an approximately 1,400-foot-long elevated boardwalk through the edge of the salt marsh and a 36-foot-long pedestrian bridge spanning a tidal creek.

Subsurface Conditions

We observed three geotechnical borings (B1 - B3) and four direct push geoprobes (GP1 - GP4) between October 12 and 21, 2021. B-1 was advanced to depth of 61 feet and B-2 and B-3 were advanced to depths of 51 feet. The geoprobes were advanced to 50 feet.

BETA performed two series of test pits to observe shallow soil conditions.

The explorations encountered approximately 5 to 6 feet of fill at the ground surface in the upland areas and 0.3 to 0.8 feet of silty sand with organics at the ground surface in the salt marsh. Beneath these layers we encountered sand or sand and gravel to the bottom of the explorations. Depth to groundwater measured in the explorations ranged from 1.5 to 6.9 feet.

Recommendations

We recommend that the proposed structures be supported on spread footings bearing in the natural sand layer or on structural fill extending down to the natural sand layer. The footings should be designed for a maximum allowable bearing pressure of 4 kips per square foot with a minimum width of 3 feet. As discussed below, narrower footings may be used with a reduced bearing pressure. Some over-excavation of existing fill soils may be required to reach the natural soil bearing layer.

Floor slabs can be designed as slabs-on-grade with a minimum of 9 inches of compacted Structural Fill below the slab.

Any fill placed within the limits of the structures should meet the gradation and compaction requirements for Structural Fill given in Table 1. Some of the site soils maybe suitable for re-use as Structural Fill below the structures. This should be confirmed during construction.

We understand that multiple boardwalk support systems were evaluated, and that helical piles were selected to minimize impacts to the existing marsh lands. We recommend that the

helical piles derive their support in the natural sand or sand and gravel layer. The helical piles should be designed and constructed in accordance with Section 1810.3 of the Massachusetts State Building Code (which incorporates the 2015 International Building Code).

The gangway approach to the Kayak Launch may be supported on timber piles. Timber piles can achieve their axial support in the upper 30 feet of the natural sandy soils with anticipated axial capacities of about 10 tons.

1. Introduction

1.1 Purpose

This report presents the results of the subsurface explorations and our geotechnical recommendations for the proposed Riverwalk Park and Boardwalk Project located in the Yarmouth, Massachusetts.

1.2 Scope

Our scope of work included:

- Observed 3 geotechnical borings and 4 direct push geoprobes to evaluate soil and groundwater conditions.
- Reviewed the results of test pits performed by BETA.
- Evaluated the soil conditions and developed geotechnical design and construction recommendations.
- Prepared this report.

1.3 Authorization

Mr. Mark R. Gershman, P.E. of BETA Group, Inc. authorized our work by a subconsultant agreement dated July 27, 2021.

1.4 Project Personnel

The following personnel at GEI were involved with the field explorations, evaluations, and preparation of this report:

Stephen J. Sarandis, P.E.	Project Manager
Michael Paster, P.E.	In-House Reviewer
Rihabe Oulal	Geotechnical Engineer

2. Site and Project Description

2.1 Site and Project Description

The site is located off Route 28 on the west side of the Parker River in Yarmouth, Massachusetts (Fig. 1). The northern half of the site is located on a former drive-in movie theater property and the southern half of the site is located on existing salt marshes.

The ground surface is generally flat and ranges from about El. 2 to El. 4 on the southern end of the site within the salt marsh, up to about El. 5 to El. 8 on the northern part of the site near the former drive-in movie theater. A large central portion of the site was previously developed as a paved, drive-in movie theater. However, the site is currently undeveloped and is covered with vegetation consisting of short grass, small trees, and shrubs.

As shown in Fig. 2, we understand the Riverwalk Park and Boardwalk project will consist of a small park office and restroom building, up to nine artist shanties, landscaped areas, a kayak launch, site amenities, and parking areas. The project will also include an approximately 1,400-foot-long elevated boardwalk through the edge of the salt marsh. A portion of the boardwalk is a 36-foot-long pedestrian bridge spanning a tidal creek.

The western portions of the site will be cut by about 2 feet. The excavated soils will be used as fills beneath new roadways and parking areas. The new park office and restroom building will be constructed on about 8 feet of fill to raise it above the flood plain.

2.2 Elevation Datum

Elevations in this report are in feet and are referenced to the 1988 North American Vertical Datum (NAVD 1988).

2.3 Code Reference

Our recommendations are based on the Massachusetts State Building Code 9th Edition which incorporates the International Building Code 2015 with Massachusetts Amendments.

3. Subsurface Conditions

3.1 Site Geology

The surficial geology map of the Dennis quadrangle indicates the soils in the project vicinity consist of coarse deposits of sand and gravel, generally ranging between 25 and 50 percent gravel particles and between 50 and 75 percent sand particles. Sand deposits are composed mainly of very coarse to fine sand, typically in well-sorted layers.

3.2 GEI Subsurface Exploration Program

Northern Drill Service Inc. (Northern) of Northborough, Massachusetts drilled 3 geotechnical borings (B1 through B3) and 4 Geoprobes (GP1 – GP4) from October 12 through October 22, 2021. The borings were performed in upland areas and the geoprobes were performed in the salt marsh where the use of lightweight equipment was required to reduce impacts to the marsh. A GEI representative observed and documented the explorations. Exploration logs are provided in Appendix A. Exploration locations are shown in Fig. 2.

Northern drilled the borings with a track-mounted Diedrich D120 drill rig using rotary-wash techniques with driven casing. Split-spoon sampling and Standard Penetration Tests (SPTs) were performed continuously in the upper 10 feet of each boring and then typically at five-foot intervals below that. The SPTs were obtained using an automatic hammer system. B-1 was advanced to a depth of 61 feet and B-2 and B-3 were advanced to depths of 51 feet.

Northern advanced the geoprobes with a 6620DT track-mounted direct push rig to depths of 50 feet. Northern used swamp matts to mobilize the rig to the geoprobe locations to reduce the impacts to the salt marsh.

A GEI field engineer observed the borings and geoprobes and logged the samples.

Upon completion, borings and probes were backfilled with soil cuttings and topped off with gravel.

The as-drilled boring and geoprobe locations and elevations were surveyed in the field by BETA.

3.3 BETA Test Pit Program

BETA Group excavated two series of test pits at the site.

Test Pit Series 1: In October 2021, BETA excavated seven test pits as part of a Soil Suitability Assessment for On-Site Sewage Disposal. The test pits ranged in depth from 40 inches to 90 inches.

Test Pit Series 2: In December 2022 BETA excavated 19 test pits to investigate for the presence of an existing pavement layer from when the site was previously occupied by a drive-in-theater.

Test Pit Series 3: In December 2022 BETA also excavated 5 test pits in the general area of stormwater BMP's and the proposed office and restroom building.

Test pit locations for the series 1 test pit program are shown in Fig. 2. The locations of the series 2 and 3 test pits are shown on a figure included in a BETA memorandum presented in Appendix B. The logs from all three test pit series are provided in Appendix B.

3.4 Subsurface Conditions

The soil layers encountered in the borings and geoprobes are described below, in order of increasing depth. Subsurface conditions are known only at the exploration locations. Conditions between explorations may differ significantly from those described below.

As discussed above, Standard Penetration Testing was performed using an automatic hammer. We corrected the Standard Penetration Test N-values for energy (N_{60}) based on published data on SPT hammer efficiencies. We assumed that the automatic hammer had an efficiency of 80 percent. N_{60} values are used in the discussion of subsurface conditions below. (Uncorrected N values are shown on the boring logs in Appendix A).

Silty Sand with Organics - A 0.3 to 0.8-foot-thick layer of Silty Sand with trace amounts of organics was encountered at the ground surface in B-3, and GP-1 to GP-4.

Fill – A 5.0 to 6.0-foot-thick layer of sandy fill was encountered in borings B-1and B-2. The fill generally consisted of widely graded sand with varying amounts of silt and gravel. SPT N-values corrected for hammer energy (N_{60}) ranged from 8 to 23 blows per foot (bpf), indicating loose to medium dense soil. Sandy fill was encountered in the majority of the BETA test pits at thicknesses ranging from about 1 to 4 feet. Many of the BETA test pits also encountered intermittent layers of remnant paving within the fill layer. The remnant paving was generally encountered 2- to 12-inches below the ground surface and was found to be about 1- to 4-inches thick. The remnant paving material appeared to be a mixture of sand and bitumen or asphalt and was friable. A small backhoe could break up the material easily.

Sand or Sand and Gravel– A layer of Sand or Sand and Gravel was encountered below the Fill and Silty Sand with Organics in all the borings and geoprobes. This layer generally consisted of widely graded sand with varying amounts of silt and gravel. SPT N_{60}-values ranged from 3 to 35 blows per foot (bpf), with most values between 6 and 20, indicating a loose to medium dense soil. All the borings and geoprobes were terminated in this layer.

3.5 Groundwater Levels

Depth to groundwater was measured in the borings and geoprobes at the completion of drilling at depths of 1.5 to 6.9 feet. It is likely that the elevation of the groundwater is close to the elevation of the ground surface in the area of the salt marsh on the southern half of the site and is influenced by the tides.

The groundwater level measurements represent conditions at the times and locations indicated. Significantly different groundwater levels may occur at other times and in other locations.

4. Design Recommendations

4.1 Foundation Design for Park Office and Restroom Building

4.1.1 Footings

We understand that the proposed park office and restroom building will be constructed on about 8 feet of structural fill to raise it above the flood plain. We recommend that the proposed building be supported on spread or strip footings bearing on the structural fill placed on the natural sandy soils with a maximum allowable bearing pressure of 4 kips per square foot (ksf). Footings designed for this allowable bearing pressure should be at least 3 feet wide. Footings 2.5 feet wide may be used with an allowable bearing pressure of 3 ksf, and footings 2 feet wide may be used with an allowable bearing pressure of 2 ksf. Exterior footings, and footings in unheated portions of the building, should bear at least 3.5 feet below the finished grade for frost protection. Interior footings should bear at least 18 inches below the bottom of the floor slab. The tops of all footings should be at least 6 inches below the bottom of the overlying floor slab.

4.1.2 Floor Slabs

The first floor of the proposed building may be designed as a slab-on-grade bearing on structural fill.

We recommend that contraction joints be incorporated between the slab-on-grade and the columns and perimeter walls of the proposed building.

We recommend that, at a minimum, a vapor retarder be installed below the ground floor slabs-on-grade. We recommend that you consult with the manufacturer of the proposed flooring system regarding vapor transmission and vapor retarder/waterproofing requirements.

4.1.3 Settlement

We estimate that the total settlements of the proposed building will be less than ¾ inch, and differential settlements will be less than ½ inch. Most of the settlement is expected to occur during construction. These estimates assume that the foundation is designed and constructed in accordance with the recommendations in this report.

4.1.4 Seismic Design

We recommend using Site Class E for seismic design.

The earthquake design factors for Yarmouth Massachusetts (per Chapter 16 of the Massachusetts Amendments to the Building Code) are:

S_S = 0.149 g

S_1 = 0.054 g

The amplification factors for Site Class E are:

F_a = 2.5

F_v = 3.5

Resulting seismic design parameters are:

S_{DS}= 0.248 g

S_{D1} = 0.126 g

Based on criteria provided in Section 1806.4 of the Building Code (Massachusetts Amendments to the IBC), the sands encountered in the borings above a depth of 30 feet are not susceptible to liquefaction. The sands below 30 ft may be susceptible to liquefaction, which could lead to significant structure settlement following an earthquake. In our opinion, no measures are needed to mitigate the risk of liquefaction.

4.2 Foundation Design for Site Amenities Such as Playground and Utility Equipment, Stairs, and Gates.

For site amenities such as playground and utility equipment, stairs, and gates, we recommend either spread footings or concrete pier foundation elements such as sonotubes. Foundations may be designed using the allowable bearing pressures stated in Section 4.1.1. For foundations smaller than the dimensions above, use 1.5 ksf for 18-inch diameter, and 1.0 ksf for 12-inch diameter.

Footing and concrete pier foundations should be founded at least 3.5 feet below the finished grade for frost protection. All footings should bear directly on the natural sandy soils or compacted structural fill extending down to the natural sandy soils.

4.3 Foundation Design for Artist Shanties

We understand that the Artist Shanties will be small light-weight wooden structures (about 10 feet by 12 feet in plan) supported on concrete slabs. The concrete slabs will be 8-inches thick with 18-inch-thick haunches along the long edges of the slabs.

All soil below the Artist Shanty slabs containing organics should be removed and replaced as needed with compacted Structural Fill (Table 1). At least 9 inches of Structural Fill should be placed below the slabs in all areas.

4.4 Foundation Design for Boardwalk

4.4.1 Elevated Boardwalk and Pedestrian Bridge

We understand that the elevated boardwalk and pedestrian bridge will be supported on helical piles to reduce disruption to the existing marshlands. We recommend that the helical piles be installed to derive their axial support in the natural sandy soils. We recommend that lateral loads be resisted by battered helical piles.

Helical piles are manufactured by several suppliers in a number of sizes and configurations used for different soil conditions and design loads. Generally, the specialty helical pile contractor designs the piles and submits the proposed design to the owner for review and approval.

The contractor is responsible for providing a design that will satisfy a performance requirement based on the installation torque resistance. Field verification of helical pile capacity is typically performed by measuring the torque resistance during installation. Empirical correlations are used to relate the torque resistance to ultimate bearing capacity. The empirical data indicate that the relationship between torque and bearing capacity varies with the pile shaft diameter, so the required torque resistance is different for different pile designs. We recommend that the required torque resistance be determined using the following correlation (Perko, 2009):

$$Q_u = \frac{22T}{d^{0.92}}$$

Where,
Q_u = Ultimate bearing capacity
T = torque resistance
d = pile shaft diameter or diameter of a circle circumscribed around a square shaft (inch)

We recommend that helical piles be designed by a Massachusetts-registered Professional Engineer, obtaining all resistance in the natural sandy soils. The helical piles should be designed in accordance with Section 1810.3.3.1.9 of the Building Code.

We also recommend that the following items be noted on the construction drawings:

- Provide hot-dip galvanizing on all surfaces of the piles.
- Specify Round Shaft (RS) helical piles.
- Fill the inside of the shaft with grout.
- Install the helical piles in accordance with Section 1810.4.11 of the Building Code.
- Install the piles to a depth where all the helices bear in the natural sandy soils.

- Maintain an installation tolerance of 1 inch for plan location and 5 degrees for verticality.
- Monitor the torque using equipment that has been calibrated within the previous 12 months.
- Maintain an adequate crowd force, sufficient that the pile advances into the ground a distance of at least 80 percent of the blade pitch per revolution during normal advancement.

4.4.2 Boardwalk Approach Abutments

The boardwalk approach abutments may be supported on helical piles similar to the boardwalk.

Alternatively, the approach abutments may be supported on spread or strip footings bearing on the natural sandy soils using the allowable bearing pressures stated in Section 4.1.1.

Footings should be founded at least 3.5 feet below the finished grade for frost protection. All footings should bear directly on the natural sandy soils or compacted structural fill extending down to the natural sandy soils. Dewatering will likely be needed to construct spread footings.

4.5 Foundation Design for Kayak Launch Gangway

The gangway approach to the Kayak Launch may be supported on timber piles. Timber piles can achieve their axial support in the upper 30 feet of the natural sandy soils with anticipated axial capacities of about 10 tons.

We recommend that lateral loads be resisted by batter piles.

5. Construction Recommendations

5.1 Preparation of Subgrades for Footings and Slab-on-Grade

Footings may bear directly on the natural Sand or Sand and Gravel layer.

Loose or disturbed soil should be removed from the bottom of the footing excavations, and the subgrade should be compacted with at least three coverages of a vibratory compactor weighing at least 200 pounds and imparting an impact load of at least 2.5 tons. Concrete for footings may be placed directly on the soil subgrade. Bearing surfaces should be free of standing water, frost, and loose soil before placement of reinforcing steel and concrete. Areas of the subgrade disturbed by traffic or surface water should be re-compacted.

For slabs-on-grade, the topsoil and the top 12 inches of existing soil should be removed, and the subgrade should be proof rolled with a 5-ton vibratory roller. Any soft zones should be over-excavated and replaced with Structural Fill. Structural Fill should then be used to raise the over-excavated subgrade to the appropriate elevation for the vapor retarder/waterproofing membrane. A minimum of 9 inches of Structural Fill should be placed below all slabs-on-grade.

5.2 Excavation and Dewatering

All excavations should be made in accordance with OSHA standards.

Depending on the final depth of the footings and utilities, groundwater may be encountered in the excavations. We anticipate that filtered sumps will be adequate to control groundwater during construction, if necessary.

The site should be graded to direct surface runoff away from foundation excavations.

5.3 Backfilling

Any fill placed below footings or slabs on grade should meet the gradation and compaction requirements for Structural Fill given in Table 1. Section 1705.6 and Table 1705.6 of the IBC 2015 calls for continuous inspection of fill placed below footings.

Backfill placed outside the structure limits should meet the requirements for Ordinary Fill in Table 2. Fill more than 9 inches below asphalt paved parking areas and driveways, and backfill for utility trenches, should meet the criteria for Ordinary Fill. Ordinary Fill may be susceptible to frost heave. The potential for frost heave can be reduced by grading outside areas for proper drainage and by using Structural Fill rather than Ordinary Fill for the top 1 to 2 feet.

5.4 Reuse of On-site Soil

It appears that most of the existing site soils will be acceptable for reuse as Ordinary Fill. Some of the site soils may be acceptable for re-use as Structural Fill, but this should be confirmed with additional testing during construction.

5.5 Freezing Conditions

Some of the site soils may be frost susceptible. Therefore, if construction is performed during freezing weather, special precautions will be required to prevent the subgrade soils from freezing. Freezing of the soil beneath the foundation during construction may result in subsequent settlement of the structure when the soil thaws.

All subgrades should be free of frost before placement of concrete. Any soils that have frozen should be removed and replaced with compacted Structural Fill. The footing and the soil adjacent to the footing should be insulated until they are backfilled.

Soil placed as fill should be free of frost, as should the ground on which it is placed.

If slabs-on-grade or footings are built and left exposed during the winter, precautions should be taken to prevent freezing of the underlying soil.

5.6 Existing Structures and Buried Structures/Utilities

It is possible that some former building foundations or buried utilities may be present on the site. Our recommendations are based on the assumption that no such structures exist. Before construction of foundations for the proposed structures, a diligent effort should be made to determine the presence and location of any buried structures including utilities. This effort should include a thorough review of available drawings and other records of the site use and facilities. If the presence of such structures is determined to be likely, GEI should be notified so that we may review and revise our recommendations, if appropriate.

5.7 Future Work

We recommend that GEI be engaged during construction to:

- Review contractor submittals.
- Provide construction observation to check that the footings and slabs-on-grade bear on appropriate soils and to observe that the soil subgrades are properly prepared.
- Provide laboratory and field testing to check that Structural and Ordinary Fill meet the recommended gradation and compaction requirements.
- Observe the installation of helical and timber piles.

6. Limitations

Our recommendations are based on the project information provided to us at the time of this report and may require modification if there are any changes in the nature, design, or location of the proposed construction. We recommend that GEI be engaged to review the final plans and specifications to judge whether changes in the project affect the validity of our recommendations and whether our recommendations have been properly implemented in the design.

The recommendations in this report are based in part on the data obtained from the explorations. The nature and extent of variations between explorations may not become evident until construction. If variations from the anticipated conditions are encountered, it may be necessary to revise the recommendations in this report. Therefore, we recommend that GEI be engaged to make site visits during construction to ascertain that, in general, the geotechnical aspects of the work are being performed in compliance with the contract documents.

Our professional services for this project have been performed in accordance with generally accepted engineering practices; no warranty, express or implied, is made.

Tables

Table 1. Requirements for Structural Fill
Riverwalk Park and Boardwalk
Yarmouth, Massachusetts

Structural Fill shall consist of hard, durable sand and gravel, free of clay, organic matter, surface coatings, and other deleterious materials. Soil finer than the No. 200 sieve (the "fines") shall be non-plastic. Structural Fill shall meet the following gradation requirements:

Sieve Size	Percent Passing by Weight
3 inches	100
½ inch	50 – 100
No. 4	35 – 85
No. 16	20 – 65
No. 50	5 – 40
No. 200 (fines)	0 – 8

Structural Fill shall be compacted in maximum 9-inch-thick, loose lifts to at least 95 percent of the maximum dry density determined in accordance with ASTM D1557 (Modified AASHTO Compaction).

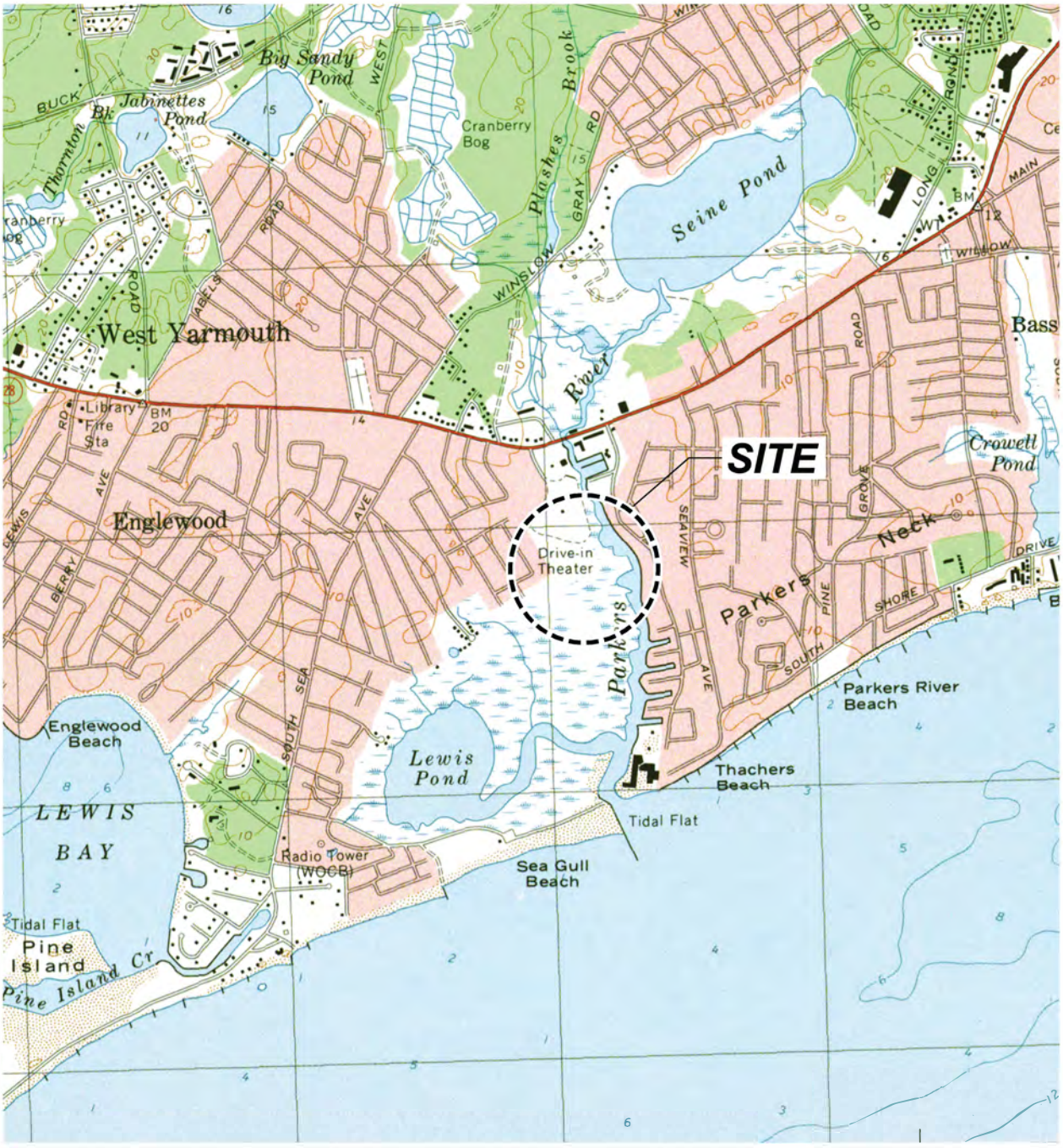
Table 2. Requirements for Ordinary Fill
Riverwalk Park and Boardwalk
Yarmouth, Massachusetts

Ordinary Fill shall consist of hard, durable sand and gravel, free of clay, organic matter, surface coatings, and other deleterious materials. Soil finer than the No. 200 sieve (the "fines") shall be nonplastic. Ordinary Fill shall meet the following gradation requirements:

Sieve Size	Percent Passing by Weight
6 inches	100
3 inches	80 – 100
No. 4	20 – 100
No. 200 (fines)	0 - 20

Ordinary Fill shall be compacted in maximum 12-inch-thick, loose lifts to at least 92 percent of the maximum dry density determined in accordance with ASTM D1557 (Modified AASHTO Compaction).

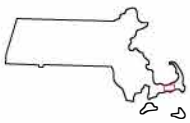
Figures



0 1000 2000 4000 6000

SCALE, FEET

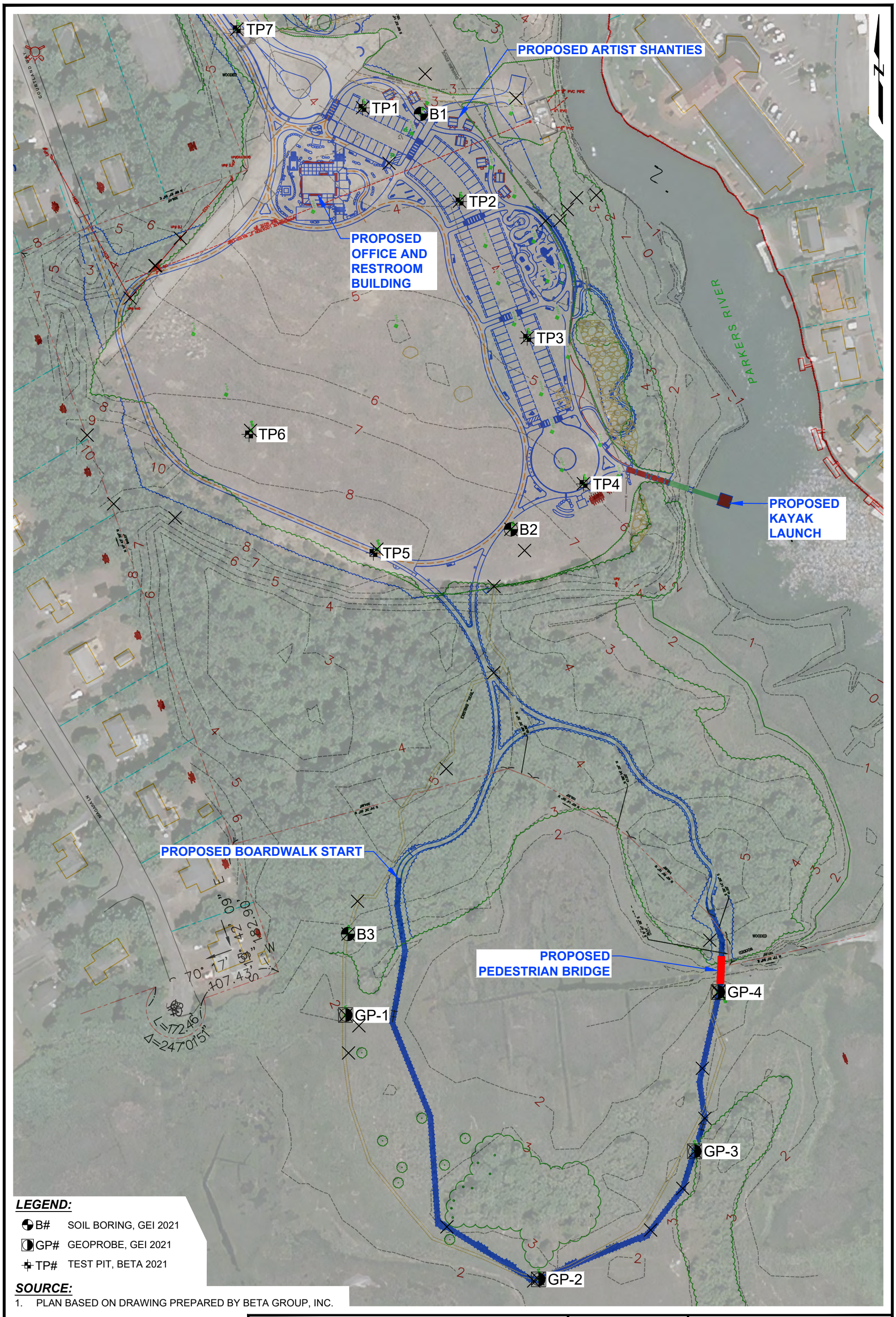
This Image provided by MassGIS is from U.S.G.S. Topographic
7.5 X 15 Minute Series
Hyannis, MA Quadrangle, 1988.
Datum is National Geodetic Vertical Datum of 1929 (NGVD29).
Contour Interval is 3 Meters.



MASSACHUSETTS
QUADRANGLE LOCATION

Riverwalk Park and Boardwalk Yarmouth, Massachusetts	GEI Consultants	SITE LOCATION MAP
BETA, Inc. Lincoln, Rhode Island	Project 2102949	August 2023 Fig. 1

B:\Working\YARMOUTH MA, TOWN OF\2102949 Yarmouth Riverwalk Park\00_CAD\Figures\Fig 1 - Site Location Plan



Yarmouth Riverwalk Park and Boardwalk
Yarmouth, Massachusetts

BETA Group, Inc.
Norwood, Massachusetts

GEI Consultants

EXPLORATION LOCATION PLAN

Project 2102949 | August 2023 | Fig. 2

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Appendix A

GEI Exploration Logs

BORING INFORMATION

LOCATION:

GROUND SURFACE EL. (ft): 3.6 **DATE START/END:** 10/20/2021 - 10/21/2021

VERTICAL DATUM: NAVD 88 **DRILLING COMPANY:** Northern Drill Service, Inc.

TOTAL DEPTH (ft): 61.0 **DRILLER NAME:** J. Raymond

LOGGED BY: R. Oulal **RIG TYPE:** Diedrich D-120

BORING

B1

DRILLING INFORMATION

HAMMER TYPE: Automatic **CASING I.D./O.D.:** 4 inch / 4.5 inch **CORE BARREL TYPE:** N/A

AUGER I.D./O.D.: NA / NA **DRILL ROD O.D.:** 2.625 inch **CORE BARREL I.D./O.D.** NA / NA

DRILLING METHOD: Drive and Wash

WATER LEVEL DEPTHS (ft): ▼ 3.5 10/21/2021 7:15 am

ABBREVIATIONS:

Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer

S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
0	5	S1	0 to 2	24/22	3-5-3-8		FILL	S1: NARROWLY GRADED SAND (SP); ~90% fine to medium sand, ~5% fine gravel, ~5% nonplastic fines, brown. Piece of glass present.
		S2	2 to 4	24/20	5-5-10-13			S2: NARROWLY GRADED SAND (SP); ~95% fine to medium sand, ~5% fine gravel, tan, dry.
		S3	4 to 6	24/11	5-7-7-9			S3: NARROWLY GRADED SAND (SW); ~100% fine to medium sand, tan, wet.
-5	10	S4	6 to 8	24/15	8-9-11-13		SAND	S4: WIDELY GRADED SAND (SW); ~95% fine to coarse sand, ~5% fine gravel, orange.
		S5	8 to 10	24/12	2-4-6-6			S5 (0-10"): WIDELY GRADED SAND (SW); ~95% fine to coarse sand, ~5% nonplastic fines, tan. S5 (10-12"); SILT(ML); ~90% nonplastic fines, ~10% fine sand, light brown.
-10	15	S6	14 to 16	24/6	3-4-4-5			S6: WIDELY GRADED SAND WITH GRAVEL (SW); ~80% medium to coarse sand, ~20% fine gravel, tan.
-15	20	S7	19 to 21	24/6	4-5-6-4			S7: NARROWLY GRADED SAND WITH GRAVEL (SP); ~80% fine to coarse sand, ~15% fine to coarse gravel, ~5% nonplastic fines, gray. Mainly fine to medium sand.
-20								

NOTES: 1. Resampled with 3-inch spoon when there was no recovery in the SPT spoon.

PROJECT NAME: Riverwalk Park and Boardwalk

CITY/STATE: Yarmouth, Massachusetts

GEI PROJECT NUMBER: 2102949

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS.GPJ 12/8/21

LOCATION:

GROUND SURFACE EL. (ft): 3.6 **DATE START/END:** 10/20/2021 - 10/21/2021

VERTICAL DATUM: NAVD 88 **DRILLING COMPANY:** Northern Drill Service, Inc.

BORING B1

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
	25	S8	24 to 26	24/8	WOH-4-4-6		SAND	S8: WIDELY GRADED SAND (SW); ~100% fine to coarse sand, gray. Mostly fine to medium sand in upper 6 inches.
-25								
	30	S9	29 to 31	24/2	3-4-4-4			S9: WIDELY GRADED SAND WITH GRAVEL (SW); ~85% fine to coarse sand, ~15% coarse gravel, gray.
-30								
	35	S10	34 to 36	24/3	2-4-3-4			S10: NARROWLY GRADED SAND (SP); ~90% fine to medium sand, ~10% fine gravel, tan.
-35								
	40	S11	39 to 41	24/0	1-3-3-5			S11: No recovery. S11[REDRIVE]: No recovery.
-40								
	45	S12	44 to 46	24/2	1-2-3-3			S12: WIDELY GRADED GRAVEL WITH SAND (GW); ~80% fine to coarse gravel, ~20% fine to coarse sand, tan.
-45								
	50	S13	49 to 51	24/0	1-1-5-5			S13: No recovery. S13[REDRIVE]; NARROWLY GRADED SAND (SW); ~95% fine to medium sand, ~5% fine gravel, tan.
-50								
	55	S14	54 to 56	24/0	1-1-1-1			S14: No recovery. S14[REDRIVE]: No recovery.

NOTES: 1. Resampled with 3-inch spoon when there was no recovery in the SPT spoon.

PROJECT NAME: Riverwalk Park and Boardwalk

CITY/STATE: Yarmouth, Massachusetts

GEI PROJECT NUMBER: 2102949

GEI Consultants

LOCATION:

GROUND SURFACE EL. (ft): 3.6 **DATE START/END:** 10/20/2021 - 10/21/2021

VERTICAL DATUM: NAVD 88 **DRILLING COMPANY:** Northern Drill Service, Inc.

BORING B1

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
-55	60	S15	59 to 61	24/2	1-2-4-6		SAND	S15: NARROWLY GRADED SAND (SW); ~100% fine to medium sand, tan.
								Bottom of boring at 61 feet. Backfilled with cuttings.
-60	65							
-65	70							
-70	75							
-75	80							
-80	85							

NOTES: 1. Resampled with 3-inch spoon when there was no recovery in the SPT spoon.

PROJECT NAME: Riverwalk Park and Boardwalk

CITY/STATE: Yarmouth, Massachusetts

GEI PROJECT NUMBER: 2102949

GEI Consultants

BORING INFORMATION

LOCATION:

GROUND SURFACE EL. (ft): 7.6 **DATE START/END:** 10/19/2021 - 10/20/2021

VERTICAL DATUM: NAVD 88 **DRILLING COMPANY:** Northern Drill Service, Inc.

TOTAL DEPTH (ft): 51.0 **DRILLER NAME:** J. Raymond

LOGGED BY: R. Oulal **RIG TYPE:** Diedrich D-120

BORING

B2

DRILLING INFORMATION

HAMMER TYPE: Automatic **CASING I.D./O.D.:** 4 inch / 4.5 inch **CORE BARREL TYPE:** N/A

AUGER I.D./O.D.: NA / NA **DRILL ROD O.D.:** 2.625 inch **CORE BARREL I.D./O.D.** NA / NA

DRILLING METHOD: Drive and Wash

WATER LEVEL DEPTHS (ft): ▼ 6.9 10/20/2021 7:10 am

ABBREVIATIONS:

Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer

S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
5	5	S1	0 to 2	24/24	4-6-7-6		FILL	S1 (0-9"): NARROWLY GRADED SAND WITH SILT (SP-SM); ~85% fine to medium sand, ~10% nonplastic fines, ~5% fine gravel, black. Roots present. S1(9-24"); NARROWLY GRADED SAND (SP); ~90% fine to medium sand, ~10%fine gravel, tan.
		S2	2 to 4	24/16	5-3-2-2			S2: NARROWLY GRADED SAND (SP); ~100% fine to coarse sand, tan.
		S3	4 to 6	24/12	1-3-9-11			S3: NARROWLY GRADED SAND (SP); ~90% fine to medium sand, ~5% fine gravel, ~5% nonplastic fines brown. Roots present and densely compacted in spoon.
0	10	S4	6 to 8	24/12	12-12-12-10		SAND	S4: Similar to s3, except no roots.
		S5	8 to 10	24/6	5-5-6-6			S5: WIDELY GRADED SAND (SW); ~100% fine to coarse sand, tan.
-5	15	S6	14 to 16	24/12	12-12-18-21			S6: NARROWLY GRADED SAND (SP); ~100% fine to medium sand, tan, dry. Oxidation throughout.
-10	20	S7	19 to 21	24/6	5-6-7-7			S7: WIDELY GRADED SAND (SW); ~95 fine to coarse sand, ~5% fine gravel, tan, wet. Mostly coarse sand.
-15								

NOTES: 1. Resampled with 3-inch spoon when there was no recovery in the SPT spoon.

PROJECT NAME: Riverwalk Park and Boardwalk

CITY/STATE: Yarmouth, Massachusetts

GEI PROJECT NUMBER: 2102949

GEI Consultants

LOCATION:

GROUND SURFACE EL. (ft): 7.6 **DATE START/END:** 10/19/2021 - 10/20/2021

VERTICAL DATUM: NAVD 88 **DRILLING COMPANY:** Northern Drill Service, Inc.

BORING B2

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
	25	S8	24 to 26	24/0	9-10-10-9		SAND	S8: No recovery. S8[REDRIVE]: WIDELY GRADED SAND WITH GRAVEL (SW); ~60% fine to coarse sand, ~40% coarse gravel, tan. Mainly medium to coarse sand.
-20								
	30	S9	29 to 31	24/0	4-5-9-11			S9: No recovery. S9[REDRIVE]: No recovery.
-25								
	35	S10	34 to 36	24/0	4-5-9-11			S10: No recovery. S10[REDRIVE]: No recovery.
		S11	36 to 38	24/0	9-13-15-14	Used 3-inch spoon to sample S11.		S11: No recovery.
-30								
	40	S12	39 to 41	24/0	4-6-9-11			S12: No recovery. S12[REDRIVE]: No recovery.
-35								
	45	S13	44 to 46	24/1	4-8-11-12			S13: NARROWLY GRADED SAND (SP); ~100% fine to coarse sand, tan. S13[REDRIVE]: No recovery.
-40								
	50	S14	49 to 51	24/2	4-7-11-13			S14: NARROWLY GRADED SAND (SP); ~95% fine to medium sand, ~5% nonplastic fines, tan.
-45								Bottom of boring at 51 feet. Backfilled with cuttings.
	55							

NOTES: 1. Resampled with 3-inch spoon when there was no recovery in the SPT spoon.

PROJECT NAME: Riverwalk Park and Boardwalk

CITY/STATE: Yarmouth, Massachusetts

GEI PROJECT NUMBER: 2102949

GEI Consultants

BORING INFORMATION

LOCATION:

GROUND SURFACE EL. (ft): 4.2 **DATE START/END:** 10/20/2020 - 10/19/2021

VERTICAL DATUM: NAVD 88 **DRILLING COMPANY:** Northern Drill Service, Inc.

TOTAL DEPTH (ft): 51.0 **DRILLER NAME:** J. Raymond

LOGGED BY: R. Oulal **RIG TYPE:** Diedrich D-120

BORING

B3

DRILLING INFORMATION

HAMMER TYPE: Automatic **CASING I.D./O.D.:** 4 inch / 4.5 inch **CORE BARREL TYPE:** N/A

AUGER I.D./O.D.: NA / NA **DRILL ROD O.D.:** 2.625 inch **CORE BARREL I.D./O.D.** NA / NA

DRILLING METHOD: Drive and Wash

WATER LEVEL DEPTHS (ft): ▼ 1.5 10/19/2021 11:32 am

ABBREVIATIONS:

Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer

S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 2	24/16	1-1-1-1		SAND	S1 (0-6"); SILTY SAND (SM); ~60% fine to medium sand, ~40% nonplastic organic fines, black/gray. Organic fibers and odor present. S1 (6-16"): NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine to medium sand, ~10% nonplastic fines, brown. Slight organic odor and roots present.
		S2	2 to 4	24/14	3-3-4-4			S2: WIDELY GRADED SAND (SW); ~90% fine to coarse sand, ~5% nonplastic fines, ~5% fine gravel, brown.
0	5	S3	4 to 6	24/7	8-4-2-5		SAND AND GRAVEL	S3: WIDELY GRADED SAND WITH GRAVEL (SW); ~70% fine to coarse sand, ~30% fine to coarse gravel, tan.
		S4	6 to 8	24/9	5-2-3-5			S4: Similar to S3.
-5	10	S5	8 to 10	24/0	8-11-15-17			S5: No recovery. Piece of 1.5-inch gravel in shoe. S5[REDRIVE]: Similar to S3.
-10	15	S6	14 to 16	24/9	4-7-11-10			S6: CLAYEY GRAVEL WITH SAND (GC); ~50% fine to coarse gravel, ~35% fine to coarse sand, ~15% low plasticity fines, tan.
-15	20	S7	19 to 21	24/0	7-6-7-8			S7: No recovery. S7 [REDRIVE]: No recovery.

NOTES: 1. Resampled with 3-inch spoon when there was no recovery in the SPT spoon.

PROJECT NAME: Riverwalk Park and Boardwalk

CITY/STATE: Yarmouth, Massachusetts

GEI PROJECT NUMBER: 2102949

GEI Consultants

LOCATION:

GROUND SURFACE EL. (ft): 4.2 **DATE START/END:** 10/20/2020 - 10/19/2021

VERTICAL DATUM: NAVD 88 **DRILLING COMPANY:** Northern Drill Service, Inc.

BORING B3

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
-20	25	S8	24 to 26	24/0	5-7-7-7		SAND AND GRAVEL	S8: No recovery. S8 [REDRIVE]: No recovery.
-25	30	S9	29 to 31	24/4	3-3-5-6			S9: Similar to S3.
-30	35	S10	34 to 36	24/9	2-3-7-5			S10: WIDELY GRADED SAND (SW); ~100% fine to coarse sand, tan.
-35	40	S11	39 to 41	24/11	2-2-3-5			S11: NARROWLY GRADED SAND WITH GRAVEL (SW); ~70% fine to MEDIUM sand. ~30% coarse gravel, tan.
-40	45	S12	44 to 46	24/9	3-3-2-3			S12: Similar to S11.
-45	50	S13	49 to 51	24/0	4-3-7-8			S13: No recovery. S13 [REDRIVE]: No recovery.
-50	55							Bottom of boring at 51 feet. Backfilled with cuttings.

NOTES: 1. Resampled with 3-inch spoon when there was no recovery in the SPT spoon.

PROJECT NAME: Riverwalk Park and Boardwalk

CITY/STATE: Yarmouth, Massachusetts

GEI PROJECT NUMBER: 2102949

GEI Consultants

BORING INFORMATION

LOCATION:

GROUND SURFACE EL. (ft): 2.4 **DATE START/END:** 10/12/2021 - 10/12/2021

VERTICAL DATUM: NAVD 88 **DRILLING COMPANY:** Northern Drill Service, Inc.

TOTAL DEPTH (ft): 50.0 **DRILLER NAME:** J. Raymond

LOGGED BY: R. Oulal **RIG TYPE:** Geoprobe 6620DT

BORING

GP-1

DRILLING INFORMATION

HAMMER TYPE: Automatic **CASING I.D./O.D.:** 2 inch / 2.5 inch **CORE BARREL TYPE:** Macrocore

AUGER I.D./O.D.: NA / NA **DRILL ROD O.D.:** NM **CORE BARREL I.D./O.D.** NA / NA

DRILLING METHOD: Direct Push

WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:

Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer

S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
0	0	S1	0 to 5	60/34	PUSH		SAND	S1 (0-10"): WIDELY GRADED SAND WITH SILT (SW-SM); ~85% fine to coarse sand, ~10% organic low plasticity fines, ~5% fine gravel, brown. S1 (10-24"): WIDELY GRADED SAND (sW); ~90% fine to coarse sand, ~5% fine gravel, ~5% nonplastic fines, brown. Organic odor present. S1 (24-34"): WIDELY GRADED SAND (SW); ~100% fine to coarse sand, light brown.
-5	5	S2	5 to 10	60/60	PUSH			S2 (0-24"): Similar to S1 (24-34"). S2 (24-60"); NARROWLY GRADED SAND (SW); ~90% fine to medium sand, ~5% fine gravel, ~5% nonplastic fines, tan. Organic odor present.
-10	10	S3	10 to 15	60/45	PUSH			S3 (0-41"); WIDELY GRADED SAND (SW); ~100% fine to coarse sand, orange. Organic odor present. S3 (41-45"): CLAYEY SAND (SC); ~70% fine to coarse sand, ~25% low plastic fines, ~5% fine gravel, tan. Organic odor present.
-15	15	S4	15 to 20	60/40	PUSH			S4 (0-12"): WIDELY GRADED SAND (sW); ~85% fine to coarse sand, ~15% coarse gravel, tan. S4 (12-23"): NARROWLY GRADED SAND (SW); ~95% fine to medium sand, ~5% nonplastic fines, tan. S4 (23-40"); WIDELY GRADED SAND (SW); ~95% fine to coarse sand, ~5% nonplastic fines, orange.
-20	20	S5	20 to 25	60/46	PUSH			S5 (0-12"); NARROWLY GRADED SAND (SP); ~95% fine to medium sand, ~5% nonplastic fines, brown. S5 (12-46"): Similar to S5 (0-12"), except tan.

NOTES:

PROJECT NAME: Riverwalk Park and Boardwalk

CITY/STATE: Yarmouth, Massachusetts

GEI PROJECT NUMBER: 2102949

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS.GPJ 12/8/21

LOCATION:

GROUND SURFACE EL. (ft): 2.4 **DATE START/END:** 10/12/2021 - 10/12/2021

VERTICAL DATUM: NAVD 88 **DRILLING COMPANY:** Northern Drill Service, Inc.

BORING GP-1

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
	25	S6	25 to 30	60/37	PUSH		SAND	S6: NARROWLY GRADED SAND (SP); ~95% fine to medium sand, ~5% nonplastic fines, light brown.
-25								
	30	S7	30 to 35	60/46	PUSH			S7: NARROWLY GRADED SAD (SP); ~95% fine to medium sand, ~5% nonplastic fines, tan. One fine gravel at 7-inches.
-30								
	35	S8	35 to 40	60/46	PUSH			S8: Similar to S7.
-35								
	40	S9	40 to 45	60/53	PUSH			S9: NARROWLY GRADED SAND (sW); ~100% fine to coarse sand, tan.
-40								
	45	S10	45 to 50	60/47	PUSH			S10: WIDELY GRADED SAND (SW); ~95% fine to coarse sand, ~5% nonplastic fines, tan. Mostly fine to medium sand.
-45								
	50							Bottom of hole at 50 feet. Backfilled with cuttings.
-50								
	55							

NOTES:

PROJECT NAME: Riverwalk Park and Boardwalk

CITY/STATE: Yarmouth, Massachusetts

GEI PROJECT NUMBER: 2102949

GEI Consultants

BORING INFORMATION

LOCATION:

GROUND SURFACE EL. (ft): 2.2 **DATE START/END:** 10/15/2021 - 10/15/2021

VERTICAL DATUM: NAVD 88 **DRILLING COMPANY:** Northern Drill Service, Inc.

TOTAL DEPTH (ft): 50.0 **DRILLER NAME:** J. Raymond

LOGGED BY: R. Oulal **RIG TYPE:** Geoprobe 6620DT

BORING

GP-2

DRILLING INFORMATION

HAMMER TYPE: Automatic **CASING I.D./O.D.:** 2 inch / 2.5 inch **CORE BARREL TYPE:** Macrocore

AUGER I.D./O.D.: NA / NA **DRILL ROD O.D.:** NM **CORE BARREL I.D./O.D.** NA / NA

DRILLING METHOD: Direct Push

WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:

Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer

S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
0	0	S1	0 to 5	60/25	PUSH		SAND	S1 (0-3"): SILTY SAND (SM); ~85% fine to medium sand, ~15% nonplastic organic fines, brown. S1 (3-25"): WIDELY GRADED SAND WITH GRAVEL (SW); ~80% fine to coarse sand, ~20% fine to coarse gravel, brown. Organic odor present.
-5	5	S2	5 to 10	60/58	PUSH	Rig chatter from 5 to 10 feet.		S2: NARROWLY GRADED SAND (SP); ~100% fine to medium sand, tan. Organic odor present.
-10	10	S3	10 to 15	60/38	PUSH			S3: Similar to S2.
-15	15	S4	15 to 20	60/51	PUSH			S4 (0-13"): Similar to S2. S4 (13-18"): SANDY LEAN CLAY (CL); ~60% low plastic fines, ~40% fine to medium sand, tan. S4 (18-51"): NARROWLY GRADED SAND (SP); ~100% fine to coarse sand, gray. Mainly fine to medium sand.
-20	20	S5	20 to 25	60/44	PUSH	Rig chatter from 20 to 30 feet.		S5 (0-24"): Similar to S2. 2-inch seam of orange at 2-feet. S5 (24-44"): Similar to S4 (18-51").

NOTES:

PROJECT NAME: Riverwalk Park and Boardwalk

CITY/STATE: Yarmouth, Massachusetts

GEI PROJECT NUMBER: 2102949

GEI Consultants

LOCATION:

GROUND SURFACE EL. (ft): 2.2 **DATE START/END:** 10/15/2021 - 10/15/2021

VERTICAL DATUM: NAVD 88 **DRILLING COMPANY:** Northern Drill Service, Inc.

BORING GP-2

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
	25	S6	25 to 30	60/53	PUSH		SAND	S6: Similar to S4 (18-51").
-25								
	30	S7	30 to 35	60/42	PUSH			S7: WIDELY GRADED SAND (SW); ~95% fine to coarse sand, ~5% nonplastic fines, tan.
-30								
	35	S8	35 to 40	60/53	PUSH	Rig chatter from 35 to 50 feet.		S8: WIDELY GRADED SAND (SW); ~100% fine to coarse sand, tan.
-35								
	40	S9	40 to 45	60/44	PUSH			S9: WIDELY GRADED SAND (SW); ~95% fine to coarse sand, ~5% fine gravel, tan.
-40								
	45	S10	45 to 50	60/58	PUSH			S10: Similar to S9, except tan.
-45								
	50							Bottom of hole at 50 feet. Backfilled with cuttings.
-50								
	55							

NOTES:

PROJECT NAME: Riverwalk Park and Boardwalk

CITY/STATE: Yarmouth, Massachusetts

GEI PROJECT NUMBER: 2102949

GEI Consultants

BORING INFORMATION

LOCATION:

GROUND SURFACE EL. (ft): 2.3 **DATE START/END:** 10/14/2021 - 10/14/2021

VERTICAL DATUM: NAVD 88 **DRILLING COMPANY:** Northern Drill Service, Inc.

TOTAL DEPTH (ft): 50.0 **DRILLER NAME:** J. Raymond

LOGGED BY: R. Oulal **RIG TYPE:** Geoprobe 6620DT

BORING

GP-3

DRILLING INFORMATION

HAMMER TYPE: Automatic **CASING I.D./O.D.:** 2 inch / 2.5 inch **CORE BARREL TYPE:** Macrocore

AUGER I.D./O.D.: NA / NA **DRILL ROD O.D.:** NM **CORE BARREL I.D./O.D.** NA / NA

DRILLING METHOD: Direct Push

WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:

Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer

S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
0	0	S1	0 to 5	60/33	PUSH		SAND	S1 (0-10"): WIDELY GRADED SAND WITH SILT (SW-SM); ~85% fine to coarse sand, ~10% organic nonplastic fines, ~5% fine gravel, brown. S1 (10-33"): WIDELY GRADED SAND (SW); ~90% fine to coarse sand, ~5% fine gravel, brown. Organic odor present.
-5	5	S2	5 to 10	60/57	PUSH			S2 (0-15"): Similar to S1 (10-33"). S2 (15-57"): WIDELY GRADED SAND (SW); ~95% fine to coarse sand, ~5% nonplastic fines, tan. Slight organic odor.
-10	10	S3	10 to 15	60/45	PUSH			S3 (0-22"): WIDELY GRADED SAND (SW); ~90% fine to coarse sand, ~5% fine to coarse gravel, ~5% nonplastic fines, orange. Slight organic odor. S3 (22-24"): SILTY SAND (SM); ~80% fine to coarse sand, ~20% low plasticity fines, gray. Slight organic odor. S3 (24-45"): Similar to S3 (0-22"), except gray.
	15	S4	15 to 20	60/37	PUSH	Rig chatter from 14 to 15 feet.		S4: Similar to S3 (0-22"), except gray.
-15						Rig chatter from 17 to 20 feet.		
-20	20	S5	20 to 25	60/53	PUSH			S5 (0-38"): NARROWLY GRADED SAND (SW); ~95% fine to medium sand, ~5% nonplastic fines, gray. S5 (38-53"): WIDELY GRADED SAND (SW); ~100% fine to coarse sand, gray. Seam of orange sand from 38 to 40 inches.

NOTES:

PROJECT NAME: Riverwalk Park and Boardwalk

CITY/STATE: Yarmouth, Massachusetts

GEI PROJECT NUMBER: 2102949

GEI Consultants

LOCATION:

GROUND SURFACE EL. (ft): 2.3 **DATE START/END:** 10/14/2021 - 10/14/2021

VERTICAL DATUM: NAVD 88 **DRILLING COMPANY:** Northern Drill Service, Inc.

BORING GP-3

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
	25	S6	25 to 30	60/44	PUSH	Rig chatter from 26 to 30 feet.	SAND	S6: Similar to S5 (38-53"), except no seam of orange sand.
-25								
	30	S7	30 to 35	60/40	PUSH			S7: WIDELY GRADED SAND (SW); ~95% fine to coarse sand, ~5% fine gravel, tan.
-30								
	35	S8	35 to 40	60/32	PUSH	Rig chattering from 35 to 36 feet.		S8: Similar to S6.
-35						Rig chattering from 38 to 50 feet.		
	40	S9	40 to 45	60/52	PUSH			S9: Similar to S6, except more coarse sand.
-40								
	45	S10	45 to 50	60/58	PUSH			S10: Similar to S6.
-45								
	50							Bottom of hole at 50 feet. Backfilled with cuttings.
-50								
	55							

NOTES:

PROJECT NAME: Riverwalk Park and Boardwalk

CITY/STATE: Yarmouth, Massachusetts

GEI PROJECT NUMBER: 2102949

GEI Consultants

BORING INFORMATION

LOCATION:

GROUND SURFACE EL. (ft): 2.8 **DATE START/END:** 10/13/2021 - 10/13/2021

VERTICAL DATUM: NAVD 88 **DRILLING COMPANY:** Northern Drill Service, Inc.

TOTAL DEPTH (ft): 50.0 **DRILLER NAME:** J. Raymond

LOGGED BY: R. Oulal **RIG TYPE:** Geoprobe 6620DT

BORING

GP-4

DRILLING INFORMATION

HAMMER TYPE: Automatic **CASING I.D./O.D.:** 2 inch / 2.5 inch **CORE BARREL TYPE:** Macrocore

AUGER I.D./O.D.: NA / NA **DRILL ROD O.D.:** NM **CORE BARREL I.D./O.D.** NA / NA

DRILLING METHOD: Direct Push

WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:

Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer

S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
0	0	S1	0 to 5	60/45	PUSH	Rig chattered from 4 to 5 feet.	SAND	S1 (0-5"): SANDY SILT (OL); ~65% non to low plasticity fines, ~35% fine to medium sand, black. Organic matter and odor present. S1 (5-45"): NARROWLY GRADED SAND (SP); ~95% fine to coarse sand, ~5% nonplastic fines, brown. Slight organic odor.
-5	5	S2	5 to 10	60/60	PUSH	Rig chattered from 5 to 10 feet.		S2: Similar to S1 (5-45").
-10	10	S3	10 to 15	60/44	PUSH			S3: WIDELY GRADED SAND (SW); ~95% fine to coarse sand, ~5% nonplastic fines, tan.
-15	15	S4	15 to 20	60/41	PUSH			S4: WIDELY GRADED SAND (SW); ~95% fine to coarse sand, ~5% fine to coarse gravel, tan.
-20	20	S5	20 to 25	60/38	PUSH	Rig chattered at 20 feet.		S5: Similar to S4.

NOTES:

PROJECT NAME: Riverwalk Park and Boardwalk

CITY/STATE: Yarmouth, Massachusetts

GEI PROJECT NUMBER: 2102949

GEI Consultants

LOCATION:

GROUND SURFACE EL. (ft): 2.8 **DATE START/END:** 10/13/2021 - 10/13/2021

VERTICAL DATUM: NAVD 88 **DRILLING COMPANY:** Northern Drill Service, Inc.

BORING GP-4

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
	25	S6	25 to 30	60/41	PUSH	Rig chattering from 25 to 35 feet.	SAND	S6: WIDELY GRADED SAND (SW); ~100% fine to coarse sand, tan.
-25								
	30	S7	30 to 35	60/50	PUSH			S7: Similar to S6.
-30								
	35	S8	35 to 40	60/23	PUSH			S8: Similar to S6.
-35								
	40	S9	40 to 45	60	PUSH	Unable to remove sleeve from the rod, banged out recovery. Rig chattering from 42 to 50 feet.		S9: Similar to S6, except orange.
-40								
	45	S10	45 to 50	60/40	PUSH			S10: NARROWLY GRADED SAND (SP); ~95% fine, ~5% nonplastic fines, light brown.
-45								
	50							Bottom of hole at 50 feet. Backfilled with cuttings.
-50								
	55							

NOTES:

PROJECT NAME: Riverwalk Park and Boardwalk

CITY/STATE: Yarmouth, Massachusetts

GEI PROJECT NUMBER: 2102949

GEI Consultants

Appendix B

BETA Test Pit Logs

Commonwealth of Massachusetts
City/Town of Yarmouth

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

Town of Yarmouth
Owner Name

Street Address | 32/122 Map/Lot #

Yarmouth City | MA State | 02664 Zip Code

B. Site Information

1. (Check one) ☐ New Construction ☐ Upgrade ☐ Repair

2. Soil Survey Available? ☒ Yes ☐ No If yes: NRCS-WSS Source | Soil Map Unit

Soil Name | Soil Limitations

Geologic/Parent Material | Landform

3. Surficial Geological Report Available? ☐ Yes ☐ No If yes: Year Published/Source | Publication Scale | Map Unit

4. Flood Rate Insurance Map

Above the 500-year flood boundary? ☐ Yes ☒ No
If Yes, continue to #5.

Within the 100-year flood boundary? ☒ Yes ☐ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☒ Yes ☐ No

MassGIS Wetland Data Layer: Wetland Type

7. Current Water Resource Conditions (USGS): 10/21 Month/Year

Range: ☐ Above Normal ☒ Normal ☐ Below Normal

8. Other references reviewed:

Commonwealth of Massachusetts
City/Town of Yarmouth

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: 1 | 10/19/21 (Date) | 07:30 (Time) | clear, 45 degrees (Weather)

1. Location

   Ground Elevation at Surface of Hole: _____ feet Latitude/Longitude: /

   Description of Location: left side

2. Land Use: sparse grass (e.g., woodland, agricultural field, vacant lot, etc.) | none (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3 (Slope (%))

   sparse grass (Vegetation) | _____ (Landform) | _____ (Position on Landscape (SU, SH, BS, FS, TS))

3. Distances from:

Open Water Body	180 feet	Drainage Way	_____ feet	Wetlands	150 feet
Property Line	150 feet	Drinking Water Well	_____ feet	Other	_____ feet

4. Parent Material: sand Unsuitable Materials Present: ☒ Yes ☐ No

   If Yes: ☒ Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 37 (Depth Weeping from Pit) | 37 (Depth Standing Water in Hole)

   Estimated Depth to High Groundwater: 20 inches _____ elevation

Commonwealth of Massachusetts
City/Town of Yarmouth
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: 1

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-14	fill & B	10 YR 5/6				L. Sand	0-5	0-5	grain		
14-20	C1	2.5 Y 5/4				Sand	0-5	0-5	grain		
20-46	C2g	10 YR 7/2		7.5 YR 5/8	>5	Med Sand	0-5	0-5	grain		

Additional Notes:

Commonwealth of Massachusetts
City/Town of Yarmouth
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: 2 | 10/ (Date) | 8:00 (Time) | clear-cold (Weather)

1. Location

   Ground Elevation at Surface of Hole: _____ feet Latitude/Longitude: /

2. Land Use: vacant (e.g., woodland, agricultural field, vacant lot, etc.) | none (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3 (Slope (%))

   sparse grass (Vegetation) | _____ (Landform) | _____ (Position on Landscape (SU, SH, BS, FS,

3. Distances from:

Open Water Body	180 feet	Drainage Way	_____ feet	Wetlands	150 feet
Property Line	150 feet	Drinking Water Well	_____ feet	Other	_____ feet

4. Parent Material: sand Unsuitable Materials Present: ☒ Yes ☐ No

   If Yes: ☒ Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 36 Depth Weeping from Pit | 36 Depth Standing Water in Hole

   Estimated Depth to High Groundwater: 16 inches _____ elevation

Commonwealth of Massachusetts
City/Town of Yarmouth
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: 2

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-3	A	10 YR 3/2				L. Sand					
3-16	B	10 YR 5/6				Sand fill			grain		loose
16-40	C1g	10 YR 5/2		7.5 YR 5/8	>5	Med Sand	0-5	0-5	grain	wet	loose

Additional Notes:

Commonwealth of Massachusetts
City/Town of Yarmouth

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: 1 | 10/19/21 (Date) | 07:30 (Time) | clear, 45 degrees (Weather)

1. Location

   Ground Elevation at Surface of Hole: _____ feet Latitude/Longitude: /

   Description of Location: left side

2. Land Use: sparse grass (e.g., woodland, agricultural field, vacant lot, etc.) | none (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3 (Slope (%))

   sparse grass (Vegetation) | _____ (Landform) | _____ (Position on Landscape (SU, SH, BS, FS, TS))

3. Distances from:

Open Water Body	180 feet	Drainage Way	_____ feet	Wetlands	150 feet
Property Line	150 feet	Drinking Water Well	_____ feet	Other	_____ feet

4. Parent Material: sand Unsuitable Materials Present: ☒ Yes ☐ No

   If Yes: ☒ Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 37 (Depth Weeping from Pit) | 37 (Depth Standing Water in Hole)

   Estimated Depth to High Groundwater: 20 inches _____ elevation

Commonwealth of Massachusetts
City/Town of Yarmouth
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: 3

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-23	C1	10 YR 5/6				M Sand	0-5	0-5	grain		
23-48	C2g	10 YR 5/2				F-M Sand	0-5	0-5	grain		
					>						

Additional Notes:

Commonwealth of Massachusetts
City/Town of Yarmouth
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: 4 | 10/15/21 (Date) | 10:00 (Time) | clear-cold (Weather)

1. Location

Ground Elevation at Surface of Hole: _____ feet Latitude/Longitude: /

2. Land Use: vacant (e.g., woodland, agricultural field, vacant lot, etc.) | none (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3 (Slope (%))

sparse grass (Vegetation) | _____ (Landform) | _____ (Position on Landscape (SU, SH, BS, FS,

3. Distances from:

Open Water Body	150 feet	Drainage Way	_____ feet	Wetlands	150 feet
Property Line	100 feet	Drinking Water Well	_____ feet	Other	_____ feet

4. Parent Material: sand Unsuitable Materials Present: ☒ Yes ☐ No

If Yes: ☒ Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 72 Depth Weeping from Pit | 72 Depth Standing Water in Hole

Estimated Depth to High Groundwater: 51 inches _____ elevation

Commonwealth of Massachusetts
City/Town of Yarmouth
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: 4

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-16	f i l l										
16-51	C1	2.5 Y 5/4				Sand fill			grain		loose
51-65	C2	10 YR 4/2				F. loamy Sand	0-5	0-5	crumb	wet	friable
65-90	C3	10 YR 4/4				Loamy sand	0-5	0-5	crumb		friable

Additional Notes:

Commonwealth of Massachusetts
City/Town of Yarmouth

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: 5 | 10/19/21 (Date) | 10:30 (Time) | clear, 45 degrees (Weather)

1. Location

   Ground Elevation at Surface of Hole: _____ feet Latitude/Longitude: /

   Description of Location: back right field near edge

2. Land Use: sparse grass (e.g., woodland, agricultural field, vacant lot, etc.) | none (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3 (Slope (%))

   sparse grass (Vegetation) | _____ (Landform) | _____ (Position on Landscape (SU, SH, BS, FS, TS))

3. Distances from:

Open Water Body	250 feet	Drainage Way	_____ feet	Wetlands	125 feet
Property Line	150 feet	Drinking Water Well	_____ feet	Other	_____ feet

4. Parent Material: sand Unsuitable Materials Present: ☒ Yes ☐ No

   If Yes: ☒ Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 90 Depth Weeping from Pit | 90 Depth Standing Water in Hole

   Estimated Depth to High Groundwater: 70 inches _____ elevation

Commonwealth of Massachusetts
City/Town of Yarmouth
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: 5

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-45	fill					Sand	0-5	0-5	grain		
45-90	C1	2.5 Y 5/4	70	7.5 YR 5/8	2	Med.Sand	0-5	0-5	grain		
90	C2g	10 YR 7/2				Med Sand	0-5	2-5	grain	wet	loose

Additional Notes:

Commonwealth of Massachusetts
City/Town of Yarmouth
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: 6 | 10/19/21 (Date) | 11:00 (Time) | clear-cold (Weather)

1. Location

   Ground Elevation at Surface of Hole: _____ feet Latitude/Longitude: /

2. Land Use: vacant (e.g., woodland, agricultural field, vacant lot, etc.) | none (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3 (Slope (%))

   Vegetation: sparse grass | Landform: _____ | Position on Landscape (SU, SH, BS, FS, _____

3. Distances from:

Open Water Body	280 feet	Drainage Way	_____ feet	Wetlands	250 feet
Property Line	100 feet	Drinking Water Well	_____ feet	Other	_____ feet

4. Parent Material: sand Unsuitable Materials Present: ☒ Yes ☐ No

   If Yes: ☒ Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 72 Depth Weeping from Pit | 72 Depth Standing Water in Hole

   Estimated Depth to High Groundwater: 65 inches _____ elevation

Commonwealth of Massachusetts
City/Town of Yarmouth
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: 6

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-35	fill					Sand					
35-45	B	10 YR 5/6				f-m Sand	5-10		crumb		
45-65	C1	5 Y 5/4				Med Sand	0-5	0-5	grain	wet	friable
65-84	C2g	10 YR 6/2				Med, sand	0-5		grain		friable

Additional Notes:

Commonwealth of Massachusetts
City/Town of Yarmouth

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: 7 | 10/19/21 (Date) | 11:30 (Time) | clear, 45 degrees (Weather)

1. Location

Ground Elevation at Surface of Hole: _____ feet Latitude/Longitude: /

Description of Location: driveway at the gate

2. Land Use: commercial (e.g., woodland, agricultural field, vacant lot, etc.) | none (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3 (Slope (%))

Vegetation: shrub | Landform: _____ | Position on Landscape (SU, SH, BS, FS, TS): _____

3. Distances from:

Open Water Body	150 feet	Drainage Way	_____ feet	Wetlands	150 feet
Property Line	20 feet	Drinking Water Well	_____ feet	Other	_____ feet

4. Parent Material: sand Unsuitable Materials Present: ☒ Yes ☐ No

If Yes: ☒ Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 39 Depth Weeping from Pit | 39 Depth Standing Water in Hole

Estimated Depth to High Groundwater: 22 inches _____ elevation

Commonwealth of Massachusetts
City/Town of Yarmouth
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: 7

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-16	fill					pavement & base					
16-40	C1	5 Y 5/4	22	10 YR 6/2	2-3	fineSand	0-5		crumb		friable

Additional Notes:

Commonwealth of Massachusetts
City/Town of Yarmouth
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Board of Health Witness

Name of Board of Health Witness	Board of Health

G. Soil Evaluator Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

Signature of Soil Evaluator	Date
	10/22/2021
Typed or Printed Name of Soil Evaluator / License #	Expiration Date of License
Gary D. James SE#15673	6/24

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Commonwealth of Massachusetts
City/Town of Yarmouth
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Field Diagrams

Use this sheet for field diagrams:

IMPROVING COMMUNITIES TOGETHER

MEMORANDUM

Date: 12/21/2022 Job No.:10056

To: Brittany DiRienzo, Conservation Agent, Town of Yarmouth

Cc: Kathy Williams, Yarmouth Town Planner
Andrew R Poyant, PWS, MassDEP Wetlands & Waterways

From: Laura Krause Lead Scientist, BETA
Gary James, PE, SE, SI, Civil Engineer, BETA
Arek Galle, BETA Group Inc., BETA

Subject: 669 Route 28, Yarmouth, MA
Riverwalk Park, Additional Site Investigations and Alternatives Analysis

BACKGROUND

In response to comments received from the Massachusetts Department of Environmental Protection, additional site investigations were performed on December 13, 2022 to provide more information on the existing site conditions and areas meeting the definition of degraded within the Riverfront Area of the proposed Riverwalk Park Site at 669 Route 28 in Yarmouth, MA to support the NOI filing.

MassDEP also requested that a site design with a supplemental alternative parking layout scheme providing some limited parking near the kayak launch with the remaining parking proposed outside the Riverfront Area be discussed. A review of this alternative approach to the parking layout is also provided in this memorandum.

SITE INVESTIGATIONS

The open area of the Site, including the Riverfront Area, was previously developed, and is degraded due to the lack of topsoil and presence of pavement. The Site was previously cleared, filled, paved, and operated as the (former) Yarmouth Drive-in Theater from 1956 until the Town acquired the land in 1985. Historic aerial photos of the site and prior documentation of site conditions was provided in the NOI filing and can be found in Appendix E.

BETA conducted over twenty test pit excavations, which were geolocated on an aerial photo using a GPS unit (Refer to Attachment A for Test Pit Location Plan). Test pits were excavated to observe soil conditions within the Riverfront Area, specifically between the existing snow fence, which parallels the river, and the outer Riverfront Area. Based on the conditions within the excavated test pits, BETA identified and classified the soils encountered as existing sand fill and confirmed a 'typical' soil profile within the proposed development area (Refer to Attachment B for photographs and Attachment C for the Test Pit Logs). Excavation was performed by Town of Yarmouth DPW utilizing a John Deere 35D mini excavator. Test pits were excavated to a depth adequate to contact groundwater weeping, where feasible. This depth ranged from 36" to 72" below the surface grade in various locations across the entire site.

FINDINGS

Twenty-one test pits/observations were excavated within the limits of the Riverfront Area. There are intact areas of asphalt as well as smaller pieces of asphalt visible on the ground surface, adjacent to and across the Riverfront Area. It is estimated that between 40-50% of the surface within the Riverfront Area of investigation is exposed sand without vegetation. In all cases, test pit investigations found the natural A Horizon soils were either removed or covered with sand fill, depending upon the depth of fill needed to accommodate cars at the Drive-In Theater. The C Horizon fill layer was determined to be a compact Fine-

Medium Sand with a color 10 YR 5/6 and was consistently found across the entire area immediately beneath the upper layer.

BETA is aware of historic precedent for soils to be mixed with sand with the purpose of creating a 'hardener' for stiffening the base course beneath bituminous pavement, thus limiting rutting by vehicle tires. In six (6) observation test pits, a solid bituminous pavement layer was encountered upon excavation and remained intact. In other areas the pavement was broken by the excavator, or possibly by former Drive-In-Theater Site closure operations that were reported to have employed large bulldozers to level the shallowly terraced Drive-In parking area that faced the projection screen. Typically, BETA found e 2"-6" of fine-medium sand fill over the top of the bituminous asphalt layer; this layer matches the color of the upper layer of soils (2.5 Y 4/2) found across the entire Site.

Upon examination of the paving material encountered, it was determined there was no gradation of aggregate in the pavement. The thickness varied from 1" to 4". The pieces indicate that the surface was an oil-sand mixture which notably matched the color of the upper-most soil layer throughout Site.

The investigations show the bituminous pavement remains mixed in with the top 2"-12" of soil on Site. As noted in the test pit logs, the top layer of material above the pavement is a Fine -Medium Sand with no discernable organic content and with limited root structure related to the grass and weed growth on the surface. Remnants of bituminous asphalt pavement and cable/wiring were encountered in 80±% the excavations, documenting that the area of investigation meets the definition of degraded under the Wetlands Protection Act.

SUMMARY OF SITE INVESTIGATIONS

The recent Site investigation data continues to support the past characterizations of the site, notably that the entirety of the Riverfront Area between the existing snow fence and the outer limit of the Riverfront Area is degraded per 310 CMR 10.58 (5), with specific reference to 1) the presence of existing pavement and 2) the absence of topsoil. Our observation notes include the following:

1. The Site is previously developed. The entirety of the open site was filled, paved, and operated as a Drive-in Theater site from 1956-1986. The surface was shallowly terraced to enhance visibility of the screen and was paved. In some areas the pavement extended to the edge of the Parkers River as evidenced in archival aerial photographs, and the visible presence of bituminous asphalt along areas of the riverbank.

2. The top layer of soil on the Site is a Class I Sand with less than 10% fines. The soil composition is individual grain particles with no cohesive capability. Simple field tests conducted on the soil in the layer show no signs of any fines or organics. In the dictionary, topsoil is defined as:

   > *Topsoil is composed of mineral particles and organic matter and usually extends to a depth of 5-10 inches. Together these make a substrate capable of holding water and air which encourages biological activity.*

   Since all soils from 5-10" could be considered topsoil, BETA evaluated these soils to determine whether the organic content is sufficient to encourage biological activity and promote vegetative growth. Based on observations, the soil conditions onsite do not meet 2his definition. The soil is a Class I soil, with few fines or organics, which is not capable of holding water and air. Further, based upon the vegetative growth on the Site, the soil does not promote plant activity.

3. The bituminous asphalt pavement is exposed in some areas, however for much of the Riverfront Area it is covered by 2"-6" of sand. In addition, there are fragments of pavement visible in nearly

80% of the observations. Although the pavement is not solid across the entirety of the area, it still has imposed an impact on the vegetative recovery in the area.

4. The subsoil layer across the Site is likely a hardening agent that was brought in as a base course for the pavement. Regardless of its use, it remains a well-defined B horizon layer in both color and texture, which should have helped the recovery of the A horizon soils. Yet after 40 years, the A Horizon soils have not recovered. The vegetation within the Riverfront Area primarily weed growth, and there are no signs of secondary or upper story growth emerging.

Based on visual observations of the site conditions, the presence of exposed soils, the lack of vegetative growth, the presence of bituminous pavement near or at the surface, the lack of development of the A horizon over the past 40+ years, BETA's findings support that the conclusion that the Riverfront Area inland of the snow fence is degraded and will remain in this condition until the pavement is removed, and the upper soil horizons replaced with a suitable topsoil layer and the related site and waterfront access and site improvements are constructed.

Additional reference is made to the attached supporting documentation:

Attachments:

1. Attachment A: Test Pit Location Plan
2. Attachment B: Photographs
3. Attachment C: Soil Logs

SUPPLEMENTAL ALTERNATIVES ANALYSIS

An alternative access drive and parking layout, which locates parking near the amenities close to the river with additional parking is located outside of the Riverfront Area, was previously considered. This alternative included maintaining approximately 10 spaces for water dependent uses near the cul-de-sac, and relocation of approximately 78 spaces to outside the Riverfront Area. While this alternative would decrease the pervious pavement parking spaces within Riverfront Areas, this alternative was not pursued for a number of reasons.

1. The Town conducted an extensive Sound Study in 2021 to determine the best location in which to place the performance stage for periodic special events. The optimal location of the stage and audience area was evaluated, with the study assessing the preferred layout for the stage and sound equipment as well as determining the best location for the audience which also provides the best buffering and protection from sound transmission for the abutting properties. This stage and audience layout is presented in the current plan set. The corresponding utility layout and configuration of the open grass event space was developed utilizing information from the Reuter's Sound Study and preferred stage and audience space layout.
2. The organization of the proposed site plan is structured to provide bicycle, pedestrian and vehicular access to the park and key destinations within as well as create spaces for the desired uses based on the Town' program for the site which includes waterfront access/paddleboard and kayak launch, a boardwalk loop, walking paths, nature-based play areas, and artist shanties, as well as interpretive and artistic displays. In the development of the design, park functionality was considered for both daily operations as well as for a diverse array of periodic special events. If the parking and park drive access were to be configured to be away from the degraded Riverfront

Areas, leaving the preferred Event Space layout intact, the proposed parking not associated with the River amenities would need to be located along the perimeter of the Site near the Cortland Way neighborhood and/or along the west side of the site near the Niagara Lane neighborhood. Emergency access/egress to and from the Site via Courtland Way would still need to be maintained. Placement of the parking area along the western and/or northwestern perimeter of the Site would increase the vehicular activity with any associated noise and visual impacts near the abutting properties, which include Environmental Justice neighborhoods. Utilizing this approach to the site design, with a western park drive and parking layout would increase the length of the park access drive substantially and potentially necessitate a separate waterfront parking access drive; increasing the overall impervious areas within the park.

LEGEND

TP3-2 — TEST PITS - 12/13/2022

TP4 — BORINGS/TEST PITS - OCT 2021

WOODED AREA

COURTLAND WAY

TP3-3

TP3-4

TP6

TP5

TP7

TP3-5

TP3-2

TP3-1

B2

TP1

TP2

TP4

TP3

B1

TP2-19

TP2-10A

TP2-11

TP2-12

TP2-13

TP2-14

TP2-15

TP2-16

TP2-18

TP2-17

TP2-9

TP2-1

TP2-2

TP2-3

TP2-4

TP2-5

TP2-6A

TP2-7

TP2-8

TP2-6B

TP2-10B

100' RIVERFRONT AREA

200' RIVERFRONT AREA

WETLAND

100' WPA BUFFER

LIMIT OF MODERATE WAVE ACTION

CB/DH FND

BOTTOM OF BANK
PROPERTY LINE

M.H.W. = ELEV. 2.05'

M.L.W. = ELEV. -0.7'

MARSH

PARKER'S RIVER

PREPARED BY

BETA
www.BETA-Inc.com

REGISTERED PROFESSIONAL

REGISTERED PROFESSIONAL

PROJECT

YARMOUTH RIVERWALK PARK

TITLE

TEST PIT LOCATIONS - 12.13.2022

NO.	REVISIONS	DATE

DRAWN BY:

DESIGNED BY:

CHECKED BY:

ISSUE DATE:

BETA JOB NO.:

SCALE

40 0 40 80

SCALE IN FEET: 1"=40'

SHEET NO.

MEMORANDUM

Date: 12/20/2022 Job No.:10056

To: Brittany DiRienzo, Conservation Agent

Cc: Kathy Williams, Yarmouth Town Planner
Andrew Poyant, MassDEP

From: Laura Krause Lead Scientist, BETA
Gary James, PE, Civil Engineer, BETA
Arek Galle, BETA Group Inc., BETA

Subject: Attachment B Photographs
Riverwalk Park, Additional Site Investigations

The following images show the test pit findings. Refer to Attachment A for Test Pit Locations.

Test Pit 2-2

Test Pit 2-5

Test Pit 2-6B

Test Pit 2-8

Test Pit 2-9

Test Pit 2-11

Test Pit 2-16

Test Pit 2-19

MEMORANDUM

Date: 12/20/2022 Job No.:10056

To: Brittany DiRienzo, Conservation Agent

Cc: Kathy Williams, Yarmouth Town Planner
Andrew Poyant, MassDEP

From: Laura Krause Lead Scientist, BETA
Gary James, PE-Civil Engineer, SE 13765, BETA
Arek Galle, BETA Group Inc., BETA

Subject: Attachment C - Test Pit Logs
Yarmouth Riverwalk Park, Additional Site Investigations

Test Pit 2-1

Depth	Soil Horizon	Soil Description	Color	Mottles	Other
0-1-1/2”	A	Sand – L. sand	10 YR 4/4		Varies in depth Pieces of asphalt visible
1-1/2”-6”	B	Sand	10 YR 5/6		Loose, grain 10-15% gravel
6-30”	C_1	Med Sand	2.5 Y 5/4		Loose, grain 5-10% Gravel
36-42”	A	Fine Loamy Sand	10 YR 3/2		Friable, crumb
42-49”	B	Loamy Sand	10 YR 4/4		

Depth to groundwater weeping: 48”

Test Pit 2-2

Depth	Soil Horizon	Soil Description	Color	Mottles	Other
0-11”	C-fill	Sand	10 YR 5/6		Loose, grain Pieces of asphalt visible at surface
11-36”	C-fill	Med Sand	2.5 Y 5/4		Loose, grain 5-10% Gravel
36-42”	A	Fine Loamy Sand	10 YR 3/2		Friable, crumb
42-50”	B	Loamy Sand	10 YR 4/4		

Depth to groundwater weeping: 49”

Test Pit 2-3

Depth	Soil Horizon	Soil Description	Color	Mottles	Other
0-3”	C-fill	Sand	2.5 Y 4/2		Varies in depth None in places
3-13”	C-fill	Med. Sand	10 YR 5/6		Loose, grain 5-10% gravel
13-30”	C-fill	Med Sand	2.5 Y 6/4		Loose, grain 5-10% Gravel
30-35”	A	Fine Loamy Sand	10 YR 3/2		Friable, crumb
35-50”	B	Loamy Sand	10 YR 4/4		

Depth to groundwater weeping: 47”

Test Pit 2-4

Depth	Soil Horizon	Soil Description	Color	Mottles	Other
0-3”	A-fill	Sand	2.5 Y 4/2		Pieces of asphalt visible
3-16”	B-fill	Sand	10 YR 5/6		Loose, grain, 5-10% gravel
16-23”	A	Fine Loamy Sand	10 YR 3/2		Friable, crumb
23-50”	B/C	Loamy Sand	7.5 YR 5/8		

Depth to groundwater weeping: 43”

Test Pit 2-5

Depth	Soil Horizon	Soil Description	Color	Mottles	Other
0-6”	A-fill	Sand	2.5 Y 4/2		
6-9”		Asphalt			
9-16”	B-fill	Sand	10 YR 5/6		Loose, grain 5-10% gravel
16-21”	A	Fine Loamy Sand	10 YR 3/2		
21-48”	B/C	Loamy Sand	7.5 YR 5/8		

Depth to groundwater weeping: 42”

Test Pit 2-6A

Depth	Soil Horizon	Soil Description	Color	Mottles	Other
0-12”	A-fill	Mixed layers	2.5 Y 4/2 10 YR 5/6		Pieces of asphalt & wiring visible
12-16”	B-fill	Sand	10 YR 5/6		Loose, grain 5-10% gravel
16-36”	B/C	Loamy Sand	7.5 YR 5/8		

Depth to groundwater weeping: 36”

Test Pit 2-6B

Depth	Soil Horizon	Soil Description	Color	Mottles	Other
0-6”	A-fill	Fine-med Sand	2.5 Y 4/2		
6-8”		Asphalt			
8-12”	C-fill	Med. Sand	2.5 Y 4/2		
12-21”	C-fill	Med. Sand	10 YR 5/6		
21-34”	C_1	M-C Sand	7.5 YR 5/8		10-15% gravel

Depth to groundwater weeping: 34”

Test Pit 2-7

Depth	Soil Horizon	Soil Description	Color	Mottles	Other
0-4”	A-fill	Sand – L. sand	2.5 Y 4/2		Pieces of asphalt visible
4-12”	B-fill	Mixed layers of Sand	10 YR 5/6 2.5 Y 4/2		Loose, grain 5-10% gravel
12-40”	B/C	M-C Sand	7.5 YR 5/8		Loose, grain 0-5% gravel

Depth to groundwater weeping: 36”

Test Pit 2-8

Depth	Soil Horizon	Soil Description	Color	Mottles	Other
0-6”	A-fill	Fine-med Sand	2.5 Y 4/2		
6-8”		Asphalt			
8-36”	C-fill	Sand fill – mixed layers	2.5 Y 4/2 10 YR 5/6		Layers mixed no clean lines
36-40”	C_1g	Med. Sand	5 Y 7/1		

Depth to groundwater weeping: 36”

Test Pit 2-9

Depth	Soil Horizon	Soil Description	Color	Mottles	Other
0-6”	A-fill	Fine-med Sand	2.5 Y 4/2		
6-8”		Asphalt			
8-36”	C-fill	Sand fill – mixed layers	2.5 Y 4/3 10 YR 5/6		Layers mixed no clean lines
36-40”	C_1g	Med. Sand	5 Y 7/1	7.5YR 5/8	

Depth to groundwater weeping: 36”

Test Pit 2-10A

Depth	Soil Horizon	Soil Description	Color	Mottles	Other
0-2”	A-fill	Fine-med Sand	2.5 Y 4/2		No vegetation at surface
2-23”	C-fill	M-C Sand	10 YR 5/6		Loose, grain 5-10% gravel

Depth to groundwater weeping: 23”

Test Pit 2-10B

Depth	Soil Horizon	Soil Description	Color	Mottles	Other
0-6”	A-fill	Sand fill	2.5 Y 4/2		No vegetation at surface
6-23”	C-fill	M-C Sand	7.5 YR 5/8		Warning tape-excavation stopped

Depth to groundwater weeping: N/A

Test Pit 2-11

Depth	Soil Horizon	Soil Description	Color	Mottles	Other
0-5”	A-fill	Fine-med Sand	2.5 Y 4/2		Pieces of asphalt visible
5-16”	C-fill	Fine-Med. Sand	10 YR 5/6		
16-46”	C-fill	Med. Sand	2.5 Y 5/4	45” 7.5 YR 5/8	Loose, grain 5-10% gravel
46”	A	Loamy Sand	10 YR 3/2		

Depth to groundwater weeping: 46”

Test Pit 2-12

Depth	Soil Horizon	Soil Description	Color	Mottles	Other
0-2”	A-fill	Fine-med Sand	2.5 Y 4/2		
2-8”	C-fill	Med. Sand	10 YR 5/3		Pieces of asphalt visible
8-16”	C-fill	Fine-Med. Sand	10 YR 5/6		Loose, grain 5-10% gravel
16-37”	C_1	Med. Sand	2.5 Y 5/4		10-15% gravel
37-43”	A	Fine loamy sand	10 YR 3/2		

Depth to groundwater weeping: 43”

Test Pit 2-13

Depth	Soil Horizon	Soil Description	Color	Mottles	Other
0-2”	A-fill	Fine-med Sand	2.5 Y 4/2		Asphalt at surface around edge of hole
2-43”	C-fill	Sand			Mixed layers & colors for full depth

Depth to groundwater weeping: 43”

Test Pit 2-14

Depth	Soil Horizon	Soil Description	Color	Mottles	Other
0-2”	A-fill	Fine-med Sand	2.5 Y 4/2		Asphalt at surface around edge of hole and wiring visible
2-24”	C-fill	Fine-Med Sand	10 YR 5/6		Loose, grain 5-10% gravel
24-36”	C	M-C Sand	5 Y 5/4		Loose, grain 5-10% gravel

Depth to groundwater weeping: 33”

Test Pit 2-15

Depth	Soil Horizon	Soil Description	Color	Mottles	Other
0-2”	A-fill	Fine-med Sand	2.5 Y 4/2		Asphalt pieces & wiring visible
2-16”	C-fill	Fine-Med Sand	10 YR 5/6		Loose, grain 5-10% gravel
16-39”	C	M-C Sand	5 Y 5/4	24” 7.5 YR 5/8	Loose, grain 5-10% gravel

Depth to groundwater weeping: 33”

Test Pit 2-16

Depth	Soil Horizon	Soil Description	Color	Mottles	Other
0-6”	A-fill	Fine-med Sand	2.5 Y 4/2		
6-8”		Asphalt			Solid layer across hole
6-20”	C-fill	Fine-Med Sand	10 YR 5/6		Loose, grain 5-10% gravel
20-36”	C_1	M-C Sand	5 Y 5/4	24” 7.5 YR 5/8	Loose, grain 5-10% gravel

Depth to groundwater weeping: 33”

Test Pit 2-17

Depth	Soil Horizon	Soil Description	Color	Mottles	Other
0-4”	A-fill	Fine-med Sand	2.5 Y 4/2		
4-16”	C-fill	Fine-Med. Sand	10 YR 4/4		Loose, grain 5-10% gravel
16-32”	C_1	Med. Sand	2.5 Y 4/2 10 YR 4/4	27”	Mixed layers
32-42”	C_2	Coarse sand	5 Y 5/4		

Depth to groundwater weeping: 37”

Test Pit 2-18

Depth	Soil Horizon	Soil Description	Color	Mottles	Other
0-3”	A-fill	Fine-med Sand	2.5 Y 4/2		
3-8”	C-fill	Fine -Med. Sand	10 YR 5/6		Loose, grain 5-10% gravel
8-34”	C_1	Med. Sand	5 Y 5/4	27” 5 Y 7/4	Loose, grain 5-10% gravel

Depth to groundwater weeping: 33”

Test Pit 2-19

Depth	Soil Horizon	Soil Description	Color	Mottles	Other
0-2”	A-fill	Fine-med Sand	2.5 Y 4/2		
2-5”		Asphalt			
5-14”	C-fill	F-Med Sand	10 YR 5/6		Loose, grain 5-10% gravel
14-34”	C	F-M Sand	5 Y 5/4	19” 7.5 YR 5/8	Loose, grain

Depth to groundwater weeping: 33”

Commonwealth of Massachusetts
City/Town of Yarmouth

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

Town of Yarmouth
Owner Name

Street Address | 32/122 Map/Lot #

Yarmouth City | MA State | 02664 Zip Code

B. Site Information

1. (Check one) ☐ New Construction ☐ Upgrade ☐ Repair

2. Soil Survey Available? ☒ Yes ☐ No If yes: NRCS-WSS Source | Soil Map Unit

Soil Name | Soil Limitations

Geologic/Parent Material | Landform

3. Surficial Geological Report Available? ☐ Yes ☐ No If yes: Year Published/Source | Publication Scale | Map Unit

4. Flood Rate Insurance Map

Above the 500-year flood boundary? ☐ Yes ☒ No
If Yes, continue to #5.

Within the 100-year flood boundary? ☒ Yes ☐ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☒ Yes ☐ No

MassGIS Wetland Data Layer: Wetland Type

7. Current Water Resource Conditions (USGS): 10/21 Month/Year

Range: ☐ Above Normal ☒ Normal ☐ Below Normal

8. Other references reviewed:

Commonwealth of Massachusetts
City/Town of Yarmouth

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: 3-1 | 12/13/22 (Date) | 12:30 (Time) | clear, 34 degrees (Weather)

1. Location

Ground Elevation at Surface of Hole: 4.8 feet Latitude/Longitude: /

Description of Location: infield trench 2

2. Land Use: sparse grass (e.g., woodland, agricultural field, vacant lot, etc.) | none (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3 (Slope (%))

sparse grass (Vegetation) | (Landform) | (Position on Landscape (SU, SH, BS, FS, TS))

3. Distances from:

Open Water Body	250 feet	Drainage Way	feet	Wetlands	200 feet
Property Line	150 feet	Drinking Water Well	feet	Other	feet

4. Parent Material: sand Unsuitable Materials Present: ☒ Yes ☐ No

If Yes: ☒ Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 43 Depth Weeping from Pit | 43 Depth Standing Water in Hole

Estimated Depth to High Groundwater: 33 inches | 2.05 elevation

Commonwealth of Massachusetts
City/Town of Yarmouth
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: 3-1

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-10	Sand fill	10 YR 4/2				Sand	0-5	0-5	grain		
10-33	C1	5 Y 5/4				Med.Sand	0-5	0-5	grain		
33-49	C2g	10 YR 7/2				Coarse Sand	5-10	0-5	grain	wet	loose

Additional Notes:

Commonwealth of Massachusetts
City/Town of Yarmouth
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: 3-2 | 12-13-2022 (Date) | 12:00 (Time) | clear-cold (Weather)

1. Location

   Ground Elevation at Surface of Hole: 5.2 feet | Latitude/Longitude: /

2. Land Use: vacant (e.g., woodland, agricultural field, vacant lot, etc.) | none (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3 (Slope (%))

   Vegetation: sparse grass | Landform: | Position on Landscape (SU, SH, BS, FS,

3. Distances from:

Open Water Body	250 feet	Drainage Way	feet	Wetlands	200 feet
Property Line	150 feet	Drinking Water Well	feet	Other	feet

4. Parent Material: sand | Unsuitable Materials Present: ☒ Yes ☐ No

   If Yes: ☒ Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No | If yes: 46 Depth Weeping from Pit | 46 Depth Standing Water in Hole

   Estimated Depth to High Groundwater: 32 inches | 2.54 elevation

Commonwealth of Massachusetts
City/Town of Yarmouth
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: 3-2

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-3	A	10 YR 4/2				Sand					
3-18	B	10 YR 5/6				Sand fill	5-10		grain		loose
18-48	C1g	5 Y 5/4	32	7.5 YR 5/8	>5	M-C Sand	0-5	0-5	grain	wet	loose

Additional Notes:

Commonwealth of Massachusetts
City/Town of Yarmouth

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: 3-3 | 12/13/22 (Date) | 12:30 (Time) | clear, 35 degrees (Weather)

1. Location

   Ground Elevation at Surface of Hole: 6.2 feet Latitude/Longitude: /

   Description of Location: infield trench 1

2. Land Use: sparse grass (e.g., woodland, agricultural field, vacant lot, etc.) | none (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3 (Slope (%))

   sparse grass (Vegetation) | (Landform) | (Position on Landscape (SU, SH, BS, FS, TS))

3. Distances from:

Open Water Body	480 feet	Drainage Way	feet	Wetlands	450 feet
Property Line	150 feet	Drinking Water Well	feet	Other	feet

4. Parent Material: sand Unsuitable Materials Present: ☒ Yes ☐ No

   If Yes: ☒ Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 58 (Depth Weeping from Pit) | 58 (Depth Standing Water in Hole)

   Estimated Depth to High Groundwater: 48 inches 2.2 elevation

Commonwealth of Massachusetts
City/Town of Yarmouth
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: 3-3

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-11	fill	10 YR 3/2				S. Loam	0-5	0-5	crumb		
11-29	B/C	10 YR 5/6				Med Sand	0-5	0-5	grain		
39-60	C2	5 Y 5/4	48"			Med sand	5-10	0-5	grain	wet	loose

Additional Notes:

Commonwealth of Massachusetts
City/Town of Yarmouth
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: 3-4 | 12/13/22 (Date) | 12:30 (Time) | clear-cold (Weather)

1. Location

   Ground Elevation at Surface of Hole: 6.8 feet | Latitude/Longitude: /

2. Land Use: vacant (e.g., woodland, agricultural field, vacant lot, etc.) | none (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3 (Slope (%))

   Vegetation: sparse grass | Landform: | Position on Landscape (SU, SH, BS, FS,

3. Distances from:

Open Water Body	450 feet	Drainage Way	feet	Wetlands	400 feet
Property Line	100 feet	Drinking Water Well	feet	Other	feet

4. Parent Material: sand | Unsuitable Materials Present: ☒ Yes ☐ No

   If Yes: ☒ Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No | If yes: 60 Depth Weeping from Pit | 60 Depth Standing Water in Hole

   Estimated Depth to High Groundwater: 46 inches | 2.95 elevation

Commonwealth of Massachusetts
City/Town of Yarmouth
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: 3-4

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-14	f i l l					mixed layers					
14-33	B	10 YR 5/6				Med. Sand			grain		loose
33-62	C1	5 Y 5/4	46"			Med. Sand	0-5	0-5	grain	wet	loose

Additional Notes:

Commonwealth of Massachusetts
City/Town of Yarmouth

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: 3-5 | 12/13/22 (Date) | 12:45 (Time) | clear, 35 degrees (Weather)

1. Location

   Ground Elevation at Surface of Hole: 4.3 feet Latitude/Longitude: /

   Description of Location: behind proposed bathroom

2. Land Use: sparse grass (e.g., woodland, agricultural field, vacant lot, etc.) | none (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3 (Slope (%))

   sparse grass (Vegetation) | (Landform) | (Position on Landscape (SU, SH, BS, FS, TS))

3. Distances from:

Open Water Body	250 feet	Drainage Way	feet	Wetlands	225 feet
Property Line	150 feet	Drinking Water Well	feet	Other	feet

4. Parent Material: sand Unsuitable Materials Present: ☒ Yes ☐ No

   If Yes: ☒ Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 42 Depth Weeping from Pit | 42 Depth Standing Water in Hole

   Estimated Depth to High Groundwater: 24 inches | 2.30 elevation

Commonwealth of Massachusetts
City/Town of Yarmouth
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: 3-5

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-12	fill					mixed					
12-24	B	10 YR 56				Med.Sand	0-5	0-5	grain		
24-43	C2g	10 YR 7/2				Med Sand	5-10	0-5	grain	wet	loose

Additional Notes:

Commonwealth of Massachusetts
City/Town of Yarmouth

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Board of Health Witness

Name of Board of Health Witness	Board of Health

G. Soil Evaluator Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accorda[illegible]ugh 15.107.

Signature of Soil Evaluator	Date
Gary D. James SE#15673	6/24
Typed or Printed Name of Soil Evaluator / License #	Expiration Date of License

12/15/2022

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Commonwealth of Massachusetts
City/Town of Yarmouth
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Field Diagrams

Use this sheet for field diagrams:

ATTACHMENT D

STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

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Yarmouth Riverwalk Park, Boardwalk, and Event Space

Yarmouth, Massachusetts

Town of Yarmouth

STORMWATER POLLUTION PREVENTION PLAN

Prepared by: BETA GROUP, INC.
Prepared for: Town of Yarmouth

November 2022

For Construction Activities At:

Yarmouth Riverwalk Park
669 Route 28
Yarmouth, MA 02664

SWPPP Prepared For:

Town of Yarmouth
Robert L Whritenour Jr. – Town Administrator
(508) 398-2231
1146 Route 28
Yarmouth, MA 02664

SWPPP Prepared By:

BETA Group, Inc.
89 Shrewsbury Street, Suite 300
Worcester, MA 01604
(844) 800-2382

SWPPP Preparation Date:

October 2022

Estimated Project Dates:

Project Start Date: Fall 2023

Project Completion Date: Winter 2024

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APPENDICES

Appendix A – Site Maps

Appendix B – Copy of 2022 CGP

Appendix C – NOI and EPA Authorization Email

Appendix D – Inspection Form

Appendix E – Corrective Action Form

Appendix F – SWPPP Amendment Log

Appendix G – Subcontractor Certifications/Agreements

Appendix H – Grading and Stabilization Activities Log

Appendix I – Training Log

Appendix J – Delegation of Authority

Appendix K – Endangered Species Documentation

Appendix L – Historic Preservation Documentation

1.0 INTRODUCTION

1.1 GENERAL PROJECT DESCRIPTION

The proposed project consists of the redevelopment of the town-owned property located at 669 Route 28 in the Town of Yarmouth, Massachusetts (Barnstable County) into a Riverwalk Park, Boardwalk, and Event Space for use by residents and visitors (the Project). The property includes a 23-acre former drive-in property located at 669 Route 28, and 8 acres of the Lewis Pond Marsh Conservation Area to the south (the Site). The proposed improvements consist of providing a parking area that provides visual access to the Parkers River; providing public access to view the Salt Marsh, providing public access to the Parkers River, installation of a permanent seasonal restroom facility, and providing a space for events.

This Stormwater Pollution Prevention Plan (SWPPP) has been prepared for the work to be performed by the Town and their subcontractors to develop and restore the site for recreational use as depicted in Appendix A – Site Maps.

1.2 STORMWATER POLLUTION PREVENTION PLAN PURPOSE

The purpose of this SWPPP is to describe the proposed proactive measures to be used to prevent water pollution during construction in accordance with the 2022 National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP). This Site-specific SWPPP is anticipated to reduce stormwater pollution, protect Waters of the U.S., and minimize construction impacts on the environment. This will be accomplished through the installation of erosion and sediment control best management practices (BMPs), regular inspections and maintenance of the proposed BMPs, and other provisions as detailed herein.

The SWPPP also provides contact information for the Operator and the Responsible Parties that will conduct maintenance and inspections of the Site in accordance with the NPDES CGP.

2.0 CONTACT INFORMATION/RESPONSIBLE PARTIES

2.1 OPERATOR(S) / SUBCONTRACTOR(S)

Operator(s):

TBD

Subcontractor(s):

TBD

Emergency 24-Hour Contact:

TBD

Stormwater Team

	Stormwater Team		
Name, Position, and Contact Information	**Responsibilities**	**I Have Completed Training Required by CGP Part 6.2**	**I Have Read the CGP and Understand the Applicable Requirements**
Elyse Tripp Staff Scientist BETA Group, Inc. 844-800-2382 etripp@BETA-Inc.com	SWPPP Preparation	☐ Yes ☐ No	☐ Yes Date: Click here to enter a date.
TBD	SWPPP Inspections	☐ Yes ☐ No	☐ Yes Date: Click here to enter a date.
TBD	SWPPP Inspections	☐ Yes ☐ No	☐ Yes Date: Click here to enter a date.
TBD	SWPPP Inspections	☐ Yes ☐ No	☐ Yes Date: Click here to enter a date.
Gary D James Senior Project Manager BETA Group, Inc. 781-255-1982 gjames@BETA-Inc.com	Oversee Development of SWPPP	☐ Yes ☐ No	☐ Yes Date: Click here to enter a date.
Town of Yarmouth Robert L Whritenour Jr. – Town Administrator (508) 398-2231	SWPPP Certifier	☐ Yes ☐ No	☐ Yes Date: Click here to enter a date.
TBD	SWPPP Implementation	☒ Yes ☐ No	☐ Yes Date: Click here to enter a date.

Stormwater Team Members Who Conduct Inspections Pursuant to CGP Part 4

Name and/or Position and Contact	Training(s) Received	Date Training(s) Completed	If Training is a Non-EPA Training, Confirm that it Satisfies the Minimum Elements of CGP Part 6.3.b
	Training will be completed by 2/23/2023, as required	Date:	☒ Principles and practices of erosion and sediment control and pollution prevention practices at construction sites ☒ Proper installation and maintenance of erosion and sediment controls and pollution prevention practices used at construction sites ☒ Performance of inspections, including the proper completion of required reports and documentation, consistent with the requirements of Part 4
	Training will be completed by 2/23/2023, as required	Date:	☒ Principles and practices of erosion and sediment control and pollution prevention practices at construction sites ☒ Proper installation and maintenance of erosion and sediment controls and pollution prevention practices used at construction sites ☒ Performance of inspections, including the proper completion of required reports and documentation, consistent with the requirements of Part 4
	Training will be completed by 2/23/2023, as required	Date:	☒ Principles and practices of erosion and sediment control and pollution prevention practices at construction sites ☒ Proper installation and maintenance of erosion and sediment controls and pollution prevention practices used at construction sites ☒ Performance of inspections, including the proper completion of required reports and documentation, consistent with the requirements of Part 4

3.0 Site Evaluation, Assessment, and Planning

3.1 Project/Site Information

Project Name and Address

Project/Site Name: **Yarmouth Riverwalk Park**
Project Street/Location: **669 Route 28**
City: **Yarmouth**
State: **Massachusetts**
ZIP Code: **02664**
County or Similar Subdivision: **Barnstable County**
Business days and hours for the project: **Monday – Friday, 7:00 AM – 5:00 PM**

Project Latitude/Longitude

Latitude: **41º 38' 55.83''º N** (decimal degrees)
Longitude: **- 70º 13' 29.35'' º W** (decimal degrees)

Latitude/Longitude Data Source: **Google Earth**

Horizontal Reference Datum: **WGS84**

3.2 Additional Project Information

The following questions are answered below pursuant to those posed within the NPDES CGP SWPPP template:

- Are you requesting permit coverage as a "federal operator" as defined in Appendix A of the 2017 CGP? **No**
- Is the project/site located on Indian country lands, or located on a property of religious or cultural significance to an Indian tribe? **No**
- If yes, provide the name of the Indian tribe associated with the area of Indian country (including the name of Indian reservation if applicable), or if not in Indian country, provide the name of the Indian tribe associated with the property: **N/A**
- If you are conducting earth-disturbing activities in response to a public emergency, document the cause of the public emergency *(e.g., natural disaster, extreme flooding conditions)*, information substantiating its occurrence *(e.g., state disaster declaration)*, and a description of the construction necessary to reestablish effective public services**: N/A**

3.3 Discharge Information

The following questions and supporting data are addressed pursuant to the NPDES CGP SWPPP template:

- Does your project/site discharge stormwater into a Municipal Separate Storm Sewer System (MS4)? **No**
- Are there any waters of the U.S. within 50 feet of your project's earth disturbances? **Yes**

Point of Discharge ID	Receiving Water	Impaired per CWA 303(d)?	Impairment(s)	TMDL?	TMDL Name/ID	Pollutant(s)	Tier Designation (2, 2.5, 3)
[001]	Parkers River	Yes	Fecal Coliform Total Nitrogen Nutrient/ Eutrophication Biological Indicators	Yes	Parkers River Embayment System Total Maximum Daily Loads for Total Nitrogen (CN 335.1)	Nitrogen	N/A

4.0 PROJECT / PROPOSED CONSTRUCTION ACTIVITIES

4.1 PROJECT DESCRIPTION

Work covered under this SWPPP involves the rehabilitation of the currently vacant property and conversion into a public park, featuring a central four-acre grassed multi-use field area for periodic outdoor events, encircled with field and woodland walking paths. Near the Parkers River, a nature-based play area for children is planned with play structures and lawn games, shade sails, and artist shanties displaying work from various artists or other vendors. The park design also features a pile-supported boardwalk leading to a float for launching canoes, kayaks and paddleboards on the Parkers River.

A woodland path is also proposed that will connect the park to a 1,300 linear foot 6-foot-wide boardwalk loop, including a pedestrian bridge, constructed as an elevated walkway over Salt Marsh. The boardwalk includes three overlook areas and four bench areas, offering expansive views of the sky and marsh below. Other improvements include a porous paving parking lot with lighting for 88 new parking spaces, a small park office and restroom building (1,015 sf), and up to ten temporary artist shanties (at 140 sf each), a kiosk near the kayak launch, and associated utilities. None of the proposed structures will be conditioned, as they will be seasonal.

The purpose of this Project is to provide accessible outdoor recreation opportunities to the public, a new event space for the Town and to restore the waterfront. The Town seeks to utilize the natural beauty of Cape Cod by restoring the previously unused property to provide a scenic park for residents and tourists in the area. Specifically, the Project aims to provide a parking area that provides visual access to the Parkers River; provide public access to view the Salt Marsh; provide public access to the Parkers River, install a permanent seasonal restroom facility; and provide a space for events.

4.1.1 SIZE AND TYPE OF CONSTRUCTION SITE

The following information and questions are addressed pursuant to the NPDES CGP SWPPP template:

Size of Construction Site

Size of Property	Approximately 119 acres
Total Area Expected to be Disturbed by Overall Construction Activities	Approximately 11 acres
Maximum Area Expected to be Disturbed at Any One Time	Approximately 6-7 acres

Type of Construction Site

☐ Single-Family Residential ☐ Multi-Family Residential ☐ Commercial ☐ Industrial

☐ Institutional ☐ Highway or Road ☐ Utility ☒ Other: **Recreational**

- Will there be demolition of any structure built or renovated before January 1, 1980? **No**
- If yes, do any of the structures being demolished have at least 10,000 square feet of floor space? **N/A**
- Was the pre-development land use used for agriculture (see Appendix A for definition of "agricultural land")? **No – The Site consists of a former drive-in property and Conservation Area.**

4.1.2 Pollutant-Generating Activities

The following is a summary of any pollutant-generating activities that are anticipated to occur at the Site throughout the proposed Project.

To prepare the Site for construction activities, removal of various types of debris including vegetative, metal, and other solid waste is anticipated. Stockpiling of materials or soils currently present at the Site to be reused during the Project will be located over 100 feet from a Water of the U.S. Ground disturbing activities will be primarily associated with installation of utilities and construction of stormwater BMP's. Erosion controls surrounding the limits of work and the staging/stockpiling areas are anticipated to prevent the migration of pollutants including debris and sediments.

Pollutant-Generating Activity (e.g., paving operations; concrete, paint, and stucco washout and waste disposal; solid waste storage and disposal; and dewatering operations)	**Pollutants or Pollutant Constituents** (e.g., sediment, fertilizers, pesticides, paints, caulks, sealants, fluorescent light ballasts, contaminated substrates, solvents, fuels)
Site clearing, grading, and excavation	Sediment, debris
Paving operations	Petroleum, debris
Structure construction	Debris
Equipment Fueling	Oil, petroleum
Landscaping	Debris
Stockpiled materials (i.e. loam, gravel)	Sediment, nutrients

4.1.3 Construction Support Activities

Equipment staging and material storage areas, and employee parking, will be located in the existing area being used by the Department of Public Works (DPW) for material storage at the far western edge of the Site.

Contact information for construction support activity:
TBD

4.2 Sequence and Estimated Dates of Construction Activities

The overall disturbance area exclusive of the boardwalk and kayak launch piers will be approximately 20.0 acres. Based on the linear nature of the proposed development, the proposed erosion control and sequencing will be specifically designed to minimize the maximum exposed surface area and provide an opportunity to capture runoff inside the development area and minimize the potential for discharge to the river. The following is a summary of phasing and scheduling associated with the Project.

Phase I Construction – dates To be Determined

1. Set all perimeter erosion control measures for the Site;
2. Establish laydown and staging area for equipment and employee parking in the existing area being used by the DPW for material storage at the far western edge of the Site;
3. Clear all vegetation onsite and grub areas within the limits of Phase I area to be altered;
4. Set all vegetation protection measures along perimeter of development area;
5. Remove existing pavement and set tracking pad at the entrance;
6. Provide and place fill needed in the proposed access driveway and parking area to bring Site grades for all proposed up to elevation 6.8± and provide construction access to the boardwalk and kayak launch pier. Once boardwalk has been completed, complete installation of stabilized aggregate walkway, including vegetative stabilization of shoulders;
7. Place fill for bathroom area while maintaining construction staging and laydown area, including temporary vehicular access to structure area;
8. Construct bathroom structure complete, including all utilities;
9. Install water, sewer & electrical utilities;
10. Shape berm along east side of access driveway complete, including loam & seed;
11. Install Infiltration System 1 complete (Do not connect with swale until roadway is paved and watershed area has been stabilized);
12. Set gravel base in entrance driveway to the start of the parking lot;
13. Complete installation of all drainage piping in the entrance driveway;
14. Provide base course paving in access driveway to station 9+50 at start of porous pavement parking lot;
15. Provide vegetative cover on all exposed slopes along the entrance driveway; and
16. Open flow into infiltration system 1.

Phase II Construction– dates To be Determined

1. Fill & shape infield area & perimeter walkway and reinforced turf shoulders;
2. Remove borrow from parking lot area to provide room for porous earth design section. Use material removed to rough grade area for development west of parking lot between pavement and the river;
3. Set base layers for porous pavement;
4. Install infiltration basin 3 complete, including loam & seed;
5. Install infiltration trench in the infield area complete, including remove & replace;
6. Set gravel base for perimeter walkway across the entire Site west of the access driveway;
7. Place porous pavement and pave cul-de-sac including vertical granite curbing;

8. Pave walkway and set reinforced turf around the infield area;
9. Finish pave access driveway and complete landscape plantings along the access driveway;
10. Loam & seed the infield area;
11. Shape walkways between the parking lot and the river;
12. Construct playground and set artist shanties;
13. Complete installation of all remaining stabilized aggregate surfaces; and
14. Complete remaining landscaping.

4.2.1 Authorized Non-Stormwater Discharges

The following table summarizes any authorized non-stormwater discharges that may be present at the Site:

Type of Authorized Non-Stormwater Discharge	Likely to be Present at the Site?
Discharges from emergency fire-fighting activities	**No**
Fire hydrant flushings	**Yes**
Landscape irrigation	**Yes**
Waters used to wash vehicles and equipment	**No**
Water used to control dust	**Yes**
Potable water including uncontaminated water line flushings	**No**
External building washdown (soaps/solvents are not used and external surfaces do not contain hazardous substances)	**No**
Pavement wash waters	**No**
Uncontaminated air conditioning or compressor condensate	**No**
Uncontaminated, non-turbid discharges of ground water or spring water	**Yes**
Foundation or footing drains	**No**
Uncontaminated construction dewatering water	**No**

4.2.2 Site Maps

Site Maps are attached to this narrative as Appendix A. These maps show the likely locations of these discharges.

5.0 Compliance with Other Federal Requirements

5.1 Endangered Species Protection

In accordance with the information found in Appendix D of the CGP, the Project is eligible for coverage under:

Criterion C: Discharges not likely to adversely affect ESA-listed species and/or designated critical habitat. ESA-listed species and/or designated critical habitat(s) under the jurisdiction of the USFWS and/or NMFS are likely to occur in or near your site's "action area," and you certify to EPA that your site's discharges and discharge-related activities are not likely to adversely affect ESA-listed threatened

or endangered species and/or designated critical habitat. This certification may include consideration of any stormwater controls and/or management practices you will adopt to ensure that your discharges and discharge-related activities are not likely to adversely affect ESA-listed species and/or designated critical habitat. To certify your eligibility under this criterion, indicate 1) the ESA-listed species and/or designated habitat located in your "action area" using the process outlined in Appendix D of this permit; 2) the distance between the site and the listed species and/or designated critical habitat in the action area (in miles); and 3) a rationale describing specifically how adverse effects to ESA-listed species will be avoided from the discharges and discharge-related activities. You must also include a copy of your site map from your SWPPP showing the upland and in-water extent of your "action area" with this NOI.

Basis statement content/Supporting documentation: A basis statement supporting the selection of Criterion C should identify the information resources and expertise (e.g., state or federal biologists) used to arrive at this conclusion. Any supporting documentation should explicitly state that both ESA-listed species and designated critical habitat under the jurisdiction of the USFWS and/or NMFS were considered in the evaluation.

- Resources used to make determination:

  To make this determination, a list of threatened and endangered species that may occur in the Project area (or could be affect by the Project) was acquired from the US Fish and Wildlife Service (Appendix K).

  Website used to determine distance to closest critical habitat: https://mass-eoeea.maps.arcgis.com/apps/Viewer/index.html?appid=de59364ebbb348a9b0de55f6febdfd52.

- ESA-listed Species/Critical Habitat in action area:

  The species mapped within the Project area include the Northern Long-Eared Bat (*Myotis septentrionalis*), the Roseate Tern (*Sterna dougallii*), the Monarch Butterfly (*Danaus plexippus*), and the Sandplain Gerardia (*Agalinis acuta*). No critical habitats are located within the Project area (Appendix K).

  Northern Long Eared Bat fact sheet:
  https://ecos.fws.gov/ecp/species/9045

  Roseate Tern fact sheet:
  https://www.mass.gov/files/documents/2016/08/wh/roseate-tern.pdf

  Monarch Butterfly fact sheet:
  https://ecos.fws.gov/ecp/species/9743

  Sandplain Gerardia fact sheet:
  https://www.mass.gov/doc/sandplain-gerardia/download

- Distance between site and ESA-listed Species/Critical Habitat:

  The Northern Long-Eared Bat (*Myotis septentrionalis*) is currently listed as a threatened species, with no critical habitats located within the Project area. The closest critical habitat for this species (a hibernacula) is located approximately fifteen (15) miles from the Site.

  The Roseate Tern (*Sterna dougallii)* is currently listed as an endangered species, however there are no mapped critical habitats for this species within the Project limits. Accordingly, no Section 7 consultation is required.

  The Monarch Butterfly (*Danaus plexippus*) is currently only listed as a candidate species. Accordingly, no Section 7 consultation is required.

  The Sandplain Gerardia (*Agalinis acuta*) is currently listed as an endangered species, however there are no mapped critical habitats for this species with the Project area. Although this species was mapped within the Project limits by the U.S. Fish and Wildlife Service, no populations of this species were identified during prior consultation with the Natural Heritage and Endangered Species Program (NHESP) of the Massachusetts Division of Fisheries and Wildlife under the Massachusetts Endangered Species Act (MESA).

- How adverse effects will be avoided:
  - **The Project is located approximately fifteen (15) miles from the nearest critical habitat of the Northern Long-eared Bat. Tree clearing has been minimized to the extent required to construct the Project, and the Project will provide a large restoration area to improve habitat within the Project limits.**
  - **The Project has been proposed to minimally impact existing vegetation when possible, and provides for revegetation of degraded habitat, including flowering species. As much existing vegetation as possible will remain with exception to targeted removal of invasive species present within the Project limits.**
  - **Much of the impacts associated with the Project have been located outside of areas that may provide breeding or foraging habitat for the Roseate Tern, which typically include sandy, gravelly, or rocky islands within dense vegetation. Work proposed within wetland areas to install piles for the boardwalk are minimal and primarily temporary.**
  - **The action area is within the range of the Northern Long Eared Bat, the Roseate Tern, the Monarch Butterfly, and the Sandplain Gerardia, however, no critical habitats for these species are present within the action area.**

5.2 HISTORIC PRESERVATION

The following information related to historic preservation is provided pursuant to Appendix E of the CGP:

Appendix E, Step 1

Do you plan on installing any of the following stormwater controls at your site? Check all that apply below, and proceed to Appendix E, Step 2.

☐ Dike

☐ Berm

☒ Catch Basin

☐ Pond

☐ Stormwater Conveyance Channel (e.g., ditch, trench, perimeter drain, swale, etc.)

☒ Culvert

☒ Other type of ground-disturbing stormwater control: **Infiltration Basin**

Appendix E, Step 2

Have prior professional cultural resource surveys or other evaluations determined that historic properties do not exist, or have prior disturbances precluded the existence of historic properties?

There are no historic properties mapped within the Project area per Massachusetts Cultural Resource Information System (MACRIS), and therefore no further screening steps are necessary. The closest mapped historic property is located across Route 28 to the north of the Site has been demolished (Captain Sears Winthrop House – YAR.272).

5.3 Safe Drinking Water Act Underground Injection Control Requirements

The following provides confirmation of any controls to be installed by the Project pursuant to the NPDES CGP SWPPP template:

☒ Infiltration trenches (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system)

☒ Commercially manufactured pre-cast or pre-built proprietary subsurface detention vaults, chambers, or other devices designed to capture and infiltrate stormwater flow

☐ Drywells, seepage pits, or improved sinkholes (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system)

6.0 Erosion and Sediment Controls

6.1 Natural Buffers or Equivalent Sediment Controls

6.1.1 Buffer Compliance Alternatives

Project disturbances **are within 50 feet** of a Water of the U.S. In accordance with section 2.2.1.a. of the 2022 CGP, the Project will implement erosion and sediment controls to achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.

Based on the rationale provided below, the following compliance alternative was selected:

☒ I qualify for one of the exceptions in Part 2.2.1.b, specifically:

☒ Where some natural buffer exists but portions of the area within 50 feet of the receiving water are occupied by preexisting development disturbances, you are required to comply with the requirements in Part 2.2.1 and this Appendix. For the purposes of calculating the sediment load

reduction for either compliance alternative 2 or 3, you are not expected to compensate for the reduction in buffer function that would have resulted from the area covered by these preexisting disturbances

In accordance with Table F-2 of the 2022 CGP, the Site falls under a "low" risk category due to soil types and the lack of slopes greater than 3% within the work area. As such, it is anticipated that a perimeter of 12-inch compost filter tubes supplemented with entrenched siltation fencing in the areas adjacent to Waters of the U.S. will be sufficient in achieving the sediment load reduction of a naturally occurring buffer.

The current condition of the Site does not maintain a 50-foot undisturbed natural buffer, or any buffer in some locations; however, an undisturbed natural buffer of less than 50 feet does exist in most areas of the Site. Work proposed for the Project aims in part to improve waterfront access and use; therefore temporary and permanent impacts to Waters of the U.S. are necessary to construct a marsh boardwalk and install a kayak launch.

To improve water quality protection to Waters of the U.S. where feasible within the Site, revegetation of existing non vegetated buffer areas and impacted buffer areas is provided in locations up to 200 feet from the ordinary high-water mark to Waters of the U.S. To enhance the quality of vegetation already existing within the 50-foot buffer area, invasive species are targeted for removal. In addition to maintaining and revegetating an undisturbed natural buffer where feasible, a robust erosion and sediment control plan has been provided. Following the completion of the Project, all areas disturbed through erosion control installation will be stabilized with loam and seed.

6.2 Perimeter Controls

6.2.1 General Description

The perimeter of all disturbed portions of the Project area within 100 feet of Waters of the U.S. will be surrounded with erosion controls consisting of compost filter tubes and entrenched siltation fencing. The perimeter controls will be inspected as described below throughout the duration of the Project.

6.2.2 Specific Perimeter Controls

Compost Filter Tubes	
Description: Compost filter tubes will be installed internal to the siltation fencing within 100 feet of Waters of the U.S.	
Installation	Prior to any earth work or construction.
Maintenance Requirements	Compost filter tubes will be inspected once every (7) calendar days and within 24 hours after an event which generates 0.25 inches of rain in a 24-hour period. If found in disrepair, they will be repaired or replaced as necessary. Sediment will be removed before it has accumulated to one-half of the above-ground height of the compost filter tubes.
Design Specifications	Compost filter tubes shall overlap by at least three (3) feet and be staked into the ground when feasible. See installation detail.

Siltation Fencing	
Description: Siltation fencing will be entrenched downgradient of the compost filter tubes at the limit of work within 100 feet of Waters of the U.S.	
Installation	Prior to any earth work or construction.
Maintenance Requirements	Siltation fencing will be inspected once every (7) calendar days and within 24 hours after an event which generates 0.25 inches of rain in a 24-hour period. If found in disrepair, they will be repaired or replaced as necessary. Sediment will be removed from the siltation fencing before it has accumulated to three inches of the above-ground height.
Design Specifications	Siltation fencing shall be entrenched at least six (6) inches below grade. See installation detail.

6.3 SEDIMENT TRACK-OUT

6.3.1 GENERAL DESCRIPTION

A sediment track-out pad will be constructed at the Site to reduce the chance of sediment leaving the Site through equipment/vehicle traffic.

The stockpile/staging area will be monitored for any loose sediments. Any migrated sediments must be immediately removed from this area.

6.3.2 SPECIFIC SEDIMENT TRACK-OUT BMPS

Construction Entrance	
Description: A stone track-out pad will be constructed at the entrance to the Site from Route 28.	
Installation	Prior to any earth work or construction.
Maintenance Requirements	The track-out pad will be inspected weekly and after storm events greater than 0.25 inches. Stone will be replaced, and sediment will be removed as needed.
Design Specifications	The track-out pad will consist of at least five inches of coarse crushed stone (3-inch +/-) underlain by geotextile fabric. A pad length of at least 50 feet should be established if possible.

6.4 STOCKPILED SEDIMENT OR SOIL

6.4.1 GENERAL DESCRIPTION

The Project will not require significant or long-term soil stockpiling. Sediment or soil stockpiles, if necessary, will be placed outside of any areas of concentrated flow or pavement, and surrounded by a row of compost filter tubes. Stockpiles unused for more than 14 days will be covered or otherwise

stabilized. Hosing down or sweeping soil or sediment accumulation on impervious surfaces unto any constructed or natural drainage feature, storm drain inlet, or receiving water is prohibited.

The designated laydown and staging area for equipment and employee parking will be in the existing area being used by the DPW for material storage at the far western edge of the Site. Where a change in the designated stockpile or staging area location is necessary, it will be located over 100 feet from any Waters of U.S.

6.4.2 Specific Soil Stockpile Protections

Compost Filter Tubes	
Description: Compost filter tubes will be installed around stockpiled soils and/or sediments.	
Installation	As needed.
Maintenance Requirements	If installed, compost filter tubes will be inspected once every (7) calendar days and within 24 hours after an event which generates 0.25 inches of rain in a 24-hour period. If found in disrepair, they will be repaired or replaced as necessary. Sediment will be removed before it has accumulated to one-half of the above-ground height of the compost filter tubes.
Design Specifications	Compost filter tubes shall overlap by at least three (3) feet and be staked into the ground when feasible.

6.5 Minimize Dust

6.5.1 General Description

In order to minimize the risk of sediments migrating from the Site through the generation of dust, measures will be taken during and after construction activities. The Contractor will take appropriate action to minimize atmosphere pollution by taking reasonable precautions to prevent particulate matter from becoming and staying airborne. Such measures include the use of water for control of dusts during grading and compaction activities and covering all open-bodied equipment carrying materials likely containing air borne dusts. The Contractor is responsible for capturing and controlling all runoff from the dust control water.

6.5.2 Specific Dust Controls

Water Application	
Description: When airborne particulate matter is observed onsite, water will be applied using either a hose or sprinkler system to wet the particulate matter.	
Installation	A hose shall be present at all times, but the dust control methodology will only be employed as needed
Maintenance Requirements	As needed
Design Specifications	n/a

6.6 Minimize Steep Slope Disturbances

6.6.1 General Description

The slopes onsite are generally shallow; therefore, steep slope controls are not anticipated to be a part of the Project.

6.7 Topsoil

6.7.1 General Description

Topsoil stripped from an immediate area of construction will be reused onsite to the maximum extent practicable, especially in areas intended to be vegetated upon completion of the Project. Stripped topsoil will be stockpiled separately from other earth material stockpiles, if present, and surrounded by compost filter tubes.

6.8 Soil Compaction

6.8.1 General Description

Construction of the boardwalk through the wetlands for the Project necessitates the use of a drill rig to install permanent supporting piles. To prevent impacts to and compaction of the soil, matts will be placed on the wetland to distribute the load of the drill-rig. Upon removal of the matts, a native salt-tolerant seed mix will be used within the impacted area to restore the type of wetland altered.

During construction within other areas of the Site, compaction of soils around the Site will be avoided to the maximum extent practicable. When possible, equipment and vehicle use will be restricted or limited in areas of proposed infiltration, landscaping, or restoration plantings. Agreed upon material and equipment storage areas, and vehicle parking areas, will be used to limit compaction of soils by machinery. If soil has been excessively compacted, the contractor should implement techniques to rehabilitate and condition the soils before seeding or planting areas.

6.8.2 Specific Soil Compaction Control

Construction Matts	
Description: To prevent impacts to, and compaction of wetland soils, construction matts will be used to distribute the load of the drill rig.	
Installation	At the start of pile installation for the boardwalk.
Maintenance Requirements	Maintain matts at grade and add additional width if soil compaction warrants.
Design Specifications	Sufficient width to spread loads associated with construction equipment access across loose uncompacted soils.

Designated Construction Areas	
Description: To avoid excessive compaction, Construction activities will be confined to the areas indicated on the plans and other specifications.	
Installation	During all phases of construction, vehicle and equipment use in areas sensitive to

	excessive compaction should be restricted to the maximum extent feasible.
Maintenance Requirements	n/a
Design Specifications	n/a

6.9 Storm Drain Inlets

6.9.1 General Description

There will be seven (7) storm drain inlets installed, and there are no existing storm drain inlets located within the Project.

From Station 5+50 to the start of the parking area at Sta 7+00, the roadway cross slope will be modified to slope towards the landscaped island at the center of the circle. Area Drain 1 will be set in the middle of the island to collect the runoff and direct it east towards the swale through 2-8" ductile iron culverts.

A public restroom/office building will be located on the west side adjacent to the infield area. The runoff from the surrounding walkways will be graded to flow into five area drains (collectively referred to as Area Drain 2) that will be piped through an "Isolator Row" in the chamber system, which will provide the pretreatment needed for the infiltration system.

At the cul-de-sac at the end of the access roadway, the kayak storage area and rental kiosk will be graded to flow through Area Drain 3, south towards the infiltration basin.

6.9.2 Specific Storm Drain Inlet Protection

Filter Fabric	
Description: Filter fabric will be cut to size and fitted under the grates of the storm drain inlets adjacent to the limits of work. Due to the small size of these grates, use of a traditional SiltSack is not feasible.	
Installation	After grate installation and before the stormwater system is put into active use.
Maintenance Requirements	Inlet protection measures will be inspected twice per week and after storm events greater than 1/4". If found in disrepair, they will be repaired or replaced as necessary. Sediment will be removed from the filter fabric as accumulation is observed.
Design Specifications	A sufficient amount of filter fabric shall be exposed from under the grate to allow for removal and maintenance by the contractor.

6.10 Stormwater Conveyance Channels

6.10.1 General Description

No existing stormwater conveyance channels are located within the limits of work, nor are there any proposed stormwater conveyance channels proposed for this Project.

6.11 Sediment Basins

6.11.1 General Description

Overall disturbance will be greater than 10.0 acres, and 1 sediment basin is proposed for use in the Project. The basin will be located east of the temporary roadway and will be formed naturally by the placement of the fill for both the parking area and the bathroom. It will collect all runoff from the 5.0-acre infield area during all phases of construction. In Phase I the basin will act to isolate the construction area from runoff emanating from the infield. In Phase II it will intercept all sediment transported from the disturbed area associated with the installation of the event area and perimeter bike path.

6.11.2 Specific Sediment Basin Details

Sediment Basin	
Description: The fill provided for the roadway will naturally form an isolated depression that will be used as a temporary sediment basin during construction. The area tributary to the basin will be approximately 5.0 acres. The basin will be sized to store a minimum of 18,000 cu. Ft. (3,600 cu. Ft. / acre). The outlet will be a 12" ADS pipe installed vertically with the top at elevation 6.20 which will act as a skimmer to discharge any volume in excess of the infiltrative capacity of the underlying soils.	
Installation	Phase II
Maintenance Requirements	The basin will be formed and operational while the perimeter walkway and grading around the event area is under construction. Any accumulated sediment more than 4" in depth shall be removed and stockpiled. Outlet riser and pipe shall be inspected weekly and after any significant rainfall event.
Design Specifications	The basin will be formed naturally through placement of fill for the roadway and parking. Storage volume shall be determined once fill has been placed. If needed, the area will be graded to provide the additional storage volume required. Skimmer and outlet culvert will be set in conjunction with temporary access roadway fill.

6.12 Chemical Treatment

6.12.1 General Description

No chemical treatment is proposed to be used on the onsite soils.

6.13 Dewatering Practices

6.13.1 General Description

Dewatering is not anticipated to occur as part of the Project.

6.14 Site Stabilization

Total Amount of Land Disturbance Occurring at Any One Time

☐ *Five Acres or less*
☒ *More than Five Acres*

6.14.1 General Description

The total amount of land disturbance occurring at any one time will be over five (5) acres. However, the work will result in minimal areas of exposed soils as the Project generally seeks to maintain existing ground cover where feasible. Any soils exposed following the removal of erosion controls shall be stabilized with seed and loam.

6.14.2 Specific Stabilization Practices

Loam and Seed	
☒ *Vegetative* ☐ *Non-Vegetative* ☐ *Temporary* ☒ *Permanent*	
Description: Use loam and seed to stabilize areas following erosion control removal.	
Installation	Loam and seed will be applied in areas where erosion controls are removed, and soils are exposed.
Completion	Immediately following erosion control removal.
Maintenance Requirements	Inspect weekly to ensure germination. Reapply seed as needed.
Design Specifications	n/a

7.0 Pollution Prevention Standards

7.1 Potential Sources of Pollution

Construction Site Pollutants

Pollutant-Generating Activity	**Pollutants or Pollutant Constituents** (that could be discharged if exposed to stormwater)	**Location on Site** (or reference SWPPP site map where this is shown)
Site clearing and grading	Debris, sediment	Site-wide
Paving operations	Petroleum, debris	Access road and parking areas
Structure Construction	Debris	Restrooms
Stockpiled materials	Sediment, nutrients	Designated staging area, or over 100 feet from any Waters of the U.S.

Pollutant-Generating Activity	Pollutants or Pollutant Constituents (that could be discharged if exposed to stormwater)	Location on Site (or reference SWPPP site map where this is shown)
Equipment fueling	Oil, petroleum	Designated staging area, or over 100 feet from any Waters of the U.S.

7.2 Spill Prevention and Response

Spills and leaks shall be avoided through frequent inspection of equipment and material storage areas. Heavy equipment and other vehicles shall be routinely inspected for leaks and repaired as necessary. Material storage areas shall be routinely inspected for leaky containers, open containers, or improper storage techniques that may lead to spills or leaks. Appropriate cleanup procedures and supplies shall be available onsite and should be clearly marked so that all personnel can locate and access these supplies quickly. Supplies available onsite shall include a spill kit to effectively clean up any emergency spills immediately. Proper response procedures shall be followed in accordance with any applicable regulatory requirements. The construction manager onsite will be responsible for spill prevention and will act as cleanup coordinator.

Responsible Party for Spill and/or Leak Detection:

TBD

7.3 Fueling and Maintenance of Equipment or Vehicles

7.3.1 General Description

Fueling of vehicles will be conducted daily within the Project area. Fueling will take place in the equipment parking areas at least 100 feet from the boundaries of Waters of the U.S. No storage of fuel, however, is anticipated onsite. Minor maintenance may occur if the vehicle is unable to be safely removed from the Site. If emergency maintenance must occur onsite, the maintenance area will be clean and dry. Proper equipment will be available onsite to mitigate any potential leaks from the vehicles. These supplies will include pans, drip cloths, and a spill kit. All construction vehicles will be equipped with a spill kit and routinely inspected for leaks and any other potential damages.

7.3.2 Specific Pollution Prevention Practices

Spill Kit	
Description: A spill kit should be located onsite at all times	
Installation	
Maintenance Requirements	The Spill Kit should be inspected monthly to ensure compliance
Design Specifications	Not Applicable

7.4 WASHING OF EQUIPMENT AND VEHICLES

7.4.1 GENERAL DESCRIPTION

Washing activities are not anticipated to occur at the Site. Vehicles and equipment traveling to and from the Site will be driving over a sediment track-out pad to shed any soils or sediments accumulated within tire treads.

7.5 STORAGE, HANDLING, AND DISPOSAL OF BUILDING PRODUCTS, MATERIALS, AND WASTES

7.5.1 BUILDING PRODUCTS

All building materials, temporary equipment, and stockpiles will be stored in a designated staging area over 100 feet from Waters of the U.S. and no material staging will occur within a Water of the U.S. These materials will be located in an upland area that does not receive a substantial amount of runoff. When soil or other earth material stockpiles are present, compost filter tubes will be used to contain the stockpile. Earth material stockpiles that are not in active use will be covered with plastic sheeting, seeded, or otherwise stabilized to minimize exposure of the stockpiles to precipitation and to stormwater.

7.5.2 PESTICIDES, HERBICIDES, INSECTICIDES, FERTILIZERS, AND LANDSCAPE MATERIALS

No pesticides, insecticides, or fertilizers will be used onsite; however, should use of any of the products be required authorization by the Owner and local regulatory authority will be obtained. Landscape material stockpiles, including earth material stockpiles, if needed, will be located over 100 feet from a Water of the U.S. and will be covered and contained as necessary to reduce exposure to precipitation and stormwater.

Targeted herbicide use may occur as necessary to remove invasive species, but use of any herbicide is limited to treatment of identified invasive species by a licensed professional. Storage of herbicides within 100 feet of any Waters of the U.S. is prohibited, and if onsite storage is necessary, herbicides shall be kept in sealed containers under cover from weather over 100 feet from any Waters of the U.S.

7.5.3 DIESEL FUEL, OIL, HYDRAULIC FLUIDS, OTHER PETROLEUM PRODUCTS, AND OTHER CHEMICALS

No fuel will be stored onsite. A fuel truck will come to the Site to fill the tanks of the construction vehicles daily. Construction vehicles that leave the Site daily will be filled at an offsite location. All construction vehicles will be equipped with a spill kit to manage any potential chemical spills. Equipment and containers will be routinely checked for leaks, corrosion, or other signs of deterioration. Those that are found to be defective shall be immediately repaired or replaced.

7.5.4 HAZARDOUS OR TOXIC WASTE

The use of hazardous or toxic wastes, including but not limited to paints, sealants, and adhesives may be present onsite during different phases of the Project. Hazardous and toxic materials will be stored in sealed containers appropriate to prevent leakage or corrosion of the container by the stored materials and be clearly labeled per applicable regulatory requirements. Hazardous and toxic material waste will be stored separately from construction and domestic waste.

If construction personnel encounter conditions that indicate the presence of unanticipated hazardous materials, hazardous wastes, or other conditions of environmental concern in a particular work zone, all work activities in the area will be immediately stopped until the situation can be evaluated.

7.5.5 Construction and Domestic Waste

7.5.5.1 General Description

Waste, including packaging materials, pavement, etc. will be collected and stored onsite in secured and covered trash receptacles. Where debris size, or other limitations, prevent use of closed top trash receptables, a different method of providing coverage may be used including, but not limited to, plastic sheeting or tarps. Construction and demolition debris will be stored in secured receptables separately from domestic waste, and these dumpsters will be located at the designated staging areas. No construction debris will be buried onsite, and receptacles will be routinely removed from the Site.

7.5.5.2 Specific Pollution Prevention Practices

Covered Dumpster	
Description: A covered onsite dumpster will be located onsite for collection of waste.	
Installation	TBD
Maintenance Requirements	Dumpsters will be inspected daily, and contents will be disposed of once the dumpster is at capacity.
Design Specifications	n/a

7.5.6 Sanitary Waste

7.5.6.1 General Description

Portable restroom units will be placed within the Project area for use by onsite workers but will be placed over 100 feet away from any Waters of the U.S. Portable restroom units will be secured and stabilized to prevent overturning and will be located away from any storm drain inlets and any natural or constructed site drainage features. Routine removal of onsite sanitary waste will be performed by a licensed sanitary waste management contractor.

7.5.6.2 Specific Pollution Prevention Practices

Portable Restrooms	
Description: One (1) portable restroom will be located over 100 feet from any Waters of the U.S.	
Installation	TBD
Maintenance Requirements	The restroom will be inspected weekly. If waste removal is required, the inspector is to contact a licensed sanitary waste management contractor.
Design Specifications	n/a

7.6 Washing of Applicators and Containers used for Paint, Concrete or Other Materials

For washing applicators and containers used for paint or similar materials, wash water will be directed into a leak-proof container or leak-proof and lined pit designed so no overflow will occur due to inadequate sizing or precipitation. All wash stations will be located over 100 feet from any Waters of the U.S. and as far as possible from constructed or natural drainage features, storm inlets, or receiving waters.

Liquid waste will not be dumped or disposed of in a way that would allow them to enter a Water of the U.S., and disposal of liquid waste on the ground where infiltration can occur is prohibited. Should concrete be used during the Project, hardened concrete should be broken up and disposed of in the applicable trash receptacle.

7.7 Fertilizers

No fertilizers are permitted to be used onsite.

7.8 Other Pollution Prevention Practices

If other pollution prevention practices are necessary during the Project, the SWPPP will be amended to include specifications for those additional practices.

8.0 Inspection, Maintenance, and Corrective Action

8.1 Inspection Personnel and Procedures

Personnel Responsible for Inspections

TBD

BETA Group, Inc.

89 Shrewsbury Street, Suite 300

Worcester, MA 01604

Inspection Schedule

Standard Frequency:
☒ Every 7 days ☐ Every 14 days and within 24 hours of a 0.25" rain or the occurrence of runoff from snowmelt sufficient to cause a discharge
Reduced Frequency:
For stabilized areas on "linear construction sites" (as defined in Appendix A) ☐ Twice during first month, no more than 14 calendar days apart; then once more within 24 hours of a storm event that produces 0.25 inches or more of rain within a 24-hour period, or within

24 hours of a snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period Note: This frequency does not currently apply for the Site, but will following completion of construction.

Dewatering Inspection (if needed)
☐ ~~☒~~ Once per day on which the discharge of dewatering water occurs.

Rain Gauge Location (if applicable)

Rain Gauge is located at the Hyannis, Barnstable Municipal-Boardman Airport (KHYA) in Hyannis, Massachusetts.

Rain Data for three days following rain events can be found here:
https://w1.weather.gov/data/obhistory/KHYA.html

Inspection Report Forms

See Appendix D for Sample Inspection Form.

8.2 Corrective Action

Personnel Responsible for Corrective Actions

TBD

Corrective Action Forms

See Appendix E for a Sample Corrective Action Form.

The corrective action log contained in each inspection report must be completed, signed, and dated by the site operator once all necessary repairs have been completed.

8.3 Delegation of Authority

Duly Authorized Representative(s) or Position(s):

Operator:

TBD

SWPPP Inspections:

TBD

9.0 TURBIDITY BENCHMARK MONITORING FOR DEWATERING DISCHARGES

9.1 APPLICABILITY OF PARTS 3.3 AND 7.2.8 OF 2022 CGP

Because the Project is not anticipated to involve dewater, no turbidity monitoring is required in accordance with Section 3.3 of the 2022 CGP.

10.0 CERTIFICATION AND NOTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: _____ Title: _____

Signature: _____ Date: _____

APPENDIX A – Site Maps

APPENDIX B – Copy of 2022 CGP

National Pollutant Discharge Elimination System (NPDES)
Construction General Permit (CGP) for Stormwater Discharges from Construction Activities

In compliance with the provisions of the Clean Water Act, 33 U.S.C. §1251 et. seq., (hereafter CWA), as amended by the Water Quality Act of 1987, P.L. 100-4, "operators" of construction activities (defined in Appendix A) that meet the requirements of Part 1.1 of this National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP), are authorized to discharge pollutants in accordance with the effluent limitations and conditions set forth herein. Permit coverage is required from the "commencement of construction activities" (see Appendix A) until one of the conditions for terminating CGP coverage has been met (see Part 8.2).

This permit becomes effective on 12:00 am, February 17, 2022.

This permit and the authorization to discharge expire at 11:59pm, February 16, 2027.

Signed and issued this 18 day of January 2022

DEBORAH SZARO
Digitally signed by DEBORAH SZARO
Date: 2022.01.18 08:31:14 -05'00'

Deborah Szaro,
Acting Regional Administrator, EPA Region 1.

Signed and issued this 18 day of January 2022

JAVIER LAUREANO
Digitally signed by JAVIER LAUREANO
Date: 2022.01.18 11:21:16 -05'00'

Javier Laureano,
Director, Water Division, EPA Region 2.

Signed and issued this 18 day of January 2022

CARMEN GUERRERO PEREZ
Digitally signed by CARMEN GUERRERO PEREZ
Date: 2022.01.18 10:19:51 -04'00'

Carmen Guerrero-Perez,
Director, Caribbean Environmental Protection Division, EPA Region 2.

Signed and issued this 18 day of January 2022

CATHERINE LIBERTZ
Digitally signed by CATHERINE LIBERTZ
Date: 2022.01.18 12:05:24 -05'00'

Catherine A. Libertz,
Director, Water Division, EPA Region 3.

Signed and issued this 18 day of January 2022

JEANEANNE GETTLE
Digitally signed by JEANEANNE GETTLE
Date: 2022.01.18 13:09:48 -05'00'

Jeaneanne Gettle,
Director, Water Division, EPA Region 4.

Signed and issued this 18 day of January 2022

Digitally signed by TERA FONG
Date: 2022.01.18 13:03:49 -06'00'

Tera Fong,
Director, Water Division, EPA Region 5.

Signed and issued this 18 day of January 2022

CHARLES MAGUIRE
Digitally signed by CHARLES MAGUIRE
DN: c=US, o=U.S. Government, ou=Environmental Protection Agency, cn=CHARLES MAGUIRE, 0.9.2342.19200300.100.1.1=68001003650036
Date: 2022.01.18 14:06:55 -06'00'

Charles W. Maguire,
Director, Water Division, EPA Region 6.

Signed and issued this 18 day of January 2022

JEFFERY ROBICHAUD
Digitally signed by JEFFERY ROBICHAUD
Date: 2022.01.18 14:41:37 -06'00'

Jeffery Robichaud,
Director, Water Division, EPA Region 7.

Signed and issued this 18 day of January 2022

DARCY OCONNOR
Digitally signed by DARCY OCONNOR
Date: 2022.01.18 14:00:05 -07'00'

Darcy O'Connor,
Director, Water Division, EPA Region 8.

Signed and issued this 18 day of January 2022

TOMAS TORRES
Digitally signed by TOMAS TORRES
Date: 2022.01.18 13:30:16 -08'00'

Tomás Torres,
Director, Water Division, EPA Region 9.

Signed and issued this 18 day of January 2022

DANIEL OPALSKI
Digitally signed by DANIEL OPALSKI
Date: 2022.01.18 15:10:20 -08'00'

Daniel D. Opalski,
Director, Water Division, EPA Region 10.

CONTENTS

1 HOW TO OBTAIN COVERAGE UNDER THE CONSTRUCTION GENERAL PERMIT (CGP)

To be covered under this permit, you must meet the eligibility conditions and follow the requirements for obtaining permit coverage in this Part.

1.1 ELIGIBILITY CONDITIONS

1.1.1 You are an "operator" of a construction site for which discharges will be covered under this permit. For the purposes of this permit and in the context of stormwater discharges associated with construction activity, an "operator" is any party associated with a construction project that meets either of the following two criteria:

a. The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or

b. The party has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit conditions.

Where there are multiple operators associated with the same project, all operators must obtain permit coverage.[1] Subcontractors generally are not considered operators for the purposes of this permit.

1.1.2 Your site's construction activities:

a. Will disturb one or more acres of land, or will disturb less than one acre of land but are part of a common plan of development or sale (as defined in Appendix A) that will ultimately disturb one or more acres of land; or

b. Have been designated by EPA as needing permit coverage under 40 CFR § 122.26(a)(1)(v) or 40 CFR § 122.26(b)(15)(ii);

1.1.3 Your site is located in an area where EPA is the permitting authority and where coverage under this permit is available (see Appendix B);

1.1.4 Discharges from your site are not:

a. Already covered by a different NPDES permit for the same discharge; or

b. In the process of having coverage under a different NPDES permit for the same discharge denied, terminated, or revoked.[2, 3]

1.1.5 You can demonstrate you meet one of the criteria in the Endangered Species Protection section of the Notice of Intent (NOI) that you submit for coverage under this permit, per Part 1.4, with respect to the protection of Federally listed endangered or threatened species and Federally designated critical habitat under the Endangered Species Act

[1] If the operator of a "construction support activity" (see Part 1.2.1c) is different than the operator of the main site, that operator must also obtain permit coverage. See Part 7.1 for clarification on the sharing of permit-related functions between and among operators on the same site and for conditions that apply to developing a SWPPP for multiple operators associated with the same site.

[2] Parts 1.1.4a and 1.1.4b do not include sites currently covered under the 2017 CGP that are in the process of obtaining coverage under this permit, nor sites covered under this permit that are transferring coverage to a different operator.

[3] Notwithstanding a site being made ineligible for coverage under this permit because it falls under the description of Parts 1.1.4a or 1.1.4b, above, EPA may waive the applicable eligibility requirement after specific review if it determines that coverage under this permit is appropriate.

(ESA). If the EPA Regional Office grants you a waiver from electronic reporting per Part 1.4.2, you must complete the ESA worksheet in Appendix D to demonstrate you meet one of the criteria and submit it with your paper NOI (Appendix I).

1.1.6 You have completed the screening process in Appendix E relating to the protection of historic properties; and

1.1.7 You have complied with all requirements in Part 9 imposed by the applicable State, Indian Tribe, or Territory in which your construction activities and/or discharge will occur.

1.1.8 For "new sources" (as defined in Appendix A) only:

a. EPA has not, prior to authorization under this permit, determined that discharges from your site will not meet applicable water quality standards. Where such a determination is made prior to authorization, EPA may notify you that an individual permit application is necessary. However, EPA may authorize your coverage under this permit after you have included appropriate controls and implementation procedures designed to bring your discharge into compliance with this permit, specifically the requirement to meet water quality standards. In the absence of information demonstrating otherwise, EPA expects that compliance with the requirements of this permit, including the requirements applicable to such discharges in Part 3, will result in discharges that meet applicable water quality standards.

b. Discharges from your site to a Tier 2, Tier 2.5, or Tier 3 water[4] will not lower the water quality of the applicable water. In the absence of information demonstrating otherwise, EPA expects that compliance with the requirements of this permit, including the requirements applicable to such discharges in Part 3.2, will result in discharges that will not lower the water quality of such waters.

1.1.9 If you plan to add "cationic treatment chemicals" (as defined in Appendix A) to stormwater and/or authorized non-stormwater prior to discharge, you may not submit your NOI until you notify your applicable EPA Regional Office (see Appendix J) in advance and the EPA Regional Office authorizes coverage under this permit after you have included appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will result in discharges that meet applicable water quality standards.

[4] Note: Your site will be considered to discharge to a Tier 2, Tier 2.5, or Tier 3 water if the first receiving water to which you discharge is identified by a State, Tribe, or EPA as a Tier 2, Tier 2.5, or Tier 3 water. For discharges that enter a storm sewer system prior to discharge, the first receiving water to which you discharge is the waterbody that receives the stormwater discharge from the storm sewer system. The current list of Tier 2, Tier 2.5, and Tier 3 waters located in the areas eligible for coverage under this permit can be found at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates. You can also use EPA's Discharge Mapping Tool (https://www.epa.gov/npdes/epas-stormwater-discharge-mapping-tools) to assist you in identifying whether any receiving waters to which you discharge are listed as impaired (and the pollutant for which it is impaired) and whether an approved total maximum daily load (TMDL) exists for that waterbody.

1.2 TYPES OF DISCHARGES AUTHORIZED[5]

1.2.1 The following stormwater discharges are authorized under this permit provided that appropriate stormwater controls are designed, installed, and maintained (see Parts 2 and 3):

- **a.** Stormwater discharges, including stormwater runoff, snowmelt runoff, and surface runoff and drainage, associated with construction activity under 40 CFR § 122.26(b)(14) or § 122.26(b)(15)(i);
- **b.** Stormwater discharges designated by EPA as needing a permit under 40 CFR §122.26(a)(1)(v) or § 122.26(b)(15)(ii);
- **c.** Stormwater discharges from on or off-site construction support activities (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas) provided that:
  - **i.** The support activity is directly related to the construction site required to have permit coverage for stormwater discharges;
  - **ii.** The support activity is not a commercial operation, nor does it serve multiple unrelated construction sites;
  - **iii.** The support activity does not continue to operate beyond the completion of the construction activity at the site it supports; and
  - **iv.** Stormwater controls are implemented in accordance with Part 2 and Part 3 for discharges from the support activity areas; and
- **d.** Stormwater discharges from earth-disturbing activities associated with the construction of staging areas and the construction of access roads conducted prior to active mining.

1.2.2 The following non-stormwater discharges associated with your construction activity are authorized under this permit provided that, with the exception of water used to control dust and to irrigate vegetation in stabilized areas, these discharges are not routed to areas of exposed soil on your site and you comply with any applicable requirements for these discharges in Parts 2 and 3:

- **a.** Discharges from emergency fire-fighting activities;
- **b.** Fire hydrant flushings;
- **c.** Landscape irrigation;
- **d.** Water used to wash vehicles and equipment, provided that there is no discharge of soaps, solvents, or detergents used for such purposes;
- **e.** Water used to control dust;
- **f.** Potable water including uncontaminated water line flushings;

[5] See "Discharge" as defined in Appendix A. Note: Any discharges not expressly authorized in this permit cannot become authorized or shielded from liability under CWA Section 402(k) by disclosure to EPA, State, or local authorities after issuance of this permit via any means, including the Notice of Intent (NOI) to be covered by the permit, the SWPPP, or during an inspection.

g. External building washdown, provided soaps, solvents, and detergents are not used, and external surfaces do not contain hazardous substances (as defined in Appendix A) (e.g., paint or caulk containing polychlorinated biphenyls (PCBs));

h. Pavement wash waters, provided spills or leaks of toxic or hazardous substances have not occurred (unless all spill material has been removed) and where soaps, solvents, and detergents are not used. You are prohibited from directing pavement wash waters directly into any receiving water, storm drain inlet, or constructed or natural site drainage features, unless the feature is connected to a sediment basin, sediment trap, or similarly effective control;

i. Uncontaminated air conditioning or compressor condensate;

j. Uncontaminated, non-turbid discharges of ground water or spring water;

k. Foundation or footing drains where flows are not contaminated with process materials such as solvents or contaminated ground water; and

l. Uncontaminated construction dewatering water[6] discharged in accordance with Part 2.4.

1.2.3 Also authorized under this permit are discharges of stormwater listed above in Part 1.2.1, or authorized non-stormwater discharges listed above in Part 1.2.2, commingled with a discharge authorized by a different NPDES permit and/or a discharge that does not require NPDES permit authorization.

1.3 PROHIBITED DISCHARGES[7]

The discharges listed in this Part are prohibited outright or authorized only under the identified conditions. To prevent the discharges in Parts 1.3.1 through 1.3.5, operators must comply with the applicable pollution prevention requirements in Part 2.3 or ensure the discharge is authorized by another NPDES permit consistent with Part 1.2.3 for commingled discharges.

1.3.1 Wastewater from washout of concrete, unless managed by an appropriate control as described in Part 2.3.4;

1.3.2 Wastewater from washout and/or cleanout of stucco, paint, form release oils, curing compounds, and other construction materials;

1.3.3 Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance;

1.3.4 Soaps, solvents, or detergents used in vehicle and equipment washing or external building washdown; and

1.3.5 Toxic or hazardous substances from a spill or other release.

[6] EPA notes that operators may need to comply with additional procedures to verify that the dewatering discharge is uncontaminated. Operators should review Part 9 to determine if any of these requirements apply to their discharge and should ensure that they have complied with any State, Tribal, or local dewatering requirements that apply.

[7] EPA includes these prohibited non-stormwater discharges here as a reminder to the operator that the only non-stormwater discharges authorized by this permit are at Part 1.2.2. Any unauthorized non-stormwater discharges must be covered under an individual permit or alternative general permit.

1.4 SUBMITTING YOUR NOTICE OF INTENT (NOI)

All "operators" (as defined in Appendix A) associated with your construction site who meet the Part 1.1 eligibility conditions, and who seek coverage under this permit, must submit to EPA a complete and accurate NOI in accordance with the deadlines in Table 1 prior to commencement of construction activities (as defined in Appendix A).

Exception: If you are conducting construction activities in response to a public emergency (e.g., mud slides, earthquake, extreme flooding conditions, widespread disruption in essential public services), and the related work requires immediate authorization to avoid imminent endangerment to human health, public safety, or the environment, or to reestablish essential public services, you may discharge on the condition that a complete and accurate NOI is submitted within 30 calendar days after commencing construction activities (see Table 1) establishing that you are eligible for coverage under this permit. You must also provide documentation in your Stormwater Pollution Prevention Plan (SWPPP) to substantiate the occurrence of the public emergency pursuant to Part 7.2.3i.

1.4.1 Prerequisite for Submitting Your NOI

You must develop a SWPPP consistent with Part 7 before submitting your NOI for coverage under this permit.

1.4.2 How to Submit Your NOI

You must use EPA's NPDES eReporting Tool (NeT) to electronically prepare and submit your NOI for coverage under the 2022 CGP unless you received a waiver from your applicable EPA Regional Office.

To access NeT, go to https://cdx.epa.gov/cdx.

Waivers from electronic reporting may be granted based on one of the following conditions:

a. If your operational headquarters is physically located in a geographic area (i.e., ZIP code or census tract) that is identified as under-served for broadband Internet access in the most recent report from the Federal Communications Commission; or

b. If you have limitations regarding available computer access or computer capability.

If the EPA Regional Office grants you approval to use a paper NOI, and you elect to use it, you must complete the form in Appendix H.

1.4.3 Deadlines for Submitting Your NOI and Your Official Date of Permit Coverage

Table 1 provides the deadlines for submitting your NOI and the official start date of your permit coverage, which differ depending on when you commence construction activities.

Table 1 NOI Submittal Deadlines and Official Start Date for Permit Coverage.

Type of Operator	NOI Submittal Deadline[8]	Permit Authorization Date[9]
Operator of a new site (i.e., a site where construction activities commence on or after February 17, 2022)	At least 14 calendar days before commencing construction activities.	14 calendar days after EPA notifies you that it has received a complete NOI, unless EPA notifies you that your authorization is delayed or denied.
Operator of an existing site (i.e., a site with 2017 CGP coverage where construction activities commenced prior to February 17, 2022)	No later than May 18, 2022.	14 calendar days after EPA notifies you that it has received a complete NOI, unless EPA notifies you that your authorization is delayed or denied. Provided you submit your NOI no later than May 18, 2022, your authorization under the 2017 CGP is automatically continued until you have been granted coverage under this permit or an alternative NPDES permit, or coverage is otherwise terminated.
New operator of a permitted site (i.e., an operator that through transfer of ownership and/or operation replaces the operator of an already permitted construction site that is either a "new site" or an "existing site")	At least 14 calendar days before the date the transfer to the new operator will take place.	14 calendar days after EPA notifies you that it has received a complete NOI, unless EPA notifies you that your authorization is delayed or denied.
Operator of an "emergency-related project" (i.e., a project initiated in response to a public emergency (e.g., mud slides, earthquake, extreme flooding conditions, disruption in essential public services), for which the related work requires immediate authorization to avoid imminent endangerment to human health or the environment, or to reestablish essential public services)	No later than 30 calendar days after commencing construction activities.	You are considered provisionally covered under the terms and conditions of this permit immediately, and fully covered 14 calendar days after EPA notifies you that it has received a complete NOI, unless EPA notifies you that your authorization is delayed or denied.

[8] If you miss the deadline to submit your NOI, any and all discharges from your construction activities will continue to be unauthorized under the CWA until they are covered by this or a different NPDES permit. EPA may take enforcement action for any unpermitted discharges that occur between the commencement of construction activities and discharge authorization.

[9] Discharges are not authorized if your NOI is incomplete or inaccurate or if you are not eligible for permit coverage.

1.4.4 Modifying your NOI

If after submitting your NOI you need to correct or update any fields, you may do so by submitting a "Change NOI" form using NeT. Waivers from electronic reporting may be granted as specified in Part 1.4.2. If the EPA Regional Office has granted you approval to submit a paper NOI modification, you may indicate any NOI changes on the same NOI form in Appendix H.

When there is a change to the site's operator, the new operator must submit a new NOI, and the previous operator must submit a Notice of Termination (NOT) form as specified in Part 8.3.

The following modifications to an NOI form will result in a 14-day review process:

- Changes to the name of the operator;
- Changes to the project or site name;
- Changes to the estimated area to be disturbed;
- Changes to the name of the receiving water[10], or additions to the applicable receiving waters;
- Changes to eligibility information related to endangered species protection or historic preservation;
- Changes to information provided related to the use of chemical treatment at your site; and
- Changes to answers provided regarding the demolition of structures over 10,000 square feet of floor space built or renovated before January 1, 1980.

During the 14-day review process, you may continue to operate based on the information provided in your original NOI, but you must wait until the review period has ended before you may commence or continue activities on any portion of your site that would be affected by any of the above modifications, unless EPA notifies you that the authorization is delayed or denied.

1.4.5 Your Official End Date of Permit Coverage

Once covered under this permit, your coverage will last until the date that:

a. You terminate permit coverage consistent with Part 8; or

b. You receive permit coverage under a different NPDES permit or a reissued or replacement version of this permit after expiring on February 16, 2027; or

c. You fail to submit an NOI for coverage under a reissued or replacement version of this permit before the deadline for existing construction sites where construction activities continue after this permit has expired.

1.5 REQUIREMENT TO POST A NOTICE OF YOUR PERMIT COVERAGE

You must post a sign or other notice of your permit coverage at a safe, publicly accessible location in close proximity to the construction site. The notice must be located so it is visible from the public road that is nearest to the active part of the construction

[10] As defined in Appendix A, a "receiving water" is "a "Water of the United States" as defined in 40 CFR §122.2 into which the regulated stormwater discharges.

site, and it must use a font large enough to be readily viewed from a public right-of-way.[11] At a minimum, the notice must include:

a. The NPDES ID (i.e., permit tracking number assigned to your NOI and the EPA webpage where a copy of the NOI can be found (https://permitsearch.epa.gov/epermit-search/ui/search));

b. A contact name and phone number for obtaining additional construction site information;

c. The Uniform Resource Locator (URL) for the SWPPP (if available), or the following statement: "If you would like to obtain a copy of the Stormwater Pollution Prevention Plan (SWPPP) for this site, contact the EPA Regional Office at [*include the appropriate CGP Regional Office contact information found at* https://www.epa.gov/npdes/contact-us-stormwater#regional];" and

d. The following statement "If you observe indicators of stormwater pollutants in the discharge or in the receiving water, contact the EPA through the following website: https://www.epa.gov/enforcement/report-environmental-violations."

2 TECHNOLOGY-BASED EFFLUENT LIMITATIONS

You must comply with the following technology-based effluent limitations in this Part for all authorized discharges.[12]

2.1 GENERAL STORMWATER CONTROL DESIGN, INSTALLATION, AND MAINTENANCE REQUIREMENTS

You must design, install, and maintain stormwater controls required in Parts 2.2, 2.3, and 2.4 to minimize the discharge of pollutants in stormwater from construction activities.[13] To meet this requirement, you must:

2.1.1 Account for the following factors in designing your stormwater controls:

a. The expected amount, frequency, intensity, and duration of precipitation;[14]

b. The nature of stormwater runoff (i.e., flow) and run-on at the site, including factors such as expected flow from impervious surfaces, slopes, and site drainage features. You must design stormwater controls to control stormwater volume, velocity, and peak flow rates to minimize discharges of pollutants in stormwater and to minimize channel and streambank erosion and scour in the immediate vicinity of discharge points; and

c. The soil type and range of soil particle sizes expected to be present on the site.

[11] If the active part of the construction site is not visible from a public road, then place the notice of permit coverage in a position that is visible from the nearest public road and as close as possible to the construction site.

[12] For each of the effluent limits in Part 2, as applicable to your site, you must include in your SWPPP (1) a description of the specific control(s) to be implemented to meet the effluent limit; (2) any applicable design specifications; (3) routine maintenance specifications; and (4) the projected schedule for installation/implementation. See Part 7.2.6.

[13] The permit does not recommend or endorse specific products or vendors.

[14] Stormwater controls must be designed using the most recent data available to account for recent precipitation patterns and trends.

If your site is exposed to or has previously experienced major storms, such as hurricanes, storm surge, extreme/heavy precipitation, and flood events, you should also include consideration of and contingencies for whether implementing structural improvements, enhanced/resilient stormwater controls, and other mitigation measures may help minimize impacts from stormwater discharges from such major storm events.

2.1.2 Design and install all stormwater controls in accordance with good engineering practices, including applicable design specifications.[15]

2.1.3 Complete installation of stormwater controls by the time each phase of construction activities has begun.

a. By the time construction activity in any given portion of the site begins, install and make operational any downgradient sediment controls (e.g., buffers, perimeter controls, exit point controls, storm drain inlet protection) that control discharges from the initial site clearing, grading, excavating, and other earth-disturbing activities.[16]

b. Following the installation of these initial controls, install and make operational all stormwater controls needed to control discharges prior to subsequent earth-disturbing activities.

2.1.4 Ensure all stormwater controls are maintained and remain in effective operating condition during permit coverage and are protected from activities that would reduce their effectiveness.

a. Comply with any specific maintenance requirements for the stormwater controls listed in this permit, as well as any recommended by the manufacturer.[17]

b. If at any time you find that a stormwater control needs routine maintenance (i.e., minor repairs or other upkeep performed to ensure the site's stormwater controls remain in effective operating condition, not including significant repairs or the need to install a new or replacement control), you must immediately initiate the needed work, and complete such work by the close of the next business day. If it is infeasible to complete the routine maintenance by the close of the next business day, you must document why this is the case and why the repair or other upkeep to be performed should still be considered routine maintenance in your inspection report under Part 4.7.1c and complete such work no later than seven (7) calendar days from the time of discovery of the condition requiring maintenance.

c. If you must repeatedly (i.e., three (3) or more times) make the same routine maintenance fixes to the same control at the same location, even if the fix can be completed by the close of the next business day, you must either:

   i. Complete work to fix any subsequent repeat occurrences of this same problem under the corrective action procedures in Part 5, including keeping any records

[15] Design specifications may be found in manufacturer specifications and/or in applicable erosion and sediment control manuals or ordinances. Any departures from such specifications must reflect good engineering practices and must be explained in your SWPPP. You must also comply with any additional design and installation requirements specified for the effluent limits in Parts 2.2, 2.3, and 2.4.

[16] Note that the requirement to install stormwater controls prior to each phase of construction activities for the site does not apply to the earth disturbance associated with the actual installation of these controls. Operators should take all reasonable actions to minimize the discharges of pollutants during the installation of stormwater controls.

[17] Any departures from such maintenance recommendations made by the manufacturer must reflect good engineering practices and must be explained in your SWPPP.

of the condition and how it was corrected under Part 5.4; or

ii. Document in your inspection report under Part 4.7.1c why the specific reoccurrence of this same problem should still be addressed as a routine maintenance fix under this Part.[18]

d. If at any time you find that a stormwater control needs a significant repair or that a new or replacement control is needed, you must comply with the corrective action deadlines for completing such work in in Part 5.2.1c.

2.2 EROSION AND SEDIMENT CONTROL REQUIREMENTS

You must implement erosion and sediment controls in accordance with the following requirements to minimize the discharge of pollutants in stormwater from construction activities.

2.2.1 Provide and maintain natural buffers and/or equivalent erosion and sediment controls for discharges to any receiving waters that is located within 50 feet of the site's earth disturbances.

a. **Compliance Alternatives.** For any discharges to receiving waters located within 50 feet of your site's earth disturbances, you must comply with one of the following alternatives:

i. Provide and maintain a 50-foot undisturbed natural buffer; or

ii. Provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by erosion and sediment controls that achieve, in combination, the sediment load reduction equivalent to a 50-foot undisturbed natural buffer; or

iii. If infeasible to provide and maintain an undisturbed natural buffer of any size, implement erosion and sediment controls to achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.

See Appendix F, Part F.2 for additional conditions applicable to each compliance alternative.

b. **Exceptions.** See Appendix F, Part F.2 for exceptions to the compliance alternatives.

2.2.2 Direct stormwater to vegetated areas and maximize stormwater infiltration and filtering to reduce pollutant discharges, unless infiltration would be inadvisable due to the underlying geology (e.g., karst topography) and ground water contamination concerns, or infeasible due to site conditions.[19]

[18] Such documentation could include, for example, that minor repairs completed within the required timeframe are all that is necessary to ensure that the stormwater control continues to operate as designed and installed and that the stormwater control remains appropriate for the flow reaching it.

[19] Operators should consider whether factors such as specific contaminant concerns from the construction site, the underlying soils or geology, hydrology, depth to the ground water table, or proximity to source water or wellhead protection area(s) make the site unsuitable for infiltrating construction stormwater. Site conditions that may be of particular concern include proximity to: a current or future drinking water aquifer; a drinking water well or spring (including private/household wells); highly conductive geology such as karst; known pollutant hot spots, such as hazardous waste sites, landfills, gas stations, brownfields; an on-site sewage system or underground storage tank; or soils that do not allow for infiltration. Operators may find it helpful to consult EPA's Drinking Water Mapping Application to Protect Source Waters (DWMAPS). DWMAPS is an online mapping tool that can be used to locate drinking water providers, potential sources of contamination, polluted waterways, and information on protection initiatives in the site area.

2.2.3 Install sediment controls along any perimeter areas of the site that are downslope from any exposed soil or other disturbed areas.[20]

a. The perimeter control must be installed upgradient of any natural buffers established under Part 2.2.1, unless the control is being implemented pursuant to Part 2.2.1a.ii-iii;

b. To prevent stormwater from circumventing the edge of the perimeter control, install the perimeter control on the contour of the slope and extend both ends of the control up slope (e.g., at 45 degrees) forming a crescent rather than a straight line;

c. After installation, to ensure that perimeter controls continue to work effectively:

   i. Remove sediment before it has accumulated to one-half of the above-ground height of any perimeter control; and

   ii. After a storm event, if there is evidence of stormwater circumventing or undercutting the perimeter control, extend controls and/or repair undercut areas to fix the problem.

d. **Exception**. For areas at "linear construction sites" (as defined in Appendix A) where perimeter controls are infeasible (e.g., due to a limited or restricted right-of-way), implement other practices as necessary to minimize pollutant discharges to perimeter areas of the site.

2.2.4 Minimize sediment track-out.

a. Restrict vehicle use to properly designated exit points;

b. Use appropriate stabilization techniques[21] at all points that exit onto paved roads;

   i. **Exception**: Stabilization is not required for exit points at linear utility construction sites that are used only episodically and for very short durations over the life of the project, provided other exit point controls[22] are implemented to minimize sediment track-out;

c. Implement additional track-out controls[23] as necessary to ensure that sediment removal occurs prior to vehicle exit; and

d. Where sediment has been tracked-out from your site onto paved roads, sidewalks, or other paved areas outside of your site, remove the deposited sediment by the end of the same business day in which the track-out occurs or by the end of the next business day if track-out occurs on a non-business day. Remove the track-out by sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal. You are prohibited from hosing or sweeping tracked-out

[20] Examples of perimeter controls include filter berms; different types of silt fence such as wire-backed silt fence, super silt fence, or multi-layer geotextile silt fence; compost filter socks; gravel barriers; and temporary diversion dikes.

[21] Examples of appropriate stabilization techniques include the use of aggregate stone with an underlying geotextile or non-woven filter fabric, and turf mats.

[22] Examples of other exit point controls include preventing the use of exit points during wet periods; minimizing exit point use by keeping vehicles on site to the extent possible; limiting exit point size to the width needed for vehicle and equipment usage; using scarifying and compaction techniques on the soil; and avoiding establishing exit points in environmentally sensitive areas (e.g., *karst areas; steep slopes).*

[23] Examples of additional track-out controls include the use of wheel washing, rumble strips, and rattle plates.

sediment into any constructed or natural site drainage feature, storm drain inlet, or receiving water.[24]

2.2.5 Manage stockpiles or land clearing debris piles composed, in whole or in part, of sediment and/or soil:[25]

a. Locate the piles outside of any natural buffers established under Part 2.2.1 and away from any constructed or natural site drainage features, storm drain inlets, and areas where stormwater flow is concentrated;

b. Install a sediment barrier along all downgradient perimeter areas of stockpiled soil or land clearing debris piles;[26]

c. For piles that will be unused for 14 or more days, provide cover[27] or appropriate temporary stabilization (consistent with Part 2.2.14);

d. You are prohibited from hosing down or sweeping soil or sediment accumulated on pavement or other impervious surfaces into any constructed or natural site drainage feature, storm drain inlet, or receiving water.

2.2.6 Minimize dust. On areas of exposed soil, minimize dust through the appropriate application of water or other dust suppression techniques to control the generation of pollutants that could be discharged in stormwater from the site.

2.2.7 Minimize steep slope disturbances. Minimize the disturbance of "steep slopes" (as defined in Appendix A).[28]

2.2.8 Preserve native topsoil, unless infeasible.[29]

2.2.9 Minimize soil compaction.[30] In areas of your site where final vegetative stabilization will occur or where infiltration practices will be installed:

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[24] Fine grains that remain visible (e.g., staining) on the surfaces of off-site streets, other paved areas, and sidewalks after you have implemented sediment removal practices are not a violation of Part 2.2.4.

[25] The requirements in Part 2.2.5 do not apply to the storage of rock, such as rip rap, landscape rock, pipe bedding gravel, and boulders. Refer to Part 2.3.3a for the requirements that apply to these types of materials.

[26] Examples of sediment barriers include berms, dikes, fiber rolls, silt fences, sandbags, gravel bags, or straw bale.

[27] Examples of cover include tarps, blown straw and hydroseeding.

[28] Where disturbance to steep slopes cannot be avoided, operators should consider implementing controls suitable for steep slope disturbances that are effective at minimizing erosion and sediment discharge (e.g., preservation of existing vegetation, hydraulic mulch, geotextiles and mats, compost blankets, earth dikes or drainage swales, terraces, velocity dissipation devices). To identify slopes and soil types that are of comparatively higher risk for sediment discharge in areas of the country where the CGP is in effect, operators can use the tables in Appendix F (see Tables F-2 thru F-6).

[29] Stockpiling topsoil at off-site locations, or transferring topsoil to other locations, is an example of a practice that is consistent with the requirements in Part 2.2.8. Preserving native topsoil is not required where the intended function of a specific area of the site dictates that the topsoil be disturbed or removed. For example, some sites may be designed to be highly impervious after construction, and therefore little or no vegetation is intended to remain, or may not have space to stockpile native topsoil on site for later use, in which case it may not be feasible to preserve topsoil.

[30] Minimizing soil compaction is not required where the intended function of a specific area of the site dictates that it be compacted.

a. Restrict vehicle and equipment use in these locations to avoid soil compaction; and

b. Before seeding or planting areas of exposed soil that have been compacted, use techniques that rehabilitate and condition the soils as necessary to support vegetative growth.

2.2.10 Protect storm drain inlets.

a. Install inlet protection measures that remove sediment from discharges prior to entry into any storm drain inlet that carries stormwater from your site to a receiving water, provided you have authority to access the storm drain inlet.[31] Inlet protection measures are not required for storm drain inlets that are conveyed to a sediment basin, sediment trap, or similarly effective control; and

b. Clean, or remove and replace, the inlet protection measures as sediment accumulates, the filter becomes clogged, and/or performance is compromised. Where there is evidence of sediment accumulation adjacent to the inlet protection measure, remove the deposited sediment by the end of the same business day in which it is found or by the end of the following business day if removal by the same business day is not feasible.

2.2.11 Control stormwater discharges, including both peak flowrates and total stormwater volume, to minimize channel and streambank erosion and scour in the immediate vicinity of discharge points.[32]

2.2.12 If you install a sediment basin or similar impoundment:

a. Situate the basin or impoundment outside of any receiving water. and any natural buffers established under Part 2.2.1;

b. Design the basin or impoundment to avoid collecting water from wetlands;

c. Design the basin or impoundment to provide storage for either:

i. The calculated volume of runoff from a 2-year, 24-hour storm;[33] or

ii. 3,600 cubic feet per acre drained.

d. Utilize outlet structures that withdraw water from the surface of the sediment basin or similar impoundment, unless infeasible;[34]

e. Use erosion controls and velocity dissipation devices to prevent erosion at inlets and outlets; and

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[31] Inlet protection measures can be removed in the event of flood conditions or to prevent erosion.

[32] Examples of stormwater controls that can be used to comply with this requirement include the use of erosion controls and/or velocity dissipation devices (e.g., check dams, sediment traps), within and along the length of a constructed site drainage feature and at the outfall to slow down stormwater.

[33] Operators may refer to https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates for guidance on determining the volume of precipitation associated with their site's local 2-year, 24-hour storm event.

[34] The circumstances in which it is infeasible to design outlet structures in this manner are rare. Exceptions may include areas with extended cold weather, where using surface outlets may not be feasible during certain time periods (although they must be used during other periods). If you determine that it is infeasible to meet this requirement, you must provide documentation in your SWPPP to support your determination, including the specific conditions or time periods when this exception will apply.

f. Remove accumulated sediment to maintain at least one-half of the design capacity and conduct all other appropriate maintenance to ensure the basin or impoundment remains in effective operating condition.

2.2.13 If using treatment chemicals (e.g., *polymers, flocculants, coagulants*):

a. **Use conventional erosion and sediment controls before and after the application of treatment chemicals.** Chemicals may only be applied where treated stormwater is directed to a sediment control *(*e.g., *sediment basin, perimeter control)* before discharge.

b. **Select appropriate treatment chemicals***.* Chemicals must be appropriately suited to the types of soils likely to be exposed during construction and present in the discharges being treated *(*i.e., *the expected turbidity, pH, and flow rate of stormwater flowing into the chemical treatment system or area).*

c. **Minimize discharge risk from stored chemicals.** Store all treatment chemicals in leak-proof containers that are kept under storm-resistant cover and surrounded by secondary containment structures *(*e.g., *spill berms, dikes, spill containment pallets),* or provide equivalent measures designed and maintained to minimize the potential discharge of treatment chemicals in stormwater or by any other means *(*e.g., *storing chemicals in a covered area, having a spill kit available on site and ensuring personnel are available to respond expeditiously in the event of a leak or spill)*.

d. **Comply with State/local requirements.** Comply with applicable State and local requirements regarding the use of treatment chemicals.

e. **Use chemicals in accordance with good engineering practices and specifications of the chemical provider/supplier.** Use treatment chemicals and chemical treatment systems in accordance with good engineering practices, and with dosing specifications and sediment removal design specifications provided by the provider/supplier of the applicable chemicals, or document in your SWPPP specific departures from these specifications and how they reflect good engineering practice.

f. **Ensure proper training.** Ensure all persons who handle and use treatment chemicals at the construction site are provided with appropriate, product-specific training prior to beginning application of treatment chemicals. Among other things, the training must cover proper dosing requirements.

g. **Perform additional measures specified by the EPA Regional Office for the authorized use of cationic chemicals.** If you have been authorized to use cationic chemicals at your site pursuant to Part 1.1.9, you must perform all additional measures as conditioned by your authorization to ensure the use of such chemicals will not result in discharges that do not meet water quality standards.

2.2.14 Stabilize exposed portions of the site. Implement and maintain stabilization measures (*e.g., seeding protected by erosion controls until vegetation is established,*[35] *sodding, mulching, erosion control blankets, hydromulch, gravel*) that minimize erosion from any areas of exposed soil on the site in accordance with Part.

[35] If you will be evaluating the use of some type of erosion control netting to the site as part of your site stabilization, EPA encourages you to consider employing products that have been shown to minimize

a. Stabilization Deadlines:[36]

Table 2 Deadlines for Initiating and Completing Site Stabilization.

Total Amount of Land Disturbance Occurring At Any One Time[37]	Deadline
i. Five acres or less (≤5.0) **Note: this includes sites disturbing more than five acres (>5.0) total over the course of a project, but that limit disturbance at any one time *(i.e., phase the disturbance)* to five acres or less (≤5.0)**	• Initiate the installation of stabilization measures immediately[38] in any areas of exposed soil where construction activities have permanently ceased or will be temporarily inactive for 14 or more calendar days;[39] and • Complete the installation of stabilization measures as soon as practicable, but no later than 14 calendar days

impacts on wildlife. For instance, the U.S. Fish & Wildlife Service provides recommendations on the type of netting practices that are considered "wildlife friendly," including those that use natural fiber or 100 percent biodegradable materials and that use a loose weave with a non-welded, movable jointed netting, as well as those products that are not wildlife friendly including square plastic netting that are degradable (e.g., photodegradable, UV-degradable, oxo-degradable), netting made from polypropylene, nylon, polyethylene, or polyester. Other recommendations include removing the netting product when it is no longer needed. See https://www.fws.gov/midwest/eastlansing/library/pdf/WildlifeFriendlyErosionControlProducts_revised.pdf for further information. There also may be State, Tribal, or local requirements about using wildlife friendly erosion control products.

[36] EPA may determine, based on an inspection carried out under Part 4.8 and corrective actions required under Part 5.3, that the level of sediment discharge on the site makes it necessary to require a faster schedule for completing stabilization. For instance, if sediment discharges from an area of exposed soil that is required to be stabilized are compromising the performance of existing stormwater controls, EPA may require stabilization to correct this problem.

[37] Limiting disturbances to five (5) acres or less at any one time means that at no time during the project do the cumulative earth disturbances exceed five (5) acres. The following examples would qualify as limiting disturbances at any one time to five (5) acres or less:

1. The total area of disturbance for a project is five (5) acres or less.
2. The total area of disturbance for a project will exceed five (5) acres, but the operator ensures that no more than five (5) acres will be disturbed at any one time through implementation of stabilization measures. In this way, site stabilization can be used to "free up" land that can be disturbed without exceeding the five (5)-acre cap to qualify for the 14-day stabilization deadline. For instance, if an operator completes stabilization of two (2) acres of land on a five (5)-acre disturbance, then two (2) additional acres could be disturbed while still qualifying for the longer 14-day stabilization deadline.

[38] The following are examples of activities that would constitute the immediate initiation of stabilization:

1. Prepping the soil for vegetative or non-vegetative stabilization as long as seeding, planting, and/or installation of non-vegetative stabilization products takes place as soon as practicable, but no later than one (1) calendar day of completing soil preparation;
2. Applying mulch or other non-vegetative product to the exposed area;
3. Seeding or planting the exposed area;
4. Starting any of the activities in # 1 – 3 on a portion of the entire area that will be stabilized; and
5. Finalizing arrangements to have stabilization product fully installed in compliance with the deadlines for completing stabilization.

[39] The requirement to initiate stabilization immediately is triggered as soon as you know that construction work on a portion of the site is temporarily ceased and will not resume for 14 or more days, or as soon as you know that construction work is permanently ceased. In the context of this provision, "immediately" means as soon as practicable, but no later than the end of the next business day, following the day when the construction activities have temporarily or permanently ceased.

Total Amount of Land Disturbance Occurring At Any One Time[37]	Deadline
	after stabilization has been initiated.[40]
ii. More than five acres (>5.0)	• Initiate the installation of stabilization measures immediately[41] in any areas of exposed soil where construction activities have permanently ceased or will be temporarily inactive for 14 or more calendar days;[42] and • Complete the installation of stabilization measures as soon as practicable, but no later than seven (7) calendar days after stabilization has been initiated.[43]

b. Exceptions:

i. Arid, semi-arid, and drought-stricken areas (as defined in Appendix A)**.** If it is the seasonally dry period (as defined in Appendix A)[44] or a period in which drought is occurring, and vegetative stabilization measures are being used:

(a) Immediately initiate and, within 14 calendar days of temporary or permanent cessation of work in any portion of your site, complete the installation of temporary non-vegetative stabilization measures to the extent necessary to prevent erosion;

(b) As soon as practicable, given conditions or circumstances on the site, complete all activities necessary to seed or plant the area to be stabilized; and

(c) If construction is occurring during the seasonally dry period, indicate in your SWPPP the beginning and ending dates of the seasonally dry period and your site conditions. Also include the schedule you will follow for initiating and completing vegetative stabilization.

ii. Unforeseen circumstances. Operators that are affected by unforeseen circumstances[45] that delay the initiation and/or completion of vegetative stabilization:

[40] If vegetative stabilization measures are being implemented, stabilization is considered "installed" when all activities necessary to seed or plant the area are completed, including the application of any non-vegetative protective cover (e.g., mulch, erosion control blanket), if applicable. If non-vegetative stabilization measures are being implemented, stabilization is considered "installed" when all such measures are implemented or applied.

[41] See footnote 38.

[42] See footnote 39.

[43] See footnote 40.

[44] The term "seasonally dry period" as defined in Appendix A refers to a month in which the long-term average total precipitation is less than or equal to 0.5 inches. Refer to EPA's Seasonally Dry Period Locator Tool at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates and supporting maps for assistance in determining whether a site is operating during a seasonally dry period for the area.

[45] Examples include problems with the supply of seed stock or with the availability of specialized equipment and unsuitability of soil conditions due to excessive precipitation and/or flooding.

(a) Immediately initiate and, within 14 calendar days, complete the installation of temporary non-vegetative stabilization measures to prevent erosion;

(b) Complete all soil conditioning, seeding, watering or irrigation installation, mulching, and other required activities related to the planting and initial establishment of vegetation as soon as conditions or circumstances allow it on your site; and

(c) Document in the SWPPP the circumstances that prevent you from meeting the deadlines in Part 2.2.14a and the schedule you will follow for initiating and completing stabilization.

iii. **Discharges to a sediment- or nutrient-impaired water or to a water that is identified by your State, Tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 for antidegradation purposes.** Complete stabilization as soon as practicable, but no later than seven (7) calendar days after stabilization has been initiated.

c. **Final Stabilization Criteria** (for any areas not covered by permanent structures)**:**

i. Establish uniform, perennial vegetation *(*i.e.*, evenly distributed, without large bare areas)* to provide 70 percent or more of the vegetative cover native to local undisturbed areas; and/or

ii. Implement permanent non-vegetative stabilization measures[46] to provide effective cover of any areas of exposed soil.

iii. **Exceptions:**

(a) **Arid, semi-arid, and drought-stricken areas** (as defined in Appendix A). Final stabilization is met if the area has been seeded or planted to establish vegetation that provides 70 percent or more of the vegetative cover native to local undisturbed areas within three (3) years and, to the extent necessary to prevent erosion on the seeded or planted area, non-vegetative erosion controls have been applied to provide cover for at least three years without active maintenance.

(b) **Disturbed areas on agricultural land that are restored to their preconstruction agricultural use.** The Part 2.2.14c final stabilization criteria do not apply.

(c) **Areas that need to remain disturbed.** In limited circumstances, stabilization may not be required if the intended function of a specific area of the site necessitates that it remain disturbed, and only the minimum area needed remains disturbed *(*e.g., *dirt access roads, utility pole pads, areas being used for storage of vehicles, equipment, materials).*

2.3 POLLUTION PREVENTION REQUIREMENTS[47]

You must implement pollution prevention controls in accordance with the following requirements to minimize the discharge of pollutants in stormwater and to prevent the discharge of pollutants from spilled or leaked materials from construction activities.

[46] Examples of permanent non-vegetative stabilization measures include riprap, gravel, gabions, and geotextiles.

[47] Under this permit, you are not required to minimize exposure for any products or materials where the exposure to precipitation and to stormwater will not result in a discharge of pollutants, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use).

2.3.1 For equipment and vehicle fueling and maintenance:

a. Provide an effective means of eliminating the discharge of spilled or leaked chemicals, including fuels and oils, from these activities;[48]

b. If applicable, comply with the Spill Prevention Control and Countermeasures (SPCC) requirements in 40 CFR part 112 and Section 311 of the CWA;

c. Ensure adequate supplies are available at all times to handle spills, leaks, and disposal of used liquids;

d. Use drip pans and absorbents under or around leaky vehicles;

e. Dispose of or recycle oil and oily wastes in accordance with other Federal, State, Tribal, or local requirements; and

f. Clean up spills or contaminated surfaces immediately, using dry clean up measures (do not clean contaminated surfaces by hosing the area down), and eliminate the source of the spill to prevent a discharge or a continuation of an ongoing discharge.

2.3.2 For equipment and vehicle washing:

a. Provide an effective means of minimizing the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other types of wash waters;[49]

b. Ensure there is no discharge of soaps, solvents, or detergents in equipment and vehicle wash water; and

c. For storage of soaps, detergents, or solvents, provide either (1) cover *(*e.g., *plastic sheeting, temporary roofs)* to minimize the exposure of these detergents to precipitation and to stormwater, or (2) a similarly effective means designed to minimize the discharge of pollutants from these areas.

2.3.3 For storage, handling, and disposal of building products, materials, and wastes:[50]

a. *For building materials and building products*,[51] provide either (1) cover (e.g., *plastic sheeting, temporary roofs*) to minimize the exposure of these products to

[48] Examples of effective means include:

- Locating activities away from receiving waters, storm drain inlets, and constructed or natural site drainage feature so that stormwater coming into contact with these activities cannot reach waters of the U.S.;
- Providing secondary containment (e.g., *spill berms, dikes, spill containment pallets*) and cover where appropriate; and
- Having a spill kit available on site and ensuring personnel are available to respond expeditiously in the event of a leak or spill.

[49] Examples of effective means include locating activities away from receiving waters and storm drain inlets or constructed or natural site drainage features and directing wash waters to a sediment basin or sediment trap, using filtration devices, such as filter bags or sand filters, or using other similarly effective controls.

[50] Compliance with the requirements of this permit does not relieve compliance requirements with respect to Federal, State, or local laws and regulations governing the storage, handling, and disposal of solid, hazardous, or toxic wastes and materials.

[51] Examples of building materials and building products typically present at construction sites include asphalt sealants, copper flashing, roofing materials, adhesives, concrete admixtures, and gravel and mulch stockpiles.

precipitation and to stormwater, or (2) a similarly effective means designed to minimize the discharge of pollutants from these areas.

Exception: Minimization of exposure is not required in cases where the exposure to precipitation and to stormwater will not result in a discharge of pollutants, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use).

b. *For pesticides, herbicides, insecticides, fertilizers, and landscape materials:*

i. In storage areas, provide either (1) cover (e.g., *plastic sheeting, temporary roofs*) to minimize the exposure of these chemicals to precipitation and to stormwater, or (2) a similarly effective means designed to minimize the discharge of pollutants from these areas; and

ii. Comply with all application and disposal requirements included on the registered pesticide, herbicide, insecticide, and fertilizer label (see also Part 2.3.5).

c. *For diesel fuel, oil, hydraulic fluids, other petroleum products, and other chemicals:* The following requirements apply to the storage and handling of chemicals on your site. If you are already implementing controls as part of an SPCC or other spill prevention plan that meet or exceed the requirements of this Part, you may continue to do so and be considered in compliance with these provisions provided you reference the applicable parts of the SPCC or other plans in your SWPPP as required in Part 7.2.6b.viii.

i. If any chemical container has a storage capacity of less than 55 gallons:

(a) The containers must be water-tight, and must be kept closed, sealed, and secured when not being actively used;

(b) If stored outside, use a spill containment pallet or similar device to capture small leaks or spills; and

(c) Have a spill kit available on site that is in good working condition (i.e., not damaged, expired, or used up) and ensure personnel are available to respond immediately in the event of a leak or spill.

ii. If any chemical container has a storage capacity of 55 gallons or more:

(a) The containers must be water-tight, and must be kept closed, sealed, and secured when not being actively used;

(b) Store containers a minimum of 50 feet from receiving waters, constructed or natural site drainage features, and storm drain inlets. If infeasible due to site constraints, store containers as far away from these features as the site permits. If site constraints prevent you from storing containers 50 feet away from receiving waters or the other features identified, you must document in your SWPPP the specific reasons why the 50-foot setback is infeasible, and how you will store containers as far away as the site permits;

(c) Provide either (1) cover (e.g., temporary roofs) to minimize the exposure of these containers to precipitation and to stormwater, or (2) secondary containment (e.g., curbing, spill berms, dikes, spill containment pallets, double-wall, above-ground storage tank); and

(d) Have a spill kit available on site that is in good working condition (i.e., not

damaged, expired, or used up) and ensure personnel are available to respond immediately in the event of a leak or spill. Additional secondary containment measures are listed at 40 CFR § 112.7(c)(1).

iii. Clean up spills immediately, using dry clean-up methods where possible, and dispose of used materials properly. You are prohibited from hosing the area down to clean surfaces or spills. Eliminate the source of the spill to prevent a discharge or a furtherance of an ongoing discharge.

d. *For hazardous or toxic wastes:*[52]

i. Separate hazardous or toxic waste from construction and domestic waste;

ii. Store waste in sealed containers, constructed of suitable materials to prevent leakage and corrosion, and labeled in accordance with applicable Resource Conservation and Recovery Act (RCRA) requirements and all other applicable Federal, State, Tribal, or local requirements;

iii. Store all outside containers within appropriately-sized secondary containment (e.g., *spill berms, dikes, spill containment pallets*) to prevent spills from being discharged, or provide a similarly effective means designed to prevent the discharge of pollutants from these areas *(*e.g., *storing chemicals in a covered area, having a spill kit available on site);*

iv. Dispose of hazardous or toxic waste in accordance with the manufacturer's recommended method of disposal and in compliance with Federal, State, Tribal, and local requirements;

v. Clean up spills immediately, using dry clean-up methods, and dispose of used materials properly. You are prohibited from hosing the area down to clean surfaces or spills. Eliminate the source of the spill to prevent a discharge or a furtherance of an ongoing discharge; and

vi. Follow all other Federal, State, Tribal, and local requirements regarding hazardous or toxic waste.

e. *For construction and domestic wastes:*[53]

i. Provide waste containers *(*e.g., *dumpster, trash receptacle)* of sufficient size and number to contain construction and domestic wastes;

(a) For waste containers with lids, keep waste container lids closed when not in use, and close lids at the end of the business day and during storm events. For waste containers without lids, provide either (1) cover *(*e.g., *a tarp, plastic sheeting, temporary roof)* to minimize exposure of wastes to precipitation, or (2) a similarly effective means designed to minimize the discharge of pollutants *(*e.g., *secondary containment)*;

(b) On business days, clean up and dispose of waste in designated waste

[52] Examples of hazardous or toxic waste that may be present at construction sites include paints, caulks, sealants, fluorescent light ballasts, solvents, petroleum-based products, wood preservatives, additives, curing compounds, and acids.

[53] Examples of construction and domestic wastes include packaging materials, scrap construction materials, masonry products, timber, pipe and electrical cuttings, plastics, styrofoam, concrete, demolition debris; and other trash or discarded materials.

containers; and

(c) Clean up immediately if containers overflow, and if there is litter elsewhere on the site from escaped trash.

ii. Waste containers are not required for the waste remnant or unused portions of construction materials or final products that are covered by the exception in Part 2.2.3a provided that:

(a) These wastes are stored separately from other construction or domestic wastes addressed by Part 2.3.3e.i (i.e., wastes not covered by the exception in Part 2.3.3a). If the wastes are mixed, they must be stored in waste containers as required in Part 2.3.3e.i; and

(b) These wastes are stored in designated areas of the site, the wastes are described in the SWPPP (see Part 7.2.6b.ix), and identified in the site plan (see Part 7.2.4i).

f. *For sanitary waste*, position portable toilets so they are secure and will not be tipped or knocked over, and are located away from receiving waters, storm drain inlets, and constructed or natural site drainage features.

2.3.4 For washing applicators and containers used for stucco, paint, concrete, form release oils, curing compounds, or other materials:

a. Direct wash water into a leak-proof container or leak-proof and lined pit designed so no overflows can occur due to inadequate sizing or precipitation;

b. Handle washout or cleanout wastes as follows:

i. For liquid wastes:

(a) Do not dump liquid wastes or allow them to enter into constructed or natural site drainage features, storm inlets, or receiving waters;

(b) Do not allow liquid wastes to be disposed of through infiltration or to otherwise be disposed of on the ground;

(c) Comply with applicable State, Tribal, or local requirements for disposal

ii. Remove and dispose of hardened concrete waste consistent with your handling of other construction wastes in Part 2.3.3e; and

c. Locate any washout or cleanout activities as far away as possible from receiving waters, constructed or natural site drainage features, and storm drain inlets, and, to the extent feasible, designate areas to be used for these activities and conduct such activities only in these areas.

2.3.5 For the application of fertilizers:

a. Apply at a rate and in amounts consistent with manufacturer's specifications, or document in the SWPPP departures from the manufacturer specifications where appropriate in accordance with Part 7.2.6b.x;

b. Apply at the appropriate time of year for your location, and preferably timed to coincide as closely as possible to the period of maximum vegetation uptake and growth;

c. Avoid applying before heavy rains that could cause excess nutrients to be discharged;

d. Never apply to frozen ground;

e. Never apply to constructed or natural site drainage features; and

f. Follow all other Federal, State, Tribal, and local requirements regarding fertilizer application.

2.3.6 Emergency Spill Notification Requirements

Discharges of toxic or hazardous substances from a spill or other release are prohibited, consistent with Part 1.3.5. Where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR part 110, 40 CFR part 117, or 40 CFR part 302 occurs during a 24-hour period, you must notify the National Response Center (NRC) at (800) 424-8802 or, in the Washington, DC metropolitan area, call (202) 267-2675 in accordance with the requirements of 40 CFR part 110, 40 CFR part 117, and 40 CFR part 302 as soon as you have knowledge of the release. You must also, within seven (7) calendar days of knowledge of the release, provide a description of the release, the circumstances leading to the release, and the date of the release. State, Tribal, or local requirements may necessitate additional reporting of spills or discharges to local emergency response, public health, or drinking water supply agencies.

2.4 CONSTRUCTION DEWATERING REQUIREMENTS

Comply with the following requirements to minimize the discharge of pollutants from dewatering[54] operations.

2.4.1 Route dewatering water through a sediment control (e.g., sediment trap or basin, pumped water filter bag) designed to prevent discharges with visual turbidity; [55]

2.4.2 Do not discharge visible floating solids or foam;

2.4.3 The discharge must not cause the formation of a visible sheen on the water surface, or visible oily deposits on the bottom or shoreline of the receiving water. Use an oil-water separator or suitable filtration device (such as a cartridge filter) designed to remove oil, grease, or other products if dewatering water is found to or expected to contain these materials;

2.4.4 To the extent feasible, use well-vegetated (e.g., grassy or wooded), upland areas of the site to infiltrate dewatering water before discharge.[56] You are prohibited from using receiving waters as part of the treatment area;

2.4.5 To prevent dewatering-related erosion and related sediment discharges:

a. Use stable, erosion-resistant surfaces (e.g., well-vegetated grassy areas, clean filter stone, geotextile underlayment) to discharge from dewatering controls;

[54] "Dewatering" is defined in Appendix A as "the act of draining accumulated stormwater and/or ground water from building foundations, vaults, and trenches, or other similar points of accumulation."

[55] For the purposes of this permit, visual turbidity is present where there is a sediment plume in the discharge or the discharge appears cloudy, or opaque, or has a visible contrast that can be identified by an observer.

[56] See footnote 19.

b. Do not place dewatering controls, such as pumped water filter bags, on steep slopes (as defined in Appendix A); and

c. At all points where dewatering water is discharged, comply with the velocity dissipation requirements of Part 2.2.11.

2.4.6 For backwash water, either haul it away for disposal or return it to the beginning of the treatment process;

2.4.7 Replace and clean the filter media used in dewatering devices when the pressure differential equals or exceeds the manufacturer's specifications; and

2.4.8 Comply with dewatering-specific inspection requirements in Part 4.

3 WATER QUALITY-BASED EFFLUENT LIMITATIONS

3.1 GENERAL EFFLUENT LIMITATION TO MEET APPLICABLE WATER QUALITY STANDARDS

Discharges must be controlled as necessary to meet applicable water quality standards. Discharges must also comply with any additional State or Tribal requirements that are in Part 9.

In the absence of information demonstrating otherwise, EPA expects that compliance with the conditions in this permit will result in stormwater discharges being controlled as necessary to meet applicable water quality standards. If at any time you become aware, or EPA determines, that discharges are not being controlled as necessary to meet applicable water quality standards, you must take corrective action as required in Parts 5.1 and 5.2, and document the corrective actions as required in Part 5.4.

EPA may insist that you install additional controls (to meet the narrative water quality-based effluent limit above) on a site-specific basis, or require you to obtain coverage under an individual permit, if information in your NOI or from other sources indicates that your discharges are not controlled as necessary to meet applicable water quality standards. This includes situations where additional controls are necessary to comply with a wasteload allocation in an EPA-established or approved TMDL.

If during your coverage under a previous permit, you were required to install and maintain stormwater controls specifically to meet the assumptions and requirements of an EPA-approved or established TMDL (for any parameter) or to otherwise control your discharge to meet water quality standards, you must continue to implement such controls as part of your coverage under this permit.

3.2 WATER QUALITY-BASED CONDITIONS FOR SITES DISCHARGING TO CERTAIN IMPAIRED AND HIGH QUALITY RECEIVING WATERS

For any portion of the site that discharges to a sediment or nutrient-impaired water or to a water that is identified by your State, Tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 for antidegradation purposes,[57] you must comply with the inspection frequency specified in Part 4.3 and you must comply with the stabilization deadline specified in Part 2.2.14b.iii.[58]

[57] Refer to Appendix A for definitions of "impaired water" and "Tier 2," "Tier 2.5," and "Tier 3" waters. For assistance in determining whether your site discharges to impaired waters, EPA has developed a tool that is available at https://www.epa.gov/npdes/epas-stormwater-discharge-mapping-tools. For assistance in determining whether your site discharges to a Tier 2, 2.5, or 3 water, refer to the list of such waters at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates.

[58] If you qualify for any of the reduced inspection frequencies in Part 4.4, you may conduct inspections in

If you discharge to a water that is impaired for a parameter other than a sediment-related parameter or nutrients, EPA will inform you if any additional controls are necessary for your discharge to be controlled as necessary to meet water quality standards. These controls might include those necessary for your discharge to be consistent with the assumptions of any available wasteload allocation in any applicable TMDL. In addition, EPA may require you to apply for and obtain coverage under an individual NPDES permit.

In addition, on a case-by-case basis, EPA may notify operators of new sites or operators of existing sites with increased discharges that additional analyses, stormwater controls, and/or other measures are necessary to comply with the applicable antidegradation requirements, or notify you that an individual permit application is necessary.

If you discharge to a water that is impaired for polychlorinated biphenyls (PCBs) and are engaging in demolition of any structure with at least 10,000 square feet of floor space built or renovated before January 1, 1980, you must:

a. Implement controls[59] to minimize the exposure of PCB-containing building materials, including paint, caulk, and pre-1980 fluorescent lighting fixtures, to precipitation and to stormwater; and

b. Ensure that disposal of such materials is performed in compliance with applicable State, Federal, and local laws.

3.3 TURBIDITY BENCHMARK MONITORING FOR SITES DISCHARGING DEWATERING WATER TO PROTECT THE WATER QUALITY OF SENSITIVE WATERS

For sites discharging dewatering water to "sensitive waters" (i.e., receiving waters listed as impaired for sediment or a sediment-related parameter (as defined in Appendix A), or receiving waters designated as a Tier 2, Tier 2.5, or Tier 3 for antidegradation purposes) you are required to comply with the benchmark monitoring requirements in this Part and document the procedures you will use at your site in your SWPPP pursuant to Part 7.2.8. A summary of these requirements is included in Table 1.

EPA notes that the benchmark threshold is not an effluent limitation, rather it is an indicator that the dewatering controls may not be working to protect water quality, which the operator must investigate and correct as appropriate. A benchmark exceedance is not a permit violation. However, if a benchmark exceedance triggers corrective action in Part 5.1.5a, failure to conduct any required action is a permit violation.

Where there are multiple operators associated with the same site, the operators may coordinate with one another to carry out the monitoring requirements of this Part in order to avoid duplicating efforts. Such coordinating arrangements must be described in the SWPPP consistent with Part 7.2.8. Regardless of how the operators divide the

accordance with Part 4.4 for any portion of your site that discharges to a sensitive water.

[59] Examples of controls to minimize exposure of PCBs to precipitation and stormwater include separating work areas from non-work areas and selecting appropriate personal protective equipment and tools, constructing a containment area so that all dust or debris generated by the work remains within the protected area, and using tools that minimize dust and heat (<212°F). For additional information, refer to Part 2.3.3 of the CGP Fact Sheet.

responsibilities for monitoring and reporting, each operator remains responsible for compliance with these requirements.[60]

3.3.1 Turbidity monitoring requirements[61]

a. **Sampling frequency.** You must collect at least one turbidity sample from your dewatering discharge each day a discharge occurs.

b. **Sampling location.** Samples must be taken at all points where dewatering water is discharged. Samples must be taken after the dewatering water has been treated by installed treatment devices pursuant to Parts 2.4.1 and 2.4.3 and prior to its discharge off site into a receiving water, constructed or natural site drainage feature, or storm drain inlet.

c. **Representative samples.** Samples taken must be representative of the dewatering discharge for any given day as required in Appendix G (standard permit conditions), Part G.10.2.

d. **Test methods.** Samples must be measured using a turbidity meter that reports results in nephelometric turbidity units (NTUs) and conforms with a Part 136-approved method (e.g., methods 180.1 and 2130). You are required to use the meter, and conduct a calibration verification prior to each day's use, consistent with the manufacturer's instructions.

3.3.2 Turbidity benchmark

a. The benchmark threshold for turbidity for this permit is 50 NTUs (referred to elsewhere in this permit as the "standard 50 NTU benchmark") unless EPA has authorized the use of an alternate benchmark in accordance with Part 3.3.2b.

b. **Request for alternate benchmark threshold.**

i. At any time prior to or during your coverage under this permit, you may request that EPA approve a benchmark for your site that is higher than 50 NTUs if you have information demonstrating the higher number is the same as your receiving water's water quality standard for turbidity. Unless EPA approves an alternate benchmark, you will be required to use the standard 50 NTU benchmark. To request approval of an alternate benchmark, you must submit the following information to your applicable EPA Regional Office (see Appendix K):
(a) The current turbidity water quality standard that applies to your receiving

[60] For instance, if Operator A relies on Operator B to meet the Part 3.3.1 turbidity monitoring requirements, the Part 3.3.4 reporting and recordkeeping requirements, and the Part 5.2.2 corrective action provisions when applicable, Operator A does not have to duplicate these same functions if Operator B is implementing them for both operators to be in compliance with the permit. However, Operator A remains responsible for complying with these permit requirements if Operator B fails to take actions that were necessary for Operator A to comply with the permit. See also footnote 83. EPA notes that both Operator A and B are required to submit turbidity monitoring reports as required under Part 3.3.4, however, Operator A's report does not need to include the data collected by Operator B as long as Operator B submits the required data and Operator A's report indicates that it is relying on Operator B to report the data. See Part 3.3.4a.

[61] Operators may find it useful to consult EPA's *Monitoring and Inspection Guide for Construction Dewatering*, available at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates, which provides guidelines on how to correctly monitor for turbidity, determine if the weekly average exceeds the benchmark, and, if so, how to proceed with corrective action.

water and the source/citation.[62]

(b) If the applicable turbidity water quality standard requires information on natural or background turbidity levels (e.g., "no more than 10 NTU above natural turbidity levels") to determine the specific standard for the receiving water, include available data that can be used to establish the natural turbidity levels of your receiving water (including literature studies or Federal, State, Tribal, or local government data). Data must be representative of the natural turbidity levels of your specific receiving water. Identify the source(s) of all data provided, including if the data are from samples you collected of the receiving water.

ii. EPA will inform you of its decision on whether to approve the requested alternate benchmark within 30 days. EPA may approve your request, request additional time (e.g., if additional information is needed to substantiate the data you provided), or deny your request. Unless and until EPA approves your request to use an alternate benchmark, you are required to use the standard benchmark of 50 NTUs and take any required corrective actions if an exceedance occurs.

3.3.3 Comparison of turbidity samples to benchmark. Compare the weekly average[63] of your turbidity monitoring results to the standard 50 NTU benchmark, or alternate benchmark if approved by EPA.

a. If the weekly average of your turbidity monitoring results exceeds the standard benchmark (or your approved alternate benchmark), you are required to conduct follow-up corrective action in accordance with Part 5.2.2 and document any corrective action taken in your corrective action log in accordance with Part 5.4**.**

b. For averaging purposes, a "monitoring week" starts with a Monday and ends on Sunday. Once a new monitoring week starts, you will need to calculate a new average for that week of turbidity monitoring results.[64] A weekly average may consist of one or more turbidity monitoring results.

c. Although you are not required to collect and analyze more than one turbidity sample per day from your dewatering discharge, if you do collect and analyze more than one sample on any given day, you must include any additional results in the

[62] For instance, if your site is located in Washington, DC, and you are discharging to a Class B water, for which the water quality standard is that turbidity may not increase above ambient levels by more than 20 percent, you would reference "Water Quality Standards for the District of Columbia, Chapter 11, Section 1104.8."

[63] A "weekly average" is defined as the sum of all of the turbidity samples taken during a "monitoring week" divided by the number of samples measured during that week. Average values should be calculated to the nearest whole number.

[64] For example, if turbidity samples from your dewatering discharge in week 1 result in values of 30 NTU on Tuesday, 40 NTU on Wednesday, and 45 NTU on Thursday, your weekly average turbidity value would be 38.33 NTU ((30+40+45) ÷ 3 = 38 NTU). If in week 2, your turbidity samples resulted in values of 45 NTU on Monday, 30 NTU on Tuesday, 25 NTU on Wednesday, and 15 NTU on Thursday, you would calculate a new average for that week, which would yield an average turbidity value of 28.75 NTU ((45+30+25+15) ÷ 4 = 29 NTU). By comparison, if your samples on consecutive days from Friday to Monday were 60 NTU, 45 NTU, 40 NTU, and 43 NTU, respectively, and there are no other dewatering discharges for the remainder of the week, you would calculate one weekly average for the Friday to Sunday to be 48 NTU ((60+45+40) ÷ 3 = 48 NTU), and a separate weekly average for the one Monday to be 43 NTU (43 ÷ 1 = 43 NTU).

calculation of your weekly average (i.e., add all individual results for that monitoring week and divide by the total number of samples).[65]

d. If you are conducting turbidity monitoring for more than one dewatering discharge point, you must calculate a weekly average turbidity value for each discharge point and compare each to the turbidity benchmark.

3.3.4 Reporting and recordkeeping.

a. You must submit reports of your weekly average turbidity data to EPA no later than 30 days following the end of each monitoring quarter. If there are monitoring weeks in which there was no dewatering discharge, or if there is a monitoring quarter with no dewatering discharge, indicate this in your turbidity monitoring report. If another operator associated with your same site is conducting turbidity monitoring on your behalf pursuant to Part 3.3, indicate this in your turbidity monitoring report.

b. For the purposes of this permit, the following monitoring quarters and reporting deadlines apply:

Table 3. Monitoring Quarters and Deadlines for Reporting Turbidity Benchmark Monitoring Data.

Monitoring Quarter #	**Months**	**Reporting Deadline** (no later than 30 days after end of the monitoring quarter)
1	January 1 – March 31	April 30
2	April 1 – June 30	July 30
3	July 1 – September 30	October 30
4	October 1 – December 31	January 30

c. You must use EPA's NPDES eReporting Tool (NeT) to electronically submit your quarterly turbidity data, unless, consistent with Part 1.4.2, you received a waiver from your applicable EPA Regional Office. If the EPA Regional Office grants you approval to use a paper turbidity monitoring report form, and you elect to use it, you must complete the form in Appendix K. If EPA approves of your request to use an alternate turbidity benchmark pursuant to Part 3.3.2b, EPA will substitute the alternate benchmark in your NeT account.

d. For each day in which you are required to monitor, you must record the monitoring information required by Appendix G, Parts G.10.2 and G.10.3 and retain all such information for a period of at least three years from the date this permit expires or from the date your authorization is terminated.

[65] For example, if during a monitoring week you take two turbidity samples on Tuesday with a value of 30 NTU and 35 NTU, three samples on Wednesday with a value of 40 NTU, 45 NTU, and 48 NTU, and one sample on Thursday with a value of 45 NTU, your weekly average turbidity value for this week would be 41 NTU ((30+35+40+45+48+45) ÷ 6 = 41 NTU).

Table 4. Summary of Turbidity Benchmark Monitoring Requirements.

Applicability	Sampling Requirement	Turbidity Benchmark	Corrective Action	Reporting
Sites discharging dewatering water to a sediment-impaired water or to a water designated as a Tier 2, Tier 2.5, or Tier 3 for antidegradation purposes.	Collect at least one turbidity sample per day, from each discharge point, on any day there is a dewatering discharge. Use turbidity sampling procedures specified in Part 3.3.1.	Compare the weekly average of your turbidity monitoring results to the 50 NTU benchmark (or alternate benchmark if approved by EPA).	If the weekly average of turbidity monitoring results exceeds the 50 NTU turbidity benchmark (or alternate benchmark if approved by EPA), you are required to take follow-up corrective action in accordance with Part 5.2.2.	Report all weekly average turbidity monitoring results on a quarterly basis via NeT-CGP (unless use of the paper monitoring form in Appendix K is approved by EPA) no later than 30 days following the end of each monitoring quarter.

4 INSPECTION REQUIREMENTS

4.1 PERSON(S) RESPONSIBLE FOR CONDUCTING SITE AND DEWATERING INSPECTIONS

The person(s) inspecting your site may be a person on your staff or a third party you hire to conduct such inspections. You are responsible for ensuring that any person conducting inspections pursuant to this Part is a "qualified person." A qualified person is someone who has completed the training required by Part 6.3.

4.2 FREQUENCY OF INSPECTIONS.[66]

At a minimum, you must conduct a site inspection in accordance with one of the two schedules listed below, unless you are subject to the Part 4.3 site inspection frequency for discharges to sediment or nutrient-impaired or high quality waters, or qualify for a Part 4.4 reduction in the inspection frequency:

4.2.1 At least once every seven (7) calendar days; *or*

4.2.2 Once every 14 calendar days *and* within 24 hours[67] of the occurrence of:

a. A storm event that produces 0.25 inches or more of rain within a 24-hour period.

   i. If a storm event produces 0.25 inches or more of rain within a 24-hour period (including when there are multiple, smaller storms that alone produce less than 0.25 inches but together produce 0.25 inches or more in 24 hours), you are required to conduct one inspection within 24 hours of when 0.25 inches of rain or more has fallen.

[66] Inspections are only required during the site's normal working hours.

[67] For the purposes of the inspection requirements in this Part, conducting an inspection "within 24 hours" means that once either of the two conditions in Parts 4.2.2a or 4.2.2b are met you have 24 hours from that time to conduct an inspection. For clarification, the 24 hours is counted as a continuous passage of time, and not counted by business hours (e.g., 3 business days of 8 hours each). When the 24-hour inspection time frame occurs entirely outside of normal working hours, you must conduct an inspection by no later than the end of the next business day.

ii. If a storm event produces 0.25 inches or more of rain within a 24-hour period on the first day of a storm and continues to produce 0.25 inches or more of rain on subsequent days, you must conduct an inspection within 24 hours of the first day of the storm and within 24 hours after the last day of the storm that produces 0.25 inches or more of rain (i.e., only two inspections would be required for such a storm event).[68]

b. A discharge caused by snowmelt from a storm event that produces 3.25 inches[69] or more of snow within a 24-hour period. You are required to conduct one inspection once the discharge of snowmelt from a 3.25-inch or more snow accumulation occurs. Additional snowmelt inspections are only required if following the discharge from the first snowmelt, there is a discharge from a separate storm event that produces 3.25 inches or more of snow.

4.2.3 To determine whether a storm event meets either of the thresholds in Parts 4.2.2a or 4.2.2b:

a. For rain, you must either keep a properly maintained rain gauge on your site, or obtain the storm event information from a weather station that is representative of your location. For any 24-hour period during which there is 0.25 inches or more of rainfall, you must record the total rainfall measured for that day in accordance with Part 4.7.1d.

b. For snow, you must either take measurements of snowfall at your site,[70] or rely on similar information from a local weather forecasting provider that is representative of your location.

4.3 INCREASE IN INSPECTION FREQUENCY FOR CERTAIN SITES.

The increased inspection frequencies established in this Part take the place of the Part 4.2 inspection frequencies for the portion of the site affected.

4.3.1 For any portion of the site that discharges to a sediment or nutrient-impaired water or to a water that is identified by your State, Tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 for antidegradation purposes (see Part 3.2), you must conduct an once every seven (7) calendar days *and* within 24 hours of the occurrence of a storm event that produces 0.25 inches or more of rain within a 24-hour period, or within 24 hours of a snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period.

[68] For example, if 0.30 inches of rain falls on Day 1, 0.25 inches of rain falls on Day 2, and 0.10 inches of rain fall on Day 3, you would be required to conduct a first inspection within 24 hours of the Day 1 rainfall and a second inspection within 24 hours of the Day 2 rainfall, but a third inspection would not be required within 24 hours of the Day 3 rainfall.

[69] This is the amount of snow that is equivalent to 0.25 inches of rain, based on information from the National Oceanic and Atmospheric Administration (NOAA) indicating that 13 inches of snow is, on average, equivalent to 1 inch of rain. See https://www.nssl.noaa.gov/education/svrwx101/winter/faq/.

[70] For snowfall measurements, EPA suggests use of NOAA's National Weather Service guidelines at https://www.weather.gov/jkl/snow_measurement. These guidelines recommend use of a "snowboard" (a piece of wood about 16 inches by 16 inches) that is placed in an unobstructed part of the site on a hard surface.

Refer to Parts 4.2.3a and 4.2.3b for the requirements to determine if a storm event produces enough rain or snow to trigger the inspection requirement.

4.3.2 **For sites discharging dewatering water,** you must conduct an inspection in accordance with Part 4.6.3 during the discharge once per day on which the discharge occurs. The Part 4.2 inspection frequency still applies to all other portions of the site, unless the site is affected by either the increased frequency in Part 4.3.1 or the reduced frequency in Part 4.4.

4.4 REDUCTIONS IN INSPECTION FREQUENCY

4.4.1 Stabilized areas.

a. You may reduce the frequency of inspections to twice per month for the first month, no more than 14 calendar days apart, then once per month until permit coverage is terminated consistent with Part 8 in any area of your site where the stabilization steps in Part 2.2.14a have been completed. If construction activity resumes in this portion of the site at a later date, the inspection frequency immediately increases to that required in Parts 4.2 and 4.3, as applicable. You must document the beginning and ending dates of this period in your SWPPP.

b. **Exception.** For "linear construction sites" (as defined in Appendix A) where disturbed portions have undergone final stabilization at the same time active construction continues on others, you may reduce the frequency of inspections to twice per month for the first month, no more than 14 calendar days apart, in any area of your site where the stabilization steps in Part 2.2.14a have been completed. After the first month, inspect once more within 24 hours of the occurrence of a storm event that produces 0.25 inches of rain or more within a 24-hour period, or within 24 hours of a snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period. If there are no issues or evidence of stabilization problems, you may suspend further inspections. If "wash-out" of stabilization materials and/or sediment is observed, following re-stabilization, inspections must resume at the inspection frequency required in Part 4.4.1a. Inspections must continue until final stabilization is visually confirmed following a storm event that produces 0.25 inches of rain or more within a 24-hour period.

4.4.2 **Arid, semi-arid, or drought-stricken areas** (as defined in Appendix A). If it is the seasonally dry period[71] or a period in which drought is occurring, you may reduce the frequency of inspections to once per month and within 24 hours of the occurrence of a storm event that produces 0.25 inches of rain or more within a 24-hour period, or within 24 hours of a snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period. You must document that you are using this reduced schedule and the beginning and ending dates of the seasonally dry period in your SWPPP. Follow the procedures in Part 4.2.3a and 4.2.3b, accordingly, to determine if a storm event occurs that produces 0.25 inches or more of rain or 3.25 inches or more of snow within a 24-hour period. For any 24-hour period during which there is 0.25 inches or more of rainfall, or 3.25 inches or more of snow, you must record the total rainfall or snow measured for that day in accordance with Part 4.7.1d.

[71] See footnote 44.

4.4.3 Frozen conditions:

a. If you are suspending construction activities due to frozen conditions, you may temporarily suspend inspections on your site until thawing conditions (as defined in Appendix A) begin to occur if:

   i. Discharges are unlikely due to continuous frozen conditions that are likely to continue at your site for at least three (3) months based on historic seasonal averages.[72] If unexpected weather conditions (such as above freezing temperatures or rain events) make discharges likely, you must immediately resume your regular inspection frequency as described in Parts 4.2 and 4.3, as applicable;

   ii. Land disturbances have been suspended; and

   iii. All disturbed areas of the site have been stabilized in accordance with Part 2.2.14a.

b. If you are still conducting construction activities during frozen conditions, you may reduce your inspection frequency to once per month if:

   i. Discharges are unlikely due to continuous frozen conditions that are likely to continue at your site for at least three (3) months based on historic seasonal averages. If unexpected weather conditions (such as above freezing temperatures or rain events) make discharges likely, you must immediately resume your regular inspection frequency as described in Parts 4.2 and 4.3, as applicable; and

   ii. Except for areas in which you are actively conducting construction activities, disturbed areas of the site have been stabilized in accordance with Part 2.2.14a.

You must document the beginning and ending dates of this period in your SWPPP.

4.5 AREAS THAT MUST BE INSPECTED

During your site inspection, you must at a minimum inspect the following areas of your site:

4.5.1 All areas that have been cleared, graded, or excavated and that have not yet completed stabilization consistent with Part 2.2.14a;

4.5.2 All stormwater controls, including pollution prevention controls, installed at the site to comply with this permit;[73]

4.5.3 Material, waste, borrow, and equipment storage and maintenance areas that are covered by this permit;

4.5.4 All areas where stormwater typically flows within the site, including constructed or natural site drainage features designed to divert, convey, and/or treat stormwater;

4.5.5 All areas where construction dewatering is taking place, including controls to treat the dewatering discharge and any channelized flow of water to and from those controls;

[72] Use data sets that include the most recent data available to account for recent precipitation patterns and trends.

[73] This includes the requirement to inspect for sediment that has been tracked out from the site onto paved roads, sidewalks, or other paved areas consistent with Part 2.2.4.

4.5.6 All points of discharge from the site; and

4.5.7 All locations where stabilization measures have been implemented.

You are not required to inspect areas that, at the time of the inspection, are considered unsafe to your inspection personnel.

4.6 REQUIREMENTS FOR INSPECTIONS

4.6.1 During each site inspection, you must at a minimum:

a. Check whether all stormwater controls *(*i.e.*, erosion and sediment controls and pollution prevention controls)* are properly installed, appear to be operational, and are working as intended to minimize pollutant discharges.

b. Check for the presence of conditions that could lead to spills, leaks, or other accumulations of pollutants on the site.

c. Identify any locations where new or modified stormwater controls are necessary to meet the requirements of Parts 2 and/or 3.

d. Check for signs of visible erosion and sedimentation *(*i.e.*, sediment deposits)* that have occurred and are attributable to your discharge at points of discharge and, if applicable, on the banks of any receiving waters flowing within or immediately adjacent to the site;

e. Check for signs of sediment deposition that are visible from your site and attributable to your discharge (e.g., sand bars with no vegetation growing on top in receiving waters or in other constructed or natural site drainage features, or the buildup of sediment deposits on nearby streets, curbs, or open conveyance channels).

f. Identify any incidents of noncompliance observed.

4.6.2 If a discharge is occurring during your inspection:

a. Identify all discharge points at the site; and

b. Observe and document the visual quality of the discharge, and take note of the characteristics of the stormwater discharge, including color; odor; floating, settled, or suspended solids; foam; oil sheen; and other indicators of stormwater pollutants. Check also for signs of these same pollutant characteristics that are visible from your site and attributable to your discharge in receiving waters or in other constructed or natural site drainage features.

4.6.3 For dewatering inspections conducted pursuant to Parts 4.3.2, record the following in a report within 24 hours of completing the inspection:

a. The inspection date;

b. Names and titles of personnel making the inspection;

c. Approximate times that the dewatering discharge began and ended on the day of inspection;[74]

d. Estimates of the rate (in gallons per day) of discharge on the day of inspection;

[74] If the dewatering discharge is a continuous discharge that continues after normal business hours, indicate that the discharge is continuous.

e. Whether or not any of the following indications of pollutant discharge were observed at the point of discharge to any receiving waters flowing through or immediately adjacent to the site and/or to constructed or natural site drainage features or storm drain inlets:[75]

   i. a sediment plume, suspended solids, unusual color, presence of odor, decreased clarity, or presence of foam; and/or

   ii. a visible sheen on the water surface or visible oily deposits on the bottom or shoreline of the receiving water; and

f. Photographs of (1) the dewatering water prior to treatment by a dewatering control(s) and the final discharge after treatment; (2) the dewatering control(s); and (3) the point of discharge to any receiving waters flowing through or immediately adjacent to the site and/or to constructed or natural site drainage features, storm drain inlets, and other conveyances to receiving waters.

You must also comply with the Part 4.7.2, 4.7.3, and 4.7.4 requirements for signing the reports, keeping them available on site, and retaining copies.

4.6.4 Based on the results of your inspection:

a. Complete any necessary maintenance repairs or replacements under Part 2.1.4 or under Part 5, whichever applies; and

b. Modify your SWPPP site map in accordance with Part 7.4.1 to reflect changes to your stormwater controls that are no longer accurately reflected on the current site map.

4.7 INSPECTION REPORT

4.7.1 You must complete an inspection report within 24 hours of completing any site inspection. Each inspection report (except for dewatering inspection reports, which are covered in Part 4.6.3) must include the following:

a. The inspection date;

b. Names and titles of personnel making the inspection;

c. A summary of your inspection findings, covering at a minimum the observations you made in accordance with Part 4.6, including any problems found during your inspection that make it necessary to perform routine maintenance pursuant to Part 2.1.4b or corrective action pursuant to Part 5. Include also any documentation as to why the corrective action procedures under Part 5 are unnecessary to fix a problem that repeatedly occurs as described in Part 2.1.4c;

d. If you are inspecting your site at the frequency specified in Part 4.2.2, Part 4.3, or Part 4.4.1b, and you conducted an inspection because of a storm event that produced rainfall measuring 0.25 inches or more within a 24-hour period, you must include the applicable rain gauge or weather station readings that triggered the inspection. Similarly, if you conducted an inspection because of a snowmelt discharge from a storm event that produced 3.25 inches or more of snow within a 24-hour period, you must include any measurements taken of snowfall at your site, or weather station information you relied on; and

[75] If the operator observes any of these indicators of pollutant discharge, corrective action is required consistent with Parts 5.1.5b and 5.2.2.

e. If you determined that it is unsafe to inspect a portion of your site, you must describe the reason you found it to be unsafe and specify the locations to which this condition applies.

4.7.2 Each inspection report must be signed by the operator's signatory in accordance with Appendix G, Part G.11 of this permit.

4.7.3 You must keep a copy of all inspection reports at the site or at an easily accessible location, so that it can be made immediately available at the time of an on-site inspection or upon request by EPA.[76]

4.7.4 You must retain all inspection reports completed for this Part for at least three (3) years from the date that your permit coverage expires or is terminated.

4.8 INSPECTIONS BY EPA

You must allow EPA, or an authorized representative of EPA, to conduct the following activities at reasonable times. To the extent that you are utilizing shared controls, that are not on site, to comply with this permit, you must make arrangements for EPA to have access at all reasonable times to those areas where the shared controls are located.

4.8.1 Enter onto all areas of the site, including any construction support activity areas covered by this permit, any off-site areas where shared controls are utilized to comply with this permit, discharge locations, adjoining waterbodies, and locations where records are kept under the conditions of this permit;

4.8.2 Access and copy any records that must be kept under the conditions of this permit;

4.8.3 Inspect your construction site, including any construction support activity areas covered by this permit (see Part 1.2.1c), any stormwater controls installed and maintained at the site, and any off-site shared controls utilized to comply with this permit; and

4.8.4 Sample or monitor for the purpose of ensuring compliance.

5 CORRECTIVE ACTIONS

5.1 CONDITIONS TRIGGERING CORRECTIVE ACTION.

You must take corrective action to address any of the following conditions identified at your site:

5.1.1 A stormwater control needs a significant repair or a new or replacement control is needed, or, in accordance with Part 2.1.4c, you find it necessary to repeatedly (i.e., three (3) or more times) conduct the same routine maintenance fix to the same control at the same location (unless you document in your inspection report under Part 4.7.1c that the specific reoccurrence of this same problem should still be addressed as a routine maintenance fix under Part 2.1.4); or

5.1.2 A stormwater control necessary to comply with the requirements of this permit was never installed, or was installed incorrectly; or

[76] Inspection reports may be prepared, signed, and kept electronically, rather than in paper form, if the records are: (a) in a format that can be read in a similar manner as a paper record; (b) legally dependable with no less evidentiary value than their paper equivalent; and (c) immediately accessible to the inspector during an inspection to the same extent as a paper copy stored at the site would be, if the records were stored in paper form. For additional guidance on the proper practices to follow for the electronic retention of inspection report records, refer to the Fact Sheet discussion related to Part 4.7.3.

5.1.3 Your discharges are not meeting applicable water quality standards;

5.1.4 A prohibited discharge has occurred (see Part 1.3); or

5.1.5 During discharge from site dewatering activities:

a. The weekly average of your turbidity monitoring results exceeds the 50 NTU benchmark (or alternate benchmark if approved by EPA pursuant to Part 3.3.2b); or

b. You observe or you are informed by EPA, State, or local authorities of the presence of the conditions specified in Part 4.6.3e.

5.2 CORRECTIVE ACTION DEADLINES

5.2.1 If responding to any of the Part 5.1.1, 5.1.2, 5.1.3, or 5.1.4 triggering conditions, you must:

a. Immediately take all reasonable steps to address the condition, including cleaning up any contaminated surfaces so the material will not discharge in subsequent storm events; and

b. When the problem does not require a new or replacement control or significant repair, the corrective action must be completed by the close of the next business day; or

c. When the problem requires a new or replacement control or significant repair, install the new or modified control and make it operational, or complete the repair, by no later than seven (7) calendar days from the time of discovery. If it is infeasible to complete the installation or repair within seven (7) calendar days, you must document in your records why it is infeasible to complete the installation or repair within the 7-day timeframe and document your schedule for installing the stormwater control(s) and making it operational as soon as feasible after the 7-day timeframe. Where these actions result in changes to any of the stormwater controls or procedures documented in your SWPPP, you must modify your SWPPP accordingly within seven (7) calendar days of completing this work.

5.2.2 If responding to either of the Part 5.1.5 triggering conditions related to site dewatering activities, you must:

a. Immediately take all reasonable steps to minimize or prevent the discharge of pollutants until you can implement a solution, including shutting off the dewatering discharge as soon as possible depending on the severity of the condition[77] taking safety considerations into account;

b. Determine whether the dewatering controls are operating effectively and whether they are causing the conditions; and

c. Make any necessary adjustments, repairs, or replacements to the dewatering controls to lower the turbidity levels below the benchmark or remove the visible plume or sheen.

[77] For instance, if the weekly average of your turbidity monitoring results or a single sample is extremely high (e.g., a single turbidity sample results in 355 NTUs or higher), you should take action to safely shut off the discharge so that you can evaluate the cause of the high turbidity. Note: A single turbidity sample of 355 NTUs or higher means that the weekly average turbidity value will exceed 50 NTU regardless of the turbidity values the other days during the week.

When you have completed these steps and made any changes deemed necessary, you may resume discharging from your dewatering activities.

5.3 CORRECTIVE ACTION REQUIRED BY EPA

You must comply with any corrective actions required by EPA as a result of permit violations found during an inspection carried out under Part 4.8.

5.4 CORRECTIVE ACTION LOG

5.4.1 For each corrective action taken in accordance with this Part, you must record the following in a corrective action log:

a. Within 24 hours of identifying the corrective action condition, document the specific condition and the date and time it was identified.

b. Within 24 hours of completing the corrective action (in accordance with the deadlines in Part 5.2), document the actions taken to address the condition, including whether any SWPPP modifications are required.

5.4.2 Each entry into the corrective action log, consisting of the information required by both Parts 5.4.1a and 5.4.1b, must be signed by the operator's signatory in accordance with Appendix G, Part G.11.2 of this permit.

5.4.3 You must keep a copy of the corrective action log at the site or at an easily accessible location, so that it can be made immediately available at the time of an on-site inspection or upon request by EPA.[78]

5.4.4 You must retain the corrective action log for at least three (3) years from the date that your permit coverage expires or is terminated.

6 STORMWATER TEAM FORMATION/STAFF TRAINING REQUIREMENTS

6.1 STORMWATER TEAM

Each operator, or group of multiple operators, must assemble a "stormwater team" that will be responsible for carrying out activities necessary to comply with this permit. The stormwater team must include the following people:

a. Personnel who are responsible for the design, installation, maintenance, and/or repair of stormwater controls (including pollution prevention controls);

b. Personnel responsible for the application and storage of treatment chemicals (if applicable);

c. Personnel who are responsible for conducting inspections as required in Part 4.1; and

d. Personnel who are responsible for taking corrective actions as required in Part 5.

Members of the stormwater team must be identified in the SWPPP pursuant to Part 7.2.2.

[78] The corrective action log may be prepared, signed, and kept electronically, rather than in paper form, if the records are: (a) in a format that can be read in a similar manner as a paper record; (b) legally dependable with no less evidentiary value than their paper equivalent; and (c) immediately accessible to the inspector during an inspection to the same extent as a paper copy stored at the site would be, if the records were stored in paper form. For additional guidance on the proper practices to follow for the electronic retention of corrective action log records, refer to the Fact Sheet discussion related to Part 4.7.3.

6.2 GENERAL TRAINING REQUIREMENTS FOR STORMWATER TEAM MEMBERS

Prior to the commencement of construction activities, you must ensure that all persons[79] assigned to the stormwater team understand the requirements of this permit and their specific responsibilities with respect to those requirements, including the following related to the scope of their job duties:

a. The permit requirements and deadlines associated with installation, maintenance, and removal of stormwater controls, as well as site stabilization;

b. The location of all stormwater controls on the site required by this permit and how they are to be maintained;

c. The proper procedures to follow with respect to the permit's pollution prevention requirements; and

d. When and how to conduct inspections, record applicable findings, and take corrective actions. Specific training requirements for persons conducting site inspections are included in Part 6.3.

You are responsible for ensuring that all activities on the site comply with the requirements of this permit. You are not required to provide or document formal training for subcontractors or other outside service providers (unless the subcontractors or outside service providers are responsible for conducting the inspections required in Part 4, in which case you must provide such documentation consistent with Part 7.2.2), but you must ensure that such personnel understand any requirements of this permit that may be affected by the work they are subcontracted to perform.

6.3 TRAINING REQUIREMENTS FOR PERSONS CONDUCTING INSPECTIONS

For projects that receive coverage under this permit on or after February 17, 2023, to be considered a qualified person under Part 4.1 for conducting inspections under Part 4, you must, at a minimum, either:

a. Have completed the EPA construction inspection course developed for this permit and have passed the exam; or

b. Hold a current valid construction inspection certification or license from a program that, at a minimum, covers the following:[80]

   i. Principles and practices of erosion and sediment control and pollution prevention practices at construction sites;

   ii. Proper installation and maintenance of erosion and sediment controls and pollution prevention practices used at construction sites; and

   iii. Performance of inspections, including the proper completion of required reports and documentation, consistent with the requirements of Part 4.

[79] If the person requiring training is a new employee who starts after you commence construction activities, you must ensure that this person has the proper understanding as required above prior to assuming particular responsibilities related to compliance with this permit. For emergency-related projects, the requirement to train personnel prior to commencement of construction activities does not apply, however, such personnel must have the required training prior to NOI submission.

[80] If one of the following topics (e.g., installation and maintenance of pollution prevention practices) is not covered by the non-EPA training program, you may consider supplementing the training with the analogous module of the EPA course (e.g., Module 4) that covers the missing topic.

For projects that receive coverage under this permit prior to February 17, 2023, any personnel conducting site inspections pursuant to Part 4 on your site must, at a minimum, be a person knowledgeable in the principles and practice of erosion and sediment controls and pollution prevention, who possesses the appropriate skills and training to assess conditions at the construction site that could impact stormwater quality, and the appropriate skills and training to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of this permit.[81]

6.4 STORMWATER TEAM'S ACCESS TO PERMIT DOCUMENTS

Each member of the stormwater team must have easy access to an electronic or paper copy of applicable portions of this permit, the most updated copy of your SWPPP, and other relevant documents or information that must be kept with the SWPPP.

7 STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

7.1 GENERAL REQUIREMENTS

All operators associated with a construction site under this permit must develop a SWPPP consistent with the requirements in Part 7 prior to their submittal of the NOI.[82, 83, 84] The SWPPP must be kept up-to-date throughout coverage under this permit.

If a SWPPP was prepared under a previous version of this permit, the operator must review and update the SWPPP to ensure that this permit's requirements are addressed prior to submitting an NOI for coverage under this permit.

7.2 SWPPP CONTENTS

At a minimum, the SWPPP must include the information specified in this Part and as specified in other parts of this permit.

7.2.1 All Site Operators. Include a list of all other operators who will be engaged in construction activities at the site, and the areas of the site over which each operator has control.

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[81] If you receive coverage for a project prior to February 17, 2023, and construction activities for the same project will continue after February 17, 2023, the personnel conducting inspections do not need to take the additional training specified in Parts 6.3a and 6.3b for inspections conducted on the project site. If the same operator obtains coverage for a different project on or after February 17, 2023, personnel conducting inspections would be required to meet the requirements for a qualified person by completing the training in either Part 6.3a or Part 6.3b.

[82] The SWPPP does not establish the effluent limits and/or other permit terms and conditions that apply to your site's discharges; these limits, terms, and conditions are established in this permit.

[83] Where there are multiple operators associated with the same site, they may develop a group SWPPP instead of multiple individual SWPPPs. Regardless of whether there is a group SWPPP or multiple individual SWPPPs, each operator is responsible for compliance with the permit's terms and conditions. In other words, if Operator A relies on Operator B to satisfy its permit obligations, Operator A does not have to duplicate those permit-related functions if Operator B is implementing them such that both operators are in compliance with the permit. However, Operator A remains responsible for permit compliance if Operator B fails to take actions necessary for Operator A to comply with the permit. In addition, all operators must ensure, either directly or through coordination with other operators, that their activities do not cause a violation or compromise any other operators' controls and/or any shared controls. See also footnote 60.

[84] There are a number of commercially available products to assist operators in developing the SWPPP, as well as companies that can be hired to help develop a site-specific SWPPP. The permit does not state which are recommended, nor does EPA endorse any specific products or vendors. Where operators choose to rely on these products or services, the choice of which ones to use to comply with the requirements of this Part is a decision for the operator alone.

7.2.2 Stormwater Team. Identify the personnel (by name and position) that you have made part of the stormwater team pursuant to Part 6.1, as well as their individual responsibilities, including which members are responsible for conducting inspections.

Include verification that each member of the stormwater team has received the training required by Part 6.2. Include documentation that members of the stormwater team responsible for conducting inspections pursuant to Part 4 have received the training required by Part 6.3. If personnel on your team elect to complete the EPA inspector training program pursuant to Part 6.3a, you must include copies of the certificate showing that the relevant personnel have completed the training and passed the exam. If personnel on your team elect to complete a non-EPA inspector training program pursuant to Part 6.3b, you must include documentation showing that these persons have successfully completed the program and their certification or license is still current. You must also confirm that the non-EPA inspector training program satisfies the minimum elements for such programs in Part 6.3b.

7.2.3 Nature of Construction Activities. Include the following:

- **a.** A description of the nature of your construction activities, including the age or dates of past renovations for structures that are undergoing demolition;
- **b.** The size of the property (in acres or length in miles if a linear construction site);
- **c.** The total area expected to be disturbed by the construction activities (to the nearest quarter acre or nearest quarter mile if a linear construction site);
- **d.** A description of any on-site and off-site construction support activity areas covered by this permit (see Part 1.2.1c);
- **e.** The maximum area expected to be disturbed at any one time, including on-site and off-site construction support activity areas;
- **f.** A description and projected schedule for the following:[85]
  - **i.** Commencement of construction activities in each portion of the site, including clearing and grubbing, mass grading, demolition activities, site preparation (i.e., excavating, cutting and filling), final grading, and creation of soil and vegetation stockpiles requiring stabilization;
  - **ii.** Temporary or permanent cessation of construction activities in each portion of the site;
  - **iii.** Temporary or final stabilization of exposed areas for each portion of the site; and
  - **iv.** Removal of temporary stormwater controls and construction equipment or vehicles, and the cessation of construction-related pollutant-generating activities.

[85] If plans change due to unforeseen circumstances or for other reasons, the requirement to describe the sequence and estimated dates of construction activities is not meant to "lock in" the operator to meeting these dates. When departures from initial projections are necessary, this should be documented in the SWPPP itself, or in associated records, as appropriate.

g. A list and description of all pollutant-generating activities[86] on the site. For each pollutant-generating activity, include an inventory of pollutants or pollutant constituents (e.g., *sediment, fertilizers, pesticides, paints, caulks, sealants, fluorescent light ballasts, contaminated substrates, solvents, fuels*) associated with that activity, which could be discharged in stormwater from your construction site. You must take into account where potential spills and leaks could occur that contribute pollutants to stormwater discharges, and any known hazardous or toxic substances, such as PCBs and asbestos, that will be disturbed or removed during construction;

h. Business days and hours for the project;

i. If you are conducting construction activities in response to a public emergency (see Part 1.4), a description of the cause of the public emergency *(*e.g.*, mud slides, earthquake, extreme flooding conditions, widespread disruption in essential public services)*, information substantiating its occurrence *(*e.g.*, State disaster declaration or similar State or local declaration)*, and a description of the construction necessary to reestablish affected public services.

7.2.4 Site Map. Include a legible map, or series of maps, showing the following features of the site:

a. Boundaries of the property;

b. Locations where construction activities will occur, including:

i. Locations where earth-disturbing activities will occur (note any phasing), including any demolition activities;

ii. Approximate slopes before and after major grading activities (note any steep slopes (as defined in Appendix A));

iii. Locations where sediment, soil, or other construction materials will be stockpiled;

iv. Any receiving water crossings;

v. Designated points where vehicles will exit onto paved roads;

vi. Locations of structures and other impervious surfaces upon completion of construction; and

vii. Locations of on-site and off-site construction support activity areas covered by this permit (see Part 1.2.1c).

c. Locations of any receiving waters within the site and all receiving waters within one mile downstream of the site's discharge point(s). Also identify if any of these receiving waters are listed as impaired or are identified as a Tier 2, Tier 2.5, or Tier 3 water;

d. Any areas of Federally listed critical habitat within the action area of the site as defined in Appendix A;

e. Type and extent of pre-construction cover on the site (e.g., vegetative cover, forest, pasture, pavement, structures);

f. Drainage patterns of stormwater and authorized non-stormwater before and after major grading activities;

[86] Examples of pollutant-generating activities include paving operations; concrete, paint, and stucco washout and waste disposal; solid waste storage and disposal; and dewatering activities.

g. Stormwater and authorized non-stormwater discharge locations, including:

   i. Locations where stormwater and/or authorized non-stormwater will be discharged to storm drain inlets, including a notation of whether the inlet conveys stormwater to a sediment basin, sediment trap, or similarly effective control;[87]

   ii. Locations where stormwater or authorized non-stormwater will be discharged directly to receiving waters (i.e., not via a storm drain inlet); and

   iii. Locations where turbidity benchmark monitoring will take place to comply with Part 3.3, if applicable to your site.

h. Locations of all potential pollutant-generating activities identified in Part 7.2.3g;

i. Designated areas where construction wastes that are covered by the exception in Part 2.3.3e.ii because they are not pollutant-generating will be stored;

j. Locations of stormwater controls, including natural buffer areas and any shared controls utilized to comply with this permit; and

k. Locations where polymers, flocculants, or other treatment chemicals will be used and stored.

7.2.5 Non-Stormwater Discharges. Identify all authorized non-stormwater discharges in Part 1.2.2 that will or may occur.

7.2.6 Description of Stormwater Controls.

a. For each of the Part 2.2 erosion and sediment control requirements, Part 2.3 pollution prevention requirements, and Part 2.4 construction dewatering requirements, as applicable to your site, you must include the following:

   i. A description of the specific control(s) to be implemented to meet these requirements;

   ii. The design specifications for controls described in Part 7.2.6a.i (including references to any manufacturer specifications and/or erosion and sediment control manuals/ordinances relied upon);[88]

   iii. Routine stormwater control maintenance specifications; and

   iv. The projected schedule for stormwater control installation/implementation.

b. You must also include any of the following additional information as applicable.

   i. **Natural buffers and/or equivalent sediment controls** (see Part 2.2.1 and Appendix F). You must include the following:

      (a) The compliance alternative to be implemented;

      (b) If complying with alternative 2, the width of natural buffer retained;

[87] The requirement to show storm drain inlets in the immediate vicinity of the site on your site map only applies to those inlets that are easily identifiable from your site or from a publicly accessible area immediately adjacent to your site.

[88] Design specifications may be found in manufacturer specifications and/or in applicable erosion and sediment control manuals or ordinances. Any departures from such specifications must reflect good engineering practice and must be explained in the SWPPP.

(c) If complying with alternative 2 or 3, the erosion and sediment control(s) you will use to achieve an equivalent sediment reduction, and any information you relied upon to demonstrate the equivalency;

(d) If complying with alternative 3, a description of why it is infeasible for you to provide and maintain an undisturbed natural buffer of any size;

(e) For "linear construction sites" where it is infeasible to implement compliance alternative 1, 2, or 3, a rationale for this determination, and a description of any buffer width retained and/or supplemental erosion and sediment controls installed; and

(f) A description of any disturbances that are exempt under Part 2.2.1 that occur within 50 feet of a receiving water.

ii. **Perimeter controls for a "linear construction site"** (see Part 2.2.3d). For areas where perimeter controls are not feasible, include documentation to support this determination and a description of the other practices that will be implemented to minimize discharges of pollutants in stormwater associated with construction activities.

Note: Routine maintenance specifications for perimeter controls documented in the SWPPP must include the Part 2.2.3c.i requirement that sediment be removed before it has accumulated to one-half of the above-ground height of any perimeter control.

iii. **Sediment track-out controls** (see Parts 2.2.4b and 2.2.4c)**.** Document the specific stabilization techniques and/or controls that will be implemented to remove sediment prior to vehicle exit.

iv. **Inlet protection measures** (see Part 2.2.10a). Where inlet protection measures are not required because the storm drain inlets to which your site discharges are conveyed to a sediment basin, sediment trap, or similarly effective control, include a short description of the control that receives the stormwater flow from the site.

v. **Sediment basins** (see Part 2.2.12). In circumstances where it is infeasible to utilize outlet structures that withdraw water from the surface, include documentation to support this determination, including the specific conditions or time periods when this exception will apply.

vi. **Treatment chemicals** (see Part 2.2.13), you must include the following:

(a) A listing of the soil types that are expected to be exposed during construction in areas of the project that will drain to chemical treatment systems. Also include a listing of soil types expected to be found in fill material to be used in these same areas, to the extent you have this information prior to construction;

(b) A listing of all treatment chemicals to be used at the site and why the selection of these chemicals is suited to the soil characteristics of your site;

(c) If the applicable EPA Regional Office authorized you to use cationic treatment chemicals for sediment control, include the specific controls and implementation procedures designed to ensure that your use of cationic

treatment chemicals will not lead to a discharge that does not meet water quality standards;

(d) The dosage of all treatment chemicals to be used at the site or the methodology to be used to determine dosage;

(e) Information from any applicable Safety Data Sheet (SDS);

(f) Schematic drawings of any chemically enhanced stormwater controls or chemical treatment systems to be used for application of the treatment chemicals;

(g) A description of how chemicals will be stored consistent with Part 2.2.13c;

(h) References to applicable State or local requirements affecting the use of treatment chemicals, and copies of applicable manufacturer's specifications regarding the use of your specific treatment chemicals and/or chemical treatment systems; and

(i) A description of the training that personnel who handle and apply chemicals have received prior to permit coverage, or will receive prior to use of the treatment chemicals at your site.

vii. Stabilization measures (see Part 2.2.14). You must include the following:

(a) The specific vegetative and/or non-vegetative practices that will be used;

(b) The stabilization deadline that will be met in accordance with Part 2.2.14;

(c) If complying with the deadlines for sites in arid, semi-arid, or drought-stricken areas, the beginning and ending dates of the seasonally dry period (as defined in Appendix A)[89] and the schedule you will follow for initiating and completing vegetative stabilization; and

(d) If complying with deadlines for sites affected by unforeseen circumstances that delay the initiation and/or completion of vegetative stabilization, document the circumstances and the schedule for initiating and completing stabilization.

viii. Spill prevention and response procedures (see Parts 1.3.5, 2.3.3c, 2.3.3d, and 2.3.6). You must include the following:

(a) Procedures for expeditiously stopping, containing, and cleaning up spills, leaks, and other releases. Identify the name or position of the employee(s) responsible for detection and response of spills or leaks; and

(b) Procedures for notification of appropriate facility personnel, emergency response agencies, and regulatory agencies where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity consistent with Part 2.3.6 and established under either 40 CFR part 110, 40 CFR part 117, or 40 CFR part 302, occurs

[89] See footnote 44.

during a 24-hour period. Contact information must be in locations that are readily accessible and available to all employees.

You may also reference the existence of SPCC plans developed for the construction activity under Section 311 of the CWA, or spill control programs otherwise required by an NPDES permit for the construction activity, provided that you keep a copy of that other plan on site.[90]

ix. **Waste management procedures** (see Part 2.3.3). Describe the procedures you will follow for handling, storing, and disposing of all wastes generated at your site consistent with all applicable Federal, State, Tribal, and local requirements, including clearing and demolition debris, sediment removed from the site, construction and domestic waste, hazardous or toxic waste, and sanitary waste. You must also include the following additional information:

(a) If site constraints prevent you from storing chemical containers 50 feet away from receiving waters or the other site drainage features as required in Part 2.3.3c.ii(b), document in your SWPPP the specific reasons why the 50-foot setback is not feasible, and how you will store containers as far away as the site permits; and

(b) If there are construction wastes that are subject to the exception in Part 2.3.3e.ii, describe the specific wastes that will be stored on your site.

x. **Application of fertilizers** (see Part 2.3.5). Document any departures from the manufacturer specifications where appropriate.

7.2.7 Procedures for Inspection, Maintenance, and Corrective Action. Describe the procedures you will follow for maintaining your stormwater controls, conducting site inspections, and, where necessary, taking corrective actions, in accordance with Part 2.1.4, Part 4, and Part 5 of this permit, accordingly. Also include:

a. The inspection schedule you will follow, which is based on whether your site is subject to Part 4.2 or Part 4.3, or whether your site qualifies for any of the reduced inspection frequencies in Part 4.4;

b. If you will be conducting inspections in accordance with the inspection schedule in Part 4.2.2, Part 4.3, or Part 4.4.1b, the location of the rain gauge or the address of the weather station you will be using to obtain rainfall data;

c. If you will be reducing your inspection frequency in accordance with Part 4.4.1b, the beginning and ending dates of the seasonally defined arid period for your area or the valid period of drought;

d. If you will be reducing your inspection frequency in accordance with Part 4.4.3, the beginning and ending dates of frozen conditions on your site; and

e. Any maintenance or inspection checklists or other forms that will be used.

7.2.8 Procedures for Turbidity Benchmark Monitoring from Dewatering Discharges (if applicable). If you are required to comply with the Part 3.3 turbidity benchmark

[90] Even if you already have an SPCC or other spill prevention plan in existence, your plans will only be considered adequate if they meet all of the requirements of this Part, either as part of your existing plan or supplemented as part of the SWPPP.

monitoring requirements, describe the procedures you will follow to collect and evaluate samples, report results to EPA and keep records of monitoring information, and take corrective action when necessary. Include the specific type of turbidity meter you will use for monitoring, as well as any manuals or manufacturer instructions on how to operate and calibrate the meter. Describe any coordinating arrangement you may have with any other permitted operators on the same site with respect to compliance with the turbidity monitoring requirements, including which parties are tasked with specific responsibilities. If EPA has approved of an alternate turbidity benchmark pursuant to Part 3.3.2b, include any data and other documentation you relied on to request use of the specific alternative benchmark.

7.2.9 Compliance with Other Requirements.

a. **Threatened and Endangered Species Protection.** Include documentation required in the Endangered Species Protection section of the NOI in NeT, or the ESA worksheet in Appendix D, supporting your eligibility with regard to the protection of threatened and endangered species and designated critical habitat.

b. **Historic Properties.** Include documentation required in Appendix E supporting your eligibility with regard to the protection of historic properties.

c. **Safe Drinking Water Act Underground Injection Control (UIC) Requirements for Certain Subsurface Stormwater Controls.** If you are using any of the following stormwater controls at your site, document any contact you have had with the applicable State agency[91] or EPA Regional Office responsible for implementing the requirements for underground injection wells in the Safe Drinking Water Act and EPA's implementing regulations at 40 CFR § 144 -147. Such controls would generally be considered Class V UIC wells:

   i. Infiltration trenches (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system);

   ii. Commercially manufactured pre-cast or pre-built proprietary subsurface detention vaults, chambers, or other devices designed to capture and infiltrate stormwater flow; and

   iii. Drywells, seepage pits, or improved sinkholes (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system).

7.2.10 SWPPP Certification. Your signatory must sign and date your SWPPP in accordance with Appendix G, Part G.11.

7.2.11 Post-Authorization Additions to the SWPPP. Once you are authorized for coverage under this permit, you must include the following documents as part of your SWPPP:

a. A copy of your NOI submitted to EPA along with any correspondence exchanged between you and EPA related to coverage under this permit;

b. A copy of the acknowledgment letter you receive from NeT assigning your NPDES ID (i.e., *permit tracking number*);

[91] For State UIC program contacts, refer to the following EPA website: https://www.epa.gov/uic.

c. A copy of this permit (an electronic copy easily available to the stormwater team is also acceptable).

7.3 ON-SITE AVAILABILITY OF YOUR SWPPP

You must keep a current copy of your SWPPP at the site or at an easily accessible location so that it can be made available at the time of an on-site inspection or upon request by EPA; a State, Tribal, or local agency approving stormwater management plans; the operator of a storm sewer system receiving discharges from the site; or representatives of the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS).[92]

EPA may provide access to portions of your SWPPP to a member of the public upon request. Confidential Business Information (CBI) will be withheld from the public, but may not be withheld from EPA, USFWS, or NMFS.[93]

If an on-site location is unavailable to keep the SWPPP when no personnel are present, notice of the plan's location must be posted near the main entrance of your construction site.

7.4 SWPPP MODIFICATIONS

7.4.1 You must modify your SWPPP, including the site map(s), within seven (7) days of any of the following conditions:

a. Whenever new operators become active in construction activities on your site, or you make changes to your construction plans, stormwater controls, or other activities at your site that are no longer accurately reflected in your SWPPP. This includes changes made in response to corrective actions triggered under Part 5. You do not need to modify your SWPPP if the estimated dates in Part 7.2.3f change during the course of construction;

b. To reflect areas on your site map where operational control has been transferred (and the date of transfer) since initiating permit coverage;

c. If inspections or investigations by EPA or its authorized representatives determine that SWPPP modifications are necessary for compliance with this permit;

d. Where EPA determines it is necessary to install and/or implement additional controls at your site in order to meet the requirements of this permit, the following must be included in your SWPPP:

   i. A copy of any correspondence describing such measures and requirements; and

[92] The SWPPP may be prepared, signed, and kept electronically, rather than in paper form, if the records are: (a) in a format that can be read in a similar manner as a paper record; (b) legally dependable with no less evidentiary value than their paper equivalent; and (c) immediately accessible to the inspector during an inspection to the same extent as a paper copy stored at the site would be, if the records were stored in paper form. For additional guidance on the proper practices to follow for the electronic retention of the SWPPP, refer to the Fact Sheet discussion related to Part 4.7.3.

[93] Information covered by a claim of confidentiality will be disclosed by EPA only to the extent of, and by means of, the procedures set forth in 40 CFR part 2, Subpart B. In general, submitted information protected by a business confidentiality claim may be disclosed to other employees, officers, or authorized representatives of the United States concerned with implementing the CWA. The authorized representatives, including employees of other executive branch agencies, may review CBI during the course of reviewing draft regulations.

ii. A description of the controls that will be used to meet such requirements.

e. To reflect any revisions to applicable Federal, State, Tribal, or local requirements that affect the stormwater controls implemented at the site; and

f. If applicable, if a change in chemical treatment systems or chemically enhanced stormwater control is made, including use of a different treatment chemical, different dosage rate, or different area of application.

7.4.2 You must maintain records showing the dates of all SWPPP modifications. The records must include the name of the person authorizing each change (see Part 7.2.9 above) and a brief summary of all changes.

7.4.3 All modifications made to the SWPPP consistent with Part 7.4 must be authorized by a person identified in Appendix G, Part G.11.b.

7.4.4 Upon determining that a modification to your SWPPP is required, if there are multiple operators covered under this permit, you must immediately notify any operators who may be impacted by the change to the SWPPP.

8 HOW TO TERMINATE COVERAGE

Until you terminate coverage under this permit, you must comply with all conditions and effluent limitations in the permit. To terminate permit coverage, you must submit to EPA a complete and accurate Notice of Termination (NOT), which certifies that you have met the requirements for terminating in Part 8.

8.1 MINIMUM INFORMATION REQUIRED IN NOT

8.1.1 NPDES ID (i.e., *permit tracking number)* provided by EPA when you received coverage under this permit;

8.1.2 Basis for submission of the NOT (see Part 8.2);

8.1.3 Operator contact information;

8.1.4 Name of site and address (or a description of location if no street address is available); and

8.1.5 NOT certification.

8.2 CONDITIONS FOR TERMINATING CGP COVERAGE

You may terminate CGP coverage only if one or more of the conditions in Parts 8.2.1, 8.2.2, or 8.2.3 has occurred. Until your termination is effective consistent with Part 8.5, you must continue to comply with the conditions of this permit.

8.2.1 You have completed all construction activities at your site and, if applicable, construction support activities covered by this permit (see Part 1.2.1c), and you have met all of the following requirements:

a. For any areas that (1) were disturbed during construction, (2) are not covered by permanent structures, and (3) over which you had control during the construction activities, you have met the requirements for final vegetative or non-vegetative stabilization in Part 2.2.14c.

To document that you have met these stabilization requirements, you must take either ground or aerial photographs that show your site's compliance with the Part 2.2.14 stabilization requirements and submit them with your NOT. If any portion of your

site is covered by one of the exceptions in Part 2.2.14c.iii, indicate which exception applies and include a supplementary explanation with your photographs that provides the necessary context for why this portion of the site is in compliance with the final stabilization criteria even though it appears to be unstabilized. You are not required to take photographs of every distinct part of your site that is being stabilized, however, the conditions of the site portrayed in any photographs that are submitted must be substantially similar[94] to those of the areas that are not photographed. You must also comply with the following related to these photographs:

i. Take photographs both before and after the site has met the final stabilization criteria in Part 2.2.14c;

ii. All photographs must be clear and in focus, and in the original format and resolution; and

iii. Include the date each photograph was taken, and a brief description of the area of the site captured by the photograph (e.g., photo shows application of seed and erosion control mats to remaining exposed surfaces on northeast corner of site).

b. You have removed and properly disposed of all construction materials, waste and waste handling devices, and have removed all equipment and vehicles that were used during construction, unless intended for long-term use following your termination of permit coverage;

c. You have removed all stormwater controls that were installed and maintained during construction, except those that are intended for long-term use following your termination of permit coverage or those that are biodegradable (as defined in Appendix A); and

d. You have removed all potential pollutants and pollutant-generating activities associated with construction, unless needed for long-term use following your termination of permit coverage; or

8.2.2 You have transferred control of all areas of the site for which you are responsible under this permit to another operator, and that operator has submitted an NOI and obtained coverage under this permit; or

8.2.3 Coverage under an individual or alternative general NPDES permit has been obtained.

8.3 HOW TO SUBMIT YOUR NOT

You must use EPA's NPDES eReporting Tool (NeT) to electronically prepare and submit an NOT for the 2022 CGP.

To access NeT, go to https://cdx.epa.gov/cdx.

Waivers from electronic reporting may be granted as specified in Part 1.4.2. If the EPA Regional Office grants you approval to use a paper NOT, and you elect to use it, you must complete the form in Appendix I.

[94] Stabilization conditions that are substantially similar would include areas that are using the same type of stabilization measures and that have similar slopes, soils, and topography, and have achieved the same level of stabilization.

8.4 DEADLINE FOR SUBMITTING THE NOT

You must submit an NOT within 30 calendar days after any one of the conditions in Part 8.2 occurs.

8.5 EFFECTIVE DATE OF TERMINATION OF COVERAGE

Your authorization to discharge under this permit terminates at midnight of the calendar day that a complete NOT is submitted to EPA.

9 PERMIT CONDITIONS APPLICABLE TO SPECIFIC STATES, INDIAN COUNTRY LANDS, OR TERRITORIES

The provisions in this Part provide additions to the applicable conditions of this permit to reflect specific additional conditions required as part of the State or Tribal CWA Section 401 certification process, or the Coastal Zone Management Act (CZMA) certification process, or as otherwise established by the permitting authority. The specific additional revisions and requirements only apply to activities in those specific States, Indian country, and areas in certain States with Federal Facilities or areas subject to construction projects by Federal Operators. States, Indian country, and other areas not included in this Part do not have any additions to the applicable conditions of this permit.

9.1 EPA REGION 1

9.1.1 NHR100000 State of New Hampshire

a. Should the permit coverage for an individual applicant be insufficient to achieve water quality standards, the New Hampshire Department of Environmental Services (NHDES) may prepare additional 401 certification conditions for that applicant. Any additional 401 certification conditions will follow all required NHDES public participation requirements.

b. If you disturb 100,000 square feet or more of contiguous area, you must also comply with RSA 485-A:17 and Env-Wq 1500, and, unless exempt, apply for an Alteration of Terrain (AoT) permit from NHDES. This requirement also applies to a lower disturbance threshold of 50,000 square feet or more when construction occurs within the protected shoreline under the Shoreland Water Quality Protection Act (see RSA 483-B and Env-Wq 1400). A permit application must also be filed if your project disturbs an area of greater than 2,500 square feet, is within 50 feet of any surface water, and has a flow path of 50 feet or longer disturbing a grade of 25 percent or greater. Project sites with disturbances smaller than those discussed above, that have the potential to adversely affect state surface waters, are subject to the conditions of an AoT General Permit by Rule (Env-Wq 1503.03).

c. You must determine that any excavation dewatering discharges are not contaminated before they will be authorized as an allowable non-stormwater discharge under this permit (see Part 1.2.2 of the Construction General Permit or CGP). In the absence of information demonstrating otherwise, the water is considered uncontaminated if there is no groundwater contamination within 1,000 feet of the groundwater dewatering location. Information on groundwater contamination can be generated over the Internet via the NHDES web site http:// des.nh.gov/ by using the One Stop Data Mapper. For a toxic substance included in the New Hampshire surface water quality standards, see Env-Wq 1703.21 (see https://www.des.nh.gov/sites/g/fi1es/ehbemt 341/files/documents/2020-01/Env-Wg

1700.pdf). If it is determined that the groundwater to be dewatered is near a remediation or other waste site, you must apply for the Remediation General Permit (see https://www3.epa.gov/region1/npdes/rgp.html)

d. As a minimum, you must treat any uncontaminated excavation "dewatering" discharges and "stormwater" discharges, as those terms are defined in Appendix A of the CGP, as necessary, to remove suspended solids and turbidity so that the surface waters receiving the construction discharges[95] meet New Hampshire surface water quality standards for turbidity (Env-Wq 1703.11 and Env-Wq 1703.03(c)(1)c), benthic deposits (Env-Wq 1703.03(c)(1)a), and Env-Wq 1703.08) and foam, debris, scum or other visible substances (i.e., plumes or visual turbidity)[96] (Env-Wq 1703.03(c)(1)b).

i. For all Construction Activities covered under this CGP, the following shall apply to ensure compliance with the aforementioned regulations for turbidity, benthic deposits and visible substances:

Unless otherwise specified, site inspection requirements shall comply with Part 4 of the CGP. As a minimum site inspection frequency shall be in accordance with Part 4.2.2 of the CGP (and Part 4.3.2 of the CGP for sites discharging dewatering water). Site inspection frequency may be reduced in accordance with Part 4.4 of the CGP (Reductions in Inspection Frequency). Monitoring of the receiving water for visible turbidity and benthic sediment deposits shall be conducted each site inspection and results reported in the Inspection Report required in Part 4.7 of the CGP. Should visible turbidity or benthic sediment deposits attributable or partly attributable to your construction activities be present in the receiving water, the "Corrective Actions" specified in Part 5 shall be immediately implemented to correct the water quality standard violations. In addition, daily monitoring (including photographs) of the receiving water shall be conducted until there is no visible turbidity or benthic deposits. Inspection Reports required in Part 4.7 of the CGP shall include, but not be limited to, the distance downstream and the percent of the river width[97] where visible turbidity was observed, and the period of time that the visible turbidity persisted. A copy of the Inspection Report(s) shall be made available to NHDES within 24 hours of receiving a written request from NHDES.

ii. For Construction Activities, disturbing 5 acres or more of land at any one time (excluding areas that have been completely stabilized in accordance with the final stabilization criteria specified in Part 2.2.14.c of the CGP), the following shall

[95] Construction Discharges include uncontaminated "dewatering" and "stormwater" discharges as those terms are defined in Appendix A of the CGP. Controlled construction discharges are construction discharges where the rate of flow can be regulated such as from a construction settling basin or NHDES approved flocculation system.

[96] For the definition of visual turbidity, see the definition for "Non-Turbid" in Appendix A of the CGP, which states the following:" "Non-Turbid" - a discharge that is free from visual turbidity. For the purposes of this permit, visual turbidity refers to a sediment plume or other cloudiness in the water caused by sediment that can be identified by an observer." *[EPA interprets the text of this footnote as intending to reference the Appendix A definitions of "visual turbidity" and "non-turbid" in the final permit.]*

[97] The distance downstream and the percent of river width where visible turbidity (i.e., plume) is observed is required to determine the extent of the river affected and to determine if there was a "zone of passage" (i.e., a portion of the receiving water where there was no visible turbidity where mobile organisms could pass without being adversely impacted). The percent of river width affected is equal 100 multiplied by the width of the plume (in feet) divided by the width of the receiving water (in feet).

apply to ensure compliance with the aforementioned regulations for turbidity, benthic deposits and visible substances.

Item 9.1.1.d.i) above shall apply to all construction discharges and the minimum site inspection frequency shall comply with Part 4.3.1 of the CGP (and Part 4.3.2 of the CGP for sites discharging dewatering water). Site inspection frequency may be reduced in accordance with Part 4.4 of the CGP (Reductions in Inspection Frequency).

With regards to controlled construction discharges, if there is no visible turbidity (i.e., plumes) or benthic deposits, and, in the absence of information demonstrating otherwise, turbidity measurements of less than or equal to 50 nephelometric turbidity units (NTU) in the controlled construction discharges at the outlet prior to mixing with the receiving surface waters, shall be presumed to meet New Hampshire surface water quality standards for the parameters listed above. As a minimum, the controlled construction discharges must be sampled at each site inspection.

If any controlled construction discharge exceeds 50 NTU, or if visible turbidity or benthic sediment deposits attributable or partly attributable to any construction discharge are observed in the receiving water, then the "Corrective Actions" specified in Part 5 of the CGP shall be immediately implemented.

In addition, should such violation occur, and, in order to determine compliance with surface water quality standards for turbidity (Env-Wq 1703.11 and Env-Wq 1703.03(c)(1)c), benthic deposits (Env-Wq 1703.03(c)(1)a), and Env-Wq 1703.08) and foam, debris, scum or other visible substances (Env-Wq 1703.03(c)(1)b)), turbidity monitoring shall be immediately implemented as specified below:

Turbidity samples of the receiving water shall be immediately taken in the receiving water upstream and beyond the influence of the construction activity, and, unless a mixing zone[98] is approved by NHDES, no more than 75 feet downstream of each controlled construction discharge that exceeded 50 NTU and no more than 75 feet downstream of each construction discharge that caused visible turbidity.

Downstream samples shall be taken at locations in the receiving water that are most likely influenced by the discharge (e.g., if visible turbidity (i.e., a plume) is present, the sample shall be taken in the plume). Samples shall be collected a minimum of 2 times per day during the daylight hours at times when construction activities are most likely to cause turbidity in the receiving water and shall continue until the turbidity water quality standards are met in the receiving water (i.e., the difference between the upstream and downstream turbidity level is no greater than 10 NTU).

[98] Permittees may request a distance greater than 75 feet downstream of a construction discharge for determining compliance with turbidity standards in Class B surface waters, by submitting a mixing zone request to NHDES that complies with Env-Wq 1707.02. If a mixing zone is approved, NHDES is required to include conditions to ensure that the criteria on which the approval is based are met (Env-Wq 1707.03).

If water quality standards are not met during daylight hours on any day, sampling shall resume the next day and continue no fewer than 2 times per day until water quality standards are met. The date, time, location and results of turbidity measurements, as well as a summary identifying the cause of the violations, corrective actions that were implemented, the period of time that the receiving water exceeded turbidity standards and the distance downstream and the percent of the river width where visible turbidity was observed, and the period of time that the visible turbidity persisted, shall be recorded and included in the Inspection Report required in Part 4.7 of the CGP. Turbidity measurements shall be conducted via a field meter in accordance with the requirements for turbidity specified in Table 1B in 40 CFR 136.3 (see 40 CFR §136.3 Identification of test procedures - Code of Federal Regulations ecfr.io). Field meters shall be calibrated every day sampling is conducted and prior to the first sample.

e. Construction site owners and operators are encouraged to consider opportunities for post- construction groundwater recharge using infiltration best management practices (BMPs) during site design and preparation of the SWPPP in order to assure compliance with Env-Wq 1703.03 and Env-Wq 1703.11. If your construction site is in a town that is required to obtain coverage under the NPDES General Permit for discharges from Municipal Separate Storm Sewer Systems (MS4) you may be required to use such practices. The SWPPP must include a description of any on-site infiltration that will be installed as a post-construction stormwater management measure or reasons for not employing such measures such as 1) The facility is located in a wellhead protection area as defined in RSA 485- C:2; or 2) The facility is located in an area where groundwater has been reclassified to GAA, GA1 or GA2 pursuant to RSA 485-C and Env-DW 901; or 3) Any areas that would be exempt from the groundwater recharge requirements contained in Env-Wq 1507.04, including all land uses or activities considered to be a "High-load Area" (see Env-Wq 1502.30). For design considerations for infiltration measures see Env-Wq 1508.06. Note that there may be additional local requirements that fall under the NH MS4 permittee's Authorization to Discharge Permit for those regulated areas.

f. Appendix F of the CGP contains information regarding Tier 2, or high quality waters in the various states. ***[EPA notes that this information has now been moved to https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates]*** Although there is no official list of tier 2 waters for New Hampshire, it can be assumed that all New Hampshire surface waters are tier 2 for turbidity unless 1) the surface water that you are proposing to discharge into is listed as impaired for turbidity in the states listing of impaired waters (see https://nhdes-surface-water-quality-assessment-site-nhdes.hub.arcgis.com/) or 2) sampling upstream of the proposed discharge location shows turbidity values greater than 10 NTU (Env-Wq 1703.11). A single grab sample collected during dry weather (no precipitation within 48 hours) is acceptable.

g. To ensure compliance with RSA 485-C, RSA 485-A, RSA 485-A:13, I(a), Env-Wq 1700 and Env-Wq 302, the following information may be requested by NHDES. This information must be kept on site unless you receive a written request from NHDES that it be sent to the address shown below in 9.1.1.h.

i. A list of all non-stormwater discharges that occur at the facility, including their source locations and the control measures being used (see Part 1.2.2 of the CGP).

ii. Records of sampling and analysis required for construction dewatering and stormwater discharges (see 9.1.1.d above).

h. All required or requested documents must be sent to: NH Department of Environmental Services, Watershed Management Bureau, P.O. Box 95 Concord, NH 03302-0095.

9.1.2 MAR100000 Commonwealth of Massachusetts (except Indian country)

a. All discharges covered by the Construction General Permit shall comply with the provisions pursuant to 314 CMR 3.00, 314 CMR 4.00, 314 CMR 9.00, including applicable construction stormwater standards and 310 CMR 10.00.

b. Pursuant to 314 CMR 3.11 (2)(a)6., and in accordance with MassDEP's obligation under 314 CMR 4.05(5)(e) to maintain surface waters free from pollutants in concentrations or combinations that are toxic to humans, aquatic life, or wildlife, permittees are prohibited from discharging dewatering water under the CGP from sites that are designated as Superfund/CERCLA or RCRA, and must make accommodations to dispose of the dewatering discharges appropriately, such as coverage under the Remediation General Permit (RGP).

c. Pursuant to 314 CMR 3.11 (2)(a), and in accordance with MassDEP's obligation to protect Outstanding Resource Waters under 314 CMR 4.04(3), applicants seeking coverage under the 2022 CGP that propose to carry out construction activities near Outstanding Resource Waters as identified in 314 CMR 4.06, shall submit to MassDEP for review:

i. a copy of the Stormwater Pollution Prevention Plan (SWPPP),

ii. a copy of the EPA NOI, and

iii. MassDEP's Stormwater BMP Checklist.

For purposes of this review, the permittee shall submit these documents to MassDEP at the same time they are submitted to EPA. Instructions on how to submit these documents to MassDEP and where to find the MassDEP Stormwater BMP Checklist and obtain authorization to discharge can be found here: https://www.mass.gov/how-to/wm-15-npdes-general-permit-notice-of- intent.

d. Pursuant to 314 CMR 3.11 (2)(a)6., and in accordance with MassDEP's obligation under 314 CMR 4.05(5)(e) to maintain surface waters free from pollutants in concentrations or combinations that are toxic to humans, aquatic life, or wildlife, applicants that propose to dewater under the 2022 CGP and plan to discharge to certain waters as described below, shall determine that any dewatering discharges are not contaminated by testing the proposed discharge as described below as part of the application for WM15 authorization. Unless otherwise specified, testing described in this section should be conducted using the methods in 40 CFR 136.

i. Applicants for sites that plan to discharge to Outstanding Resource Waters as identified in 314 CMR 4.06 shall test one sample of the proposed dewatering discharge water for pH, E. Coli (for discharges to freshwater), fecal coliform (for

discharges to salt water), Enterococci (for discharges to salt water), total suspended solids, oil and grease, total nitrogen, total phosphorus, and all parameters with numeric criteria listed in the Massachusetts Surface Water Quality Standards at 314 CMR 4.05(e). Results shall be reported to MassDEP as part of the WM15 application. To determine if the dewatering discharge could be covered under the 2022 CGP, the effluent at zero dilution must meet numeric water quality criteria. If the effluent does not meet numeric water quality criteria, the applicant shall contact EPA Region 1 to discuss coverage under the Remediation General Permit.

ii. Applicants for sites that propose to discharge to Public Water Supplies (314 CMR 4.06(1)(d)1) shall also test one sample of the proposed dewatering discharge water for per- and polyfluoroalkyl substances (PFAS), as outlined in the table below. Results shall be reported to MassDEP as part of the WM15 application. If any PFAS compounds are detected, the applicant shall apply for coverage under the NPDES Remediation General Permit for Massachusetts if required.

PFAS Testing Parameters for Discharges to Public Drinking Water Supplies[99]	
Perfluorohexanesulfonic acid (PFHxS), grab	Report ng/L
Perfluoroheptanoic acid (PFHpA), grab	Report ng/L
Perfluorononanoic acid (PFNA), grab	Report ng/L
Perfluorooctanesulfonic acid (PFOS), grab	Report ng/L
Perfluorooctanoic acid (PFOA), grab	Report ng/L
Perfluorodecanoic acid (PFDA), grab	Report ng/L

iii. Applicants for sites that propose to discharge to an impaired water as identified in the most recent final Massachusetts Integrated List of Waters,shall test one sample of the proposed dewatering discharge water for the parameter(s) for which the waterbody is impaired. To determine if the dewatering discharge could be covered under the 2022 CGP, the effluent at zero dilution must meet numeric water quality criteria. If the effluent does not meet numeric water quality criteria, the applicant shall contact EPA Region 1 to discuss coverage under the Remediation GeneralPermit and shall apply for RGP coverage if required.

iv. For dewatering discharges to all other waters, if any pollutants are knownor believed present in the proposed dewatering discharge water, the applicant shall apply for coverage under the NPDES Remediation General Permit for Massachusetts if required. For the purposes of this condition, a pollutant is "known present" if measured above the analytical detection limit using a sufficiently sensitive test method in an environmental sample, and "believed present" if a pollutant has not been measured in an environmental sample but will be added or generated prior to discharge, such as through a treatment process. Consequently, a pollutant is "known absent" if measured as non-detect relative to the analytical detection limit using a sufficiently sensitive test method in an environmental sample, and "believed absent" if a pollutant has not been measured in an environmentalsample but will not be added or generated prior to discharge and is not a parameter that applies to the applicable activity category for a site. If any pollutants are known or believed present in the

[99] PFAS testing shall follow established EPA methods 537 or 537.1 for drinking water until EPA Method 3512 for non-potable water becomes available.

proposed dewatering discharge water, the applicant shall test one sample of the proposed dewatering discharge water for the pollutants known or believed to be present. To determine if the dewatering discharge could be covered under the 2022 CGP, the effluent at zero dilution must meet numeric water quality criteria. If the effluent does not meet numeric water quality criteria, the applicant shall contact EPA Region 1 to discuss coverage under the Remediation General Permit.

e. Pursuant to 314 CMR 3.11 (2)(a), and in accordance with MassDEP's obligation to protect Outstanding Resource Waters under 314 CMR 4.04(3), applicants that propose to dewater under the 2022 CGP and discharge to Outstanding Resource Waters as identified in 314 CMR 4.06, shall submit the SWPPP and associated documents to MassDEP to review. MassDEP shall complete review within 30 daysof receipt.

f. Pursuant to 314 CMR 3.11 (2)(a)6., and in accordance with MassDEP's obligation under 314 CMR 4.05 to maintain surface waters free from color and turbidity in concentrations or combinations that are aesthetically objectionable or would impair any use assigned to the waterbody, permittees that have been authorized to dewater under the 2022 CGP and that discharge to Outstanding Resource Waters as identified in 314 CMR 4.06 shall carry out daily benchmark monitoring for turbidity[100] for the duration of dewatering. Permittees shall compare the weekly average of the turbidity monitoring results with the established benchmark turbidity value of 25 Nephelometric Turbidity Units (NTU). If a permittee's weekly average turbidity results exceed the benchmark, the operator shall conduct follow-up corrective action to determine the source of the problem and to make any necessary repairs or upgrades to the dewatering controls to lower the turbidity levels. The permittee shall document any corrective action taken in its corrective action log. Furthermore, permittees at these sites shall carry out inspections at higher frequency, specifically, daily inspections of the dewatering discharge treatment for the duration of the discharge. The permittee shall inspect the site for sediment plume or whether a hydrocarbon sheen is visible at the point of discharge, estimate the flow rate at the point of discharge, and inspect the site downstream to assess whether sedimentation is attributable to the dewatering discharges.

g. Pursuant to 314 CMR 3.11 (2)(a)6., and in accordance with MassDEP's obligation under 314 CMR 4.05 to maintain surface waters free from color and turbidity in concentrations or combinations that are aesthetically objectionable or would impair any use assigned to the waterbody, permittees shall store materials outside the Base Flood Elevation[101] when feasible to prevent displacing runoff and erosion.

h. Pursuant to 314 CMR 3.11 (2)(a), and in accordance with MassDEP's obligation to maintain surface waters free from nutrients in concentrations that would cause or contribute to impairment of existing or designated uses under 314 CMR 4.05(5)(c), all applicants who apply for coverage under the 2022 CGP shall follow guidelines on fertilizer application, including use of fertilizer containing no phosphorus, in accordance with 330 CMR 31.00 Plant Nutrient Application Requirements for

[100] Applicants shall follow EPA Method 180.1 to monitor for turbidity

[101] Base Flood Elevation (BFE) is the elevation of surface water resulting from a flood that has a 1% chance of equaling or exceeding that level in any given year. The BFE is shown on the Flood Insurance Rate Map (FIRM) for zones AE, AH, A1–A30, AR, AR/A, AR/AE, AR/A1– A30, AR/AH, AR/AO, V1–V30 and VE. (Source: https://www.fema.gov/node/404233).

Agricultural Land and Non-Agricultural Turf and Lawns. Further, fertilizer shall never be applied to a site when a rain event greater than 0.5 inches is forecast in the next 48 hours.

i. Pursuant to 314 CMR 3.11 (2)(a), all applicants who apply for coverage under the 2022 CGP and elect to carry out site inspections every 14 days shall also inspect sites within 24 hours of 0.25 inches of precipitation events or greater over 24 hours,or within 24 hours of a discharge that occurred due to snowmelt from 3.25 inches or greater of snow accumulation.[102] During the high flow periods in spring (i.e., months of April to June), inspection frequency shall be increased to once per week for all sites.

   i. To determine whether 3.25 inches or greater of snow accumulation has occurred at a site, snowfall measurements can be taken at the site,[103] or theoperator can rely on similar information from a local weather forecast.

j. Implementing structural improvements, enhanced/resilient pollution prevention measures, and other mitigation measures can help to minimize impacts from stormwater discharges from major storm events such as hurricanes, storm surge, extreme/heavy precipitation,[104] and flood events. Pursuant to 314 CMR 3.11 (2)(a), if such stormwater control measures are already in place due to existing requirements mandated by other state, local or federal agencies, the SWPPP shall include a brief description of the controls and a reference to the existing requirement(s). If the site may be exposed to or has previously experienced suchmajor storm events[105], additional stormwater control measures that may be considered, and implemented as necessary, include, but are not limited to:

   i. Reinforce materials storage structures to withstand flooding and additional exertion of force;

   ii. Prevent floating of semi-stationary structures by elevating to the Base Flood Elevation (BFE) level or securing with non-corrosive device;

   iii. When a delivery of exposed materials is expected, and a storm is anticipated within 48 hours, delay delivery until after the storm or storematerials as appropriate (refer to emergency procedures);

[102] This is the amount of snow that is equivalent to 0.25 inches of rain, based on information from the National Oceanic and Atmospheric Administration (NOAA) indicating that 13 inches of snow is, on average, equivalent to 1 inch of rain. See https://www.nssl.noaa.gov/education/svrwx101/winter/faq/.

[103] NOAA's National Weather Service has guidelines on snowfall measurements at https://www.weather.gov/jkl/snow_measurement. These guidelines recommend use of a "snowboard" (a piece of wood about 16 inches by 16 inches) that is placed in an unobstructed part of the site on a hard surface.

[104] Heavy precipitation refers to instances during which the amount of rain or snow experienced in a location substantially exceeds what is normal. What constitutes a period of heavy precipitation varies according to location and season. Heavy precipitation does not necessarily mean the total amount of precipitation at a location has increased— just that precipitation is occurring in more intense or more frequent events.

[105] To determine if your facility is susceptible to an increased frequency of major storm events that could impact the discharge of pollutants in stormwater, you may reference FEMA, NOAA, or USGS flood map products at https://www.usgs.gov/faqs/where-can-i-find-flood-maps?qt-news_science_products=0#qtnews_science_products.

iv. Temporarily store materials and waste above the Base Flood Elevation ***[EPA notes that it has deleted a footnote reference to the term "Base Flood Elevation" since the same footnote is already included in Part 9.1.2.g, above.]*** level;

v. Temporarily reduce or eliminate outdoor storage;

vi. Temporarily relocate any mobile vehicles and equipment to higher ground;

vii. Develop scenario-based emergency procedures for major storms that are complementary to regular stormwater pollution prevention planning andidentify emergency contacts for staff and contractors; and

viii. Conduct staff training for implementing your emergency procedures atregular intervals.

k. Pursuant to 314 CMR 3.11 (2)(a)6., and in accordance with MassDEP's obligation under 314 CMR 4.05(5)(e) to maintain surface waters free from pollutants in concentrations or combinations that are toxic to humans, aquatic life, or wildlife, permittees who seek coverage under the 2022 CGP and anticipate to carry out dust control shall limit their dust control methodology to using water only and specifically avoid using other techniques, such as solutions containing calcium chloride.

l. If MassDEP requests a copy of the Stormwater Pollution Prevention Plan (SWPPP) for any construction site at any time, the permittee shall submit the SWPPP to MassDEP within 14 days of such a request. MassDEP may conduct an inspection of any site covered by this permit to ensure compliance with state lawrequirements, including state water quality standards.

9.1.3 MTR10F000 Areas in the State of Vermont located at a federal facility

a. Earth disturbance at any one time is limited to five acres.

b. All areas of earth disturbance must have temporary or final stabilization within 14 days of the initial disturbance. After this time, disturbed areas must be temporarily or permanently stabilized in advance of any runoff producing event. A runoff producing event is an event that produces runoff from the construction site. Temporary stabilization is not required if precipitation is not forecast and work is to continue in the next 24-hours or if the work is occurring in a self-contained excavation (i.e. no outlet) with a depth of two feet or greater (e.g. house foundation excavation, utility trenches). Areas of a construction site that drain to sediment basins are not considered eligible for this exemption, and the exemption applies only to the excavated area itself.

c. Site inspections on active construction sites shall be conducted daily during the period from October 15 through April 15.

d. The use of chemical treatments (e.g. polymers, flocculants, and coagulants) for the settling and/or removal of sediment from stormwater runoff associated with construction and construction-related activities requires prior written approval and an approved site and project-specific plan, from the Vermont Agency of Natural Resources. In addition, the use of cationic polymers is prohibited unless approved by the Vermont Agency of Natural Resources under a site and project-specific plan.

e. Any applicant under EPA's CGP shall allow authorized Vermont Agency of Natural Resources representatives, at reasonable times and upon presentation of credentials, to enter upon the project site for purposes of inspecting the project and determining

compliance with this Certification.

f. The Vermont Agency of Natural Resources may reopen and alter or amend the conditions of this Certification over the life of the EPA 2022 Construction General Permit when such action is necessary to assure compliance with the VWQS.

9.2 EPA REGION 2

9.2.1 NYR10I000 Indian country within the State of New York

a. Saint Regis Mohawk Tribe

i. Any Responsible-Person/Decision-Maker required under the CGP to submit a Notice of Intent (NOI) to EPA for coverage under the CGP, must concurrently submit an electronic copy of the NOI to the SRMT Environmental Division, Water Resource Program Manager. Additionally, an electronic copy of the Notice of Termination (NOT) must be provided within three business days after electronic confirmation is received from EPA that the NOT has been accepted. The NOI and NOT must be electronically provided to the following addresses:

Mr. Tieman W. Smith
Water Resources Program Manager Saint Regis Mohawk Tribe
449 Frogtown Road
Akwesasne, NY 13655 Tiernan.Smith@srmt-nsn.gov 518.358.2272 ext. 5073

ii. Any Responsible-Person/Decision-Maker that is required as part of the CGP to prepare a Discharge Management Plan (OMP) or Storm Water Management Plan (SWMP) and/or Storm Water Pollution Prevention Plan (SWPPP) must submit an electronic copy of the DMP, SWMP and/or SWPPP to the SRMT Environment Division, Water Resources Program Manager IO business days prior to the start of construction of any work to be conducted under the CGP. The applicable documents must be provided to the electronic address listed above.

iii. Any Responsible-Person/Decision-Maker that is required under the CGP to submit an annual report to EPA must submit an electronic copy of the annual report concurrently to the SRMT Water Resource Program. Additionally, any correspondences between the applicant and EPA related to analytical data, written reports, corrective action, enforcement, monitoring, or an adverse incident must likewise be routed to the SRMT Water Resources Program at the above electronic address.

iv. An "Authorization to Proceed Letter" with site-specific mitigation requirements may be sent out to the permittee when a review of the NOI and OMP, SWMP and /or SWPPP on a case-by-case basis, is completed by the SRMT Environment Division, Water Resource Program. This approval will allow the application to proceed if all mitigation requirements are met.

b. Seneca Nation

i. Under Part 1.1.5 of the CGP, the Seneca Nation requests that an applicant must demonstrate that they meet the eligibility criteria listed in Appendix D (certify in your Notice of Intent (NOI) that you meet one of the eligibility criteria [Criterion A-F]) as well as species and critical habitats that are listed under the Seneca Nation's "Fishing and Conservation Laws" and the "Seneca Nation of Indians Comprehensive Conservation Law".

ii. The Tribal Historic Preservation Office (THPO) was established in 2000 after the Seneca Nation received a recognition letter from the National Park Service (NPS); therefore under Part 1.1.6 of the CGP (Appendix E) and prior to submitting a Notice of Intent (NOI) operators must complete the Nation's TPHO, Project Review Form (https://sni.org/media/246603/sni-thpo-project-review-form.pdf) and submit the completed form with associated information to the Tribal Historic Preservation Officer at 90 Ohi:yo' Way, Salamanca, NY 14779. Federal agencies engaging in construction activities must provide for construction review by a certified construction reviewer in accordance with 7 Del. C. §§4010 & 4013 and 7 DE Admin. Code 5101, subsection 6.1.6.

iii. Under Part 1.2 of the CGP, discharges must also follow the Section 13 of the Guide for Construction (Seneca Nation of Indians Source Water Code) and respectively, Council Resolution, dated April 13, 2013 (CN: R-04-13-13-11) to ensure that the health, safety and welfare of the citizens of the Seneca Nation, and all other within the Lands and Territories of the Seneca Nation of Indians, and to facilitate the adequate provisions of water through the elimination or prevention of ground water contamination in the vicinity of wells that supply drinking water for the Nation. The area is known as the Source Water Protection Area (SWPA) and specified activities are regulated within this SWPA, as cited in Section 13 of the Guide for Construction and Section VI, of CN: R-04-13-13-11.

iv. Under Part 1.4, any operator who seeks coverage of the CGP, and is required to submit a notice of intent NOI and Notice of Termination (NOT) (as necessary) to the EPA for coverage, under Part 1.4.2 must also submit a copy of the NOI to the Seneca Nation's Environmental Protection Department (EPD) within three business days of submittal to the EPA, (address shown below). Respectively, a copy of the NOT (as described under Part 8.3 of the CGP), which certifies that you have met the requirements of Part 8, must be provided within three business days after electronic confirmation is received from the EPA that the NOT has been accepted. In addition to a NOI and NOT, the Seneca Nation (Environmental Protection Department [EPD]) would require an Environmental Impact Assessment (EA) (Long Form), as shown in Section 2 of the Seneca Nation of Indians Laws, Ordinances & Policies (Guide for Construction), to be completed and submitted to the EPD prior to any project to determine whether the impacts from a project would create significant and detrimental effects to the Nation's lands, water (violate WQS), and environment. The NOI, NOT, and EA must be submitted electronically to epd@sni.org and provided to the following address:

    Seneca Nation
    Environmental Protection Department (EPD) Attn: Director of EPD
    12837 Route 438
    Irving, NY 14081

v. Under Part 3.0 of the CGP, discharges must be controlled as necessary to meet applicable WQS. The Seneca Nation is working actively towards finalizing and implementing the; therefore, the EPD would require an applicant to submit or grant access to the permit to obtain information on the impact of effluents on receiving waters, including the capability of receiving waters to support future designated uses and achieve the WQS of the Nation; and to advise prospective dischargers of discharge requirements, and coordinate with the appropriate

permitting agencies. As stated in the Decision Document, under Section 303(c) of the CWA, 33 U.S.C. § 1313(c), states develop, review, and revise (as appropriate) water quality standards for surface waters of the United States. At a minimum, such standards are to include designated water uses, water quality criteria to protect such uses, and an antidegradation policy. 40 C.F.R. § 131.6. In addition, under Section 401 of the CWA states may grant, condition, or deny "certification" for federally permitted or licensed activities that may result in a discharge to the waters of the United States 33 U.S.C. § 1341.

vi. Under Part 7.2.8(a)(b)(c) and for Part 9 of the CGP, the following Sections of the Seneca Nation's Guide for Construction shall be considered, in conjunction with the CGP:

(a) Section 1. Executive Order - To Establish a Policy for Governing Access to Nation Territories and Facilities by Officials of Foreign Government, dated March 31, 2011

(b) Section 3. Natural Resources Committee, Sand and Gravel Law (CN: R-06-24-05-08)

(c) Section 4. Fishing and Conservation Laws - Part 1.1.5 of the CGP

(d) Section 5. Seneca Nation of Indians Comprehensive Conservation Law, adopted January 14, 2012

(e) Section 9. Food is Our Medicine (FIOM) Program/Native Planting Policy (CN: R-03- 08-14-14)

(f) Section 10. Forestry Management Plan (CN: R-08-14-10-23)

(g) Section 11. Timber Ordinance #411-092, dated May 8, 1982

(h) Section 14. Flood Damage Prevention Local Law, dated September 27, 1988

(i) Section 16. Utilities Ordinance No. 87-100

(j) Authorizing Emergency Action and Contingency Plan to Restrain Pollution of Nations Waters, (Council Resolution: R-03-01-18-10), dated March 10, 2018 Seneca Nation of Indians Permit Application for Construction within Waterways Permit, Form NR98-01.00

9.3 EPA REGION 3

9.3.1 DCR100000 District of Columbia

a. Discharges authorized by this permit shall comply with the District of Columbia Water Pollution Control Act of 1984, as amended (DC Official Code § 8-103.01 and § 8-103.06, et seq.) to ensure that District of Columbia waters, waters in adjacent and downstream states, and the beneficial uses of these waters will not be harmed or degraded by the discharges.

b. Discharges authorized by this permit must comply with §§ 1104.1 and 1104.8 of Chapter 11 and the provisions of Chapter 19 of Title 21of District of Columbia Municipal Regulations in order to attain and maintain designated uses of the District of Columbia waters.

c. The permittee shall comply with the District of Columbia Stormwater Management and Soil Erosion and Sediment Control regulations in Chapter 5 of Title 21 of the District of Columbia Municipal Regulations.

d. The permittee shall comply with the District of Columbia Flood Management Control regulations in Chapter 31 of Title 20 of the District of Columbia Municipal Regulations.

e. The permittee shall submit a copy of the Stormwater Pollution Prevention Plan (SWPPP) to the Regulatory Review Division, Department of Energy & Environment, Government of the District of Columbia, 1200 First Street, NE, 5th Floor, Washington, DC 20002, during the review and approval of the permittee's DOEE Erosion and Sediment Control Plan in accordance with the provisions of Chapter 542 of Title 21 of the District of Columbia Municipal Regulations.

f. Upon request, the permittee shall submit all inspection and monitoring reports as required by this permit and 40 CFR § 122.41 to the Associate Director, Inspection and Enforcement Division, Department of Energy & Environment, Government of the District of Columbia, 1200 First Street, NE, 5th Floor, Washington, DC 20002; telephone (202) 535-2226, or by email at Joshua.Rodriguez@dc.gov.

g. In the event the permittee intends to discharge dewatering water, groundwater, or groundwater comingled with stormwater from a known contaminated site, the permittee shall contact the Regulatory Review Division, Department of Energy & Environment, Government of the District of Columbia, 1200 First Street, NE, 5th Floor, Washington, DC 20002; telephone (202) 535-2600, or by email at MS4DischargeAuthorization@dc.gov to request authorization to discharge dewatering water, groundwater, or groundwater comingled with stormwater to the District's Municipal Separate Storm Sewer System (MS4) or to a surface water body pursuant to §§ 8-103.02, 8-103.06, and 8-103.07 of the District of Columbia Water Pollution Control Act of 1984, as amended.

9.3.2 DER10F000 Areas in the State of Delaware located at a federal facility (as defined in Appendix A)

a. Federal agencies must submit a sediment and stormwater management plan (SSMP) and receive Department approval prior to undertaking any land clearing, soil movement or construction activity unless conducting an exempt activity.

b. Federal construction activities are required to have a third-party Certified Construction Reviewer (CCR) perform weekly reviews to ensure the adequacy of construction activities pursuant to the approved SSMP and regulations.

Implementation of approved SSMPs requires the daily oversight of construction activity by certified responsible personnel.

c. Implementation of approved SSMPs requires the daily oversight of construction activity by certified responsible personnel.

d. A current copy of the SSMP must be maintained at the construction site.

e. Unless authorized by the Department, not more than 20 acres may be disturbed at any one time.

9.4 EPA REGION 4

No additional conditions

9.5 EPA REGION 5

9.5.1 MIR10I000 Indian country within the State of Minnesota

a. Fond du Lac Reservation

i. New dischargers wishing to discharge to an Outstanding Reservation Resource Water (ORRW)[106] must obtain an individual permit from EPA for storm water discharges from large and small construction activities.

ii. A copy of the Storm Water Pollution Prevention Plan (SWPPP) must be submitted to the Office of Water Protection at least fifteen (15) days in advance of sending the Notice of Intent to EPA. The SWPPP can be submitted electronically to richardgitar@FDLREZ.com or by hardcopy sent to:

Fond du Lac Reservation
Office of Water Protection
1720 Big Lake Road
Cloquet, MN 55720

iii. Copies of the Notice of Intent (NOI) and the Notice of Termination (NOT) must be sent to the Fond du Lac Office of Water Protection at the same time they are submitted to EPA. [The condition helps the Office of Water Protection keep track of when a project is about to start and when it has ended. FDL Water Quality Certification Ordinance, Section 204 (a) (2)).

iv. If the project will entail a discharge to any watercourse or open water body, the turbidity limit shall NOT exceed 10% of natural background within the receiving water(s) as determined by Office of Water Protection staff. For such discharges, turbidity sampling must take place within 24 hours of a ½-inch or greater rainfall event. The results of the sampling must be reported to the Office of Water Protection within 7 days of the sample collection. All sample reporting must include the date and time, location (GPS: UTM/Zone 15), and NTU. CGP applicants are encouraged to work with the Office of Water Protection in determining the most appropriate location(s) for sampling. [This condition helps both the Office of Water Protection and the project proponent in knowing whether or not their erosion control efforts are effective. FDL Water Quality Certification, Section 204 (b) (1)).

v. Receiving waters with open water must be sampled for turbidity prior to any authorized discharge as determined by Office of Water Protection staff. This requirement only applies to receiving waters which no ambient turbidity data exists. [This condition allows the Office of Water Protection to obtain a baseline turbidity sample in which to compare to other samples. FDL Water Quality Certification Ordinance, Section 204 (b) (2)].

vi. All work shall be carried out in such a manner as will prevent violations of water quality criteria as stated in the Water Quality Standards of the Fond du Lac Reservation, Ordinance #12/98, as amended. This includes, but is not limited to, the prevention of any discharge that causes a condition in which visible solids, bottom deposits, or turbidity impairs the usefulness of water of the Fond du Lac

[106] Although additional waters may be designated in the future, currently Perch Lake, Rice Portage Lake, Miller Lake, Deadfish Lake, and Jaskari Lake are designated as ORRWs.

Reservation for any of the uses designated in the Water Quality Standards of the Fond du Lac Reservation. These uses include wildlife, aquatic life, warm water fisheries, cold water fisheries, subsistence fishing (netting), primary contact recreation, secondary contact recreation, cultural, wild rice areas, aesthetic waters, agriculture, navigation, commercial and wetlands. It also includes the designated uses of wetlands including, but not limited to, baseflow discharge, cultural opportunities, flood flow attenuation, groundwater recharge, indigenous floral and fauna) diversity and abundance, nutrient cycling, organic carbon export/cycling, protection of downstream water quality, recreation, resilience against climactic effects, sediment/shoreline stabilization, surface water storage, wild rice, and water dependent wildlife. [In addition to listing the designated uses of waters of the Fond du Lac Reservation, this condition also limits the project proponent to discharges that will not violate our Water Quality Standards. FDL Water Quality Certification Ordinance, Section 204 (a) (7)).

vii. Appropriate steps shall be taken to ensure that petroleum products or other chemical pollutants are prevented from entering waters of the Fond du Lac Reservation. All spills must be reported to the appropriate emergency management Agency (National Response Center AND the State Duty Officer), and measures shall be taken immediately to prevent the pollution of waters of the Fond du Lac Reservation, including groundwater. The Fond du Lac Office of Water Protection must also be notified immediately of any spill regardless of size. [This condition helps protect water quality and also reminds project proponents of their responsibility in reporting spill events. FDL Water Quality Certification Ordinance, Section 204 (b) (3)).

viii. All seed mixes, whether used for temporary stabilization or permanent seeding, shall NOT contain any annual ryegrass (Lolium species). Wild rye (Elymus species) or Oats (Avena species) may be used as a replacement in seed mixes. [This condition prevents the use of annual ryegrass on the Reservation. Annual ryegrass is allelopathic, which means it produces biochemical in its roots that inhibit the growth of native plants. If used in seed mixes, annual ryegrass could contribute to erosion, especially on slopes. However, the condition also specifies substitute grasses that germinate almost as fast as annual ryegrass for use as a cover crop to help prevent erosion. FDL Water Quality Certification Ordinance, Section 204 (t) (1)).

ix. To prevent the introduction of invasive species, ALL contractors and subcontractors MUST disclose information stating prior equipment location(s) and ALL known invasive species potentially being transported from said location(s). All equipment MUST undergo a high pressure wash (including any equipment mats) BEFORE ENTERING the Fond du Lac Reservation. Personal equipment such as work boots, gloves, vest, etc. MUST be clean of debris, dirt and plant and animal material BEFORE ENTERING the Fond du Lac Reservation. Equipment being transported from known infested areas MUST undergo a high pressure wash as soon as possible after leaving the infested site and again BEFORE ENTERING the Fond du Lac Reservation, to avoid transport of invasive species into areas surrounding the Reservation. Written certification of equipment cleaning MUST be provided to the Fond du Lac Office of Water Protection. Upon arrival, ALL contractor and subcontractor equipment will be inspected by appointed Fond du Lac staff. If equipment is deemed unsatisfactory, the equipment MUST

undergo a high pressure washing until the equipment is cleared by the inspector, until such time, minimal travel will be allowed through the Reservation. The contractor shall be held responsible for the control of any invasive species introduced as a result of their project. [This condition requires the project proponent to prevent the inadvertent introduction of invasive species by taking an active role in cleaning all vehicles, equipment, and equipment mats before entering the Reservation. This condition has been placed in certifications since 2012, due to the introduction of Wild Parsnip in 2011 from a pipeline contractor. It is much easier to prevent the introduction of an invasive species than it is to eradicate it once it has been introduced. Many invasive plant species form monocultures, preventing native plants from growing. This situation often leads to cases of erosion, which in turn effects water quality. FOL Water Quality Certification Ordinance, Section 204 (g) (1)].

x. A copy of this certification MUST be kept by the contractor on-site at all times and be available for viewing by all personnel, including inspectors. [This condition ensures that the information contained in the certification, especially the conditions, is readily available onsite for reference. FOL Water Quality Certification Ordinance, Section 204 (a) (9)].

b. The Grand Portage Band of Lake Superior Chippewa

i. The CGP authorization is for construction activities that may occur within the exterior boundaries of the Grand Portage Reservation in accordance to the Grand Portage Land Use Ordinance. The CGP regulates stormwater discharges associated with construction sites of one acre or more in size. Only those activities specifically authorized by the CGP are authorized by this certification (the "Certification").

ii. All construction stormwater discharges authorized by the CGP must comply with the Water Quality Standards and Water Resources Ordinance, as well as Applicable Federal Standards (as defined in the Water Resources Ordinance).

iii. All appropriate steps must be taken to ensure that petroleum products or other chemical pollutants are prevented from entering the Waters of the Reservation. All spills must be reported to the appropriate emergency-management agency, and measures must be taken to prevent the pollution of the Waters of the Reservation, including groundwater.

iv. The 2022 CGP requires inspections and monitoring reports of the construction site stormwater discharges by a qualified person. Monitoring and inspection reports must comply with the minimum requirements contained in the 2022 CGP. The monitoring plan must be prepared and incorporated into the Storm Water Pollution Prevention Plan (the "SWPP"). A copy of the SWPP must be submitted to the Board at least 30 days in advance of sending the requisite Notice of Intent to EPA. The SWPP should be sent to:

Grand Portage Environmental Resources Board
P.O. Box 428
Grand Portage, MN 55605

Copies of the Notice of Intent and Notice of Termination required under the General Permit must be submitted to the Board at the address above at the same time they are submitted to the EPA.

v. If requested by the Grand Portage Environmental Department, the permittee must provide additional information necessary for a case-by-case eligibility determination to assure compliance with the Water Quality Standards and any Applicable Federal Standards. The burden is on the applicant to demonstrate compliance with the Water Quality Standards, the Water Resources Ordinance, and Applicable Federal Standards whether or not the application is ultimately eligible for the CGP.

vi. CGP discharges must not cause nuisance conditions as defined in Grand Portage Water Quality Standards.

vii. The Board retains full authority to ensure compliance with and to enforce the provisions of the Water Resource Ordinance and Water Quality Standards, Applicable Federal Standards, and these Certification conditions. Nothing herein affects the scope or applicability of other controlling tribal or federal requirements, including but not limited to impacts to cultural, historical, or archeological features or sites, or properties that may be eligible for listing on the National Register of Historic Places under the National Historic Preservation Act, 54 U.S.C. §§ 300101 et seq.

viii. Appeals related to Board actions taken in accordance with any of the preceding conditions may be heard by the Grand Portage Tribal Court.

c. Leech Lake Band of Ojibwe

i. The water quality standards that apply to the construction site are the standards at the time the operator submits its Notice of Intent (NOI) to EPA and the LLBO WRP (see conditions # 2 and # 3).

ii. A copy of the Stormwater Pollution Prevention Plan (SWPPP) must be submitted to the LLBO WRP at least 30 days in advance of sending the NOI for the project to EPA. See attached LLBO 401 Water Quality Certification Ordinance. Section 304(a)(1). The SWPPP should be submitted electronically to Jeff.Harper@llojibwe.net and by hardcopy sent to:

Leech Lake Band of Ojibwe
ATTN: Water Resources Program - 401 Cert
Division of Resource Management
190 Sailstar Drive NW
Cass Lake, Minnesota 56633

iii. Copies of the NOI and the Notice of Termination (NOT) must be submitted to the LLBO WRP at the same time they are submitted to EPA. See attached LLBO 401 Water Quality Certification Ordinance, Section 304(a)(2). The NOI and NOT should be submitted electronically to Jeff.Harper@llojibwe.net and sent by hardcopy to the address cited in condition # 2.

iv. Any and all other conditions listed in Section 304 of the attached LLBO 401 Water Quality Certification Ordinance shall be observed unless the LLBO WRP deems that certain conditions therein are not applicable to the project in need of a permit under this certification.

v. A copy of this certification MUST be kept by the contractor on-site at all times and be available for viewing by all personnel, including inspectors.

vi. Upon consideration of the NOI, if the LLBO WRP finds that the discharge will not be controlled as necessary to meet applicable water quality standards, the LLBO WRP may insist, consistent with Part 3.1 of the CGP, that additional controls are installed to meet applicable water quality standards, or recommend to EPA that the operator obtain coverage under an individual permit.

9.5.2 WIR10I000 Indian country within the State of Wisconsin

a. Bad River Band of Lake Superior Tribe of Chippewa Indians

i. Only those activities specifically authorized by the CGP are authorized by this Certification. This Certification does not authorize impacts to cultural properties, orhistorical sites, or properties that may be eligible for listing as such.

ii. All projects which are eligible for coverage under the CGP and are located within the exterior boundaries of the Bad River Reservation shall be implemented in such a manner that is consistent with the Tribe's Water Quality Standards (WQS). The Tribe's WQS can be viewed at: http://www.badriver-nsn.gov/wp-content/uploads/2020/01/NRD_WaterQualityStandards_2011.pdf

iii. Operators are not eligible to obtain authorization under the CGP for all new discharges to an Outstanding Tribal Resource Water (OTRW or Tier 3 water). OTRWs, or Tier 3 waters, include the following: Kakagon Slough and the lower wetland reaches of its tributaries that support wild rice, Kakagon River, Bad River Slough, Honest John Lake, Bog Lake, a portion of Bad River, from where it enters the Reservation through the confluence with the White River, and Potato River. OTRWs can be viewed at: https://www.arcgis.com/apps/View/index.html?appid=6f44c371217e4ee8b5f1c2c705c 7c7c5

iv. An operator proposing to discharge to an Outstanding Resource Water (ORW or Tier 2.5 water) under the CGP must comply with the antidegradation provisions of the Tribe's WQS. ORWs, or Tier 2.5 waters, include the following: a portion of Bad River, from downstream the confluence with the White River to Lake Superior, White River, Marengo River, Graveyard Creek, Bear Trap Creek, Wood Creek, Brunsweiler River, Tyler Forks, Bell Creek, and Vaughn Creek. ORWs can be viewed at: https://www.arcgis.com/apps/View/index.html?appid=6f44c371217e4ee8b5f1c2c705c 7c7c5. The antidegradation demonstration materials described in provision E.4.iii., and included on the antidegradation demonstration template found at: https://www.badriver-nsn.gov/natural-resources/projectreviews/, must be submitted to the following address:

Bad River Tribe's Natural Resources Department

Attn: Water Regulatory Specialist

P.O. Box 39 Odanah, WI 54861

WaterReg@badriver-nsn.gov

v. An operator proposing to discharge to an Exceptional Resource Water (ERW or Tier 2 water) under the CGP must comply with the antidegradation provisions of the Tribe's WQS. ERWs, or Tier 2 waters, include the following: any surface water within the exterior boundaries of the Reservation that is not specifically classified as an Outstanding Resource Water (Tier 2.5 water) or an Outstanding Tribal Resource Water (Tier 3 water). ERWs can be viewed at:

https://www.arcgis.com/apps/View/index.html?appid=6f44c371217e4ee8b5f1c2c705c 7c7c5. The antidegradation demonstration materials described in provision E.4.ii., and included on the antidegradation demonstration template found at: https://www.badriver-nsn.gov/natural-resources/projectreviews/, must be submitted to the following address:

Bad River Tribe's Natural Resources Department
Attn: Water Regulatory Specialist
P.O. Box 39 Odanah, WI 54861
WaterReg@badriver-nsn.gov

vi. Projects utilizing cationic treatment chemicals within the Bad River Reservation boundaries are not eligible for coverage under the CGP.

vii. A discharge to a surface water within the Bad River Reservation boundaries shall not cause or contribute to an exceedance of the turbidity criterion included in the Tribe's WQS, which states: Turbidity shall not exceed 5 NTU over natural background turbidity when the background turbidity is 50 NTU or less, or turbidity shall not increase more than 10% when the background turbidity is more than 50 NTU.

viii. All projects which are eligible for coverage under the CGP within the exterior boundaries of the Bad River Reservation must comply with the Bad River Reservation Wetland and Watercourse Protection Ordinance, or Chapter 323 of the Bad River Tribal Ordinances, including the erosion and sedimentation control, natural buffer, and stabilization requirements. Questions regarding Chapter 323 and requests for permit applications can be directed to the Wetlands Specialist in the Tribe's Natural Resources Department at (715) 682-7123 or wetlands@badriver-nsn.gov.

ix. An operator of a project, which is eligible for coverage under the CGP, that would result in an allowable discharge under the CGP occurring within the exterior boundaries of the Bad River Reservation must notify the Tribe prior to the commencing earth-disturbing activities. The operator must submit a copy of the Notice of Intent (NOI) to the following addresses at the same time it is submitted to the U.S. EPA:

Bad River Tribe's Natural Resources Department
Attn: Water Regulatory Specialist
P.O. Box 39 Odanah, WI 54861
WaterReg@badriver-nsn.gov

Bad River Tribe's Natural Resources Department
Attn: Tribal Historic Preservation Officer (THPO)
P.O. Box 39 Odanah, WI 54861
THPO@badriver-nsn.gov

The operator must also submit a copy of the Notice of Termination (NOT) to the above addresses at the same time it is submitted to the U.S. EPA. Photographs showing the current site conditions must be included as part of the NOT to document the stabilization requirements have been met.

x. The THPO must be provided 30 days to comment on the project.

xi. The operator must obtain THPO concurrence in writing. This written concurrence will outline measures to be taken to prevent or mitigate effects to historic properties. For more information regarding the specifics of the cultural resources process, see 36 CFR Part 800. A best practice for an operator is to consult with the THPO during the planning stages of an undertaking.

xii. An operator of a project, which is eligible for coverage under the CGP, that would result in an allowable discharge under the CGP occurring within the exterior boundaries of the Bad River Reservation must submit a copy of the Stormwater Pollution Prevention Plan (SWPPP) to the following address at the same time as submitting the NOI:

Bad River Tribe's Natural Resources Department

Attn: Water Regulatory Specialist

P.O. Box 39 Odanah, WI 54861

WaterReg@badriver-nsn.gov

xiii. Any corrective action reports that are required under the CGP must be submitted to the following address within one (1) working day of the report completion:

Bad River Tribe's Natural Resources Department

P.O. Box 39 Odanah, WI 54861

WaterReg@badriver-nsn.gov

xiv. An operator of a project, which is eligible for coverage under the CGP, that would result in an allowable discharge under the CGP occurring within the exterior boundaries of the Bad River Reservation must submit a copies of the inspection reports (including photographs) to the following address within 24 hours of completing any site inspection required:

Bad River Tribe's Natural Resources Department Attn: Water Regulatory Specialist

P.O. Box 39 Odanah, WI 54861

WaterReg@badriver-nsn.gov

xv. An operator shall be responsible for meeting any additional permit requirements imposed by the U.S. EPA necessary to comply with the Tribe's antidegradation policies if the discharge point is located upstream of waters designated by the Tribe.

9.6 EPA REGION 6

9.6.1 NMR100000 State of New Mexico, except Indian country

a. In Outstanding National Resource Waters (ONRWs) in New Mexico, no degradation is permitted except in limited, specifically defined instances. Therefore, Operators are not eligible to obtain authorization under this general permit for stormwater discharges to waters classified as ONRWs listed in Paragraph D of 20.6.4.9 New Mexico Administrative Code (NMAC), also referred to as "Tier 3 waters" as defined in Appendix A of this permit. Exception: When construction activities are in response to a public emergency (e.g., wildfire, extreme flooding, etc.) and the related work requires immediate authorization to avoid a threat to public health or safety.

i. Operators who conduct construction activities in response to a public emergency to mitigate an immediate threat to public health or safety shall

adhere to the requirements in 20.6.4.8(A)(3)(c) NMAC, including notifying the New Mexico Environment Department (NMED) within seven days of initiation of the emergency action and providing NMED with a summary of the action taken within 30 days of initiation of the emergency action.

ii. For all other scenarios, Operators with proposed discharges to ONRWs in New Mexico shall obtain coverage from EPA under an NPDES Individual Permit and will comply with the additional standards and regulations related to discharges to ONRWs in 20.6.4.8(A) NMAC. Additional information is available from:

New Mexico Environment Department Surface Water Quality Bureau

P.O. Box 5469

Santa Fe, NM 87502-5469 Telephone: 505-827-0187

https://www.env.nm.gov/surface-water-quality/wqs/
https://gis.web.env.nm.gov/oem/?map=swqb

b. If construction dewatering activities are anticipated at a construction site and non-stormwater discharges of groundwater, subsurface water, spring water, and/or other dewatering water are anticipated, the Operators/Permittees must complete the following steps:

1. Review the state's Ground Water Quality Bureau Mapper (https://gis.web.env.nm.gov/GWQB/) and Petroleum Storage Tank Bureau Mapper (https://gis.web.env.nm.gov/GWQB/).

   Check if the following sources are located within the noted distance from the anticipated construction dewatering activity. At a minimum, a list of the following potential sources of contaminants and pollutants at the noted distance is to be kept in the SWPPP.

Source of Potential Contamination or Pollutants*	Constituents likely to be required for testing*
Within 0.5 mile of an open Leaking Underground Storage Tank (LUST) site	BTEX (Benzene, Toluene, Ethylbenzene, and Xylene) plus additional parameters depending on site conditions**
Within 0.5 mile of an open Voluntary Remediation site	All applicable parameters or pollutants listed in 20.6.4.13, 20.6.4.52, 20.6.4.54, 20.6.4.97 thru 20.6.4.99, 20.6.4.101 through 20.6.4.899, and 20.6.4.900 NMAC (or an alternate list approved by the NMED-SWQB)*
Within 0.5 mile of an open RCRA Corrective Action Site	
Within 0.5 mile of an open Abatement Site	
Within 0.5 mile of an open Brownfield Site	
Within 1.0 mile or more of a Superfund site or National Priorities List (NPL) site with associated groundwater contamination.	
Construction activity contaminants and/or natural water pollutants	Additional parameters depending on site activities and conditions (Contact NMED- SWQB for an alternate list)*

*For further assistance determining whether dewatering may encounter contaminated sources, please contact the NMED Ground Water Quality Bureau at 505-827-2965 or NMED Surface Water Quality Bureau (SWQB) at 505-827-0187.

** EPA approved sufficiently sensitive methods must be used. For known PCB sources and analysis, EPA Method 1668C must be used (see https://www.epa.gov/cwa-methods).

2. If dewatering activities are anticipated, information on the flow rate and potential to encounter contaminated groundwater, subsurface water, spring water, or dewatering water must be provideddirectly to NMED at the following address:

   NMED Surface Water Quality Bureau

   Program Manager, Point Source Regulation
   SectionPO Box 5469, Santa Fe, NM 87502

   Please call the SWQB to obtain the appropriate email address (505-827-0187).

3. In addition, the Operator/Permittee must characterize the quality of the groundwater and subsurface water, spring water, or dewatering water being considered for discharge according to the table above and including dissolved hardness and pH. Considering the contaminant sources listed in the table above, water quality data may already be available. For further assistance, contactthe

NMED Surface Water Quality Bureau (505-827-0187), Ground Water Quality Bureau (505-827- 2965), Petroleum Storage Tank Bureau (505-476-4397), or Hazardous Waste Bureau (505-476- 6000).

i. The Operator/Permittee must submit recent analytical test results (i.e., within the past 5 years) according to the table above, and including dissolved hardness and pH, to the EPA Region 6 Stormwater Permit Contact and the NMED Surface Water Quality Bureau (see contact information in #2 above). If the test data exceed applicable water quality standards, then the groundwater, subsurface water, spring water, or dewatering water cannot be discharged into surface waters under this general permit. Operators/Permittees may submit an NPDES Individual Permit application to treat and discharge to waters of the U.S. or find alternative disposal measures. No discharges to surface waters are allowed until authorized.

ii. If the discharge has the potential to affect groundwater (e.g., land application), the Operator/Permittee must submit an NOI to the NMED Ground Water Quality Bureau (see 20.6.2.1201 NMAC – Notice of Intent to Discharge).

4. The Operator/Permittee must document any findings and all correspondence with NMED and EPA in the SWPPP.

c. Operators who intend to obtain authorization under this permit for new and existing storm water dischargesfrom construction sites must satisfy the following condition:

i. The SWPPP must include site-specific interim and permanent stabilization, managerial, and structural solids, erosion and sediment control best management practices (BMPs) and/or other controls that are designed to prevent to the maximum extent practicable an increase in the sediment yield and flow velocity from pre-construction, pre-development conditions to assure thatapplicable standards in 20.6.4 NMAC, including the antidegradation policy, and TMDL waste load allocations (WLAs) are met. This requirement applies to discharges both during construction and after construction operations have been completed. The SWPPP must identify and document the rationale for selecting these BMPs and/or other controls. The SWPPP must also describe design specifications, construction specifications, maintenance schedules (including a long-term maintenance plan), criteria for inspections, and expected performance and longevity of these BMPs.For sites greater than 5 acres in size, BMP selection must be made based on the use of appropriatesoil loss prediction models (i.e. SEDCAD, RUSLE, SEDIMOT, MULTISED, etc.) OR equivalent generallyaccepted (by professional erosion control specialists) soil loss prediction tools.

ii. For all sites, the Operator(s) must demonstrate, and include documentation in the SWPPP, that implementation of the site-specific practices will ensure that the applicable standards and TMDL WLAs are met, and will result in sediment yields and flow velocities that, to the maximum extent practicable, will not be greater than the sediment yield levels and flow velocities from preconstruction, pre-development conditions.

iii. All SWPPPs must be prepared in accordance with good engineering practices by qualified (e.g., CPESC certified, engineers with appropriate training) erosion control specialists familiar with the use of soil loss prediction models and design of erosion and sediment control systems based on these models (or equivalent soil

loss prediction tools). Qualifications of the preparer (e.g., professional certifications, description of appropriate training) must be documented in the SWPPP.The Operator(s) must design, implement, and maintain BMPs in the manner specified in the SWPPP.

NMED supports the use of EPA's small residential lot template if a site qualifies to use it as explained inthe permit, as long as it is consistent with the above requirements. NMED's requirement does not preclude small residential sites from using the template, but it may require an additional short paragraphto justify the selection of specific BMPs for the site.

d. Operators must notify NMED when discharges of toxic or hazardous substances or oil from a spill or other release occurs - see Emergency Spill Notification Requirements, Part 2.3.6 of the permit. For emergencies, Operators can call 505-827-9329 at any time. For non-emergencies, Operators can call 866-428-6535 (voice mail 24-hours per day) or 505-476-6000 during business hours from 8am-5pm, Monday through Friday. Operators can also call the NMED Surface Water Quality Bureau directly at 505-827-0187.

e. Operators of small construction activities (i.e., 1-5 acres) are not eligible to qualify for a waiver in lieu of needing to obtain coverage under this general permit based on Item C.3 of Appendix C (Equivalent Analysis Waiver) in the State of New Mexico.

9.6.2 NMR10I000 Indian country within the State of New Mexico, except Navajo Reservation Lands that are covered under Arizona permit AZR10000I and Ute Mountain Reservation Lands that are covered under Colorado permit COR10000I.

a. Nambe Pueblo

i. The operator must provide a copy of the Notice of Intent (NOI) and Notice of Termination (NOT) to the Nambe Pueblo Governor's Office at the same time it is provided to the US Environmental Protection Agency. The NOI and NOT should be provided to the following address:

Office of the Governor Nambe Pueblo

!SA NPI02 WEST

Nambe Pueblo, New Mexico 87506

ii. The operator must provide a copy of the Storm Water Pollution Prevention Plan (SWPPP) to Nambe Pueblo at the same time it is submitted to the EPA, either by email to governor@nambepueblo.org or mailed to the above address.

iii. The operator must provide copies of inspection reports, a copy of the corrective action log, and modifications made to the SWPPP as a result of inspection findings, upon request by the Nambe Pueblo Department of Environmental and Natural Resources or Nam be Governor.

b. Ohkay Owingeh Tribe

i. All operators obtaining permit coverage under the EPA CGP, must submit a copy of the certified (signed) Notice of Intent (NOI) to the Ohkay Owingeh Office of Environmental Affairs, a copy of NOI modifications and the Notice of Termination (NOT), must be provided within three business days after EPA provides electronic confirmation that the submission has been received. The NOI and NOT must be provided to the following address:

Naomi L. Archuleta - Environmental Programs Manager Ohkay Owingeh Office of Environmental Affairs
P.O. Box 717
Ohkay Owingeh, NM 87566
naomi.archuleta@ohkay.org

Noah Kaniatobe - Environmental Specialist Ohkay Owingeh, Office of Environmental Affairs
P.O. Box 717
Ohkay Owingeh, NM 87566
noah.kaniatohe@ohkay.org

ii. All operators obtaining permit coverage under the EPA CGP, must submit an electronic copy of the Storm Water Pollution Prevention Plan (SWPPP) to Ohkay Owingeh Office of Environmental Affairsat the same time that the NOI is submitted to the tribe (see contact information listed above).

iii. Following each incident where the operator takes a corrective action the operator must provide thecorrective action log to the Ohkay Owingeh Office of Environmental Affairs.

iv. The operator must notify Ohkay Owingeh Office of Environmental Affairs within 24 hours, in the event of an emergency spill in addition to the notification requirements at Part 2.3.6 of the CGP. Please contact: Ohkay Owingeh Tribal Police Department at 505.852.2757.

Please contact:
Ohkay Owingeh
Tribal Police Department
505.852.2757

c. Pueblo of Isleta

i. All operators obtaining permit coverage under the EPA CGP must submit a copy of the certified Notice ofIntent (NOI) to the Pueblo of Isleta at the same time it is submitted to EPA for projects occurring within the exterior boundaries of the Pueblo of Isleta. Additionally, a copy of NOI modifications and the Notice of Termination (NOT), must be provided within three business days after EPA provides electronic confirmation that the submission has been received. The Notices must be provided to the following address:

Water Quality Control OfficerPueblo of Isleta
Environment DepartmentPO Box 1270
Isleta NM 87022
505-869-7565
WQCO@isletapueblo.com

ii. The operator must notify the Pueblo of Isleta's Dispatch at 505-869-3030 as soon as possible and thePueblo of Isleta Water Quality Control Officer within 10 hours, in the event of a spill of hazardous ortoxic substances or if health or the

environment become endangered in addition to the notification requirements at Part 2.3.6 and at I.12.6.1 of the CGP.

iii. All operators obtaining permit coverage under the EPA CGP must submit an electronic copy of the Stormwater Pollution Prevention Plan (SWPPP) to the Pueblo of Isleta Water Quality Control Officer atthe above address, 30 days prior to submitting the certified NOI to EPA. If the electronic file is too largeto send through e-mail, a zip file or flash drive may be submitted.

iv. All operators obtaining permit coverage under the EPA CGP must give 2 days advance notice to the Pueblo of Isleta Water Quality Control Officer of any planned changes in the permitted activity whichmay result in noncompliance with permit requirements.

v. All operators obtaining permit coverage under the EPA CGP must post a sign or other notice of permit coverage at a safe, publicly accessible location in close proximity to the construction site. The notice mustbe located so that it is visible from the public road or tribal road that is nearest to the active part of the construction site. The sign must be maintained on-site from the time construction activities begin until final stabilization is met.

vi. Erosion and sediment controls shall be designed to retain sediment on-site and project-generatedwaste materials that have the potential to discharge pollutants shall not be placed on open soil oron a surface that is not stabilized. Volumes of sediment over five (5) cubic yards must be removed from the active construction site; additionally, if sediment is placed for disposal withinthe exterior boundaries of the Pueblo of Isleta, disposal must be within a tribally approved sediment disposal site.

d. **Pueblo of Laguna**

i. All operators obtaining permit coverage under the EPA CGP must submit an electronic copy of the certified (signed) Notice of Intent (NOI) to the Pueblo of Laguna's Environmental & Natural Resources Department (ENRD) within three business days of submittal to the EPA. Additionally, a copy of NOI modifications and the Notice of Termination (NOT), must be provided within three business days after the EPA provides electronic confirmation that the submission has been received. The NOI and NOT must be electronically submitted to info.environmental@pol-nsn.gov.

ii. All operators obtaining permit coverage under the EPA CGP must submit an electronic copy of the Stormwater Pollution Prevention Plan (SWPPP) to the Pueblo of Laguna's ENRD 14 days prior to the submittal of the NOI (see contact information listed above).

iii. The operator must provide copies of corrective actions logs and modifications made to the SWPPP as a result of inspection findings to the Pueblo of Laguna ENRD (see contact information above).

iv. In addition to the notification requirements of Part 2.3.6 of the CPG ***[EPA interprets this intending to refer to the CGP]***, the operator must notify the Pueblo of Laguna ENRD at 505-552-7512 in the event of an emergency spill as soon as possible.

e. **Pueblo of Sandia. The following conditions apply only to discharges on the Pueblo of Sandia Reservation:**

i. All operators obtaining permit coverage under the EPA CGP, must submit a copy of the certified (signed) Notice of Intent (NOI) to the Pueblo of Sandia Environment Department concurrently with submittal to the EPA. Additionally, a copy of NOI modifications and the Notice of Termination (NOT), must be provided concurrently with submittal to the EPA. The NOI and NOT must be provided electronically to the following addresses:

Electronic Addresses:

Amy Rosebrough (Water Quality Manager): rosebrough@sanidapueblo.nsn.us
Greg Kaufman (Environment Director):gkaufman@sandiapueblo.nsn.us

ii. All operators obtaining permit coverage under the EPA CGP, must submit an electronic copy of the Stormwater Pollution Prevention Plan (SWPPP) to the Pueblo of Sandia Environment. Department at least 14 days prior to submittal of the NOI to the Pueblo (see contact information listed above).

iii. If requested by the Pueblo of Sandia Environment Department, the permittee must provide additional information necessary on a case-by-case basis to assure compliance with the Pueblo of Sandia Water Quality Standards and/or applicable Federal Standards.

iv. An "Authorization to Proceed Letter" with site specific mitigation requirements may be sent out to the permittee when a review of the NOI and SWPPP, on a case-by-case basis, is completed by the Pueblo of Sandia Environment Department. This approval will allow the application to proceed if all mitigation requirements are met.

v. The Pueblo of Sandia will not allow Small Construction Waivers (Appendix C) to be granted for any small construction activities.

vi. The operator must provide copies of inspection reports, a copy of the corrective action log, and modifications made to the SWPPP as a result of inspection findings to the Pueblo of Sandia Environment Department upon request. An inspection report and corrective action log must be submitted to the Pueblo within 3 days of any inspection that results in corrective action (see contact information listed above).

vii. The operator must notify the Pueblo of Sandia within 24 hours in the event of an emergency spill, in addition to the notification requirements at Part 2.3.6 of the COP (see contact information listed above).

viii. Before submitting a Notice of Termination (NOT) to the EPA, permittees must clearly demonstrate to the Pueblo of Sandia Environment Department through a site visit or documentation that requirements for site stabilization have been met and any temporary erosion control structures have been removed. A short letter stating that the NOT is acceptable and all requirements have been met will be sent to the permittee to add to the permittee's NOT submission to the EPA.

f. **Pueblo of Santa Ana. The following conditions apply only to discharges on the Pueblo of Santa Ana Reservation:**

i. All operators obtaining permit coverage under the EPA CGP, must submit a copy of the certified (signed) Notice of Intent (NOI) to the Pueblo's Department of Natural Resources within three business days of submittal to EPA. Additionally, a copy of NOI modifications and the Notice of Termination (NOT), must be

provided within three business days after EPA provides electronic confirmation that the submission has been received. The NOI and NOT must be provided to the following address:

Regular U.S. Delivery Mail:

Pueblo of Santa Ana

Department of Natural Resources Water Resources Division

Attn: Andrew Sweetman 02 Dove Rd

Santa Ana Pueblo, NM 87004

Electronically:

Andrew Sweetman

Water Resources Division Manager Andrew.Sweetman@santaana-nsn.gov

Tammy Montoya Hydrologist

Tammy.Montoya@santaana-nsn.gov

ii. All operators obtaining permit coverage under the EPA CGP, must submit an electronic copyof the Stormwater Pollution Prevention Plan (SWPPP) to the to the Pueblo's Department of Natural Resources at the same time that the NOI is submitted to the tribe (see contact information listed above).

iii. The operator must provide copies of inspection reports, a copy of the corrective action log, and modifications made to the SWPPP as a result of inspection findings, upon request by the Pueblo's Department of Natural Resources.

iv. The operator must notify the Pueblo's Department of Natural Resources within 24 hours in the event of an emergency spill, in addition to the notification requirements at Part 2.3.6 of the CGP.

g. Pueblo of Taos

i. All operators obtaining permit coverage under the EPA CGP, must submit a copy of the certified (signed) Notice of Intent (NOi) to the Taos Pueblo Environmental Office and Taos Pueblo Governor's Office within three business days of submittal to EPA. Additionally, a copy of NOi modifications and the Notice of Termination (NOT), must be provided within three business days after EPA provides electronic confirmation that the submission has been received. The NOi and NOTmust be provided to the following addresses:

Honorable Governor of Taos Pueblo PO Box 1846

Taos, New Mexico 87571

Taos Pueblo Environmental Office PO Box 1846

Taos, New Mexico 87571

ii. All operators obtaining permit coverage under the EPA CGP, must submit an electronic copy of theStormwater Pollution Prevention Plan (SWPPP) to the Taos Pueblo Environmental Office when the NOI is submitted to the tribe. Electronic copy of SWPPP downloaded on flash drive may be sent to the above address for the Taos Pueblo Environmental Office.

iii. The operator must provide a copy of the corrective action log following each corrective action undertaken and modifications made to the SWPPP as a result of

a corrective action to the Taos Pueblo Environmental Office at address listed above.

h. Pueblo of Tesuque.

i. All operators obtaining permit coverage under the EPA CGP, must submit a copy of the certified (signed) Notice of Intent (NOI) to the Pueblo of Tesuque Department of Environment and Natural Resources (DENR) and the Pueblo's Governor within three business days of submittal to EPA. Additionally, a copy of any NOi modifications and the Notice of Termination (NOT), must be provided within three business days after EPA provides electronic confirmation that the submission has been received. The NOI and NOT must be provided to the following address:

Governor Mark Mitchell Pueblo of Tesuque
20 TP 828
Santa Fe, NM 87506 governor@puebloftesuque.org

Sage Mountain.flower Pueblo of Tesuque
Department of Environment and Natural Resources Director
20 TP 828

ii. All operators obtaining permit coverage under the EPA CGP, must submit an electronic copyof the Stormwater Pollution Prevention Plan (SWPPP) to Pueblo of Tesuque DENR and the Pueblo's Governor at the same time that the NO! is submitted to the EPA (see contact information listed above).

iii. The operator must provide a copy of the corrective action log, and any modifications made tothe SWPPP as a result of inspection findings, or upon request by the Pueblo of Tesuque DENR.

iv. The operator must notify the Pueblo of Tesuque DENR within 24 hours in the event of an emergency spill, in addition to the notification requirements at Part 2.3.6 of the CGP (seecontact information listed above).

i. Santa Clara Indian Pueblo.

i. All operators obtaining permit coverage under the EPA CGP, must submit a copy of the certified (signed) Notice of Intent (NOI) to the Santa Clara Pueblo Office of Environmental Affairs at the same time the NOI is submitted to the U.S. EPA. Additionally, a copy of the NOI modifications and the Notice of Termination (NOT), must be provided at the same time after electronic confirmation is received from EPA that the NOT has been accepted. The NOI and NOT shall be provided to the following address in electronic format:

Dino Chavarria,
Santa Clara Pueblo
Office of Environmental Affairs
dinoc@santaclarapueblo.org

ii. All operators obtaining permit coverage under the EPA CGP, must submit an electronic copy of the Stormwater Pollution Prevention Plan to the Santa Clara Pueblo Office of Environmental Affairs at the same time the NOI is submitted to the U.S. EPA (see contact information listed above).

iii. The operator must notify the Santa Clara Pueblo Office of Environmental Affairs at the address above within 24 hours, in the event of an emergency spill, in addition to the notification requirements at Part 2.3.6 of the CGP

9.6.3 OKR10I000 Indian country within the State of Oklahoma, except areas of Indian country covered by an extension of state program authority pursuant to Section 10211 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act (SAFETEA).

a. Pawnee Nation. The following conditions apply only to discharges within Pawnee Indian country:

i. Copies of the Notice of Intent (NOI) and Notice of Termination (NOT) must be provided to the Pawnee Nation at the same time it is submitted to the Environmental Protection Agency to the following address:

Pawnee Nation Department of Environmental Conservation and Safety
P.O. Box 470
Pawnee, OK 74058
Or email to dnrs@pawneenation.org

ii. An electronic copy of the Storm Water Pollution Prevention Plan (SWPPP) must be submitted to the Pawnee Nation Department of Environmental Conservation and Safety at the same time the NOI is submitted.

iii. The operator must provide access to the site for inspections and for copies of inspection reports, copy of the corrective action log and modifications, made to the SWPPP because of inspection findings, upon request by the Pawnee Nation DECS.

iv. The Pawnee Nation Department of Environmental Conservation and Safety must be notified at 918.762.3655 immediately upon discovery of any noncompliance with any provision of the permit conditions.

9.6.4 OKR10F000 Discharges in the State of Oklahoma that are not under the authority of the Oklahoma Department of Environmental Quality, or the Oklahoma Department of Agriculture and Forestry including activities associated with oil and gas exploration, drilling, operations, and pipelines (includes SIC Groups 13 and 46, and SIC codes 492 and 5171), and point source discharges associated with agricultural production, services, and silviculture (includes SIC Groups 01, 02, 07, 08, 09).

a. For activities located within the watershed of any Oklahoma Scenic River, including the Illinois River, Flint Creek, Barren Fork Creek, Upper Mountain Fork, Little Lee Creek, and Lee Creek or any water or watershed designated "ORW" in Oklahoma's Water Quality Standards, this permit may only be used to authorize discharges from temporary construction activities. Certification is denied for any on-going activities such as sand and gravel mining or any other mineral mining.

b. For activities located within the watershed of any Oklahoma Scenic River, including the Illinois River, Flint Creek, Barren Fork Creek, Upper Mountain Fork, Little Lee Creek, and Lee Creek or any water or watershed designated "ORW" in Oklahoma's Water Quality Standards, certification is denied for any discharges originating from support activities, including, but not limited to, concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, or borrow areas.

c. Dewatering discharges into sediment or nutrient-impaired waters, and waters identified as Tier 2, Tier 2.5, or Tier 3 (OAC 785:46-13) shall be controlled to meet water quality standards for turbidity in those waters as follows:

i. Cool Water Aquatic Community/Trout Fisheries: 10 NTUs (OAC 785: 45-5-12(f)(7)(A)(i)

ii. Lakes: 25 NTUs (OAC 785: 45-5-12(f)(7)(A)(ii)

iii. In waters where background turbidity exceeds these values, turbidity from dewatering discharges should be restricted to not exceed ambient levels (OAC 785: 45-5-12(f)(7)(B)

9.7 EPA REGION 7

No additional conditions.

9.8 EPA REGION 8

9.8.1 MTR10I000 Indian country within the State of Montana

a. **Blackfeet Nation.**

i. The Applicant and applicants for projects authorized under the NWPs should obtain all other permits, licenses, and certifications that may be required by federal, state, or tribal authority. Primary relevant tribal permit will be ALPO (Ordinance 117). Others may apply. It is the applicant's responsibility to know the tribal and local ordinances and complete all necessary permissions before they can commence work.

ii. If a project is unable to meet the enclosed conditions, or if certification is denied for an applicable NWP, the Applicant may request an individual certification from Blackfeet. An individual certification request must follow the requirements outlined in 40 CFR 121.5 of EPA's CWA § 401 Certification Rule, effective September 11, 2020.

iii. Copies of this certification should be kept on the job site and readily available for reference.

iv. If the project is constructed and/or operated in a manner not consistent with the applicable NWP, general conditions, or regional conditions, the permittee may be in violation of this certification.

v. Blackfeet and EPA representatives may inspect the authorized activity and any mitigation areas to determine compliance with the terms and conditions of the NWP.

vi. This NWP Reissuance does not reduce Tribal authority under any other rule.

vii. The project, including any stream relocations and restoration, must be built as shown and as otherwise described in the application, the construction plans, cross sections, mitigation plans and other supporting documents submitted to this office. Impacts to aquatic systems and restoration efforts will be monitored by an appropriate aquatic resource professional to ensure that disturbed areas are restored to at least their original condition.

viii. All existing water uses will be fully maintained during and after the completion of the project. (If applicable)

ix. Where practicable, perform all in-channel and wetland work during periods of low flow or drawn—down or when dry

x. Equipment staging areas must be located out of all delineated wetlands

xi. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during and immediately after construction, and all exposed soil and other fills, as well as any work below the ordinary high-water mark or in a wetland, must be permanently stabilized as soon as possible

xii. Materials such as piling, culverts, sandbags, fabric, mats, timbers used for temporary facilities in wetlands or below the high- water mark of Waters of the US must be free from oil, gas, excess dirt, loose paint and other pollutants.

xiii. Equipment staging areas in wetlands or in stream or river channels must be placed on mats, or other measures must be taken to minimize soil disturbance and compaction.

xiv. Clearing of riparian or wetland vegetation for the sole purpose of constructing work bridges, detours, staging areas or other temporary facilities must be limited to the absolute minimum necessary. When temporary impacts to native riparian or wetland vegetation are unavoidable, it must be mowed or cut above ground with the topsoil and root mass left intact.

xv. Remove all temporary fills and structures in the entirety when they are no longer needed. Restore affected areas to the appropriate original and planned contours where possible. Re-vegetate disturbed areas with appropriate native species when native species are impacted.

xvi. Construction methods and best management practices (BMPs) must minimize aquatic resource impacts to the maximum extent possible. Any BMPs described in the Joint Application must be followed. BMPs should include installation and maintenance of sediment control measures; separation, storage and reuse of any topsoil; and recovery of all disturbed areas where possible. All best management practices must in place prior to the onset of construction or as soon as practicable during the construction process.

xvii. Best available technology and/or best management practices must be utilized to protect existing water uses and maintain turbidity and sedimentation at the lowest practical level.

xviii. Applicant/contractor should manage disturbed streambank topsoil in a manner that optimizes plant establishment for the site.

xix. When operating equipment or otherwise undertaking construction in wetlands and water bodies the following conditions apply:

(a) Work should be done in dry conditions if possible.

(b) All equipment is to be inspected for oil, gas, diesel, anti-freeze, hydraulic fluid or other petroleum leaks. All such leaks will be properly repaired and equipment cleaned prior to being allowed on the project site. Leaks that occur after the equipment is moved to the project site will be fixed the same day or the next day or removed from the project area. The equipment is not allowed to continue operation once a leak is discovered.

(c) All equipment is to be inspected and cleaned before and after use to minimize the spread or introduction of invasive or undesirable species.

(d) Construction equipment shall not operate below the existing water surface except as follows:

- Impacts from construction should be minimized through the use of best management practices submitted in the permit application.
- Essential work below the waterline shall be done in a manner to minimize impacts to aquatic system and water quality.

(e) Containment booms and/or absorbent material must be available onsite. Any spills of petroleum products must be reported to the Army Corps, Blackfeet Nation BEO Office and the US EPA within 24 hours.

xx. Upland, riparian and in-stream vegetation should be protected except where its removal is necessary for completion of work. Revegetation should be completed as soon as possible. Applicant/contractor should revegetate disturbed soil in a manner that optimizes plant establishment for the site. Revegetation must include topsoil replacement, planting, seeding, fertilization, liming and weed-free mulching as necessary. Applicant must use native plant material and soils where appropriate and feasible. This certification does not allow for the introduction of non-native flora and fauna. All disturbed surface areas must be restored to pre-construction contours and elevation.

xxi. Spoils piles should not be placed or stored within the delineated wetlands or streams unless protected by a temporary structure designed to divert and handle high flows that can be anticipated during permit activity. Spoils piles should be placed on landscaping fabric or some other material to separate spoils material and allow retrieval of spoils material with minimal impact.

xxii. Impacts to wetlands shall not exceed 4.92 acres.

xxiii. Any unexpected and additional impacts to waters of the US should be reported to the

xxiv. Army Corps, Blackfeet Environmental Office Water Quality Coordinator and the US EPA.

xxv. All instream and stream channel reconstruction work must be completed before the stream is diverted into the new channel.

xxvi. Any temporary crossings, bridge supports, cofferdams, or other structures that are necessary during permit activity should be designed to handle high flows that can be anticipated during permit activity. All temporary structures should be completely removed from the water body at the conclusion of the permitted activity and the area restored to a natural function and appearance.

xxvii. The certification does not authorize any unconfined discharge of liquid cement into the waters of the United States. Grouting riprap must occur under dry conditions with no exposure of wet concrete to the water body.

xxviii. BMPs shall include application of certified weed-free straw or hay across all disturbed wetland areas that are temporarily impacted; installation and maintenance of sediment control measures during construction and if necessary, after construction is completed; use of heavy mud mats if necessary; separation,

storage and reuse of all streambank topsoil and wetland topsoil, as appropriate; and recovery of all disturbed wetland and streambank areas where possible. All conditions set by the Blackfeet Tribe and US Army Corps must be followed.

xxix. All applicants, including federal agencies, must notify EPA and the Blackfeet Environmental Office of the use of all NWPs for which certification has been granted prior to commencing work on the project. Notifications must include:

(a) project location (lat. Long., exact point on map);

(b) NWP that will be used and the specific activity that will be authorized under the NWP;

(c) amount of permanent and temporary fills;

(d) a short summary of the proposed activity, and all other federal, state, tribal or local permits or licenses required for the project;

(e) complete contact information of both the applicant and contractor (name, name of the company or property if applicable, telephone, mobile, and email); and,

(f) Summary of best management practices that will be used.

(g) A summary of communications with the affected Tribe's water quality staff regarding the project, including any concerns or issues.

(h) Notify Blackfeet and EPA at least 7 days before the completion of construction and operations begin.

xxx. Point source discharges may not occur: (1) in fens, bogs or other peatlands; (2) within 100 feet of the point of discharge of a known natural spring source; or (3) hanging gardens.

xxxi. Except as specified in the application, no debris, silt, sand, cement, concrete, oil or petroleum, organic material, or other construction related materials or wastes shall be allowed to enter into or be stored where it may enter into waters of the U.S.

xxxii. Silt fences, straw wattles, and other techniques shall be employed as appropriate to protect waters of the U.S. from sedimentation and other pollutants.

xxxiii. Water used in dust suppression shall not contain contaminants that could violate water quality standards.

xxxiv. Erosion control matting that is either biodegradable blankets or loose-weave mesh must be used to the maximum extent practicable.

xxxv. All equipment used in waters of the U.S. must be inspected for fluid leaks and invasive species prior to use on a project. All fluid leaks shall be repaired and cleaned prior to use or when discovered, or if the fluid leak can't be repaired, the equipment shall not be used on site. Equipment used in waters with the possibility of aquatic nuisance species infestation must be thoroughly cleaned and effectively decontaminated before they are used on the project.

xxxvi. Vegetation should be protected except where its removal is necessary for completion of the work. Locations disturbed by construction activities should be revegetated with appropriate native vegetation in a manner that optimizes plant establishment for the specific site.

xxxvii. Revegetation may include topsoil replacement, planting, seeding, fertilization, liming, and weed-free mulching, as necessary. Where practical, stockpile weed- seed-free topsoil and replace it on disturbed areas. All revegetation materials, including plants and plant seed shall be on site or scheduled for delivery prior to or upon completion of the earth moving activities.

xxxviii. Activities may not result in any unconfined discharge of liquid cement into waters of the U.S. Grouting riprap must occur under dry conditions with no exposure of wet concrete to the waterbody.

xxxix. Activities that may result in a point source discharge shall occur during seasonal low flow or no flow periods to the extent practicable.

xl. The placement of material (discharge) for the construction of new dams is not certified, except for stream restoration projects.

xli. Any decision-maker that is required under 7.0 of the CGP to prepare a Stormwater Pollution Prevention Plan (SWPPP), must submit an electronic copy of the SWPPP to the Blackfeet Environmental Office at least 30 days before construction starts for review and approval. Any modifications to the SWPPP should be submitted to the Blackfeet Environmental Office.

xlii. Any Decision-maker required under Part 1.4 of the CGP to submit a Notice of Intent (NOI) to EPA for coverage under the CGP, must submit a copy of the NOI to the Blackfeet Environmental Office within three business days of submittal to EPA. Additionally, a copy of the Notice of Termination (NOT) must be provided within three business days after electronic confirmation is received from EPA that the NOT has been accepted. The NOI and NOT must be provided to the following address Gerald Wagner, Blackfeet Environmental Office Director.

62 Hospital Drive, Browning, MT 59417

beo.director@gmail.com

b. Fort Peck Tribes.

i. Any Decision-maker required under Part 1.4 of the CGP to submit a Notice of Intent (NOI) to EPA for coverage under the CGP, must submit a copy of the NOI to the Fort Peck Tribes Office of Environmental Protection within three business days of submittal to EPA. Additionally, a copy of the Notice of Termination (NOT) must be provided within three business days after electronic confirmation is received from EPA that the NOT has been accepted. The NOI and NOT must be provided to the following address:

Martina Wilson, Office of Environmental Protection Director

501 Medicine Bear Rd Poplar, MT 59255

martinawilson@fortpecktribes.net

ii. Any Decision-maker that is required under Part 7.0 of the CGP to prepare a Stormwater Pollution Prevention Plan (SWPPP), must submit an electronic copy of the SWPPP to the Fort Peck Tribes Office of Environmental Protection at least 30 days before construction starts for review and approval. Any modifications to the

SWPPP should be submitted to the Fort Peck Tribes Office of Environmental Protection.

iii. Any Decision-maker that is required under Part 8.0 of the CGP to submit a weekly, bi-weekly, and/or annual report to EPA, must submit an electronic copy of the annual report to the Fort Peck Tribes Office of Environmental Protection within three business days after submittal to EPA.

9.9 EPA REGION 9

9.9.1 CAR10I000 Indian country within the State of California

a. Morongo Band of Mission Indians

i. A copy of the Stormwater Pollution Prevention Plan (SWPPP) must be submitted (either mailed or electronically) to the MEPD no less than thirty (30) days before commencing construction activities:

Morongo Band of Mission Indians
Environmental Protection Department
12700 Pumarra Road
Banning, CA 92220
Email: epd@morongo-nsn.gov

ii. Copies of the Notice of Intent (NOI) and the Notice of Termination (NOT) must be sent to the MEPD at the same time they are submitted to EPA.

iii. Operators of an "emergency-related project" must submit notice to the MEPD within twenty- four (24) hours after commencing construction activities.

iv. Spills, leaks, or unpermitted discharges must be reported to the MEPD within twenty-four (24) hours of the incident, in addition to the reporting requirements of the CGP.

v. Projects utilizing cationic treatment chemicals (as defined in Appendix A of the CGP) within the Morongo Reservation are not eligible for coverage under this certification of the CGP.

vi. Facilities covered under the CGP will be subject to compliance inspections by MEPD staff, including compliance with final site stabilization criteria prior to submitting an NOI ***[EPA assumes this intended to refer to an NOT]***.

9.9.2 GUR100000 Island of Guam

a. For purposes of this Order, the term "Project Proponent" shall mean U.S. Environmental Protection Agency, and its agents, assignees, and contractors.

b. For purposes of this Order, the permit "Operator" shall mean any party associated with a construction project that meets either of the following two criteria:

i. The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications (e.g. in most cases this is the owner of the site); or

ii. The party has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the permit; in most cases this is the general contractor of the project).

Subcontractors generally are not considered operators for the purposes of this permit.

c. The Project Proponent shall enforce the proposed 2022 CGP and ensure that the Operator complies with the conditions of the permit at all times.[107] (40 CFR §121.11(c))

d. All submittals required by this Order shall be sent to the Guam Environmental Protection Agency Attn: 401 Federal Permit Manager, Non-Point Source Program, EMAS Division, 3304 Mariner Avenue, Bldg. 17-3304, Barrigada, Guam 96913, AND via email to jesse.cruz@epa.guam.gov. The submittals shall be identified with WQC Order #2021- 04 and include the COP Permit Number, certifying representative's name, title, mailing address and phone number. (§51060)(4) 2017 GWQS)

e. A copy of the Operator's signed Stormwater Pollution Prevention Plan (SWPPP) and signed Notice of Intent (NOI) and Notice of Termination (NOT) submitted to EPA for review and approval, shall concurrently be submitted to Guam EPA, consistent with condition A4. Coordination with Guam EPA is encouraged when the receiving water(s) for the proposed discharge is/are being identified. (§10105.B.5.d.) GSESCR; (§51060)(4) 2017 GWQS)

f. The Operator must comply with the conditions and requirements set forth in 22 GAR 10, Guam Soil Erosion and Sediment Control Regulations (GSESCR).

g. Before submitting the NOT to EPA, Operators shall comply with GSESC regulations at §10105.B10. (Stabilization of Affected Areas) and §10107.B. {Final Inspection and Approval)

h. All operators/owners shall comply with the general design criteria for best management practices (BMPs) acceptable for meeting the Construction and Post-construction stormwater criteria in the 2006 CNMI and Guam Stormwater Management Manual. (E.O. 2012-02)

i. Operating reports and monitoring and analytical data (e.g. Discharge Monitoring Reports (DMRs), follow-up monitoring reports, Exceedance Reports for Numerical Effluent Limits, etc.) submitted to EPA shall be concurrently submitted to Guam EPA, consistent with condition A4. §51060)(4) 2017 GWQS

j. The Operators who install a sediment basin or similar impoundment shall maintain the storage capacity of five thousand cubic feet {5,000 cu. ft.) per acre of project area tributary to the basin. (§10105.B.5.i.) GSESCR

k. (1) This Order does not authorize EPA to qualify Rainfall Erosivity Waivers to stormwater discharges associated with small construction activities (i.e. 1-5 acres). Operators are required to apply for an NOI for those projects eligible for coverage under the proposed 2022 CGP. An Erosion and Sediment Control Plan is required for every site that would be covered by the proposed 2022 CGP. (22 GAR §10104) The average annual rainfall for Guam and the CNMI exceeds l00 inches per year in many locations. These climatic conditions combined with the region's unique limestone, volcanic geologic formations, sensitive water resources and significant land

[107] By incorporating this condition into the permit, EPA acknowledges receipt of Guam's certification conditions.

development forces make stormwater discharges a very significant environmental and economic issue. (2006 CNMJ/Guam Stormwater Management Manual) E.O. 2012-02

(2) This Order does not authorize EPA to approve a Sediment TMDL Waiver for the Ugum River. Operators of construction activities eligible for a TMDL Waiver in lieu of coverage under the proposed 2022 CGP, shall submit a complete and accurate waiver certification as described in C.2., Appendix C - (Small Construction Waivers) to Guam EPA per condition A4., prior to notifying EPA of its intention to obtain a waiver. §51060)(4) 2017 GWQS

l. The Project Proponent shall submit to Guam EPA a signed Statement of Understanding of Water Quality Certification Conditions.[108] (see Attachment A for an example) per condition A4. §51060)(4) 2017 GWQS

m. The Operator shall comply with applicable provisions of the Guam Pesticides Act of2007 (10 GCA Chapter 50) and implementing regulations at Title 22 GAR Chapter 15 for any use and application of pesticides.

n. Point source discharge(s) to waterbodies under the jurisdiction of Guam EPA must be consistent with the antidegradation policy in 22 GAR §510l(b).

o. The operator shall carry out construction activities in such a manner that will not violate Guam Water Quality Standards (GWQS). Proposed 2022 CGP discharges are prohibited as follows:

   i. In Marine Waters, Category M-1 Excellent 22 GAR Chapter 5 §5102(b)(l); and

   ii. In Surface Waters, Category S-1 High 22 GAR Chapter 5 §5102(c)(l)

p. In addition to complying with construction dewatering requirements in Part 2.4 and site inspection requirements for all areas where construction dewatering is taking place in Part 4 of the proposed 2022 CGP, Operators shall comply with all dewatering conditions and requirements set forth in 22 GAR 7, Water Resources Development and Operating Regulations, to include securing Guam EPA permits prior to any dewatering activities.

q. The Operator shall develop and implement a Spill Prevention and Containment Plan.

r. The Operator shall have adequate and appropriate spill response materials on hand to respond to emergency release of oil, petroleum or any other material into waters of the territory.

s. Any unpermitted discharge into territorial waters or onto land with a potential for entry into territorial waters, is prohibited. If this occurs, the Operator shall immediately take the following actions:

   i. Cease operations at the location of the violation or spill.

   ii. Assess the cause of the water quality problem and take appropriate measures to correct the problem and/or prevent further environmental damage.

   iii. Notify Guam EPA of the failure to comply. All petroleum spills shall be reported immediately to:

[108] By incorporating this condition into the permit, EPA acknowledges receipt of Guam's certification conditions.

(a) Guam's Emergency 911 system

(b) Guam EPA's 24-Hour Spill Response Team at (671) 888-6488 or during working hours (671) 300-4751

(c) US Coast Guard Sector Guam (671) 355-4824

(d) National Response Center 1-800-424-8802

iv. Submit a detailed written report to Guam EPA within five days of noncompliance that describes the nature of the event corrective action taken and/or planned, steps to be taken to prevent a recurrence, results of any samples taken, and any other pertinent information.

t. Compliance with this condition does not relieve the Operator from responsibility to maintain continuous compliance with the terms and conditions of this Order or the resulting liability from failure to comply.

u. Submittal or reporting of any of this information does not provide relief from any subsequent enforcement actions for unpermitted discharges to waters of the United States.

v. This Order is valid for five (5) Years from Date of Certification, unless otherwise approved by the Guam EPA Administrator.

w. The Operator shall be required to adhere to the current Guam Coral Spawning Moratorium dates for both hard and soft corals where in-water activities and/or construction activity in close proximity with marine waters may impair water quality. These dates can be obtained from the Guam Department of Agriculture, Division of Aquatic and Wildlife Resources, or the NOAA NMFS Pacific Islands Regional Office Habitat Conservation Division.

x. The Operator shall provide notice to Guam EPA consistent with Condition A4:

(a) Immediately upon discovery of noncompliance with the provisions of this Order.

y. A Notice of Violation/Work Stop Order will be issued if certification conditions are not adhered to or when significant or sustained water quality degradation occurs. Work or discharge shall be suspended or halted until the Operator addresses environmental problems/concerns to Guam EPA's satisfaction. Guam EPA may also levy penalties and fines (10 GCA §47111). Invalidity or enforceability of one or more provisions of this certification shall not affect any other provision of this certification.

9.10 EPA REGION 10

9.10.1 IDR10I000 Indian country within the State of Idaho, except Duck Valley Reservation lands (see Region 9)

a. **Shoshone-Bannock Tribes**

i. Copies of the following information must be sent to the SBT-WRD:

(a) Notice of Intents (NOI)

The Notice of Intent shall be forwarded to the SBT-WRD within thirty (30) days of receipt of submitting NOI to the USEPA.

Shoshone-Bannock Tribes Water Resources Department
PO Box 306 Pima Drive
Fort Hall, ID 83203 Phone: (208) 239-4582
Fax: (208) 239-4592
Or Email ctanaka@sbtribes.com

b. If requested by the SBT-WRD, the permittee must submit a copy of the SWPPP to SBT-WRD within fourteen (14) days of the request.

9.10.2 ORR10I000 Indian country within the State of Oregon, except Fort McDermitt Reservation lands (see Region 9)

a. Confederated Tribes of Coos, Lower Umpqua, and Siuslaw

i. No activities allowed under the CGP shall result in the degradation of any Tribal waters or affect resident aquatic communities or resident or migratory wildlife species at any life stage.

ii. The operator shall be responsible for achieving compliance with CTCLUSI Water Quality Standards and all other tribal codes, regulations, and laws as they exist at the time that the permit is submitted.

iii. The operator shall submit a copy of the Notice of Intent (NOI) to be covered by the general permit to the CTCLUSI Water Quality Program before, or at the same time as, it is submitted to EPA.

iv. The operator shall be responsible for submitting all Stormwater Pollution Prevention Plans (SWPPP) required under this general permit to the CTCLUSI Water Quality Program for review and determination that the SWPPP is sufficient to meet Tribal Water Quality Standards, prior to the beginning of any discharge activities taking place.

v. The operator shall be responsible for reporting an exceedance to Tribal Water Quality Standards to the CTCLUSI Water Quality Program at the same time it is reported to EPA.

vi. The THPO will be provided 30 days to comment on the APE as defined in the permit application.

vii. If the project is an undertaking, a cultural resource assessment must occur. All fieldwork must be permitted by the THPO (as appropriate), conducted by qualified personnel (as outlined by the Secretary of Interior's Standards and Guidelines; http://www.nps.gov/history/local-law/arch_stnds_O.htm) and documented according to Oregon Reporting Standards (Reporting_Guidelines.pdf) (oregon.gov). The resulting report must be submitted to the THPO and the THPO must concur with the finding of effect and recommendations before any ground disturbing work can occur. The THPO requires 30 days to review all reports.

viii. The operator must obtain THPO concurrence in writing. If historic properties are present, this written concurrence will outline measures to be taken to prevent or mitigate adverse effects to historic properties.

b. Confederated Tribes of the Umatilla Indian Reservation

i. The operator shall be responsible for achieving compliance with the

Confederated Tribes of the Umatilla Indian Reservation's (CTUIR) Water Quality Standards.

ii. The operator shall submit a copy of the Notice of Intent (NOI) to be covered by the general permit to the CTUIR Water Resources Program at the address below, at the same time it is submitted to EPA.

iii. The operator shall be responsible for submitting all Stormwater Pollution Prevention Plans (SWPPP) required under this general permit to the CTUIR Water Resources Program for review and determination that the SWPPP is sufficient to meet Tribal Water Quality Standards, prior to the beginning of any discharge activities taking place.

iv. The operator shall be responsible for reporting an exceedance to Tribal Water QualityStandards to the CTUIR Water Resources Program at the same time it is reported to EPA.

Confederated Tribes of the Umatilla Indian Reservation
Water Resources Program
46411 Timíne Way
Pendleton, OR 97801
(541) 429-7200

v. The THPO will be provided 30 days to comment on the APE as defined in the permit application.

vi. If the project is an undertaking, a cultural resource assessment must occur. All fieldwork must be permitted by the Tribal Historic Preservation Office (as appropriate), conducted by qualified personnel (as outlined by the Secretary of Interior's Standards and Guidelines; http://www.nps.gov/history/local-law/arch_stnds_0.htm) and documented according to Oregon Reporting Standards (Reporting_Guidelines.pdf (oregon.gov). The resulting report must be submitted to the THPO and the THPO must concur with the finding of effect and recommendations before any ground disturbing work can occur. The THPO requires 30 days to review all reports.

vii. The operator must obtain THPO concurrence in writing. If historic properties are present, this written concurrence will outline measures to be taken to prevent or mitigate adverse effects to historic properties.

9.10.3 WAR10F000 Areas in the State of Washington, except those located on Indian country, subject to construction activity by a Federal Operator

a. For purposes of this Order, the term "Project Proponent" shall mean those that are seeking coverage under this permit, and its agents, assignees and contractors.

b. The Federal Agency shall mean the US Environmental Protection Agency. The Federal Agency shall enforce the permit and ensure that the Project Proponent complies with the conditions of the permits at all times.

c. Failure of any person or entity to comply with this Certification may result in the issuance of civil penalties or other actions, whether administrative or judicial, to enforce the terms of this Certification.

d. The Certification conditions within this Order must be incorporated into EPA's final NPDES permit. Per 40 CFR 121.10(a), all certification conditions herein that satisfy the

requirements of 40 CFR 121.7(d) must be incorporated into the permit. Per 40 CFR 121.10(b), the permit must clearly identify all certification conditions.

e. This Certification does not authorize exceedances of water quality standards established in chapter 173-201A WAC.

f. Discharges from construction activity must not cause or contribute to violations of the Water Quality Standards for Surface Water of the State of Washington (chapter 173-201A WAC), Ground Water Quality Standards (chapter 173- 200 WAC), Sediment Management Standards (chapter 173-204 WAC), and standards in the EPA's Revision of certain Federal water quality criteria applicable to Washington (40 CFR 131.45). Discharges that do not comply with these standards are prohibited.

g. Prior to discharge of stormwater and non-stormwater to waters of the State, the Permittee must apply all known, available, and reasonable methods of prevention, control, and treatment (AKART). This includes the preparation and implementation of an adequate Stormwater Pollution Prevention Plan (SWPPP), with all appropriate Best Management Practices (BMPs) installed and maintained in accordance with the SWPPP and the terms and conditions of the permit.

i. BMPs must be consistent with:

(a) The Stormwater Management Manual for Western Washington (most current approved edition at the time this permit was issued), for sites west of the crest of the Cascade Mountains; or

(b) The Stormwater Management Manual for Eastern Washington (most current approved edition at the time this permit was issued), for sites east of the crest of the Cascade Mountains; or

(c) Revisions to either manual, or other stormwater management guidance documents or manuals which provide equivalent level of pollution prevention, that are approved by Ecology and incorporated into this permit in accordance with the permit modification requirements of WAC 173-226-230. (For purposes of this section, the stormwater manuals listed in Appendix 10 of the Phase I Municipal Stormwater Permit are approved by Ecology); or

(d) Documentation in the SWPPP that the BMPs selected provided an equivalent level of pollution prevention, compared to the applicable stormwater management manuals, including:

- The technical basis for the selection of all stormwater BMPs (scientific, technical studies, and/or modeling) that support the performance claims for the BMPs being selected.
- An assessment of how the selected BMP will satisfy AKART requirements and the applicable federal technology-based treatment requirements under 40 CFR part 125.3.

The Stormwater Management Manuals for Eastern and Western Washington can be found at: https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-permittee-guidance-resources/Stormwater-manuals.

ii. An adequate SWPPP must include a narrative and drawings. All BMPs must be clearly referenced in the narrative and marked on the drawings. The SWPPP

narrative must include documentation to explain and justify the pollution prevention decisions made for the project. Documentation must include:

(a) Information about existing site conditions (topography, drainage, soils, vegetation, etc.).

(b) Potential erosion problem areas.

(c) The 13 elements of a SWPPP, including BMPs used to address each element. Unless site conditions render the element unnecessary and the exemption is clearly justified in the SWPPP, the 13 elements are as follows:

- Preserve Vegetation/Mark Clearing Limits
- Establish Construction Access
- Control Flow Rates
- Install Sediment Controls
- Stabilize Soils
- Protect Slopes
- Protect Drain Inlets
- Stabilize Channels and Outlets
- Control Pollutants
- Control Dewatering
- Maintain BMPs
- Manage the Project
- Protect Low Impact Development (LID) BMPs

h. Discharges of stormwater and authorized non-stormwater must be monitored for turbidity (or transparency) and, in the event of significant concrete work or engineered soils, pH must also be monitored. As applicable based on project specifics, monitoring, benchmarks, and reporting requirements contained in Condition S.4. (pp.10-16) of the Washington State Construction Stormwater General Permit, effective January 1, 2021, shall apply.

i. Discharges to segments of waterbodies listed as impaired by the State of Washington under Section 303(d) of the Clean Water Act for turbidity, fine sediment, phosphorus, or pH must comply with the following numeric effluent limits:

Parameter identified in 303(d) listing	Parameter Sampled	Unit	Analytical Method	Numeric Effluent Limit
• Turbidity • Fine Sediment • Phosphorus	Turbidity	NTU	SM2130	25 NTUs at the point where the stormwater is discharged from the site.
High pH	pH	su	pH meter	In the range of 6.5 – 8.5

All references and requirements associated with Section 303(d) of the Clean Water Act mean the most current EPA-approved listing of impaired waters that exists on the

effective date of the permit, or the date when the operator's complete permit application is received by EPA, whichever is later.

The EPA approved WQ Assessment can be found at: https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-improvement/Assessment-of-state-waters-303d

j. Discharges to a waterbody that is subject to a Total Maximum Daily Load (TMDL) for turbidity, fine sediment, high pH, or phosphorus must be consistent with the TMDL.

- **i.** Where an applicable TMDL sets specific waste load allocations or requirements for discharges covered by this permit, discharges shall be consistent with any specific waste load allocations or requirements established by the applicable TMDL.
- **ii.** Where an applicable TMDL has established a general waste load allocation for construction stormwater discharges, but no specific requirements have been identified, compliance with this permit will be assumed to be consistent with the approved TMDL.
- **iii.** Where an applicable TMDL has not specified a waste load allocation for construction stormwater discharges, but has not excluded these discharges, compliance with this permit will be assumed to be consistent with the approved TMDL.
- **iv.** Where an applicable TMDL specifically precludes or prohibits discharges from construction activity, the operator is not eligible for coverage under this permit.

Applicable TMDL means a TMDL for turbidity, fine sediment, high pH, or phosphorus which has been completed and approved by EPA as of the effective date of the permit, or prior to the date of the operator's complete application for permit coverage is received by EPA, whichever is later.

k. Discharges to waters of the state from the following activities are prohibited:

- **i.** Concrete wastewater.
- **ii.** Wastewater from washout and clean-up of stucco, paint, form release oils, curing compounds and other construction materials.
- **iii.** Process wastewater as defined by 40 Code of Federal Regulations (CFR) 122.2.
- **iv.** Slurry materials and waste from shaft drilling, including process wastewater from shaft drilling for construction of building, road, and bridge foundations unless managed to prevent discharge to surface water.
- **v.** Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance.
- **vi.** Soaps or solvents used in vehicle and equipment washing.
- **vii.** Wheel wash wastewater, unless managed to prevent discharge to surface water.
- **viii.** Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, unless managed according to appropriate controls described within the permit.

l. This Certification is valid until the expiration date including any administrative extension or termination date of the NPDES 2022 Construction General Permit. (40 CFR § 122.46)

m. The Federal Agency shall enforce and the Project Proponent must comply with all the reporting and notification conditions of the NPDES 2022 Construction General Permit in order to comply with this Order and the certification conditions herein (40 CFR § 121.11).

n. You have a right to appeal this Order to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this Order. The appeal process is governed by chapter 43.21B RCW and chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do all of the following within 30 days of the date of receipt of this Order:

- File your appeal and a copy of this Order with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this Order on Ecology in paper form - by mail or in person (see addresses below). E-mail is not accepted.

You must also comply with other applicable requirements in chapter 43.21B RCW and chapter 371-08 WAC.

ADDRESS AND LOCATION INFORMATION

Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503 **Pollution Control Hearings Board** 1111 Israel RD SW STE 301 Tumwater, WA 98501	**Department of Ecology** Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608 **Pollution Control Hearings Board** PO Box 40903 Olympia, WA 98504-0903

CONTACT INFORMATION

Please direct all questions about this Order to:

Noel Tamboer
Department of Ecology
P.O. Box 47600
Olympia, WA 98503-7600

(360) 701-6171
noel.tamboer@ecy.wa.gov

9.10.4 WAR10I000 Indian country within the State of Washington

a. Lummi Nation

i. This certification does not exempt and is provisional upon compliance with other applicable statutes and codes administered by federal and Lummi tribal agencies. Pursuant to Lummi Code of Laws (LCL) 17.05.020(a), the operator must also obtaina land use permit from the Lummi Planning Department as provided in Title 15 of theLummi Code of Laws and regulations adopted thereunder.

ii. Pursuant to LCL 17.05.020(a), each operator shall develop and submit a Storm WaterPollution Prevention Plan to the Lummi Water Resources Division for review and approval by the Water Resources Manager prior to beginning any discharge activities.

iii. Pursuant to LCL Title 17, each operator shall be responsible for achieving compliance with the Water Quality Standards for Surface Waters of the Lummi

iv. Indian Reservation (Lummi Administrative Regulations [LAR] 17 LAR 07.010 through 17 LAR 07.210 together with supplements and amendments thereto).

v. Each operator shall submit a signed copy of the Notice of Intent (NOI) to the Lummi Water Resources Division at the same time it is submitted electronically to the Environmental Protection Agency (EPA) and shall provide the Lummi Water Resources Division the acknowledgement of receipt of the NOI from the EPA and the associated NPDES tracking number provided by the EPA within 7 calendar days of receipt from the EPA.

vi. Each operator shall submit a signed copy of the Notice of Termination (NOT) to the Lummi Water Resources Division at the same time it is submitted electronically to the EPA and shall provide the Lummi Water Resources Division the EPA acknowledgement of receipt of the NOT.

vii. Storm Water Pollution Prevention Plans, Notice of Intent, Notice of Termination and associated correspondence with the EPA shall be submitted to:

Lummi Natural Resources Department
ATTN: Water Resources Manager 2665 Kwina Road
Bellingham, WA 98226-9298

b. Port Gamble S'Klallam Tribe

i. No discharge from the project site shall cause exceedances of Port Gamble S'KlallamSurface Water Quality Standards narrative or numeric criteria in Tribal waters. This includes activities outside of Tribal lands that occur upstream of Tribal waters.

(a) If any exceedance of these water quality standards occurred, the Natural Resources Department shall be notified immediately.

- The Department shall additionally be provided a complete draft of the proposed corrective action within a reasonable timeframe and its approval will be required before any corrective action may be taken.

Operators performing activities under the CGP that may affect Tribal waters will requirea permit and shall submit their plans to the Port Gamble S'Klallam Natural Resources Department for review.

- The Department has the right to require conditions outside of this Water QualityCertification prior to permit approval.

iii. No activities allowed under the CGP shall result in the degradation of any Tribal watersor change in designated uses.

iv. No activities allowed under the CGP shall affect resident aquatic communities or resident/migratory wildlife species at any life stage.

- Biological assessment methods used to determine the effect of an activity allowedunder the CGP shall be approved by the PGST Natural Resources Department.

v. No activities allowed under the CGP shall be conducted within wetland and stream bufferzones, nor shall said activities affect in any way wetland or stream buffers, as defined by *PGST Law and Order Code 24.08.01(c).*

vi. Concentrations for substances listed within the table in *Water Quality Standards for Surface Waters* sec. 7(7) shall not be exceeded by activities allowed under the CGP.

c. **Spokane Tribe of Indians**

i. Pursuant to Tribal Law and Order Code (TLOC) Chapter 30 each operator shall be responsible for achieving compliance with the Surface Water Quality Standards of the Spokane Tribe. The operator shall notify the Spokane Tribe, Water Control Board (WCB) of any spills of hazardous material and;

ii. Each operator shall submit a signed hard copy of the Notice of Intent (NOI) to the WCB at the same time it is submitted to EPA.

iii. The permittee shall allow the Tribal Water Control Board or its designee to inspect and sample at the construction site as needed.

iv. Each operator shall submit a signed copy of the Notice of Termination (NOT) to the WCB at the same time it is submitted to EPA

The correspondence address for the Spokane Tribe Water Control Board is:

Water Control Board c/o Brian Crossley PO Box480
Wellpinit WA 99040
(509)626-4409
crossley@spokanetribe.com

d. **Swinomish Tribe**

i. Owners and operators seeking coverage under this permit must submit a copy of the Notice of Intent (NOI) to the DEP at the same time the NOI is submitted to EPA.

ii. Owners and operators must also submit to the DEP changes in NOI and/or Notices of Termination at the same time they are submitted to EPA.

iii. Owners and operators seeking coverage under this permit must also submit a Stormwater Pollution Prevention Plan to the DEP for review and approval by DEP prior to beginning any discharge activities.

e. **Tulalip Tribes**

i. Submission of NOI: Copies of the Notice of Intent (NOI),) Certification shall be submitted to the Tribe's Natural Resources Department to notify the Tribes of the

pending project and in order for the Tribes to review the projects potential impacts to endangered or threatened species.

ii. Submission of SWPPP: A copy of the Stormwater Pollution Plans (SWPPPs) shall be submitted to the Tribe's Natural Resources Department along with the NOI during the 30 day waiting period.

iii. Submission of Monitoring Data and Reports: The results of any monitoring required by this permit and reports must be sent to the Tribe's Natural Resources Depa1tment,

iv. The Tulalip Tribes are federally recognized successors in the interest to the Snohomish, Snoqualmie, Skykomish, and other allied tribes and bands signatory to the Treaty of Point Elliott.

v. including a description of the corrective actions required and undertaken to meet effluent limits or benchmarks (as applicable).

vi. Authorization to Inspect: The Tribe's Natural Resources Department may conduct an inspection of any facility covered by this permit to ensure compliance with tribal water quality standards. The Department may enforce its certification conditions.

vii. Submission of Inspection Reports: Inspection reports must be sent to the Tribe's Natural Resources Department, including a description of the corrective actions required and undertaken to meet effluent limits or benchmarks (as applicable).

viii. Permits on-site: A copy of the pe1mit shall be kept on the job site and readily available for reference by the construction supervisor, construction managers and foreman, and Tribal inspectors.

ix. Project Management: The applicant shall ensure that project managers, construction managers and foreman, and other responsible parties have read and understand conditions of the permit, this certification, and other relevant documents, to avoid violations or noncompliance with this certification.

x. Emergency Spill Notification Requirements: In the event of a spill or the contractor shall immediately take action to stop the violation and correct the problem, and immediately repo1t spill to the Tulalip Tribes Police Department (425) 508-1565. Compliance with this condition does not relieve the applicant from responsibility to maintain continuous compliance with the tem1S and conditions of this certification or the resulting liability from failure to comply.

xi. Discharges to CERCLA Sites: This permit does not autho1ize direct stormwater discharges to certain sites undergoing remedial cleanup actions pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) unless first approved by the appropriate EPA Regional office. In the case of the Tulalip Landfill site (WAD980639256), the Tulalip Tribes also requests notification by the facility and consultation with EPA prior to discharge. Contaminants at this site may include but are not limited to: dioxins, furans, arsenic, copper, lead, zinc, 4- methyl-phenol, Hex-CB, HPAHs, PCBs, PCE, cadmium, mercury, and LPAHs.

xii. Discharge-related Activities that have Potential to Cause an Adverse Effect on Historic Properties: Installation of stormwater controls that involve subsurface disturbances may potentially have an adverse impact on historic properties.

xiii. Procedures detailed in the permit shall be completed. Richard Young, of the Tulalip Tribe's Cultural Resources Department shall be contacted prior to initiating discharge- related activities that may have an impact on historic properties. His contact information is (360) 716-2652, ryoung@tulaliptribes-nsn.gov.

xiv. Invalidation: This certification will cease to be valid if the project is constructed and/or operated in a manner not consistent with the project description contained in

xv. the permit. This certification will also cease to be valid and the applicant must reapply with an updated application if info1mation contained in the permit is voided by subsequent submittals.

xvi. Modification: Nothing in this certification waives the Tulalip Tribes of Washington's authority to issue modifications to this ce1iification if additional impacts due to operational changes are identified, or if additional conditions are necessary to protect water quality or further protect the Tribal Communities interest.

xvii. incorporation by reference: TI1is certification does not exempt the applicant from compliance with other statues and codes administered by the Tribes, county, state and federal agencies.

xviii. Compliance with Tribe's I996 Water Quality Standards: Each permittee shall be responsible for controlling discharges and achieving compliance with the T1ibe's Water Quality Standards.

xix. Compliant with Tulalip Tribes Tidelands Management Policy: Permittee shall be responsible for achieving compliance with applicable sections of the Tulalip Tribe's Tidelands Management Policy. (Tulalip Tribal Code Title 8 Chapter 8.30).

xx. Compliant with Tulalip Tribes Environmental Infractions: Permittee shall be responsible for achieving compliance with applicable sections of the Tulalip Tribe's Environmental Infractions. (Tulalip Tribal Code Title 8 Chapter 8.20).

xxi. Where to Submit information and for further Coordination: All requested documents should be sent to the: Tulalip Tribes Natural Resources Environmental Department c/o Kurt Nelson and Valerie Streeter, 6704 Marine Drive, Tulalip, Washington 98271. For further 40 I Certification coordination with the Tulalip Tribes Natural Resources Department, please contact Mr. Kurt Nelson (360) 716-4617 knelson@tu1aliptribes- nsn.gov. 6406 Marine Dr., Tulalip WA 98271.

f. Makah Tribe

i. The permittee shall be responsible for meeting any additional permit requirements imposed by EPA necessary to comply with the Makah Tribe's Water Quality Standards if the discharge point is located within the Makah's U&A treaty reserved areas.

ii. Each permittee shall submit a copy of the Notice of Intent (NOI) to be covered by the general permit to Makah Fisheries Management, Water Quality Department at the address listed below at the same time it is submitted to the EPA.

Makah Water Quality
Makah Fisheries Management (MFM)
ray.colby@makah.com

PO Box 115

Neah bay, WA 98357

iii. All supporting documentation and certifications in the NOI related to coverage under the general permit for Endangered Species Act purposes shall be submitted to the Tribe's Habitat programs for their review.

iv. If EPA requires coverage under an individual or alternative permit, the permittee shall submit a copy of the permit to Assistant Fisheries Director, ray.colby@makah.com.

v. The permittee shall submit all Stormwater Pollution Prevention plan (SWPP) to MFM for review and approval prior to beginning any activities resulting in a discharge to Makah tribal waters.

vi. The permittee shall notify Ray Colby, ray.colby@makah.com (360) 645-3150 prior to conducting inspections at construction sites generating stormwater discharges to tribal waters.

vii. The operator shall treat dewatering discharges with controls necessary to minimize discharges of pollutants to surface waters, or ground waters, and from stormwater runoff onsite from excavations, trenches, foundations, or storage areas. To the extent feasible, at all points where dewatering is discharged, comply with the velocity dissipation using check dams, sediment traps, and grouted outlets.

g. Puyallup Tribe of Indians

i. The permittee shall be responsible for meeting any additional permit requirements imposed by EPA necessary to comply with the Puyallup Tribe's antidegradation procedures.

ii. Each permittee shall submit a copy of the Notice of Intent (NOI) to be covered by the general permit to Char Naylor, Tribal Water Quality Manager at the following e-mail address: (char.naylor@puyalluptribe-nsn.gov) at the same time it is submitted to EPA.

iii. All supporting documentation and certifications in the NOI related to coverage under the general permit for Endangered Species Act purposes shall be submitted to Char Naylor, Tribal Water Quality Manager/Assistant Fisheries Director (char.naylor@puyalluptribe-nsn.gov) for review.

iv. If EPA requires coverage under an individual or alternative permit, the permittee shall submit a copy of the permit to Char Naylor at the email address listed above.

v. The permittee shall submit all stormwater pollution prevention plans to Char Naylor for review and approval prior to beginning any activities resulting in a discharge to Puyallup tribal waters.

vi. The permittee shall contact Brandon Reynon (Brandon.reynon@puyalluptribe-nsn-gov), Tribe's Historic Preservation Officer or Jennifer Keating (Jennifer.keating@puyalluptribe-nsn.gov), Tribe's Assistant Historic Preservation Officer regarding historic properties and cultural resources.

vii. To minimize the discharge of pollutants to groundwater or surface waters from stormwater that is removed from excavations, trenches, foundations, vaults, or

other storage areas, treat dewatering discharges with controls necessary to minimize discharges of pollutants. Examples of appropriate controls include sediment basins or sediment traps, sediment socks, dewatering tanks, tube settlers, weir tanks, and filtration systems (e.g., bag or sand filters) that are designed to remove sediment.

To the extent feasible, utilize vegetated, upland areas of the site to infiltrate dewatering water before discharge. At all points where dewatering water is discharged, utilize velocity dissipation controls. Examples of velocity dissipation devices include check dams, sediment traps, riprap, and grouted riprap at outlets.

viii. The permittee shall provide and maintain natural buffers to the maximum extent possible (and/or equivalent erosion and sediment controls) when tribal waters are located within 100 feet of the boundaries. If infeasible to provide and maintain an undisturbed 100 foot natural buffer, erosion and sediment controls to achieve the sediment load reduction equivalent to a 100-foot undisturbed natural buffer shall be required.

APPENDIX C – NOI and EPA Authorization Email

APPENDIX D – Inspection Form

Project Name: _____
NPDES ID Number: _____

Section A – General Information (If necessary, complete additional inspection reports for each separate inspection location.)	
Inspector Information	
Inspector Name:	**Title:**
Company Name:	**Email:**
Address:	**Phone Number:**
Inspection Details	
Inspection Date:	**Inspection Location:**
Inspection Start Time:	**Inspection End Time:**
Current Phase of Construction:	**Weather Conditions During Inspection:**

Did you determine that any portion of your site was unsafe for inspection per CGP Part 4.5? ☐ Yes ☐ No

If "Yes," provide the following information:

Location of unsafe conditions:

The conditions that prevented you inspecting this location:

Indicate the required inspection frequency: (Check all that apply. You may be subject to different inspection frequencies in different areas of the site.)

Standard Frequency (CGP Part 4.2):

☐ At least once every 7 calendar days; **OR**

☐ Once every 14 calendar days *and* within 24 hours of the occurrence of either:

- A storm event that produces 0.25 inches or more of rain within a 24-hour period, or
- A snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period

Increased Frequency (CGP Part 4.3.1) (If site discharges to sediment or nutrient-impaired waters or to waters designated as Tier 2, Tier 2.5, or Tier 3):

☐ Once every 7 calendar days *and* within 24 hours of the occurrence of either:

- A storm event that produces 0.25 inches or more of rain within a 24-hour period, or
- A snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period

Reduced Frequency (CGP Part 4.4):

- ☐ For stabilized areas: Twice during first month, no more than 14 calendar days apart; then once per month after first month until permit coverage is terminated
- ☐ For stabilized areas on "linear construction sites": Twice during first month, no more than 14 calendar days apart; then once more within 24 hours of the occurrence of either:
  - A storm event that produces 0.25 inches or more of rain within a 24-hour period, or
  - A snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period
- ☐ For arid, semi-arid, or drought-stricken areas during seasonally dry periods or during drought: Once per month and within 24 hours of the occurrence of either:
  - A storm event that produces 0.25 inches or more of rain within a 24-hour period, or
  - A snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period
- ☐ For frozen conditions where construction activities are being conducted: Once per month

Was this inspection triggered by a storm event producing 0.25 inches or more of rain within a 24-hour period? ☐ Yes ☐ No

If "Yes," how did you determine whether the storm produced 0.25 inches or more of rain?

- ☐ On-site rain gauge
- ☐ Weather station representative of site.
  Weather station location:

Total rainfall amount that triggered the inspection (inches):

Was this inspection triggered by a snowmelt discharge from a storm event producing 3.25 inches or more of snow within a 24-hour period? ☐ Yes ☐ No

If "Yes," how did you determine whether the storm produced 3.25 inches or more of snow?

- ☐ On-site rain gauge
- ☐ Weather station representative of site.
  Weather station location:

Total snowfall amount that triggered the inspection (inches):

Project Name: _____
NPDES ID Number: _____

Section B – Condition and Effectiveness of Erosion and Sediment (E&S) Controls (CGP Part 2.2) (Insert additional rows if needed)					
Type and Location of E&S Control	**Conditions Requiring Routine Maintenance?[1]**	**If "Yes," How Many Times (Including This Occurrence) Has This Condition Been Identified?**	**Conditions Requiring Corrective Action?[2, 3]**	**Date on Which Condition First Observed (If Applicable)?**	**Description of Conditions Observed**
1.	☐ Yes ☐ No		☐ Yes ☐ No		
2.	☐ Yes ☐ No		☐ Yes ☐ No		
3.	☐ Yes ☐ No		☐ Yes ☐ No		
4.	☐ Yes ☐ No		☐ Yes ☐ No		
5.	☐ Yes ☐ No		☐ Yes ☐ No		
If the same routine maintenance was found to be necessary three or more times for the same control at the same location (including this occurrence), follow the corrective action requirements and record the required information in your corrective action log, or describe here why you believe the specific condition should still be addressed as routine maintenance:					

[1] Routine maintenance includes minor repairs or other upkeep performed to ensure that the site's stormwater controls remain in effective operating condition, not including significant repairs or the need to install a new or replacement control. Routine maintenance is also required for specific conditions: (1) for perimeter controls, whenever sediment has accumulated to half or more the above-ground height of the control (CGP Part 2.2.3.c.i); (2) where sediment has been tracked-out from the site onto paved roads, sidewalks, or other paved areas (CGP Part 2.2.4.d); (3) for inlet protection measures, when sediment accumulates, the filter becomes clogged, and/or performance is compromised (CGP Part 2.2.10.b); and (4) for sediment basins, as necessary to maintain at least half of the design capacity of the basin (CGP Part 2.2.12.f)

[2] Corrective actions are triggered only for specific conditions (CGP Part 5.1):

1. A stormwater control needs a significant repair or a new or replacement control is needed, or, in accordance with Part 2.1.4.c, you find it necessary to repeatedly (i.e., three (3) or more times) conduct the same routine maintenance fix to the same control at the same location (unless you document in your inspection report under Part 4.7.1.c that the specific reoccurrence of this same problem should still be addressed as a routine maintenance fix under 2.1.4); or
2. A stormwater control necessary to comply with the requirements of this permit was never installed, or was installed incorrectly; or
3. Your discharges are not meeting applicable water quality standards; or
4. A prohibited discharge has occurred (see CGP Part 1.3); or
5. During the discharge from site dewatering activities:
   a. The weekly average of your turbidity monitoring results exceeds the 50 NTU benchmark (or alternate benchmark if approved by EPA pursuant to Part 3.3.2.b); or
   b. You observe or you are informed by EPA, State, or local authorities of the presence of the conditions specified in Part 4.6.3.e.

[3] If a condition on your site requires a corrective action, you must also fill out a corrective action log found at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates. See CGP Part 5.4 for more information.

Project Name: _____
NPDES ID Number: _____

Section C – Condition and Effectiveness of Pollution Prevention (P2) Practices and Controls (CGP Part 2.3) (Insert additional rows if needed)					
Type and Location of P2 Practices and Controls	**Conditions Requiring Routine Maintenance?[1]**	**If "Yes," How Many Times (Including This Occurrence) Has This Condition Been Identified?**	**Conditions Requiring Corrective Action?[2, 3]**	**Date on Which Condition First Observed (If Applicable)?**	**Description of Conditions Observed**
1.	☐ Yes ☐ No		☐ Yes ☐ No		
2.	☐ Yes ☐ No		☐ Yes ☐ No		
3.	☐ Yes ☐ No		☐ Yes ☐ No		
4.	☐ Yes ☐ No		☐ Yes ☐ No		
5.	☐ Yes ☐ No		☐ Yes ☐ No		
If the same routine maintenance was found to be necessary three or more times for the same control at the same location (including this occurrence), follow the corrective action requirements and record the required information in your corrective action log, or describe here why you believe the specific condition should still be addressed as routine maintenance:					

Section D – Stabilization of Exposed Soil (CGP Part 2.2.14) (Insert additional rows if needed)					
Specific Location That Has Been or Will Be Stabilized	**Stabilization Method and Applicable Deadline**	**Stabilization Initiated?**	**Final Stabilization Criteria Met?**	**Final Stabilization Photos Taken?**	**Notes**
1.		☐ Yes ☐ No If "Yes," date initiated:	☐ Yes ☐ No If "Yes," date criteria met:	☐ Yes ☐ No	
2.		☐ Yes ☐ No If "Yes," date initiated:	☐ Yes ☐ No If "Yes," date criteria met:	☐ Yes ☐ No	
3.		☐ Yes ☐ No If "Yes," date initiated:	☐ Yes ☐ No If "Yes," date criteria met:	☐ Yes ☐ No	
4.		☐ Yes ☐ No If "Yes," date initiated:	☐ Yes ☐ No If "Yes," date criteria met:	☐ Yes ☐ No	
5.		☐ Yes ☐ No If "Yes," date initiated:	☐ Yes ☐ No If "Yes," date criteria met:	☐ Yes ☐ No	

Section E – Description of Discharges (CGP Part 4.6.2)

(Insert additional rows if needed)

Was a discharge (not including dewatering) occurring from any part of your site at the time of the inspection?[4] ☐ Yes ☐ No

If "Yes," for each point of discharge, document the following:

- The visual quality of the discharge.
- The characteristics of the discharge, including color; odor; floating, settled, or suspended solids; foam; oil sheen; and other indicators of stormwater pollutants.
- Signs of the above pollutant characteristics that are visible from your site and attributable to your discharge in receiving waters or in other constructed or natural site drainage features.

Discharge Location	Observations
1.	
2.	
3.	
4.	
5.	

[4] If a dewatering discharge was occurring, you must conduct a dewatering inspection pursuant to CGP Part 4.3.2 and complete a separate dewatering inspection report.

Section F – Signature and Certification (CGP Part 4.7.2)	
"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."	
MANDATORY: Signature of Operator or "Duly Authorized Representative:"	
Signature:	**Date:**
Printed Name:	**Affiliation:**
OPTIONAL: Signature of Contractor or Subcontractor	
Signature:	**Date:**
Printed Name:	**Affiliation:**

General Tips for Using This Template

This Site Inspection Report Template is provided to assist you in preparing site inspection reports for EPA's 2022 Construction General Permit (CGP). If you are covered under the 2022 CGP, you can use this template to create a site inspection report form that is customized to the specific circumstances of your site and that complies with the minimum reporting requirements of Part 4.7 of the permit. Note that the use of this form is optional; you may use your own site inspection report form provided it includes the minimum information required in Part 4.7 of the CGP.

This template does not address the CGP's inspection reporting requirements related to dewatering activities. A separate inspection template has been developed specifically for dewatering activities and is available at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates.

Keep in mind that this document is a template and not an "off-the-shelf" inspection report that is ready to use without some modification. You must first customize this form to include the specifics of your project in order for it to be useable for your inspection reports. Once you have entered all of your site-specific information into the blank fields, you may use this form to complete inspection reports.

The following tips for using this template will help you ensure that the minimum permit requirements are met:

- **Review the inspection requirements.** Before you start developing your inspection report form, read the CGP's Part 4 inspection requirements. This will ensure that you have a working understanding of the permit's underlying inspection requirements.
- **Complete all required blank fields.** Fill out all blank fields. Only by filling out all fields will the template be compliant with the requirements of the permit. (Note: Where you do not need the number of rows provided in the template form for your inspection, you may delete these or cross them off as you see fit. Or, if you need more space to document your findings, you may insert additional rows in the electronic version of this form or use the bottom of the page in the field version of this form.)
- **Use your site map to document inspection findings.** In several places in the template, you are directed to specify the location of certain features of your site, including where stormwater controls are installed and where you will be stabilizing exposed soil. You are also asked to fill in location information for unsafe conditions and the locations of any discharges occurring during your inspections. Where you are asked for location information, EPA encourages you to reference the point on your SWPPP site map that corresponds to the requested location on the inspection form. Using the site map as a tool in this way will help you conduct efficient inspections, will assist you in evaluating problems found, and will ensure proper documentation.
- **Complete the inspection report within 24 hours of completing a site inspection.** You must complete an inspection report in accordance with Part 4.7.1 of the CGP.
- **Include the inspection form with your SWPPP.** Once your form is complete, make sure to include a copy of the inspection form in your SWPPP in accordance with Part 7.2.7.e of the CGP.
- **Retain copies of all inspection reports with your records.** You must also retain in your records copies of all inspection reports in accordance with the requirements in Part 4.7.3 of the CGP. These reports must be retained for at least 3 years from the date your permit coverage expires or is terminated in accordance with the requirements in Part 4.7.4 of the CGP.

Instructions for Section A

Inspector Name

Enter the name of the person that conducted the inspection. Include the person's contact information (title, affiliated company name, address, email, and phone number).

Inspection Date and Time

Enter the date you performed the inspection and the time you started and ended the inspection.

Weather Conditions During Inspection

Enter the weather conditions occurring during the inspection, e.g., sunny, overcast, light rain, heavy rain, snowing, icy, windy.

Current Phase of Construction
If this project is being completed in more than one phase, indicate which phase it is currently in.

Inspection Location
If your project has multiple locations where you conduct separate inspections, specify the location where this inspection is being conducted. If only one inspection is conducted for your entire project, enter "Entire Site." If necessary, complete additional inspection report forms for each separate inspection location.

Unsafe Conditions for Inspection (CGP Part 4.5.7)
Inspections are not required where a portion of the site or the entire site is subject to unsafe conditions. These conditions should not regularly occur and should not be consistently present on a site. Generally, unsafe conditions are those that render the site (or a portion of it) inaccessible or that would pose a significant probability of injury to applicable personnel. Examples could include severe storm or flood conditions, high winds, and downed electrical wires.

If your site, or a portion of it, is affected by unsafe conditions during the time of your inspection, provide a description of the conditions that prevented you from conducting the inspection and what parts of the site were affected. If the entire site was considered unsafe, specify the location as "Entire Site."

Inspection Frequency
Check all the inspection frequencies that apply to your project. Note that you may be subject to different inspection frequencies in different areas of your site.

Inspection Triggered by a Storm Event
If you were required to conduct this inspection because of a storm event that produced 0.25 inches or more of rain within a 24-hour period, indicate whether you relied on an on-site rain gauge or a nearby weather station (and where the weather station is located). Also, specify the total amount of rainfall for this specific storm event.

If you were required to conduct this inspection because of a snowmelt discharge from a storm event that produced 3.25 inches or more of snow within a 24-hour period, then indicate whether you relied on an on-site measurement or a nearby weather station (and where the weather station is located). Also, specify the total amount of snowfall for this specific storm event.

Instructions for Section B

Type and Location of Erosion and Sediment (E&S) Controls
Provide a list of all erosion and sediment (E&S) controls that your SWPPP indicates will be installed and implemented at your site. This list must include at a minimum all E&S controls required by CGP Part 2.2. Include also any natural buffers established under CGP Part 2.2.1. Buffer requirements apply if your project's earth-disturbing activities will occur within 50 feet of a discharge to receiving water. You may group your E&S controls on your form if you have several of the same type of controls (e.g., you may group "Inlet Protection Measures," "Perimeter Controls," and "Stockpile Controls" together on one line), but if there are any problems with a specific control, you must separately identify the location of the control, whether routine maintenance or corrective action is necessary, and in the notes section you must describe the specifics about the problem you observed.

Conditions Requiring Routine Maintenance?
Answer "Yes" if the E&S control requires routine maintenance as defined in footnote 1 of this template. Note that in many cases, "Yes" answers are expected and indicate a project with an active operation and maintenance program. You should also answer "Yes" if work to fix the problem is still ongoing from the previous inspection, though necessary work must be initiated immediately and completed by the end of the next business day or within seven calendar days if documented in accordance with CGP Part 2.1.4.b.

If "Yes," How Many Times (Including this Occurrence) Has this Condition Been Identified?
Indicate how many times the routine maintenance has been required for the same control at the same location.

Conditions Requiring Corrective Action?
Answer "Yes" if you found any of the conditions listed in footnote 2 in this template to be present during your inspection (CGP Part 5.1). If you answer "Yes," you must take corrective action and complete a corrective action log, found at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates. You should also answer "Yes" if work to fix the problem from a previous inspection is still ongoing, though the operator must comply with the corrective action deadlines in CGP Part 5.2.

Date on Which Condition First Observed (If Applicable)?
Provide the date on which the condition that triggered the need for routine maintenance or corrective action was first identified. If the condition was just discovered during this inspection, enter the inspection date. If the condition is a carryover from a previous inspection, enter the original date of the condition's discovery.

Description of Conditions Observed
For each E&S control and the area immediately surrounding it, describe whether the control is properly installed and whether it appears to be working to minimize sediment discharge. Indicate also whether a new or modified control is necessary to comply with the permit. Describe any problem condition(s) you observed such as the following:

1. Failure to install or to properly install a required E&S control
2. Damage or destruction to an E&S control caused by vehicles, equipment, or personnel, a storm event, or other event
3. Mud or sediment deposits found downslope from E&S controls, including in receiving waters, or on nearby streets, curbs, or open conveyance channels
4. Sediment tracked out onto paved areas by vehicles leaving construction site
5. Noticeable erosion or sedimentation at discharge outlets or at adjacent streambanks or channels
6. Erosion of the site's sloped areas (e.g., formation of rills or gullies)
7. E&S control is no longer working due to lack of maintenance
8. Other incidents of noncompliance

Describe also why you think the problem condition(s) occurred as well as actions (e.g., routine maintenance or corrective action) you will take or have taken to fix the problem.

For buffer areas, make note of whether they are marked off as required, whether there are signs of construction disturbance within the buffer, which is prohibited under the CGP, and whether there are visible signs of erosion resulting from discharges through the area.

If routine maintenance or corrective action is required, briefly note the reason. If routine maintenance or corrective action has been completed, make a note of the date it was completed and what was done. *If corrective action is required, note that you will need to complete a separate corrective action log describing the condition and your work to fix the problem.*

Routine Maintenance Need Has Been Found to be Necessary Three (3) or More Times for the Same Control at the Same Location (Including this Occurrence)
If routine maintenance has been required three (3) or more times for the same control at the same location, the permit requires (CGP Part 2.1.4.c) you to fix the problem using the corrective action procedures in CGP Part 5 or to document why you believe the reoccurring problem can be addressed as a routine maintenance fix. If you believe the problem can continue to be fixed as routine maintenance, describe why you believe the specific condition should still be addressed as routine maintenance.

Instructions for Section C

Type and Location of Pollution Prevention (P2) Practices and Controls
Provide a list of all pollution prevention (P2) practices and controls that are implemented at your site. This list must include all P2 practices and controls required by CGP Part 2.3 and those that are described in your SWPPP.

Conditions Requiring Routine Maintenance?
Answer "Yes" if the P2 practice or control requires routine maintenance as defined in footnote 1of this template. Note that in many cases, "Yes" answers are expected and indicate a project with an active operation and maintenance program. You should also answer "Yes" if work to fix the problem is still ongoing

from the previous inspection, though necessary work must be initiated immediately and completed by the end of the next business day or within seven calendar days if documented in accordance with CGP Part 2.1.4.b.

If "Yes," How Many Times (Including this Occurrence) Has this Condition Been Identified?
Indicate how many times the routine maintenance has been required for the same practice or control at the same location.

Conditions Requiring Corrective Action?
Answer "Yes" if you found any of the conditions listed in footnote 2 in this template to be present during your inspection (CGP Part 5.1). If you answer "Yes," you must take corrective action and complete a corrective action log, found at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates. You should also answer "Yes" if work to fix the problem from a previous inspection is still ongoing, though the operator must comply with the corrective action deadlines in CGP Part 5.2.

Date on Which Condition First Observed (If Applicable)?
Provide the date on which the condition that triggered the need for maintenance or corrective action was first identified. If the condition was just discovered during this inspection, enter the inspection date. If the condition is a carryover from a previous inspection, enter the original date of the condition's discovery.

Description of Conditions Observed
For each P2 control and the area immediately surrounding it, describe whether the control is properly installed, and whether it appears to be working to minimize or eliminate pollutant discharges. Indicate also whether a new or modified control is necessary to comply with the permit. Describe any problem condition(s) you observed such as the following:

1. Failure to install or to properly install a required P2 control
2. Damage or destruction to a P2 control caused by vehicles, equipment, or personnel, or a storm event
3. Evidence of a spill, leak, or other type of pollutant discharge, or failure to have properly cleaned up a previous spill, leak, or other type of pollutant discharge
4. Spill response supplies are absent, insufficient, or not where they are supposed to be located
5. Improper storage, handling, or disposal of chemicals, building materials or products, fuels, or wastes
6. P2 control is no longer working due to lack of maintenance
7. Other incidents of noncompliance

Describe also why you think the problem condition(s) occurred as well as actions (e.g., routine maintenance or corrective action) you will take or have taken to fix the problem.

If routine maintenance or corrective action is required, briefly note the reason. If routine maintenance or corrective action has been completed, make a note of the date it was completed and what was done. *If corrective action is required, note that you will need to complete a separate corrective action log describing the condition and your work to fix the problem.*

Routine Maintenance Need Was Found to be Necessary Three (3) or More Times for the Same Control at the Same Location (Including this Occurrence)
If routine maintenance has been required three (3) or more times for the same control at the same location, the permit requires (CGP Part 2.1.4.c) you to fix the problem using the corrective action procedures in CGP Part 5 or to document why you believe the reoccurring problem can be addressed as a routine maintenance fix. If you believe the problem can continue to be fixed as routine maintenance, describe why you believe the specific condition should still be addressed as routine maintenance.

Instructions for Section D

Specific Location That Has Been or Will Be Stabilized
List all areas where soil stabilization is required to begin because construction work in that area has permanently stopped or temporarily stopped (i.e., work will stop for 14 or more days), and all areas where stabilization has been implemented (CGP Part 2.2.14).

Stabilization Method and Applicable Deadline
For each area, specify the method of stabilization (e.g., hydroseed, sod, planted vegetation, erosion control blanket, mulch, rock).

Specify also which of the following stabilization deadlines apply to this location:

1. 5 acres or less of land disturbance occurring at any one time at site: Complete no later than 14 calendar days after stabilization initiated.
2. More than 5 acres of land disturbance occurring at any one time at site: Complete no later than 7 calendar days after stabilization initiated.
3. Arid, semi-arid, and drought-stricken areas: See CGP Part 2.2.14.b.i.
4. Unforeseen circumstances: See CGP Part 2.2.14.b.ii.
5. Discharges to a sediment- or nutrient-impaired water or to a water identified as Tier 2, 2.5, or 3 for antidegradation purposes: Complete no later than 7 days after stabilization initiated.

Stabilization Initiated?
For each area, indicate whether stabilization has been initiated. If "Yes," then enter the date stabilization was initiated.

Final Stabilization Criteria Met?
For each area, indicate whether the final stabilization criteria in CGP Part 2.2.14.c have been met. If "Yes," then enter the date final stabilization criteria were met.

Final Stabilization Photos Taken?
Answer "Yes" if you have taken photos before and after meeting the stabilization criteria as required in CGP Part 8.2.1.a.

Notes
For each area where stabilization has been initiated, describe the progress that has been made and what additional actions are necessary to complete stabilization. Note the effectiveness of stabilization in preventing erosion. If stabilization has been initiated but not completed, make a note of the date it is to be completed. If stabilization has been completed, make a note of the date it was completed. If stabilization has not yet been initiated, make a note of the date it is to be initiated and the date it is to be completed.

Instructions for Section E

You are only required to complete this section if a discharge is occurring at the time of the inspection (CGP Part 4.6.2).

Was a discharge (not including dewatering) occurring from any part of your site at the time of the inspection?
During your inspection, examine all points of discharge from your site, and determine whether a discharge is occurring. If a dewatering discharge was occurring, you must conduct a dewatering inspection pursuant to CGP Part 4.3.2. If there is a discharge, answer "Yes" and complete the questions below regarding the specific discharge. If there is not a discharge, answer "No" and skip to the next page.

Discharge Location (Repeat as necessary if there are multiple points of discharge.)
Specify the location on your site where the discharge is occurring. The location may be an outlet from a stormwater control or constructed stormwater channel, a discharge into a storm sewer inlet, or a specific point on the site. Be as specific as possible; it is recommended that you refer to a precise point on your site map.

Observations
Document the visual quality of the discharge and take note of the characteristics of the stormwater discharge, including color; odor; floating, settled, or suspended solids; foam; oily sheen; and other indicators of stormwater pollutants. Also, document signs of these same pollutant characteristics that are visible from your site and attributable to your discharge in receiving waters or in other constructed or natural site drainage features.

Instructions for Section F

Each inspection report must be signed and certified to be considered complete (CGP Part 4.7.2).

Operator or "Duly Authorized Representative" – MANDATORY (CGP Appendix G Part G.11.2 and CGP Appendix H Section X)

At a minimum, the site inspection report must be signed by either (1) the person who signed the NOI, or (2) a duly authorized representative of that person. The following requirements apply:

If the signatory will be the person who signed the NOI for permit coverage, as a reminder, that person must be one of the following types of individuals:

- *For a corporation*: By a responsible corporate officer. For the purpose of this subsection, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
- *For a partnership or sole proprietorship*: By a general partner or the proprietor, respectively.
- *For a municipality, State, Federal, or other public agency*: By either a principal executive officer or ranking elected official. For purposes of this subsection, a principal executive officer of a Federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

If the signatory will be a duly authorized representative, the following requirements must be met:

- The authorization is made in writing by the person who signed the NOI (see above);
- The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and
- The signed and dated written authorization is included in the SWPPP. A copy must be submitted to EPA, if requested.

Sign, date and print your name and affiliation.

Contractor or Subcontractor - OPTIONAL

Where you rely on a contractor or subcontractor to complete the site inspection report, you should consider requiring the individual(s) to sign and certify each report. Note that this does not relieve you, the permitted operator, of the requirement to sign and certify the site inspection report as well. If applicable, sign, date, and print your name and affiliation.

Note

While EPA has made every effort to ensure the accuracy of all instructions contained in this template, it is the permit, not this template, that determines the actual obligations of regulated construction stormwater discharges. In the event of a conflict between this template and any corresponding provision of the CGP, you must abide by the requirements in the permit. EPA welcomes comments on this Site Inspection Report Template at any time and will consider those comments in any future revision. You may contact EPA for CGP-related inquiries at cgp@epa.gov

APPENDIX E – Corrective Action Form

2022 CGP Corrective Action Log
Project Name: _____
NPDES ID Number: _____

Section A – Individual Completing this Log	
Name:	**Title:**
Company Name:	**Email:**
Address:	**Phone Number:**
Section B – Details of the Problem (CGP Part 5.4.1.a) Complete this section within 24 hours of discovering the condition that triggered corrective action.	
Date problem was first identified:	**Time problem was first identified**:
What site conditions triggered this corrective action? *(Check the box that applies. See instructions for a description of each triggering condition (1 thru 6).)* ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5a ☐ 5b ☐ 6	
Specific location where problem identified:	
Provide a description of the specific condition that triggered the need for corrective action and the cause (if identifiable):	
Section C – Corrective Action Completion (CGP Part 5.4.1.b) Complete this section within 24 hours after completing the corrective action.	
For site condition # 1, 2, 3, 4, or 6 (those not related to a dewatering discharge) confirm that you met the following deadlines (CGP Part 5.2.1):	
☐ Immediately took all reasonable steps to address the condition, including cleaning up any contaminated surfaces so the material will not discharge in subsequent storm events. **AND**	
☐ Completed corrective action by the close of the next business day, unless a new or replacement control, or significant repair, was required. **OR**	
☐ Completed corrective action within seven (7) calendar days from the time of discovery because a new or replacement control, or significant repair, was necessary to complete the installation of the new or modified control or complete the repair. **OR**	
☐ It was infeasible to complete the installation or repair within 7 calendar days from the time of discovery. Provide the following additional information: Explain why 7 calendar days was infeasible to complete the installation or repair:	

Provide your schedule for installing the stormwater control and making it operational as soon as feasible after the 7 calendar days:

For site condition # 5a, 5b, or 6 (those related to a dewatering discharge), confirm that you met the following deadlines:

- ☐ Immediately took all reasonable steps to minimize or prevent the discharge of pollutants until a solution could be implemented, including shutting off the dewatering discharge as soon as possible depending on the severity of the condition taking safety considerations into account.
- ☐ Determined whether the dewatering controls were operating effectively and whether they were causing the conditions.
- ☐ Made any necessary adjustments, repairs, or replacements to the dewatering controls to lower the turbidity levels below the benchmark or remove the visible plume or sheen.

Describe any modification(s) made as part of corrective action: (Insert additional rows below if applicable)	**Date of completion:**	**SWPPP update necessary?**	**If yes, date SWPPP was updated:**
1.		☐ Yes ☐ No	
2.		☐ Yes ☐ No	

Section D - Signature and Certification (CGP Part 5.4.2)

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

MANDATORY: Signature of Operator or "Duly Authorized Representative:"	
Signature:	**Date:**
Printed Name:	**Affiliation:**
OPTIONAL: Signature of Contractor or Subcontractor	
Signature:	**Date:**
Printed Name:	**Affiliation:**

General Instructions

This Corrective Action Log Template is provided to assist you creating a corrective action log that complies with the minimum reporting requirements of Part 5.4 of the EPA's Construction General Permit (CGP). For each triggering condition on your site, you will need to fill out a separate corrective action log.

The entire form must be completed to be compliant with the requirements of the permit. (Note: In Section C, if you do not need the number of rows provided in the corrective action log, you may delete these or cross them off. Alternatively, if you need more space to describe any modifications, you may insert additional rows in the electronic version of this form or use the bottom of the page in the field version of this form.)

If you are covered under a State CGP, this template may be helpful in developing a log that can be used for that permit; however, you will likely need to modify this form to meet the specific requirements of any State-issued permit. If your permitting authority requires you to use a specific corrective action log, you should not use this template.

Instructions for Section A

Individual completing this form Enter the name of the person completing this log. Include the person's contact information (title, affiliated company name, address, email, and phone number).

Instructions for Section B

You must complete Section B within 24 hours of discovering the condition that triggered corrective action. (CGP Part 5.4)

When was the problem first discovered?

Specify the date and time when the triggering condition was first discovered.

What site conditions triggered this corrective action? (CGP Parts 5.1 and 5.3)

Check the box corresponding to the numbered triggering condition below that applies to your site.

1. A stormwater control needs a significant repair or a new or replacement control is needed, or, in accordance with Part Error! Reference source not found., you find it necessary to repeatedly (i.e., 3 or more times) conduct the same routine maintenance fix to the same control at the same location (unless you document in your inspection report under Part Error! Reference source not found. that the specific reoccurrence of this same problem should still be addressed as a routine maintenance fix under Part Error! Reference source not found.);
2. A stormwater control necessary to comply with the requirements of this permit was never installed, or was installed incorrectly;
3. Your discharges are not meeting applicable water quality standards;
4. A prohibited discharge has occurred (see Part 1.3);
5. During discharge from site dewatering activities:
   a. The weekly average of your turbidity monitoring results exceeds the 50 NTU benchmark (or alternate benchmark if approved by EPA pursuant to Part **Error! Reference source not found.**); or
   b. You observe or you are informed by EPA, State, or local authorities of the presence of any of the following at the point of discharge to a receiving water flowing through or immediately adjacent to your site and/or to constructed or natural site drainage features or storm drain inlets:
      - sediment plume
      - suspended solids
      - unusual color
      - presence of odor
      - decreased clarity
      - presence of foam
      - visible sheen on the water surface or visible oily deposits on the bottom or shoreline of the receiving water
6. EPA requires corrective action as a result of permit violations found during an inspection carried out under Part 4.8.

Provide a description of the problem (CGP Part 5.4.1.a)
Provide a summary description of the condition you found that triggered corrective action, the cause of the problem (if identifiable), and the specific location where it was found. Be as specific as possible about the location; it is recommended that you refer to a precise point on your site map.

Instructions for Section C

You must complete Section C within 24 hours after completing the correction action. (CGP Part 5.4)

Deadlines for completing corrective action for condition # 1, 2, 3, 4, or 6 (if not relating to a dewatering discharge) (CGP Part 5.2.1)
Check the box to confirm that you met the deadlines that apply to each triggering condition. You are always required to check the first box (i.e., Immediately took all reasonable steps to address the condition, including cleaning up any contaminated surfaces so the material will not discharge in subsequent storm events.). Only one of the next three boxes should be checked depending on the situation that applies to this corrective action.

Check the second box if the corrective action for this particular triggering condition does not require a new or replacement control, or a significant repair. These actions must be completed by the close of the next business day from the time of discovery of the condition.

Check the third box if the corrective action for this particular triggering condition requires a new or replacement control, or a significant repair. These actions must be completed by no later than seven calendar days from the time of discover of the condition.

Check the fourth box if the corrective action for this particular triggering condition requires a new or replacement control, or a significant repair, and if it is infeasible to complete the work within seven calendar days. Additionally, you will need to fill out the table below the checkbox that requires:

1. An explanation as to why it was infeasible to complete the installation or repair within seven calendar days of discovering the condition.
2. Provide the schedule you will adhere to for installing the stormwater control and making it operational as soon as feasible after the seventh day following discovery.

Note: Per Part 5.2.1.c, where these actions result in changes to any of the stormwater controls or procedures documented in your SWPPP, you must modify your SWPPP accordingly within seven calendar days of completing this work.

Deadlines for completing corrective action for condition # 5a, 5b, or 6 related to a dewatering discharge (CGP Part 5.2.2)
These deadlines apply to conditions relating to construction dewatering activities. Check the box to confirm that you met the deadlines that apply to each triggering condition. You are required to check all of the boxes in this section to indicate your compliance with the corrective action deadlines.

List of modification(s) to correct problem
Provide a list of modifications you completed to correct the problem.

Date of completion
Enter the date you completed the modification. The work must be completed by the deadline you indicated above.

SWPPP update necessary?
Check "Yes" or "No" to indicate if a SWPPP update is necessary consistent with Part 7.4.1.a in order to reflect changes implemented at your site. If "Yes," then enter the date you updated your SWPPP. The SWPPP updates must be made within seven calendar days of completing a corrective action. (CGP Part 5.2.1.c)

Instructions for Section D

Each corrective action log entry must be signed and certified following completion of Section D to be considered complete. (CGP Part 5.4.2)

Operator or "Duly Authorized Representative" – MANDATORY (CGP Appendix G Part G.11.2 and CGP Appendix H Section X)

At a minimum, the corrective action log must be signed by either (1) the person who signed the NOI, or (2) a duly authorized representative of that person. The following requirements apply:

If the signatory will be the person who signed the NOI for permit coverage, as a reminder, that person must be one of the following types of individuals:

- *For a corporation*: By a responsible corporate officer. For the purpose of this subsection, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
- *For a partnership or sole proprietorship*: By a general partner or the proprietor, respectively.
- *For a municipality, State, Federal, or other public agency*: By either a principal executive officer or ranking elected official. For purposes of this subsection, a principal executive officer of a Federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

If the signatory will be a duly authorized representative, the following requirements must be met:

- The authorization is made in writing by the person who signed the NOI (see above);
- The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and
- The signed and dated written authorization is included in the SWPPP. A copy must be submitted to EPA, if requested.

Sign, date and print your name and affiliation.

Contractor or Subcontractor - OPTIONAL

Where you rely on a contractor or subcontractor to complete this log and the associated corrective action, you should consider requiring the individual(s) to sign and certify each log entry. Note that this does not relieve you, the permitted operator, of the requirement to sign and certify the log as well. If applicable, sign, date, and print your name and affiliation.

Recordkeeping

Logs must be retained for at least 3 years from the date your permit coverage expires or is terminated. (CGP Part 5.4.4)

Keep copies of your signed corrective action log entries at the site or at an easily accessible location so that it can be made immediately available at the time of an on-site inspection or upon request by EPA. (CGP Part 5.4.3) Include a copy of the corrective action log in your SWPPP. (CGP Part 7.2.7.e)

Note

While EPA has made every effort to ensure the accuracy of all instructions contained in this template, it is the permit, not this template, that determines the actual obligations of regulated construction stormwater discharges. In the event of a conflict between this template and any corresponding provision of the CGP, you must abide by the requirements in the permit. EPA welcomes comments on this Corrective Action Log Template at any time and will consider those comments in any future revision. You may contact EPA for CGP-related inquiries at cgp@epa.gov

APPENDIX F – SWPPP Amendment Log

Appendix F – SWPPP Amendment Log

No.	Description of the Amendment	Date of Amendment	Amendment Prepared by [Name(s) and Title]

APPENDIX G – Subcontractor Certifications/Agreements

Appendix G – Subcontractor Certifications/Agreements

SUBCONTRACTOR CERTIFICATION
STORMWATER POLLUTION PREVENTION PLAN

Project Number: _____

Project Title: _____

Operator(s): _____

As a subcontractor, you are required to comply with the Stormwater Pollution Prevention Plan (SWPPP) for any work that you perform on-site. Any person or group who violates any condition of the SWPPP may be subject to substantial penalties or loss of contract. You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP. A copy of the SWPPP is available for your review at the office trailer.

Each subcontractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement:

I certify under the penalty of law that I have read and understand the terms and conditions of the SWPPP for the above designated project and agree to follow the practices described in the SWPPP.

This certification is hereby signed in reference to the above named project:

Company: _____

Address: _____

Telephone Number: _____

Type of construction service to be provided: _____

_____

_____

Signature: _____

Title: _____

Date: _____

APPENDIX H – Grading and Stabilization Activities Log

Appendix H – Grading and Stabilization Activities Log

Date Grading Activity Initiated	**Description of Grading Activity**	**Description of Stabilization Measure and Location**	**Date Grading Activity Ceased** (Indicate Temporary or Permanent)	**Date When Stabilization Measures Initiated**
			☐ Temporary ☐ Permanent	
			☐ Temporary ☐ Permanent	
			☐ Temporary ☐ Permanent	
			☐ Temporary ☐ Permanent	
			☐ Temporary ☐ Permanent	
			☐ Temporary ☐ Permanent	
			☐ Temporary ☐ Permanent	

APPENDIX I – Training Log

Appendix I – SWPPP Training Log

Stormwater Pollution Prevention Training Log

Project Name: **Yarmouth Riverwalk Park, Boardwalk, and Event Space**

Project Location: **669 Route 28, Yarmouth, MA 02664**

Instructor's Name(s):

Instructor's Title(s):

Course Location: _____ Date: _____

Course Length (hours): _____

Stormwater Training Topic: *(check as appropriate)*

- ☐ **Sediment and Erosion Controls**
- ☐ **Stabilization Controls**
- ☐ **Pollution Prevention Measures**
- ☐ **Emergency Procedures**
- ☐ **Inspections/Corrective Actions**

Specific Training Objective:_____

_____

Attendee Roster: *(attach additional pages as necessary)*

No.	Name of Attendee	Company
1		
2		
3		
4		
5		
6		
7		
8		

APPENDIX J – Delegation of Authority

Appendix J – Delegation of Authority Form

Delegation of Authority

I, _____ (name), hereby designate the person or specifically described position below to be a duly authorized representative for the purpose of overseeing compliance with environmental requirements, including the Construction General Permit (CGP), at the _____ construction site. The designee is authorized to sign any reports, stormwater pollution prevention plans and all other documents required by the permit.

_____ (name of person or position)
_____ (company)
_____ (address)
_____ (city, state, zip)
_____ (phone)

By signing this authorization, I confirm that I meet the requirements to make such a designation as set forth in Appendix I of EPA's CGP, and that the designee above meets the definition of a "duly authorized representative" as set forth in Appendix I.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: _____

Company: _____

Title: _____

Signature: _____

Date: _____

APPENDIX K – Endangered Species Documentation

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104

In Reply Refer To:
Project Code: 2023-0009991
Project Name: Yarmouth Riverwalk Park

October 28, 2022

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Please review this letter each time you request an Official Species List, we will continue to update it with additional information and links to websites may change.

About Official Species Lists

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Federal and non-Federal project proponents have responsibilities under the Act to consider effects on listed species.

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested by returning to an existing project's page in IPaC.

Endangered Species Act Project Review

Please visit the "**New England Field Office Endangered Species Project Review and Consultation**" website for step-by-step instructions on how to consider effects on listed

species and prepare and submit a project review package if necessary:

https://www.fws.gov/office/new-england-ecological-services/endangered-species-project-review

NOTE Please do not use the **Consultation Package Builder** tool in IPaC except in specific situations following coordination with our office. Please follow the project review guidance on our website instead and reference your **Project Code** in all correspondence.

Northern Long-eared Bat Update - Additionally, please note that on March 23, 2022, the Service published a proposal to reclassify the northern long-eared bat (NLEB) as endangered under the Endangered Species Act. The U.S. District Court for the District of Columbia has ordered the Service to complete a new final listing determination for the NLEB by November 2022 (Case 1:15-cv-00477, March 1, 2021). The bat, currently listed as threatened, faces extinction due to the range-wide impacts of white-nose syndrome (WNS), a deadly fungal disease affecting cave-dwelling bats across the continent. The proposed reclassification, if finalized, would remove the current 4(d) rule for the NLEB, as these rules may be applied only to threatened species. Depending on the type of effects a project has on NLEB, the change in the species' status may trigger the need to re-initiate consultation for any actions that are not completed and for which the Federal action agency retains discretion once the new listing determination becomes effective (anticipated to occur by December 30, 2022). If your project may result in incidental take of NLEB after the new listing goes into effect this will first need to be addressed in an updated consultation that includes an Incidental Take Statement. If your project may require re-initiation of consultation, please contact our office for additional guidance.

Additional Info About Section 7 of the Act
Under section 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to determine whether projects may affect threatened and endangered species and/or designated critical habitat. If a Federal agency, or its non-Federal representative, determines that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Federal agency also may need to consider proposed species and proposed critical habitat in the consultation. 50 CFR 402.14(c)(1) specifies the information required for consultation under the Act regardless of the format of the evaluation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/service/section-7-consultations

In addition to consultation requirements under Section 7(a)(2) of the ESA, please note that under sections 7(a)(1) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Please contact NEFO if you would like more information.

Candidate species that appear on the enclosed species list have no current protections under the

ESA. The species' occurrence on an official species list does not convey a requirement to consider impacts to this species as you would a proposed, threatened, or endangered species. The ESA does not provide for interagency consultations on candidate species under section 7, however, the Service recommends that all project proponents incorporate measures into projects to benefit candidate species and their habitats wherever possible.

Migratory Birds

In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see:

https://www.fws.gov/program/migratory-bird-permit

https://www.fws.gov/library/collections/bald-and-golden-eagle-management

Please feel free to contact us at **newengland@fws.gov** with your **Project Code** in the subject line if you need more information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat.

Attachment(s): Official Species List

Attachment(s):

- Official Species List
- Coastal Barriers

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Project Code: 2023-0009991
Project Name: Yarmouth Riverwalk Park
Project Type: Recreation - New Construction
Project Description: The Town of Yarmouth is proposing to redevelop the town-owned property located at 669 Route 28 in the Town of Yarmouth, Massachusetts (Barnstable County) into a Riverwalk Park, Boardwalk, and Even Space for use by residents and visitors (the Project). The “Site” includes a 23-acre former drive-in property located at 669 Route 28, and 8 acres of the Lewis Pond Marsh Conservation Area to the south. The Project aims improve the existing property through providing event space, recreation opportunities, public amenities and a restored coastline.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@41.645897149999996,-70.22330474166597,14z

Counties: Barnstable County, Massachusetts

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Roseate Tern *Sterna dougallii dougallii* Population: Northeast U.S. nesting population No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2083	Endangered

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Flowering Plants

NAME	STATUS
Sandplain Gerardia *Agalinis acuta*	Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/8128

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Coastal Barriers

Projects within the John H. Chafee Coastal Barrier Resources System (CBRS) may be subject to the restrictions on federal expenditures and financial assistance and the consultation requirements of the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.). For more information, please contact the local Ecological Services Field Office or visit the CBRA Consultations website. The CBRA website provides tools such as a flow chart to help determine whether consultation is required and a template to facilitate the consultation process.

System Unit (SU)

Most new federal expenditures and financial assistance, including federal flood insurance, are prohibited within System Units. ***Federally-funded projects within System Units require consultation with the Service.*** *Consultation is not required for projects using private, state, or local funds.*

UNIT	NAME	TYPE	SYSTEM UNIT ESTABLISHMENT DATE	FLOOD INSURANCE PROHIBITION DATE
C13	Lewis Bay	SU	11/16/1990	11/16/1990

IPaC User Contact Information

Agency:	Yarmouth town
Name:	Elyse Tripp
Address:	89 Shrewsbury St
Address Line 2:	Suite 300
City:	Worcester
State:	MA
Zip:	01604
Email	etripp@beta-inc.com
Phone:	8848002382

APPENDIX L – Historic Preservation Documentation

Figure 6
Historic Resources Map
Yarmouth Riverwalk Park
Yarmouth, Massachusetts

Legend

- National Register of Historic Places
- Preservation Restriction
- Massachusetts Historic Landmark
- Local Historic District
- NRHP and LHD
- Inventoried Property
- National Register of Historic Places
- Preservation Restriction
- Massachusetts Historic Landmark
- Local Historic District
- NRHP and LHD
- Inventoried Property

N
W E
S

0 500 1,000 Feet

1 inch = 500 feet

Data Source: MassGIS Orthophoto (2013/2014); MassGIS Data: MHC Historic Inventory

BETA
IMPROVING COMMUNITIES TOGETHER

ATTACHMENT E

PROJECT PERMITS

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ATTACHMENT E

PROJECT PERMITS

1.01 GENERAL

A. The Successful Bidder is required to conform to the Project Permit documents and the requirements of each as stated therein.

B. COMPLETED The following permits have been obtained by the Owner.

1. MEPA Certifícate EEA No. 16623, June 10, 2023
2. Town of Yarmouth Conservation Commission Order of Conditions
   a. DEP File No.083-2372 December 1, 2022, No. 083-2372 February 3,2023.
   b. DEP File No.083-2773 December 1, 20232 No. 083-2373 February 3, 2023.
3. Town of Yarmouth Stormwater Permit No. SW2023-001, February 2023
4. Town of Yarmouth Planning Board Approval Petition No. VCOD 2023-1, February 6, 2023.
5. Town of Yarmouth Zoning Board of Appeals Approval, Petition No 5003, March 10, 2023.
6. Town of Yarmouth Health Inspector Disposal System June 6, 2023.
7. Cape Cod Commission Development of Regional Impact File No. 22031, September 28, 2023.
8. Massachusetts DEP Water Quality Certificate WQC No WW10-0000042, November 11, 2023.
9. Massachusetts DEP Chapter 91 License - WW01-0000271.
10. U.S. Army Corps of Engineers (USACE) General Permit – File # NAE-2022-02890
11. Massachusetts DOT State Highway Access Permit – Permit # 5-2023-0263.

C. PERMIT CONDITIONS AND RESPONSIBILITIES

1. The Contractor shall review and become completely familiar with the requirements described within the permits obtained, recognizing that some conditions are the responsibility of the Owner and other terms and conditions are fully the responsibility of the Contractor. A listing of the location of the various permit requirements follows below. This list is provided as a general guide and shall not be considered all-inclusive.

2. Mass DEP SE83-2372 Town of Yarmouth Order of Conditions
   a. General Conditions pg4-pg.7 of 10pg.
   b. Special Conditions pg. 8A-8C of 10pg
   .
3. Mass DEP SE83-2373 Town of Yarmouth Order of Conditions
   a. General Conditions pg4-pg.7 of 10pg.
   b. Special Conditions pg. 8A-8C of 10pg.

4. Stormwater Management Permit SW 2023-001
   a. General Conditions pg.3-pg.7.
   b. Special Conditions pg.5A

5. Cape Cod Commission DRI Decision CCC No. 22031
   a. General Conditions pg. 16-pg 17.
   b. Note Item C-10 Transportation: Mid-block crosswalk coordination shall be the responsibility of the Owner. A mid-block crosswalk is not within the Phase-1 project scope.

6. Mass DEP WQC No. WW10-0000042
   a. WQC Conditions pg. 3-pg.6

7. U.S. Army Corps of Engineers (USACE) General Permit - File # NAE-2022-02890
   a. Pages 1 – 2

8. Massachusetts DOT State Highway Access Permit – Permit # 5-2023-0263.
   a. Pages 2 - 11

D. PENDING PERMITS - OWNER TO COMPLETE

1. Owner permitting for Phase 1 is Complete.

E. PENDING PERMITS – CONTRACTOR TO COMPLETE

1. National Pollution Discharge Elimination System (NPDES) Construction General Permit is required before Mass DOT State Highway Access Permit # 5-2023-0263 may take effect, as well as completion of the Stormwater Pollution Prevention Plan (SWPPP). The Contractor shall finalize and file the SWPPP and secure NPDEs permit, as required.

F. PERMITS TO BE SECURED

1. The Contractor is responsible for obtaining additional required permits which may include but are not limited those listed below:

   a) Commercial Building Permit
   b) Electrical Permit
   c) Trench Permit
   d) Sign Permit
   e) Certificate of Use / Occupancy Permit

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Maura T. Healey
GOVERNOR

Kimberley Driscoll
LIEUTENANT GOVERNOR

Rebecca L. Tepper
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1081
http://www.mass.gov/eea

June 23, 2023

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
SINGLE ENVIRONMENTAL IMPACT REPORT

PROJECT NAME	: Yarmouth Riverwalk Park, Boardwalk and Event Space
PROJECT MUNICIPALITY	: Yarmouth
PROJECT WATERSHED	: Cape Cod
EEA NUMBER	: 16623
PROJECT PROPONENT	: Town of Yarmouth
DATE NOTICED IN MONITOR	: June 10, 2023

Pursuant to the Massachusetts Environmental Policy Act (MEPA; M.G.L. c. 30, ss. 61-62L) and Section 11.08 of the MEPA regulations (301 CMR 11.00), I have reviewed the Single Environmental Impact Report (Single EIR) and hereby determine that it **adequately and properly complies** with MEPA and its implementing regulations.

Project Description

As described in the Single EIR, the project consists of the redevelopment and restoration of a site owned by the Town of Yarmouth (Town) into a park (referred to as "Riverwalk Park"), boardwalk, and event space. Riverwalk Park will include a four-acre, grassed, multi-use field area surrounded by walking paths. The field area is intended to be used periodically for outdoor events (such as concerts) and overflow parking associated with such events. As currently proposed, access to the site will be provided by a paved roadway extending in a southerly direction off of Route 28 that will border the eastern limit of the field area, adjacent to Parkers River. The access road will have two loops, one at the southern terminus and one adjacent to a 1,130 square foot (sf) park office/restroom building that is proposed just north of the field area. A total of 88 pervious parking spaces are proposed on either side of the access road between the two loops. Between the access road and the Parkers River, the project proposes to construct up to nine artist shanties (140 sf each) supported by concrete pads, as well as a nature-based play area

for children. Other improvements include outdoor (dark sky) lighting, a kiosk near the kayak launch (further described below), and associated utilities. All structures are proposed to be used seasonally and therefore none will be conditioned spaces.

The project proposes the construction of several walking paths and shared-use pathways. A 3-foot-wide stabilized aggregate walking path is proposed to extend from the play area to the kayak launch (traveling along the Parkers River) to serve as a nature path. An 8-foot-wide, paved, shared-use path (SUP) will extend from Route 28 along the western limit of the proposed access road, continuing around the field area and tying back to itself south of the restroom building. A 6-foot-wide stabilized aggregate walking path is proposed to extend from the northern loop within the access road to the kayak launch, traveling along the eastern limit of the site to provide access to the amenities proposed in this area. An additional 6-foot-wide stabilized aggregate walking path is proposed to extend from the SUP into the woods located south of the event space (between the field area and marsh), eventually branching into two trails that extend to meet the boardwalk proposed in the marsh area at the rear of the site. The boardwalk will generally consist of a looped, 6-foot-wide, wooden structure supported by helical piles, constructed at a variable height above the substrate to minimize shading. The looped boardwalk will total 1,300 linear feet (lf) and will include a pedestrian bridge spanning a tidal creek within the marsh, four bench seating areas, and three 8-foot-wide overlook areas. Both the boardwalk and walking path located in the forested area generally follow existing, informal walking trails within the marsh/woods.

As noted above, the park design also proposes a kayak launch located southeast of the field area, consisting of a pile-supported boardwalk and gangway system leading to a float for launching motorless watercraft on the Parkers River. Where the boardwalk for the kayak launch is located over Salt Marsh, the boardwalk will be 6 feet wide with 6 feet of clearance, supported by helical piles. The boardwalk will tie into a 6-foot-wide, fixed, sloped gangway connecting to a level landing platform, both of which will be supported by wooden piles. The landing platform will connect to a hinged, 5-foot-wide gangway, which will connect to an 18-foot by 18-foot floating launch that will be anchored to the underwater substrate. Separately, northeast of the field area, a 10-foot-wide stabilized aggregate access path is proposed to extend from the parking area to an existing upweller facility (a shellfish nursery). As described in the Expanded Environmental Notification Form (EENF), this driveway will improve the existing rutted and unstable condition of the current upweller driveway and will create a turnaround area with two parking spaces for operations staff at a greater distance from the Parkers River than exists today.

Changes Since the EENF

As described in the Single EIR, there have been several changes to the project since the filing of the EENF in response to feedback received from Agencies and Environmental Justice (EJ) communities. Specifically, the Single EIR states that in response to comments received from the EJ population located to the west of the site, the proposed elevated boardwalk has been realigned to the east to reduce outside views of the boardwalk from the nearby neighborhoods. Plantings were also added along the boardwalk to provide additional screening to the neighbors. According to the Single EIR, the new alignment represents a slight reduction in the overall length of the boardwalk, as well as impacts to Salt Marsh, from 15,300 sf (as described in the

EENF) to 14,277 sf. An invasive species inventory and management plan was also prepared and incorporated into the proposed project mitigation through the Yarmouth Conservation Commission review process.

In response to feedback from the Massachusetts Office of Coastal Zone Management (CZM), the previously proposed use of geogrid reinforced turf along the perimeter shared-use path was eliminated, and instead replaced with a modified gravel and loam soil mixture that the Single EIR states will both support grass growth and withstand vehicle loads. As described in the Single EIR, this revision will avoid extensive areas of plastic geogrid material and eliminate the risk of the geogrid working loose in a flood event and becoming floating marine debris. Additionally, the site grading has been revised in the area east of the first cul-de-sac to provide grading to approximately elevation (el.) 7.30 feet (ft) NAVD88. This change was introduced as a mitigation measure to minimize the risk of potential erosion due to increased flood velocities occurring within the Coastal AE Zone. The Single EIR states that this area will have additional boulder outcrops, plant pockets and tree and shrub plantings to slow and dissipate flood waters. Finally, the Single EIR states that the proposed grading around the event space was revised to prevent channelization of water at the southern extent of the event space as flood water recedes.

Project Site

The 119.78-acre project site includes a 23-acre parcel previously utilized for the Yarmouth Drive-In theater, as well as 8 acres of the Lewis Pond Marsh Conservation Area (which separately totals 170 acres). The remainder of the project site is comprised of predominantly undeveloped land. The area previously utilized for the drive-in (where the majority of the project will be located) includes a large area of cleared land (in addition to a vegetated perimeter) that has been extensively altered. Informal walking trails, litter, and debris (including glass and asphalt associated with the former use) are currently found in the area. As noted above, an existing driveway leads to the upweller facility located on the west bank of Parkers River, which is currently in operation. The project site is bounded by commercial developments associated with Route 28 to the north, residential housing to the west, the Parkers River to the east, and the remainder of the Lewis Pond Marsh Conservation Area to the south. At the entrance to the project site, abutting Route 28, a wastewater pump station is proposed to be constructed by the Town, separate from the project proposed herein. The pump station (and associated service drive, walkways, landscaping, etc.) is in the final stages of design, and will be constructed under a separate contract.[1]

The project site contains numerous coastal and wetland resources areas, including Salt Marsh, Coastal Beach, Land Under Ocean (LUO), Land Subject to Coastal Storm Flowage (LSCSF), BVW, Riverfront Area, Fish Runs, and Land Containing Shellfish. Parkers River is listed as an impaired waterbody due to the presence and/or concentration of several different nutrients or pollutants, and has an associated Total Maximum Daily Load (TMDL) for nitrogen.

[1] The pump station is proposed as part of the Yarmouth Comprehensive Wastewater Management Plan (CWMP), which was first filed with the MEPA Office in 2011 and assigned EEA# 14659. A Certificate was issued on September 30, 2022 (on the Single EIR filed for the Yarmouth CWMP) which found that the project adequately and properly complied with MEPA and its implementing regulations.

As further discussed below, the site contains 0.02 acres of Commonwealth tidelands. The entirety of the project site is mapped as Flood Zone AE (an area inundated during a 100-year storm), with a Base Flood Elevation (BFE) of elevation (el.) ranging from 12 to 13 ft NAVD88 as delineated on Federal Emergency Management Agency (FEMA) map 25001C0588J (effective date July 16, 2014). The southern portion of the project site (within the marsh) contains *Estimated and Priority Habitat of Rare Species* as delineated by the Natural Heritage and Endangered Species Program (NHESP) in the 15th Edition of the Massachusetts Natural Heritage Atlas. The project site is not located in an Area of Critical Environmental Concern (ACEC) and does not contain any structures listed in the State Register of Historic Places or the Massachusetts Historical Commission's (MHC) Inventory of Historic and Archaeological Assets of the Commonwealth. The entirety of the project site is considered conservation land protected under Article 97 of the amendments to the state constitution.

The project site is located within one Environmental Justice (EJ) population characterized by Income criteria and within one mile of two additional EJ populations characterized by Income criteria; additional EJ populations are located within five miles of the site.

Environmental Impacts and Mitigation

Environmental impacts associated with the project include the alteration of 10.06 acres of land (including 874 sf (0.02 acres) of Commonwealth tidelands), the creation of 0.67 acres of impervious surface (for a total of 1.75 acres on-site), the generation of 900 average daily trips (adt), the creation of 88 parking spaces, the generation of 900 gallons per day (gpd) of water demand and 800 gpd of wastewater (during the times of year the facility is in use), and the installation of 0.12 miles of water mains and 0.13 miles of sewer mains. The project will alter the following wetland resource areas: 6 sf of LUO; 179 sf of Coastal Beach; 14,277 sf (0.33 acres) of Salt Marsh; 14 sf of Land Containing Shellfish; 14 sf of Fish Runs; 438,245 sf (10.06 acres) of LSCSF (which overlaps with all other resource areas); 933 sf (0.02 acres) of BVW; and 134,869 sf (3.10 acres) of Riverfront Area. The impact calculations account for newly altered areas, areas to be restored, and formerly altered or degraded areas to be redeveloped.

Measures to avoid, minimize, and mitigate project impacts include locating the project predominantly in previously developed/degraded areas; use of piles to minimize impacts to wetland and coastal resource areas; elevating structures located in Salt Marsh to minimize shading; restoration of 31,920 sf (0.73) of degraded LSCSF, including 29,250 sf (0.67 acres) of degraded Riverfront Area; restoration of temporarily impacted wetland and coastal resources areas; use of time-of-year (TOY) restrictions; orienting the project to reduce noise impacts (further discussed below); use of dark-sky-compliant lighting; construction of a stormwater management system utilizing best management practices (BMPs); dry-floodproofing the proposed restroom; vegetative plantings; and use of erosion and sedimentation controls during project construction.

Jurisdiction and Permitting

The project is undergoing MEPA review and is subject to a mandatory EIR pursuant to 301 CMR 11.03(3)(a)(1)(b) of the MEPA regulations because it requires Agency Actions and

will involve the alteration of 10 or more acres of any other wetlands. The project additionally exceeds the ENF thresholds at 301 CMR 11.03(3)(b)(1)(c) and 11.03(3)(b)(1)(f) because it will result in the alteration of 1,000 or more sf of Salt Marsh and the alteration of one half or more acres of any other wetlands, respectively. The project requires the preparation of an EIR under 301 CMR 11.06(7)(b) of the MEPA regulations because it is located within one mile of one or more EJ populations (specifically, the site is within an EJ population). The project requires a Chapter 91 (c.91) License and 401 Water Quality Certification (WQC) from the Massachusetts Department of Environmental Protection (MassDEP) and a Vehicular Access Permit from the Massachusetts Department of Transportation (MassDOT).

The project requires a Stormwater Management Permit and an Order of Conditions from the Yarmouth Conservation Commission among several other permits from the Town; the Single EIR indicates that Orders of Conditions were issued for the project on January 26, 2023 and February 3, 2023 and were not appealed, and that the Stormwater Management Permit was issued on February 22, 2023. The project requires authorization from the U.S. Army Corps of Engineers (USACE) under the General Permits for Massachusetts in accordance with Section 404 of the Federal Clean Water Act as well as a National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP) from the United States Environmental Protection Agency (EPA).

Because the project is seeking Financial Assistance through the Seaport Economic Council and the Massachusetts Department of Conservation and Recreation (DCR), MEPA jurisdiction is broad in scope and extends to all aspects of the project that are likely, directly or indirectly, to cause Damage to the Environment as defined in MEPA regulations.

Review of the Single EIR

The Single EIR provided a description of existing and proposed conditions; preliminary project plans; a description of coordination with CZM, MassDEP, and the Cape Cod Commission (CCC) conducted since the filing of the EENF; a floodplain analysis; additional analysis of project alternatives; additional information on potential impacts, benefits, and outreach to EJ populations; additional discussion of traffic impacts and mitigation; and an expanded analysis of impacts to wetland resource areas.

Supplemental information was distributed by the Proponent on June 13, 2023 that provided information regarding the project's floodplain impacts, further discussed below. For purposes of clarity, all supplemental materials provided by the Proponent are included in references to the "Single EIR," unless otherwise indicated.

Comments from Agencies do not identify any impacts that were not reviewed in the Single EIR or identify additional information that should be provided on the project.

Alternatives Analysis

The Scope on the EENF requested that the Single EIR provide an expanded discussion of alternative layouts for the parking lot that reduce the amount of alteration within Riverfront

Area. As described in the Single EIR, two additional design alternatives were evaluated that locate the parking area farther outside or entirely outside the Riverfront Area. The first alternative alignment involved locating the parking lot along the western and southern perimeter (as opposed to along the eastern perimeter); the second alternative alignment involved locating the parking lot to a central location on the site. As described in the Single EIR, the alternative alignments were dismissed as they would result in additional noise and visual impacts to EJ neighborhoods, increase pedestrian and vehicle contact points, limit the park functionality, and/or jeopardize project funding (as the accessway would fall outside the footprint of the defined area of improvements funded by the Land and Water Conservation Fund Grant).

I note that at the time the EENF filed, the extent of degraded Riverfront Area within the project site was unconfirmed, and impacts associated with the parking lot were considered potentially new alteration to Riverfront Area. As further discussed below, the project will meet the performance standards for work proposed in degraded Riverfront Area; it was unclear at the time the EENF was filed whether the project could meet the performance standards associated with Riverfront Area that was not considered degraded. As described in the Single EIR, based on detailed investigations conducted at the site in December 2022, it was determined that the area where the parking lot is proposed qualifies as degraded (as defined at 310 CMR 10.58(5)), as the area lacks topsoil, does not support vegetation, and has both surficial and buried asphalt pavement as well as other debris present documented throughout the site.

The Scope on the EENF also directed the Proponent to evaluate further measures to reduce impervious surface. The EENF originally described the creation of 0.60 acres of new impervious surface and 0.97 acres of existing impervious surface on-site associated with previous uses, for a total of 1.57 acres on-site following project construction. Following refinements to existing and proposed conditions calculations during the local permitting process, the Single EIR identifies the creation of 0.67 acres of impervious surface and 1.08 acres of existing impervious surface, for a total of 1.75 acres on-site following project construction. The Single EIR states that, due to site constraints and the anticipated use of the site, the proposed impervious areas have been minimized to the extent practicable, and therefore cannot be further reduced. Specifically, the Single EIR indicates that reductions in the width of the accessway would result in traffic impacts that were considered unacceptable, and further increasing the use of pervious surface (as opposed to asphalt) would result in failure of the roadway (given the expected use of commercial trucks and vehicles in the areas were asphalt is proposed) and impact the access of emergency vehicles during special events. Currently, the parking spaces and certain pedestrian pathways on-site are proposed to consist of pervious surface.

Environmental Justice

As noted above, the project site is located within one EJ population characterized by Income criteria and within one mile of two additional EJ populations characterized by Income criteria. The "Designated Geographic Areas" ("DGA," as defined in 301 CMR 11.02, as amended) for the project is one mile. No languages were identified as spoken by 5% or more of residents who also identify as not speaking English very well. A list of community-based organizations (CBOs) and tribes/indigenous organizations (the "EJ Reference List") provided by the MEPA Office was used to notify the listed entities of the filing of the Single EIR. The Single

EIR states that this notice also included a summary of project updates, and that the notice was placed in the Cape Cod Times, on various social media pages and on the front page of the Town's website, and at various public locations including bus stops and public libraries.

The Single EIR indicates that, since the filing of the EENF, several public meeting and presentations have been held for the project associated with the local permitting process (in addition to the nearly 50 public meetings held on the project prior to the filing of the EENF). The Single EIR notes that these meetings have included abutter notification and legal notices placed in the Cape Cod Times, and that during these meetings, the surrounding EJ neighborhood identified concerns with the proposed boardwalk's impact on the privacy of the neighborhood. As noted above, the project design was refined in response to this feedback to move the boardwalk away from the community and to provide additional vegetative plantings/screening. The Single EIR states that, through coordination with adjacent neighborhoods, the newly proposed alignment has alleviated the neighbors' concerns.

The Scope on the EENF directed the Town to confirm that traffic impacts will be sufficiently mitigated to avoid impacts to EJ populations. The Single EIR states that the Town does not anticipate creating any significant traffic impacts, other than when periodic special events are held. When special events are held, the Single EIR states that traffic will be managed through an event-specific Transportation Management Plan to avoid impacts to EJ populations. As further discussed below, comments from MassDOT note that the project is expected to have limited traffic impacts, and that the Proponent has proposed safety and multi-modal site access improvements to mitigate potential impacts. As previously discussed in the EENF, while the project may potentially increase traffic in the area associated with new visitors to the park, the site is currently located on a Cape Cod Regional Transit bus route and future work planned by MassDOT includes the creation of dedicated bike lane, shared-use-path facilities, and new crosswalks which will provide safer, multi-modal transportation options to the site.

The Single EIR also discusses the potential for construction to affect the surrounding EJ populations, as requested by the Scope. As described in the Single EIR, project construction will result in a temporary increase in diesel truck routes along Route 28 (the main east-west transportation corridor) to and from the site, adjacent to EJ populations. The Single EIR states that measures to reduce impacts associated with construction include consolidating vehicle delivery trips, limiting construction activities to weekdays between 7:00 AM and 5:00 PM, implementing dust control measures, and requiring the contractor to comply with vehicle emission guidelines.

Public Health

The Single EIR included a separate section on "Public Health." The EENF provided a comprehensive review of publicly available data to identify existing and potential public health impacts within the applicable EJ communities. The Single EIR states that the project is not anticipated to cause negative environmental or public health impacts that would affect EJ populations. As described in the Single EIR, the project has been designed to equitably allocate environmental benefits to further environmental justice principles, and will provide an array of public health benefits associated with the creation of a public park in a previously degraded and

abandoned property. The Single EIR notes that the project, located within an EJ community, will provide a nature-based playground area for children, new ADA accessible outdoor recreation opportunities, and access to both land and water recreation as well as an outdoor event space. Additionally, the Single EIR states that the proposed fill associated with the project will provide flood protection to the EJ population located west of the site during smaller, more frequent flood events (up to el. 7.5 ft NAVD88), as further discussed in the Climate Change section below.

Wetland and Coastal Resources

The Single EIR provided the proposed elevation of the stream crossing associated with the boardwalk, the bankfull width of the tidal creek, and Mean High Water (MHW) on project design plans, as requested by the Scope. The Scope also directed the Town to address how future sea level rise has been considered and incorporated into the design of the stream crossing to maintain tidal flow over the design life of the structure. According to the Single EIR, the useful life of the proposed boardwalk and kayak launch is approximately 40 years. Based on current projections, it is estimated that as compared to water surface elevations in the early 2000's, sea levels will rise by 1.3 and 2.4 feet by 2050, and by 2.3 and 4.2 feet by 2070. Based on the "High" sea level rise projections, the MHW at the site would increase from 2.05 feet to 4.45 feet by 2050 and to 6.05 feet by 2070 (NAVD88). The Single EIR states that, with this increase in MHW, the majority of the boardwalk would travel over areas that would be submerged during a typical tidal cycle in 2050 and 2070. However, while the structure would be situated over water, it is not anticipated to impact the flow of tidal waters, as water will be able to move freely under the structure during a typical tidal cycle.

The Single EIR also evaluated an alternative for the boardwalk with a 1.5:1 height-to-width (H:W) ratio where it is located over Salt Marsh (including the boardwalk associated with the kayak launch). As stated in comments from the Massachusetts Department of Marine Fisheries (DMF) submitted on the EENF, a minimum 1.5:1 H:W ratio for all decking installed over Salt Marsh is recommended, based on field studies showing reductions in shading and marsh loss above this threshold. According to the Single EIR, a 1.5:1 H:W was evaluated and dismissed as it would increase negative visual impacts to abutting properties, including EJ communities that have expressed concerns about such impacts; potentially result in greater permanent impacts to Salt Marsh due to an increase in the overall number of piles/bracings required to support the additional height; greater permanent impacts in resource area buffers due to the increased length of ADA compliant ramp and landing structural systems required for the boardwalk approaches; and increased construction duration and increased public project costs. Comments from DMF acknowledge the trade-offs that exist in design considerations between indirect (shading) and direct (habitat displacement) impacts of walkways constructed over Salt Marsh, and state that the proposed design appears to balance these impacts. The Single EIR continues to propose to construct the boardwalk to provide a minimum of 1:1 H:W ratio over the ground elevation when in a north-south orientation, and a 1.25:1 H:W ratio when in an east-west orientation to minimize shading impacts on Salt Marsh. Comments from DMF state that the material provided in the Single EIR adequately addresses prior recommendations to explore alternative designs towards minimizing impact to Salt Marsh habitat. The Single EIR also commits to the time of year (TOY) restrictions recommended by DMF in comments on the EENF.

As noted above, the Scope on the EENF required that the Town determine the extent of the Riverfront Area within the project site that meets the definition of degraded as defined by the WPA at 310 CMR 10.58(5), as requested by MassDEP. As described in the Single EIR, on October 19, 2021, a Massachusetts Registered Professional Engineer and Massachusetts Certified Soil Scientist conducted three test pits and two borings onsite within Riverfront Area. The results of the tetes pits were included in the Single EIR. In response to comments from MassDEP on the EENF, an additional 21 test pits/observations were performed on December 13, 2022 using an excavator; the test pit logs were also included in the Single EIR. The Single EIR included plans that clearly identify the area of Riverfront Area that is considered degraded, and states that the data continues to support the past characterizations of the site; notably, that the entirety of the Riverfront Area between the existing snow fence and the outer limit of the Riverfront Area is degraded per 310 CMR 10.58 (5), with specific reference to 1) the presence of existing pavement and 2) the absence of topsoil. The Single EIR also provided a discussion of the project's compliance with the Riverfront Area Performance Standards, as well as the restoration activities proposed as part of the project. Comments from MassDEP state that the Town has adequately addressed the Department's comments on the EENF. The project includes approximately 29,250 sf of Riverfront Area restoration and 31,920 sf of LSCSF restoration. All Riverfront Area restoration is proposed within existing degraded Riverfront Area in accordance with the requirements at 310 CMR 10.58(5). Restoration of these areas includes planting of native species appropriate for the ecological conditions at the Site.

Comments from CZM submitted on the EENF noted that portions of the site, including the former Yarmouth Drive-In property, are modeled in the Sea Level Affecting Marshes (SLAMM) model[2] as potentially suitable for marsh migration. As described in the Single EIR, in 2050, under both the intermediate-low (IL) and intermediate-high (IH) sea level rise (SLR) scenarios, marsh migration is primarily anticipated to occur on the site along the Parkers River in the vegetated areas that will remain following the project's construction. Accordingly, the project is not anticipated to alter migration within that planning horizon, and Salt Marsh will be able to migrate onto the site north of the Upweller facility. In addition, the project will promote and enhance Salt Marsh migration in the area of existing Upweller driveway, which is proposed to be restored as part of the project. In 2070, the IL SLR scenario maintains generally the same marsh migration patterns seen in 2050 IH SLR scenario. The IH SLR scenario in 2070, however, shows potential brackish / transitional marsh extending both into the area of IVW south of the former drive-in and across the lower-lying portions of the former open drive-in area. Due to the proposed use of the former drive-in area at the northern limit of the site, the project will prevent Salt Marsh migration into this area. However, no action will be taken to prevent the Salt Marsh migration pathway south of the site.

Finally, the Single EIR addressed measures to prevent stormwater impacts to the Parkers River, which has a TMDL for nitrogen. The Single EIR states that the project is not anticipated to increase nitrogen loading to the Parkers River as the project does not include installation of a septic system, the primary source of nitrogen to the Parkers River. In addition, the application of fertilizer onsite is not proposed by the Town, as plants included in the design are native to

[2] Available at https://arcg.is/my90C0

Massachusetts and are adapted to thrive at the site. As described in the Single EIR, the only anticipated source of nitrogen is stormwater runoff, and while the project will increase impervious areas by 0.67 acres, the project will actually result in a decrease in stormwater runoff from the site compared to existing conditions. The proposed stormwater system will manage and treat all 1.75 acres of impervious area proposed at the site, including the 1.08 acres of existing impervious area, from which stormwater currently flows untreated to the Parkers River.

Comments from the CCC submitted on the EENF identified concerns about the potential for the steel coating on the proposed boardwalk helical anchors to leach into the surrounding wetland and coastal resources. As described in the Single EIR, to significantly increase the service life of the steel helical piles, corrosion protection is required, and the most common, efficient, and economical way of providing corrosion protection of steel is to galvanize it, which is the process of placing a zinc coating over the steel. The Single EIR states that the helical piles are proposed to be galvanized, which will result in an estimated service life of approximately 70-85 years, as opposed to the approximately 10-year service life expected for steel helical piles without any corrosion protection in temperate marine environments. According to the Single EIR, the zinc will leach slowly over the service life of the piles, but is expected to disperse as opposed to concentrate, and will also prevent steel corrosion and iron leaching. The Single EIR notes that there is no evidence that a zinc leaching containment plan has ever been executed for a boardwalk structure in a marsh land. Additionally, recent studies on various projects have shown that zinc leaching would not cause background levels of zinc to exceed the levels that would cause toxicity to aquatic organisms. As a result, a containment plan for the zinc is not proposed. I note that CCC's comments identified concerns specifically with the potential for steel leaching, as opposed to zinc.

Public Benefit Determination

The project proposes activities within 874 sf (0.02 acres) of tidelands subject to the provisions of *An Act Relative to Licensing Requirements for Certain Tidelands* (2007 Mass. Acts ch. 168), now codified at M.G.L. c. 91, § 18B, and the Public Benefit Determination (PBD) regulations (301 CMR 13.00).[3] Consistent with Section 8 of the legislation, I must conduct a Public Benefit Review as part of the review of EIR projects located on tidelands that entail new use or modification of an existing use. The Single EIR described the benefits of the project as restoring degraded wetland and coastal resource areas; improving public access to the waterfront in an area that is currently primarily vegetated with invasive species and shows evidence of previous development; creating a dedicated, ADA accessible boardwalk, which will minimize erosion to Salt Marsh associated with current, unsupported public use of the space; providing public restrooms, a playground for children, shared-use paths, and crosswalks, as well as an outdoor event space.

The PBD regulations, at 301 CMR 13.04(1), include a presumption that water-dependent projects provide adequate public benefit. As noted above, the project will be required to obtain a c.91 License from MassDEP. Comments from the MassDEP on the EENF included a

[3] Area of Commonwealth tidelands that will be impacted by the project were described in an email sent from Laura Krause (BETA Group, Inc.) to Eva Vaughan (MEPA Office) on June 21, 2023.

determination that the proposed activities would be classified as a water-dependent use project pursuant to the Waterways Regulations at 310 CMR 9.12. For this reason, I find that the Single EIR has demonstrated that the project will have a public benefit in accordance with M.G.L. c. 91, § 18B and 301 CMR 13.00. Thus, this Single EIR Certificate shall serve as the PBD for this project.

Traffic and Transportation

The Single EIR describes coordination that the Town has conducted with MassDOT since the filing of the EENF, and work that is being proposed by MassDOT proximate to the site that has been considered and incorporated into the project design. The Single EIR provided the stopping sight distance and intersection site distance available to vehicles at the site driveway, as well as the sight distance to pedestrians on the north and south sides of the proposed mid-block crossing, as requested in comments from MassDOT on the EENF. The Single EIR also provides a discussion of potential measures to reduce traffic to the site during special events that would result in above-average traffic generation, as required by the Scope. A Traffic Management Plan (TMP), developed in consultation with the Town, is required and must be provided as a condition of approval for larger events at the site. The TMP will be implemented by the Event Sponsor, in concert with the Yarmouth Police Department, who may be required to hire a police detail for events, particularly those that have a specific start and stop time. Traffic management is anticipated to be structured in a similar manner to the set-up and processes that have worked well for the town in the past. A commitment to provide additional traffic coordination during on-site events has been incorporated into the Draft Section 61 Findings, as requested by the Scope. Comments from MassDOT state that, based on the limited project impacts and proposed mitigation to improve safety and multi-modal site access, MassDOT does not recommend further environmental review of the project based on transportation issues.

Climate Change Adaption and Resiliency

The Single EIR addresses the project's compliance with Building Code, as requested by the Scope. The site is entirely within the 100-year FEMA floodplain, Zone AE, with a BFE of el. 13 ft NAVD88 across the majority of the site. The proposed public restroom in the center of the park is proposed to be set at el. 12 ft NAVD88, with dry flood proofing extending vertically to offer flood protection to el. 15. For the artist shanties (described as simple accessory structures), wet flood-proofing is proposed. In addition to securely anchoring the structures to concrete base slabs, floodway openings will be incorporated into all the shanties. The Single EIR indicates that the project will comply with all Building Code requirements for buildings constructed in the floodplain.

Comments from CZM submitted on the EENF noted that floodwaters and waves will likely move across the site during coastal storm events, and proposed fill, retaining walls, new impervious surfaces, and amenities on the site may change the way these floodwaters move over the site. To demonstrate that the project has been designed to avoid increasing potential impacts associated with coastal flooding, the Town conducted a pre- and post-construction flow path analysis. The flow path analysis was conducted for pre- and post-construction conditions with a floodwater elevation of 4.2, 6.2, 7.2, 8.0, 8.5, and 13 ft NAVD88. These elevations were chosen

as they were associated with significant site conditions/elevations on-site or at adjacent properties (such as the crest of the Route 28 Bridge over the Parkers River, or the 100-year floodplain BFE).

As described in the EENF, once floodwater elevations exceed el. 8.5 ft NAVD88, the existing flood limits and approach velocities over the site will match existing conditions, as at this elevation, proposed changes in grades will be overtopped. At lower elevations, the project is expected to reduce flooding impacts on the adjacent residents. Specifically, the Single EIR states that the proposed access roadway and parking area will function as a dike, which will provide the site and the residential abutters to the west of the site additional flood protection for events up to el. 7.5 ft NAVD88, which corresponds to flood levels anticipated at the peak of a Category 1 hurricane. The Single EIR states that the park improvements will also increase the vegetative buffer between the river and the proposed improvements, maintain the existing vegetation between the river and the former drive-in site, and improve the access driveway surface to the Upweller facility to reduce the potential for erosion from inundation velocities.

The only change in floodwater flow identified in the Single EIR that may not result in reduced flood waters in neighboring areas is associated with an area at the entrance driveway. Below el. 8.0 ft in this area, the roadway and proposed earthen berm (which forms the outside edge of the stormwater improvements) will displace all potential flows. Under current conditions, water flows across the site to and from Route 28 through this area. With the proposed improvements, flow will be restricted through this area to a proposed swale and the existing mounded septic system associated with the abutting commercial property (the Lobster Boat Restaurant); the project will not result in channelized flows to Route 28. To mitigate a potential increase in velocities through this pathway, an earthen berm at crest el. 7.5 has been extended between the northern cul-de-sac and the Lobster Boat Restaurant. An 8-inch pipe with a check-valve will extend through the berm to allow for floodwaters to drain out of the area. The Single EIR states that the berm will prevent the passage of water around the restaurant property and compel flows to be maintained in the main channel. It will also form a ponding area between the access roadway and the adjacent commercial property, which will act as a stilling basin for flows through the entrance at Route 28; as such, the Single EIR states the diversion of floodwaters should have little impact on the abutting commercial parking lot. I refer the Town to comments from CZM state that the design plans should be revised to use salt-tolerant, erosion-control plantings to stabilize the proposed berm instead of boulders, which often scour in storms.

The Single EIR also addressed the recommendations from the MA Resilience Design Tool, including whether stormwater sizing is adequate to accommodate the 2070 10-year storm recommendation (24-hour rainfall volume of 6.4 inches), and building elevations as compared to the 2070 50-year water surface elevation (14.5 ft NAVD88) and the 2050 and 2070 “wave action water elevation” (16 to 18.6 ft NAVD88) provided by the Tool. The Single EIR indicates that the proposed stormwater system exceeds the recommendations of the MA Resilience Design Tool, as it has been sized to accommodate a 24-hour rainfall volume of 7.42 inches, 1.02 inches greater than that recommend by the Tool. As noted above, stormwater runoff has been minimized through the use of pervious pavement, and the project proposes to treat all runoff associated with the existing 1.08 acres of impervious surface (in addition to the impervious surface proposed to be created), which is currently completely untreated/unattenuated.

The proposed restroom/office building design includes a finished floor elevation of 12 ft NAVD88, which is comparable to 2050 50-year water surface elevation (12.8 feet), but below the 2070 50-year water surface elevation; this elevation is below both the 2050 and the 2070 wave action water elevations provided by the MA Resilience Design Tool. The Single EIR states that, while the finished floor elevation is 12 ft NAVD88, the current building design includes dry flood-proofing to an elevation of 15 ft NAVD88, above the 2070 50-year water surface elevation (14.5 ft NAVD88). While still below the 2050 and 2070 "wave action water elevations" (16 to 18.6 ft NAVD88, respectively), the Single EIR states that the current design of the building allows for implementation of additional measures in the future to prevent flood water from entering the windows, which would provide flood protection beyond el. 15 ft NAVD88, up to the top of the restroom/office building.

Mitigation and Draft Section 61 Findings

The Single EIR provides final mitigation commitments and draft Section 61 Findings for use by Agencies, which are summarized below. The Section 61 Findings should be provided to Agencies to assist in the permitting process and issuance of final Section 61 Findings. As noted in the Certificate issued on the EENF, the project qualifies for the de minimis exemption included in the May 2010 MEPA Greenhouse Gas Emission (GHG) Policy and Protocol (Policy) for projects that are expected to produce minimal GHG emissions. As stated in the EENF, GHG emissions are predominately associated with the anticipated mobile source emissions, and total GHG emissions associated with the project are de minimis. Therefore, a GHG analysis was not required for the project, and a self-certification of GHG emissions reduction measures is not required by the Proponent.

Environmental Justice

- Restoration of a degraded site to create an ADA accessible public recreation asset with public bathrooms, facilitating both land and water recreation activities
- Implementation of traffic control measures to minimize traffic and air quality impacts
- Limiting the use of use of event space perimeter lights for special events only
- Installation of screening/privacy plantings for surrounding EJ populations
- Requiring special event sponsors to limit sound levels to 90 dBA at 100 feet from stage area to reduce noise impacts
- Reduction of flooding impacts to the EJ residences adjacent to the site

Land/Stormwater

- Use of a previously disturbed/currently developed site
- The Stormwater design will be constructed in compliance with the Massachusetts Stormwater Standard and will include:
    - Subsurface infiltration
    - Drainage swales

  - Infiltration basins
  - Porous pavement parking spaces
  - Infiltration trenches
- The stormwater infrastructure will be constructed to accommodate the current 24-hour 100-year storm (24-hour rainfall volume of 7.42")
- The stormwater system will be maintained in accordance with the Operations and Maintenance Plan

Wetland and Coastal Resources

- Salt Marsh restoration, including amending soils and planting native vegetation
- 29,250 sf of Riverfront Area restoration and 31,920 sf of LSCSF restoration, including:
  - Removal of debris from the site, including debris throughout the woods
  - Management of invasive species
  - Planting native vegetation
  - Amending soils
- Use of sedimentation and erosion controls during project construction
- TOY restrictions, including:
  - Implementing an April 2 – October 14 time of year restriction during installation of the boardwalk piles to minimize impacts to rare bird species
  - Implementing a February 15 – June 15 time of year restriction during installation of the float to minimize impacts to anadromous fish species

Traffic and Transportation

- Installation of right and left-turn only lanes exiting the parking lot to decrease queues
- Bicycle/Pedestrian accommodations, including the construction of an 8-foot-wide shared-use-path, installation of bicycle racks, and walking paths throughout the site.
- Preparation of a Traffic Management Plan will be required for events and coordination with the Police Department during larger periodic events. Traffic management techniques typically include:
  - Police cruiser, Police officers at the intersection for officer traffic control,
  - Barrels, drums, and cones to direct and restrict traffic movements,
  - Use of portable, changeable message boards on Route 28 displaying event times and dates in advance of the event as well as with driving instructions the day of the event to further guide visitors,
  - Reversible lanes for peak entering and exiting traffic,
  - Designate areas to stack early-arriving vehicles before gates opened,

- Collect parking fees in interior areas of the Site to avoid backups to Route 28,
- Use of a shuttle bus for the largest events/parades.

Climate Change Adaptation and Resiliency

- Inclusion of a berm along the eastern limit of the driveway a prevent flood water channelization and increases in flood water velocities
- Grading the site to ensure flood flows will not increase on adjacent parcels
- Maintaining areas of existing vegetation to allow marsh migration onsite.
- Planting native vegetation in suitable habitat to minimize water use
- Constructing the stormwater system to accommodate the current 24-hour rainfall volume for the 100-year storm (7.42"), which is greater than the 2070 10-year storm (6.4")
- Dry floodproofing the proposed office/bathroom building to a minimum elevation of 15 ft NAVD88, two feet above the 100-year BFE
- Enhancement of wetland areas, which provide flooding benefits

Greenhouse Gas Emissions

- Restricting restroom use to summer months
- Orienting restroom to accommodate installation of solar panels
- Use of energy-efficient design elements, including an electric tankless water heater, adjustable lights, and motion-operated lights in restroom
- Installation of permanent signs limiting idling to five minutes or less

Construction Period

- Dust will be managed in accordance with the NPDES General Permit to minimize airborne particulate matter
- Non-road diesel equipment rated 50 horsepower or greater will meet EPA's Tier 4 emission limits. If a piece of equipment is not available in the Tier 4 configuration, the Construction Manager will work with the general contractor to confirm that construction equipment will be retrofitted with appropriate emissions reduction equipment.
- Implementation of a Storm Water Pollution Prevention Plan (SWPPP) which will include:
  - Implementation and enforcement of a Spill Contingency Plan
  - Storage of any chemicals or hazardous materials under cover
  - Installation of sediment and erosion controls including turbidity curtains, compost filter tubes, and inlet protection measures
  - Inspection of the Site weekly to confirm erosion controls are functioning
- Construction waste and debris management, including:

  - Reuse of crushed asphalt and concrete to the extent feasible.
  - Chipping and reuse of native vegetation as mulch.
  - Use of covered waste-storage containers
- Limiting idling to five minutes or less through the installation of construction-phase signs noting that idling shall be limited, and periodic inspections to confirm contractor is complying with the requirement.

Conclusion

Based on a review of the Single EIR and consultation with Agencies, I find that the Single EIR adequately and properly complies with MEPA and its implementing regulations. The project may proceed to permitting. Participating Agencies should forward copies of the final Section 61 Findings to the MEPA Office for publication in accordance with 301 CMR 11.12.

June 23, 2023
Date

Rebecca L. Tepper

Comments received:

06/09/2023 Massachusetts Department of Transportation (MassDOT)
06/09/2023 Massachusetts Division of Marine Fisheries (DMF)
06/15/2023 Massachusetts Department of Environmental Protection (MassDEP), Southeast Regional Office (SERO)
06/20/2023 Massachusetts Office of Coastal Zone Management (CZM)

RLT/ELV/elv

The Commonwealth of Massachusetts
Division of Marine Fisheries

(617) 626-1520 | www.mass.gov/marinefisheries

MAURA T. HEALEY, Governor | KIMBERLEY DRISCOLL, Lt. Governor | REBECCA L. TEPPER, Secretary | THOMAS K. O'SHEA, Commissioner | DANIEL J. MCKIERNAN, Director

June 8, 2023

Secretary Rebecca L. Tepper
Executive Office of Energy and Environmental Affairs (EEA)
Attn: MEPA Office
Eva Vaughan, EEA No. 16623
100 Cambridge Street, Suite 900
Boston, MA 02114

Dear Secretary Tepper:

The Division of Marine Fisheries (MA DMF) has reviewed the Single Environmental Impact Report (SEIR) by the Town of Yarmouth for its Yarmouth Riverwalk Park, Boardwalk and Event Space Project. The project includes the proposed construction of a public park on a vacant lot bordering the Parkers River. A 1,300 linear foot boardwalk loop is also included with a pedestrian bridge, three overlook areas and four bench areas. The boardwalk would be six feet in width and height over salt marsh would be set to a minimum 1:1 height to width (H:W) ratio for the north-south facing sections and 1.25:1 for the east-west facing sections. The preferred alternative uses three 3.5-inch diameter helical piles at each bent location for a total of 252 helical piles which would collectively impact 13 square feet of salt marsh habitat. A kayak launch is also proposed. The terminal float to the launch would be in an area of the Parkers River with at least a four foot depth at MLW and would be held in place with a helical anchor and elastomeric mooring stay system. Existing marine fisheries resources and habitat and potential project impacts to those resources are outlined in the following paragraphs.

The region of the Parkers River bordering the project site includes shellfish habitat for quahog (*Mercenaria mercenaria*) and blue mussel (*Mytilus edulis*). Land containing shellfish is deemed significant to the interest of the Wetlands Protection Act (310 CMR 10.34) and the protection of marine fisheries.

The region of the Parkers River bordering the project also provides passage for a variety of diadromous fish species. Alewife (*Alosa pseudoharengus*), American eel (*Anguilla rostrata*), white perch (*Morone americana*), and Atlantic tomcod (*Microgadus tomcod*) all seasonally occupy this system [1].

Much of the proposed boardwalk and a portion of the proposed kayak launch walkway directly overlie salt marsh habitat. Salt marsh provides a variety of ecosystem services, including habitat and energy sources for many fish and invertebrate species [2–4].

MA DMF offers the following comments for your consideration:

- In our review of the Expanded Environmental Notification Form (EENF) for this project, we recommended that the SEIR include revisions to boardwalk height over salt marsh to

meet the 1.5:1 height to width (H:W) ratio currently recommended by MA DMF for all decking over salt marsh [5–7] or to provide justification for the currently proposed mix of 1:1 H:W for north-south and 1.25:1 H:W for east-west facing boardwalk segments. Discussion of this aspect of the project in Section 6.1.3 Boardwalk Alternatives of the SEIR notes that further increases to decking H:W would result in visual impacts to bordering EJ communities as well as increased direct impacts to salt marsh associated with the greater number of support piles and other infrastructure needed for a taller structure. MA DMF acknowledges the trade-offs that exist in design considerations between indirect (shading) and direct (habitat displacement) impacts of walkways constructed over salt marsh. The proposed design appears to balance these impacts by maintaining a minimum 1:1 H:W ratio and a predominant north-south orientation across the majority of the project footprint while limiting support structures to small diameter helical piles. MA DMF feels that material provided in the SEIR adequately addresses prior recommendations to explore alternative designs towards minimizing impact to salt marsh habitat.

- MA DMF continues to support the proposed late fall to early winter (October 15 to April 1) construction window for work in salt marsh habitat detailed in the SEIR as this period would avoid impacts to salt marsh during the growing season.
- MA DMF supports the time of year (TOY) restriction for in-water construction of **February 15 to June 15** to protect the above listed diadromous fish species [1] detailed in Section 6.2 of the SEIR.

Questions regarding this review may be directed to John Logan in our New Bedford office at john.logan@mass.gov.

Sincerely,

Daniel J. McKiernan

Director

cc: Yarmouth Conservation Commission
Laura Krause, BETA Group, Inc.
Sabrina Pereira, NMFS
Robert Boeri, CZM
Rachel Croy, Ed Reiner, EPA
Brendan Mullaney, DEP
John Sheppard, Emma Gallagher, Amanda Davis, DMF

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5. Logan JM, Davis A, Markos C, Ford KH. Effects of docks on salt marsh vegetation: an evaluation of ecological impacts and the efficacy of current design standards. Estuaries and Coasts. 2018;41: 661–675.

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7. Logan JM, Boeri A, Carr J, Evans T, Feeney EM, Frew K, et al. A review of habitat impacts from residential docks and recommended Best Management Practices with an emphasis on the Northeastern United States. https://www.mass.gov/doc/dock-bmp-recommendations/download. Accessed November 18, 2021. Estuaries and Coasts. 2022;45: 1189-1216.

DM/JL/sd

Maura Healey, Governor
Kimberley Driscoll, Lieutenant Governor
Gina Fiandaca, Secretary & CEO

massDOT
Massachusetts Department of Transportation

June 9, 2023

Rebecca Tepper, Secretary
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114-2150

RE: Yarmouth – Yarmouth Riverwalk – SEIR
(EEA #16626)

ATTN: MEPA Unit
Eva Vaughan

Dear Secretary Tepper:

On behalf of the Massachusetts Department of Transportation, I am submitting comments regarding the Single Environmental Impact Report filed for the proposed Yarmouth Riverwalk in Yarmouth as prepared by the Office of Transportation Planning. If you have any questions regarding these comments, please contact J. Lionel Lucien, P.E., Manager of the Public/Private Development Unit, at (857) 368-8862.

Sincerely,

David J. Mohler
Executive Director
Office of Transportation Planning

DJM/jll

Ten Park Plaza, Suite 4160, Boston, MA 02116
Tel: 857-368-4636, TTY: 857-368-0655
www.mass.gov/massdot

cc: Jonathan Gulliver, Administrator, Highway Division
Carrie Lavallee, P.E., Chief Engineer, Highway Division
Mary-Joe Perry, District 5 Highway Director
James Danila, P.E., State Traffic Engineer
Cape Cod Commission (CCC)
Planning Board, Town of Yarmouth

MEMORANDUM

TO: David J. Mohler, Executive Director
Office of Transportation Planning

FROM: J. Lionel Lucien, P.E., Manager
Public/Private Development Unit

DATE: June 9, 2023

RE: Yarmouth – Yarmouth Riverwalk – SEIR
(EEA #16626)

The Public/Private Development Unit (PPDU) has reviewed the Single Environmental Impact Report (SEIR) for the Yarmouth Riverwalk (the "Project") in Yarmouth as submitted by BETA Group, Inc. on behalf of Yarmouth Town Administrator Robert Whritenour Jr. (the "Proponent").

The Project site is a 119.78-acre parcel which is currently an undeveloped wetland comprising of salt marsh and coastal beach land. The Project proposes to construct a riverwalk park facility, including a walking/bicycling pathway, restroom facilities, kayak rental and launch, and associated infrastructure including impervious surface and 88 off-street parking spaces. Access to the site will be provided via a full-access driveway under STOP-sign control connecting to Main Street, with an entrance lane and dedicated right-turn and left-turn exit lanes. The Project includes a mid-block crosswalk located west of the Project driveway as well as a crosswalk across the driveway and connection to the internal bikeway/walkway.

The Project previously submitted an Expanded Environmental Notification Form (EENF) which was duly noticed in the Environmental Monitor on November 9, 2022. The EENF included supplemental information to support the Proponent's request for a waiver to allow the preparation of a Single Environmental Impact Report (SEIR) rather than a Draft and Final EIR. On December 16, 2023, the Secretary of Energy and Environmental Affairs (EEA) issued a Certificate finding that the Project adequately complied with the Massachusetts Environmental Protection Act (MEPA) and granting the requested waiver to allow the submittal of an SEIR.

The SEIR and associated transportation analysis are responsive to MassDOT commentary submitted for the EENF. The Transportation Impact Assessment (TIA) has been updated and prepared following requirements and standards for the preparation of traffic studies as jointly issued by the Commonwealth of Massachusetts Executive Office of Energy & Environmental Affairs and the Massachusetts Department of Transportation (MassDOT). As requested, the SEIR provides the stopping sight distance and intersection site distance available to vehicles at the site driveway, as well as the sight distance to pedestrians on the

north and south sides of the proposed mid-block crossing. Also, a commitment to provide additional traffic coordination during on-site events in order to prevent impacts on the state highway system as well as mitigation measures are incorporated into the SEIR.

The Proponent provides a summary of the transportation mitigation program that would include the following items:

- Bicycle/Pedestrian accommodations are incorporated into the design, including:
  - Construction of an 8-foot-wide shared-use-path; and
  - Walking paths throughout the Site.
- Installation of right and left turn only lanes exiting the parking lot to decrease queues.
- For events that require preparation of a Traffic Management Plan (TMP) and coordination with the Police Department, traffic management techniques will typically include:
  - Police cruisers, police officers, and traffic control;
  - Use of portable, changeable message boards on Route 28 displaying event times and dates in advance of the event, with driving instructions the day of the event to further guide visitors;
  - Reversible lanes for peak entering and exiting traffic;
  - Designate areas to stack early arriving vehicles before gates opened;
  - Collect parking fees in interior areas of the Site to avoid backups to Route 28; and
  - Use of shuttle buses for large events.

Based on the limited project impacts and proposed mitigation to improve safety and multi-modal site access, MassDOT recommends that no further environmental review be required based on transportation issues. The Proponent should continue consultation with MassDOT PPDU and the District 5 office to finalize the issuance of the Section 61 Finding for the Project. If you have any questions regarding these comments, please contact *william.m.simon@dot.state.ma.us*.

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection
Southeast Regional Office • 20 Riverside Drive, Lakeville MA 02347 • 508-946-2700

Maura T. Healey
Governor

Kimberley Driscoll
Lieutenant Governor

Rebecca L. Tepper
Secretary

Bonnie Heiple
Commissioner

June 14, 2023

Rebecca L. Tepper,
Secretary of Energy and Environment
Executive Office of Energy &
Environmental Affairs
ATTN: MEPA Office
100 Cambridge Street, Suite 900
Boston, MA 02114

RE: SEIR Review EOEEA #16623
YARMOUTH. Riverwalk Park, Boardwalk and Event Space at 669 Route 28 and a portion of the unnumbered lot to the south

Dear Secretary Tepper,

The Southeast Regional Office of the Department of Environmental Protection (MassDEP) has reviewed the Single Environmental Impact Report (SEIR) for the Riverwalk Park, Boardwalk, and Event Space at 669 Route 28 and a portion of the un-numbered lot to the south, Yarmouth, Massachusetts (EOEEA #16623). The Project Proponent provides the following information for the Project:

The Town of Yarmouth (the Proponent) is proposing to redevelop the town-owned properties located at 669 Route 28 and a portion of the un-numbered lot to the south in the Town of Yarmouth, Massachusetts (Barnstable County) into a Riverwalk Park, Boardwalk, and Event Space for use by residents and visitors (the Project). The Project aims to improve the existing property through providing event space, recreation opportunities, public amenities and a restored coastline.

The "Site" includes a 23-acre former Drive-In property located at 669 Route 28, and 8 acres of the Lewis Pond Marsh Conservation Area to the south. Work involves the rehabilitation of the currently vacant property and conversion into a public park, featuring a central four-acre grassed multi-use field area for periodic outdoor events, encircled with field and woodland walking paths. Near the Parkers River, a nature-based play area for children is planned with play structures and lawn games, shade sails, and artist shanties displaying work from various artists or other vendors. The park design also features a pile-supported boardwalk leading to a float for launching canoes, kayaks and paddleboards on the Parkers River.

A woodland path is also proposed that will connect the park to a 1,300 linear foot 6-foot-wide boardwalk loop, including a pedestrian bridge, constructed as an elevated walkway over Salt Marsh. The boardwalk includes three overlook areas and four bench areas, offering expansive views of the sky and marsh below. Other improvements include a porous paving parking lot with

lighting for 88 new parking spaces, a small park office and restroom building (1,130 sf), and up to nine artist shanties (at 140 sf each), a kiosk near the kayak launch, and associated utilities. None of the proposed structures will be conditioned, as they will be seasonal.

Comments//Guidance

The MassDEP Southeast Regional Office has reviewed this SEIR and believes the Project Proponent has adequately addressed the Department's EENF comments. As such, the Department supports the applicants request for a Single EIR.

If you have any questions regarding these comments, please contact George Zoto at George.Zoto@mass.gov or Jonathan.Hobill@mass.gov.

Very truly yours,

Jonathan E. Hobill,
Regional Engineer,
Bureau of Water Resources

JH/GZ

Cc: DEP/SERO

ATTN: Millie Garcia-Serrano, Regional Director
Gerard Martin, Deputy Regional Director, BWR
John Handrahan, Deputy Regional Director, BWSC
Seth Pickering, Deputy Regional Director, BAW
Jennifer Viveiros, Deputy Regional Director, ADMIN
Maissoun Reda, Chief, Wetlands and Waterways.BWR
Greg DeCesare, Wetlands, BWR
Cally Harper, Wetlands, BWR
Brendan Mullaney, Waterways, BWR
Mark Dakers, Chief, Solid Waste, BAW
Elza Bystrom, Solid Waste, BAW
Angela Gallagher, Chief, Site Management, BWSC
Jennifer Wharff, Site Management, BWSC

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS
OFFICE OF COASTAL ZONE MANAGEMENT
100 Cambridge Street, Suite 900, Boston, MA 02114 ◦ (617) 626-1200

MEMORANDUM

TO: Rebecca L. Tepper, Secretary, EEA
ATTN: Eva Vaughan, MEPA Unit
FROM: Lisa Berry Engler, Director, CZM
DATE: June 20, 2023
RE: EEA-16623, Riverwalk Park, Boardwalk, and Event Space SEIR, Yarmouth

The Massachusetts Office of Coastal Zone Management (CZM) has completed its review of the above-referenced Single Environmental Impact Report (SEIR) noticed in the *Environmental Monitor* dated May 10, 2023, and offers the following comments.

Project Description

The project involves the redevelopment of a previously altered town-owned property adjacent to Parkers River in Yarmouth. The site includes a 23-acre former drive-in property and eight acres of the Lewis Pond Marsh Conservation Area to the south. Work involves the redevelopment of the currently vacant property and conversion into a public park. Proposed features include; a central four-acre grassed multi-use field area for periodic outdoor events; multiple walking paths throughout the property; a nature-based play area for children with play structures; numerous artist shanties; a pile-supported boardwalk leading to a float for launching canoes, kayaks, and paddleboards; and a 1,300 linear foot boardwalk loop over the salt marsh.

The project has received financial assistance from state agencies including a Seaport Economic Council Grant of $1,000,000 and a Department of Conservation and Recreation award of $200,000. Other funding sources include a Local Community Preservation Act award for $3,700,000; a Local Tourism Revenue Preservation Fund award for $100,000 and a Federal National Park Service award for $956,000.

Project Comments

Comments were submitted previously on the Expanded Environmental Notification Form in December 2022 and there was a meeting with the project proponents on April 7, 2023, to review comments and to discuss flood pathway analysis, opportunities to decrease impervious areas, alternatives for the proposed reinforced turf and potential salt marsh migration pathways. The plans presented in the SEIR were modified to address these comments and mitigate potential direct and indirect environmental impacts. These changes include:

- The proposed use of geogrid-reinforced turf adjacent to the perimeter shared-use path was eliminated from the plan and was replaced with a modified gravel and loam soil mixture that will both support grass growth and withstand vehicle loads. This revision will avoid extensive areas of the plastic geogrid material and eliminate the risk of the geogrid in those areas working loose in a flood event and becoming floating marine debris.

- Revised site grading for an area east of the first cul-de-sac to create a berm to minimize the risk of potential erosion due to increased flood velocities occurring within the Coastal AE Zone. Additional plant pockets, trees, and shrubs are proposed to further slow and dissipate flood waters.
- Revised site grading around the event space to reduce channelization of water at the southern extent of the event space as flood water recedes following a flood event that increases that surface water elevation above 7.5 feet (NAVD88).

The plans should be revised to use salt-tolerant, erosion-control plantings to stabilize the proposed berm instead of boulders, which often scour around rocks in storms. Deep-rooted erosion control plantings will help slow flood water more effectively without causing scour. For information about plants for this application, please see the coastal bank section of StormSmart Properties Fact Sheet #3: Planting Vegetation to Reduce Erosion and Storm Damage.

Federal Consistency Review

The proposed project may be subject to CZM federal consistency review, and if so, must be found to be consistent with CZM's enforceable program policies. For further information on this process, please contact Robert Boeri, Project Review Coordinator, at robert.boeri@mass.gov, or visit the CZM website at www.mass.gov/federal-consistency-review-program.

Cc: Laura Krause, Beta Groupe, Inc.
Robert L Whritenour Jr., Yarmouth Town Administrator
Brittany DiRienzo, Yarmouth Conservation Administrator
Kathleen Williams, Yarmouth Town Planner
Steve McKenna, MACZM
Rebecca Haney, MACZM

Town of Yarmouth Order of Conditions

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:
MassDEP File #:083-2372
eDEP Transaction #:1469360
City/Town:YARMOUTH

A. General Information

1. Conservation Commission: YARMOUTH
2. Issuance: a. ☑ OOC b. ☐ Amended OOC
3. Applicant Details

a. First Name	ROBERT		b. Last Name	WHRITENOUR	
c. Organization	TOWN OF YARMOUTH				
d. Mailing Address	1146 ROUTE 28				
e. City/Town	SOUTH YARMOUTH	f. State	MA	g. Zip Code	02664

4. Property Owner

a. First Name	ROBERT		b. Last Name	WHRITENOUR	
c. Organization	TOWN OF YARMOUTH				
d. Mailing Address	1146 ROUTE 28				
e. City/Town	SOUTH YARMOUTH	f. State	MA	g. Zip Code	02664

5. Project Location

a.Street Address	669 ROUTE 28 AND UNNUMBERED PARCEL TO SOUTH		
b.City/Town	YARMOUTH	c. Zip Code	02673
d. Assessors Map/Plat#	32 AND 24	e. Parcel/Lot#	122 AND 92
f. Latitude	41.64635N	g. Longitude	70.22223W

6. Property recorded at the Registry of Deed for:

a. County	b. Certificate	c. Book	d. Page
BARNSTABLE		4985 AND 8979	181 AND 44

7.Dates

a. Date NOI Filed : 12/1/2022 b. Date Public Hearing Closed: 1/5/2023 c. Date Of Issuance: 1/26/2023

8.Final Approved Plans and Other Documents

a. Plan Title:	b. Plan Prepared by:	c. Plan Signed/Stamped by:	d. Revised Final Date:	e. Scale:
YARMOUTH RIVERFRONT PARK NOTICE OF INTENT BOARDWALK AND KAYAK LAUNCH G.1-3 C 1.1- C 3.4	BETA GROUP	GARY D. JAMES P.E.	12/1/22	SCALE AS NOTED

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:
MassDEP File #:083-2372
eDEP Transaction #:1469360
City/Town:YARMOUTH

YARMOUTH RIVERFRONT PARK NOTICE OF INTENT BOARDWALK AND KAYAK LAUNCH S.1.1- S 2.8	CHRISTOPHER W. JONES P.E	12/1/22	SCALE AS NOTED

B. Findings

1.Findings pursuant to the Massachusetts Wetlands Protection Act
Following the review of the 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.

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. ☑ Ground Water Supply	h. ☑ Storm Damage Prevention	i. ☑ Flood Control

2. Commission hereby finds the project, as proposed, is:

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.

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 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 interests of the Act , 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 310CMR10.02(1)(a). _____ a. linear feet

Inland Resource Area Impacts:(For Approvals Only):

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. ☐ Bank	a. linear feet	b. linear feet	c. linear feet	d. linear feet
5. ☑ Bordering Vegetated Wetland	452 a. square feet	452 b. square feet	0 c. square feet	d. square feet
6. ☐ 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. ☐ 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. ☐ Isolated Land Subject to Flooding	a. square feet	b. square feet		
Cubic Feet Flood Storage	c. cubic feet	d. cubic feet	e. cubic feet	f. cubic feet
9. ☑ Riverfront Area	9148 a. total sq. feet	9148 b. total sq. feet		
Sq ft within 100 ft	7702 c. square feet	7702 d. square feet	e. square feet	f. square feet
Sq ft between 100-200 ft	1146 g. square feet	1146 h. square feet	i. square feet	j. square feet

Coastal Resource Area Impacts:

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
10. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below			
11. ☑ Land Under the Ocean	6 a. square feet	6 b. square feet		
	0 c. c/y dredged	d. c/y dredged		
12. ☐ Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below			
13. ☑ Coastal Beaches	8 a. square feet	8 b. square feet	0 c. c/y nourishment	d. c/y nourishment
14. ☐ Coastal Dunes	a. square feet	b. square feet	c. c/y nourishment	d. c/y nourishment
15. ☐ Coastal Banks	a. linear feet	b. linear feet		

16. ☐ Rocky Intertidal Shores	_____ a. square feet	_____ b. square feet		
17. ☑ Salt Marshes	8696 a. square feet	8696 b. square feet	0 c. square feet	_____ d. square feet
18. ☐ Land Under Salt Ponds	_____ a. square feet	_____ b. square feet		
	_____ c. c/y dredged	_____ d. c/y dredged		
19. ☑ Land Containing Shellfish	14 a. square feet	14 b. square feet	0 c. square feet	_____ d. square feet
20. ☑ Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above			
	6 c. c/y dredged	6 d. c/y dredged		
21. ☑ Land Subject to Coastal Storm Flowage	9240 a. square feet	9240 b. square feet		

22.

☐ Restoration/Enhancement (For Approvals Only)

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 & d or B.17.c & d above, please entered the additional amount here.

_____ a. square feet of BVW

_____ b. square feet of Salt Marsh

23.

☑ Streams Crossing(s)

If the project involves Stream Crossings, please enter the number of new stream crossings/number of replacement stream crossings.

1 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.

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.
6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not exceed the issuance date of the original Final Order of Conditions.
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.
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 then two square feet or more than three square feet in size bearing the words,

" Massachusetts Department of Environmental Protection"
[or 'MassDEP"']
File Number :"083-2372"

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 Mass DEP.
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.
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.

NOTICE OF STORMWATER CONTROL AND MAINTENANCE REQUIREMENTS

19. The work associated with this Order(the "Project") is (1) ☑ is not (2)☐ subject to the Massachusetts Stormwater Standards. If the work is subject to 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 Pollutant Discharge Elimination System Construction General Permit as required by Stormwater Standard 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; *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 19(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 Pollutant 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 19(f) through 19(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 19(f) through 19(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.

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:

D. Findings Under Municipal Wetlands Bylaw or Ordinance

1.Is a municipal wetlands bylaw or ordinance applicable? ☑ Yes ☐ No

2.The Conservation Commission hereby(check one that applies):

a. ☐ DENIES the proposed work which 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 or Conditions is issued. Which are necessary to comply with a municipal ordinance or bylaw:

b. ☑ APPROVES the proposed work, subject to the following additional conditions.

1. Municipal Ordinance or Bylaw: YARMOUTH WETLANDS BYLAW

2. Citation: CHAPTER 143

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:
SEE ATTACHED SPECIAL CONDITIONS PAGES 8A- 8C OF 10

ORDER OF CONDITIONS – SE83-2372 eDEP Transaction # 1469360
SPECIAL CONDITIONS Page 8A of 10
669 Route 28, Yarmouth
Town of Yarmouth

1. This Order shall apply to any successors and assigns in interest or control and any other person engaging in activity on the property identified in the Notice of Intent.

2. The applicant/owner shall be responsible for having a copy of the "Order of Conditions" on the job site at all times and shall be responsible for insuring that all persons performing the permitted activity are fully aware of its terms and conditions. Failure to do so may result in the revocation of these "Orders", a fine or both.

3. The Conservation Commission, its agent(s) or assigned(s) shall have the express right of entry upon the job site at all reasonable times for the purposes of establishing compliance with the "Order of Conditions", "By-Laws" and "Regulations". Commission members and the Conservation Administrator may acquire any information, measurements, photographs, observations and/or materials or may require the submittal of any data/information deemed necessary by this Commission for that evaluation.

4. A preconstruction review shall be arranged by the contractor with the Conservation Administrator and shall occur prior to the commencement of any work.

5. Any change in the approved plan(s) shall require the Applicant to file, in writing, a notice of project change with this Commission. The Commission will determine the significance of the change and determine whether administrative approval or an "Amended Order of Conditions" is required. Should the project be changed without permission, or found by the Yarmouth Conservation Commission to be altered in any way from the approved plan(s), all work will immediately cease until the project is reapproved by the Commission.

6. The "Order of Conditions" is valid for three years from the date of issuance unless otherwise specifically noted in the "Orders". Extension Permit requests must be applied for at least 30 calendar days prior to the expiration date of the original Orders". Failure to do so will result in a new "Notice of Intent" filing.

7. Noncompliance with these conditions shall constitute grounds for an Enforcement Order and possible fines. Fines shall not exceed $300.00 per day/per violation.

8. Grading shall be accomplished so that the project shall not cause flooding or storm damage to Wetland Resource Areas.

9. If fill is used to elevate a structure within the land subject to coastal storm flowage, the fill must be compacted and protected against scour and erosion.

10. A "work limit " line shall be established with Erosion Controls (i.e. straw bales, staked filter fabric, bark mulch, "silt sacks", products made with rice straw, and other weed-free products or approved by the Commission). Hay bales are not allowed. It is the applicant's responsibility to implement and maintain appropriate and adequate erosion controls measures throughout the construction process.
11. No work of any kind shall occur on the Resource Area side of the work limit line. This line shall be established prior to any construction or work.

12. All imported fill shall be clean and not contain any foreign debris such as cement, bituminous concrete, rubber, metal, trash, boulders, etc. Boulders will be allowed in specific instances if part of the project design.

13. Debris, including litter, shall be picked up immediately. Any excess material that is excavated from the job site shall be disposed of at a location approved by the Conservation Administrator or in a covered dumpster. No debris shall be allowed in a Wetland or Waterway.

14. Washing of equipment/tools shall be done OFF-SITE or handled in a manner appropriate by the Conservation Administrator.

15. No equipment shall be refueled, nor shall fuel be stored within 100 feet of a resource area or within the riverfront area. Refueling is allowed within land subject to coastal storm flowage with secondary containment provided.

16. Any area that is disturbed during construction shall be revegetated immediately or as soon after as the growing season commences, with appropriate native plantings. Permanent stabilization shall be carried out in order to minimize erosion.

17. A buffer strip of native vegetation shall be planted per the approved plan. The buffer strip of native vegetation shall be left UNDISTURBED. This is an on-going condition, in-perpetuity, that does not expire with the issuance of a Certificate of Compliance. The applicant must wait until the second growing season is complete before the Request for a Certificate of Compliance is submitted. During this time period, the Commission/Conservation Administrator may require additional plantings if it is determined that any specimens are dead or dying and need replacement.

18. No lawn shall exist beyond as shown on the approved plan. This is an ongoing condition, in perpetuity, that does not expire with the issuance of a Certificate of Compliance.

19. Landscape Debris, including leaves, grass clippings, brush, or other shall not be allowed within the wetland resource area. This is an on-going condition that does not expire with the issuance of a Certificate of Compliance.
20. Bare areas left from invasive species management and boardwalk installation will be planted with appropriate native plantings and approved by the CA

21. Further alteration within the restoration or mitigation area is prohibited, except as may be required to maintain the area in its restored or mitigated condition. Prior to requesting the issuance of the Certificate of Compliance, the applicant shall demonstrate the restoration or mitigation has been successfully completed for at least two growing seasons.

22. There shall be no dredging in connection with this project.

23. Helical piles placed below Mean Low Water (MLW) shall be drilled, not jetted.

24. The project shall consist of using only non-leaching types of treated lumber. CCA or creosote lumber is prohibited.

25. The proposed pier shall be designed to allow for adequate public passage either above or below the structure between Mean high and Mean Low water lines.

26. Heavy construction equipment and vehicles required for the installation of the boardwalk shall only be permitted on a bordering vegetated wetland, saltmarsh or tidal flat during the construction of the pier with the use of protective matting to decrease damage to the salt marsh and will only take place during the dormant season.

27. During the non-boating season, any pier components, including but not limited to floats and ramps, dinghies, kayaks etc... shall be stored above the mean high-water lines. There shall be no items stored upon salt marsh areas under any circumstances.

28. No additional floats of any kind (including but not limited to swim floats and jet ski floats) shall be moored from the dock, pilings, or approved floats.

29. All shellfish within the footprint of the proposed structure shall be removed under the direction of the Natural Resource Department at the applicant's expense.

30. A copy of the Chapter 91 license from DEP Waterways shall be submitted to the Conservation Commission.
31. A 401 Water Quality Certification is required for this project before activities described can commence.

32. The owner of the property covered by this Order of Conditions, or their successors in title, shall be responsible for the maintenance and operation of all components of the Stormwater Management System in accordance with the Operation and Maintenance schedule provided on the approved plans. This condition is ongoing and does not expire with the issuance of a Certificate of Compliance.

33. A gravel apron shall be created and maintained at the edge of driveway/road entrance where vehicles will access the work site. The roadway shall be swept as necessary to keep sediment off the roadway.

34. Catch basins adjacent to wetland resource areas shall be protected with filter fabric to ensure sediments do not enter existing drainage system.

35. A stamped "As Built Plan" shall be certified by the Design Engineer (Massachusetts registered Professional Engineer or land Surveyor) and will certify that this project has been completed in accordance with the "Order of Conditions" before a Certificate of Compliance will be issued. The as-built plan shall indicate the structure location, gradients, distances to the resource areas, and other pertinent information described in the application and approved plans. Any deviation from the approved plan shall be identified.

36. Upon completion of the project, a "Request for a "Certificate of Compliance" shall be submitted by the applicant to the Conservation Commission for review. The "Order of Conditions" shall be considered incomplete until the "Certificate of Compliance" is issued by the Conservation Commission and recorded at the Registry of Deeds.

37. DMF- A time of year restriction should be observed on all in-water, silt producing activities to protect the sensitive life stages of diadromous species. No in water, silt producing activities should take place from February 15 to June 15 of any year.

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:
MassDEP File #:083-2372
eDEP Transaction #: 1469360
City/Town: YARMOUTH

E. Signatures

This Order is valid for three years from the date of issuance, unless otherwise specified pursuant to General Condition #4. If this is an Amended Order of Conditions, the Amended Order expires on the same date as the original Order of Conditions.

1/26/2023
1. Date of Original Order

Please indicate the number of members who will sign this form. This Order must be signed by a majority of the Conservation Commission.

4
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

Signatures:

Paul E. Huggins

☑ by hand delivery on

Date 1/26/2023

☐ 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

subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

YARMOUTH
Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

YARMOUTH
Conservation Commission

Please be advised that the Order of Conditions for the Project at:

669 ROUTE 28 AND UNNUMBERED PARCEL TO SOUTH
Project Location

083-2372
MassDEP File Number

Has been recorded at the Registry of Deeds of:

County | Book | Page

for:

Property Owner ROBERT WHRITENOUR

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

Rev. 4/1/2010

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:
MassDEP File #:083-2373
eDEP Transaction #:1469362
City/Town:YARMOUTH

A. General Information

1. Conservation Commission: YARMOUTH
2. Issuance: a. ☑ OOC b. ☐ Amended OOC
3. Applicant Details

a. First Name	ROBERT	b. Last Name	WHRITENOUR
c. Organization	TOWN OF YARMOUTH		
d. Mailing Address	1146 ROUTE 28		
e. City/Town	YARMOUTH	f. State MA	g. Zip Code 02664

4. Property Owner

a. First Name	ROBERT	b. Last Name	WHRITENOUR
c. Organization	TOWN OF YARMOUTH		
d. Mailing Address	1146 ROUTE 28		
e. City/Town	YARMOUTH	f. State MA	g. Zip Code 02664

5. Project Location

a.Street Address	669 ROUTE 28 AND UNNUMBERED PARCEL TO SOUTH		
b.City/Town	YARMOUTH	c. Zip Code	02673
d. Assessors Map/Plat#	32 AND 24	e. Parcel/Lot#	122 AND 92
f. Latitude	41.64539N	g. Longitude	70.22289W

6. Property recorded at the Registry of Deed for:

a. County	b. Certificate	c. Book	d. Page
BARNSTABLE		4985 AND 8979	181 AND 44

7.Dates

a. Date NOI Filed : 12/1/2022 b. Date Public Hearing Closed: 1/19/2023 c. Date Of Issuance: 2/3/2023

8.Final Approved Plans and Other Documents

a. Plan Title:	b. Plan Prepared by:	c. Plan Signed/Stamped by:	d. Revised Final Date:	e. Scale:
YARMOUTH RIVERWALK PARK- NOTICE OF INTENT- RIVERWALK PARK AND EVENT SPACE PLAN SET PAGES G2-3, C1.1-4, 1.10, 2.1, 2.2, 3.1, 3.3, 3.4, 4.3, 4.4, 5.1-4, 6.1-5, U.1.1, C.7.1-6,AND UD.1-3	GARY D. JAMES P.E. BETA		December 1, 2022	AS SHOWN

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:
MassDEP File #:083-2373
eDEP Transaction #:1469362
City/Town:YARMOUTH

YARMOUTH RIVERWALK PARK-PLANTING L1.1-13, L2.1	AREK W. GALLE R.L.A.	BETA	December 1, 2022	AS SHOWN

B. Findings

1.Findings pursuant to the Massachusetts Wetlands Protection Act
Following the review of the 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.

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. ☑ Ground Water Supply	h. ☑ Storm Damage Prevention	i. ☑ Flood Control

2. Commission hereby finds the project, as proposed, is:

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.

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 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 interests of the Act , 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 310CMR10.02(1)(a). _____ a. linear feet

Inland Resource Area Impacts:(For Approvals Only):

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. ☐ Bank	_____	_____	_____	_____

	a. linear feet	b. linear feet	c. linear feet	d. linear feet
5.☐ Bordering Vegetated Wetland	_____	_____	_____	_____
	a. square feet	b. square feet	c. square feet	d. square feet
6. ☐ 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.☐ 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.☐ Isolated Land Subject to Flooding	_____	_____		
	a. square feet	b. square feet		
Cubic Feet Flood Storage	_____	_____	_____	_____
	c. cubic feet	d. cubic feet	e. cubic feet	f. cubic feet
9.☑ Riverfront Area	13335	13335		
	a. total sq. feet	b. total sq. feet		
Sq ft within 100 ft	10090	10090	_____	_____
	c. square feet	d. square feet	e. square feet	f. square feet
Sq ft between 100-200 ft	3297	3297	_____	_____
	g. square feet	h. square feet	i. square feet	j. square feet

Coastal Resource Area Impacts:

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
10.☐ Designated Port Areas	Indicate size under Land Under the Ocean, below			
11.☐ Land Under the Ocean	_____ a. square feet	_____ b. square feet		
	_____ c. c/y dredged	_____ d. c/y dredged		
12.☐ Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below			
13.☐ Coastal Beaches	_____ a. square feet	_____ b. square feet	_____ c. c/y nourishment	_____ d. c/y nourishment
14.☐ Coastal Dunes	_____ a. square feet	_____ b. square feet	_____ c. c/y nourishment	_____ d. c/y nourishment
15.☐ Coastal Banks	_____ a. linear feet	_____ b. linear feet		
16.☐ Rocky Intertidal Shores	_____ a. square feet	_____ b. square feet		
17.☐ Salt Marshes	_____ a. square feet	_____ b. square feet	_____ c. square feet	_____ d. square feet

18. ☐ Land Under Salt Ponds
a. square feet _____ b. square feet _____
c. c/y dredged _____ d. c/y dredged _____

19. ☐ Land Containing Shellfish
a. square feet _____ b. square feet _____ c. square feet _____ d. square feet _____

20. ☐ Fish Runs
Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above
c. c/y dredged _____ d. c/y dredged _____

21. ☑ Land Subject to Coastal Storm Flowage
a. square feet 404408 b. square feet 404408

22.
☑ Restoration/Enhancement (For Approvals Only)
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 & d or B.17.c & d above, please entered the additional amount here.

a. square feet of BVW _____ b. square feet of Salt Marsh 1535

23.
☐ Streams Crossing(s)
If the project involves Stream Crossings, please enter the number of new stream crossings/number of replacement stream crossings.

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.
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.

6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not exceed the issuance date of the original Final Order of Conditions.
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.
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 then two square feet or more than three square feet in size bearing the words,

" Massachusetts Department of Environmental Protection"
[or 'MassDEP"]
File Number :"083-2373"

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 Mass DEP.
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.
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.

NOTICE OF STORMWATER CONTROL AND MAINTENANCE REQUIREMENTS

19. The work associated with this Order(the "Project") is (1) ☑ is not (2)☐ subject to the Massachusetts

Stormwater Standards. If the work is subject to 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 Pollutant Discharge Elimination System Construction General Permit as required by Stormwater Standard 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; *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 19(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 Pollutant 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 19(f) through 19(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 19(f) through 19(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.

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:

PLEASE SEE THE APPROVED STORMWATER MANAGEMENT PERMIT APPROVED THROUGH THE TOWN OF YARMOUTH STORMWATER BYLAW

D. Findings Under Municipal Wetlands Bylaw or Ordinance

1. Is a municipal wetlands bylaw or ordinance applicable? ☑ Yes ☐ No

2. The Conservation Commission hereby(check one that applies):

a. ☐ DENIES the proposed work which 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 or Conditions is issued. Which are necessary to comply with a municipal ordinance or bylaw:

b. ☑ APPROVES the proposed work, subject to the following additional conditions.

1. Municipal Ordinance or Bylaw: YARMOUTH WETLAND BYLAW

2. Citation: CHAPTER 143

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:
PLEASE SEE ATTACHED SPECIAL CONDITIONS PAGES 8A & 8B OF 10

ORDER OF CONDITIONS – SE83-2373 eDEP Transaction # 1469362
SPECIAL CONDITIONS Page 8A of 10
669 Route 28, Yarmouth
Town of Yarmouth

1. This Order shall apply to any successors and assigns in interest or control and any other person engaging in activity on the property identified in the Notice of Intent.

2. The applicant/owner shall be responsible for having a copy of the "Order of Conditions" on the job site at all times and shall be responsible for insuring that all persons performing the permitted activity are fully aware of its terms and conditions. Failure to do so may result in the revocation of these "Orders", a fine or both.

3. The Conservation Commission, its agent(s) or assigned(s) shall have the express right of entry upon the job site at all reasonable times for the purposes of establishing compliance with the "Order of Conditions", "By-Laws" and "Regulations". Commission members and the Conservation Administrator may acquire any information, measurements, photographs, observations and/or materials or may require the submittal of any data/information deemed necessary by this Commission for that evaluation.

4. A preconstruction review shall be arranged by the contractor with the Conservation Administrator and shall occur prior to the commencement of any work.

5. Any change in the approved plan(s) shall require the Applicant to file, in writing, a notice of project change with this Commission. The Commission will determine the significance of the change and determine whether administrative approval or an "Amended Order of Conditions" is required. Should the project be changed without permission, or found by the Yarmouth Conservation Commission to be altered in any way from the approved plan(s), all work will immediately cease until the project is reapproved by the Commission.

6. The "Order of Conditions" is valid for three years from the date of issuance unless otherwise specifically noted in the "Orders". Extension Permit requests must be applied for at least 30 calendar days prior to the expiration date of the original Orders". Failure to do so will result in a new "Notice of Intent" filing.

7. Noncompliance with these conditions shall constitute grounds for an Enforcement Order and possible fines. Fines shall not exceed $300.00 per day/per violation.
8. Grading shall be accomplished so that the project shall not cause flooding or storm damage to Wetland Resource Areas.

9. If fill is used to elevate a structure within the land subject to coastal storm flowage, the fill must be compacted and protected against scour and erosion.
10. The parking area shall be constructed of pervious materials where noted on the approved plan. This is an on-going condition that does not expire with the issuance of a Certificate of Compliance.

11. Stormwater Management practices are subject to details as noted in the approved Stormwater Management Permit SW2023-001 issued under the Yarmouth Stormwater Bylaw
12. A "work limit " line shall be established with Erosion Controls (i.e. straw bales, staked filter fabric, bark mulch, "silt sacks", products made with rice straw, and other weed-free products or approved by the Commission). Hay bales are not allowed. It is the applicant's responsibility to implement and maintain appropriate and adequate erosion controls measures throughout the construction process.
13. No work of any kind shall occur on the Resource Area side of the work limit line. This line shall be established prior to any construction or work.

14. All imported fill shall be clean and not contain any foreign debris such as cement, bituminous concrete, rubber, metal, trash, boulders, etc. Boulders will be allowed in specific instances if part of the project design.

15. Debris, including litter, shall be picked up immediately. Any excess material that is excavated from the job site shall be disposed of at a location approved by the Conservation Administrator or in a covered dumpster. No debris shall be allowed in a Wetland or Waterway.

16. Washing of equipment/tools shall be done OFF-SITE or handled in a manner appropriate by the Conservation Administrator.

17. No equipment shall be refueled, nor shall fuel be stored within 100 feet of a resource area or within the riverfront area. Refueling is allowed within land subject to coastal storm flowage with secondary containment provided.
18. Any area that is disturbed during construction shall be revegetated immediately or as soon after as the growing season commences, with appropriate native plantings. Permanent stabilization shall be carried out in order to minimize erosion.

19. Vegetation shall be planted per the approved plan. The buffer strip of native vegetation shall be left UNDISTURBED. This is an on-going condition, in-perpetuity, that does not expire with the issuance of a Certificate of Compliance. The applicant must wait until the second growing season is complete before the Request for a Certificate of Compliance is submitted. During this time period, the Commission/Conservation Administrator may require additional plantings if it is determined that any specimens are dead or dying and need replacement.

20. Bare areas left from invasive species management and boardwalk installation will be planted with appropriate native plantings and approved by the CA

21. No lawn shall exist beyond as shown on the approved plan. This is an ongoing condition, in perpetuity, that does not expire with the issuance of a Certificate of Compliance.

22. Landscape Debris, including leaves, grass clippings, brush, or other shall not be allowed within the wetland resource area. This is an on-going condition that does not expire with the issuance of a Certificate of Compliance.
23. Further alteration within the restoration or mitigation area is prohibited, except as may be required to maintain the area in its restored or mitigated condition. Prior to requesting the issuance of the Certificate of Compliance, the applicant shall demonstrate the restoration or mitigation has been successfully completed for at least two growing seasons.
24. The owner of the property covered by this Order of Conditions, or their successors in title, shall be responsible for the maintenance and operation of all components of the Stormwater Management System in accordance with the Operation and Maintenance schedule provided on the approved plans. This condition is ongoing and does not expire with the issuance of a Certificate of Compliance.

25. A gravel apron shall be created and maintained at the edge of driveway/road entrance where vehicles will access the work site. The roadway shall be swept as necessary to keep sediment off the roadway.

26. Catch basins adjacent to wetland resource areas shall be protected with filter fabric to ensure sediments do not enter existing drainage system.
27. A stamped "As Built Plan" shall be certified by the Design Engineer (Massachusetts registered Professional Engineer or land Surveyor) and will certify that this project has been completed in accordance with the "Order of Conditions" before a Certificate of Compliance will be issued. The as-built plan shall indicate the structure location, gradients, distances to the resource areas, and other pertinent information described in the application and approved plans. Any deviation from the approved plan shall be identified.

28. Upon completion of the project, a "Request for a "Certificate of Compliance" shall be submitted by the applicant to the Conservation Commission for review. The "Order of Conditions" shall be considered incomplete until the "Certificate of Compliance" is issued by the Conservation Commission and recorded at the Registry of Deeds.

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:
MassDEP File #:083-2373
eDEP Transaction #: 1469362
City/Town: YARMOUTH

E. Signatures

This Order is valid for three years from the date of issuance, unless otherwise specified pursuant to General Condition #4. If this is an Amended Order of Conditions, the Amended Order expires on the same date as the original Order of Conditions.

2/3/2023
1. Date of Original Order

Please indicate the number of members who will sign this form. This Order must be signed by a majority of the Conservation Commission.

6
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

Signatures:

☑ by hand delivery on

Date 2/3/2023

☐ 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

subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

YARMOUTH
Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

YARMOUTH
Conservation Commission

Please be advised that the Order of Conditions for the Project at:

669 ROUTE 28 AND UNNUMBERED PARCEL TO SOUTH
Project Location

083-2373
MassDEP File Number

Has been recorded at the Registry of Deeds of:

County | Book | Page

for:

Property Owner ROBERT WHRITENOUR

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

Rev. 4/1/2010

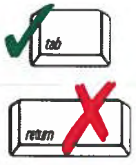
Stormwater Management Permit

Town of Yarmouth Stormwater By-Law Chapter 145
Stormwater Management Permit

Yarmouth File Number: SW2023-001

A. General Information

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: Yarmouth
   Conservation Commission

2. To:
   Applicant:
   Robert (a. First Name) | Whritenour, Jr (b. Last Name)
   Town of Yarmouth (c. Organization)
   1146 Route 28 (d. Mailing Address)
   South Yarmouth (e. City/Town) | Ma (f. State) | 02664-4492 (g. Zip Code)

3. 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

4. Project Location:
   669 Route 28 & un-numbered lot to the south (a. Street Address) | Yarmouth (b. City/Town)
   24, 32 (c. Assessors Map/Plat Number) | 92, 122 (d. Parcel/Lot Number)
   Latitude and Longitude, if known: 41-38' 55.83" N (e. Latitude) | 70-13' 29.35"W (f. Longitude)

5. Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):
   Barnstable (a. County) | b. Certificate Number (if registered land)
   4985 & 5742 (c. Book) | 181 & 175 (d. Page)

6. Dates: 11/17/2022 (a. Date of Application) | 2/16/2023 (b. Date Public Hearing Closed) | 2/22/2023 (c. Date of Issuance)

7. Final Approved Plans and Other Documents (attach additional plan or document references as needed):
   Stormwater Mgt Permit App Plan Set.G1-3, C1.3-1.4, 5.1, 5.2, 6.1, & 7.7 U1.1 dated 11.17.22 C6.5, 7.8, 7.9, WS1A, WS1B, WS2A, WSS2B, rvsd 2.15.23
   BETA (b. Prepared By) | Gary D. James, P.E. (c. Signed and Stamped by)
   February 15, 2023 (d. Final Revision Date) | Varies (e. Scale)
   Stormwater report, rvsd Jan 2023, Letters to Conservation, 2.2.23 and 2.16.23, revised site plans, watershed plans, and data rvsd 2.15.23 (f. Additional Plan or Document Title) | g. Date

B. Findings

Findings pursuant to the Yarmouth Stormwater By-Law Chapter 145:

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 stormwater standards set forth in the Yarmouth Stormwater Regulations. This Commission orders that all work shall be performed in accordance with the Stormwater Management Permit Application referenced above, the following General Conditions, and any other special conditions attached to this Permit. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the application, these conditions shall control.

Denied because:

b. ☐ the proposed work cannot be conditioned to meet the stormwater standards set forth in the Yarmouth Stormwater Regulations. Therefore, work on this project may not go forward unless and until a new Stormwater Management Permit Application is submitted which provides measures that are adequate to protect these standards, and a final Stormwater Management Permit is issued. **A description of the stormwater standards which the proposed work cannot meet is attached to this Permit.**

c. ☐ the information submitted by the applicant is not sufficient to describe the site, the work, or the effect of the work on the stormwater standards identified in the Yarmouth Stormwater Regulations. Therefore, work on this project may not go forward unless and until a revised Stormwater Management Permit Application is submitted which provides sufficient information and includes measures which are adequate to protect the stormwater standards, and a final Stormwater Management Permit is issued. **A description of the specific information which is lacking and why it is necessary is attached to this Denial.**

C. General Conditions

(only applicable to approved projects)

1. This Permit shall apply to any successor in interest or successor in control of the property subject to this Permit and to any contractor or other person performing work conditioned by this Permit.
2. This Permit is not final until all administrative appeal periods described in the Yarmouth Stormwater By-Law have elapsed, or if such an appeal has been taken, until all proceedings before the courts have been completed.
3. This permit shall be recorded at the Barnstable County Registry of Deeds. 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 Permit 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 this Conservation Commission on the form at the end of this Permit, which form must be stamped by the Registry of Deeds, prior to the commencement of work.
4. 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 Permit.
5. Noncompliance with these conditions shall constitute grounds for enforcement and possible fines. Fines shall not exceed $300.00 per day/per violation.
6. The Permit does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
7. This Permit 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.
8. The work authorized hereunder shall be completed within three years from the date of this Permit.
9. This Permit 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 Permit.
10. The work shall conform to the plans and special conditions referenced in this Permit. Any change in the approved plan(s) shall require the Applicant to file, in writing, a notice of project change with this Commission. The Commission will determine the significance of the change and determine whether administrative approval or an amendment to the Permit is required. Should the project be changed without permission, or found by the Yarmouth Conservation Commission to be altered in any way from the approved plan(s), all work will immediately cease until the project is reapproved by the Commission.
11. Pre-construction Meeting. Prior to starting to clear, excavation, construction, or land disturbing activity the Applicant, the Applicant's technical representative, the general contractor or any other person with authority to make changes to the project, shall meet with the Commission to review the permitted plans and their implementation.
12. The applicant/owner shall be responsible for having a copy of the "Stormwater Management Permit" on the job site at all times and shall be responsible for insuring that all persons performing the permitted activity are fully aware of its terms and conditions. Failure to do so may result in the revocation of this "Permit", a fine or both.
13. The Department of Municipal Inspections and/or the Conservation Commission and its duly appointed representatives shall have the right to enter and inspect the area subject to this Permit at reasonable hours to evaluate compliance with the conditions stated in this Permit, and may require the submittal of any data deemed necessary by the Department of Municipal Inspections and/or the Conservation Commission for that evaluation.
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. 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 Department of Municipal Inspections and/or the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary.

15. The owner of the property covered by this Permit, or their successors in title, shall be responsible for the maintenance and operation of all components of the Stormwater Management System in accordance with the Operation and Maintenance schedule provided with the approved plans. This condition is ongoing and does not expire with the issuance of a Certificate of Completion.
16. Upon completion of the project, a request for a Certificate of Completion shall be submitted by the applicant to the Conservation Commission for review. The Stormwater Management Permit shall be considered incomplete until the Certificate of Completion is issued by the Conservation Commission and recorded at the Registry of Deeds.
17. 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, the Stormwater Pollution Prevention Plan. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.
18. No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that:
19. 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;
20. as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized;
21. any illicit discharges to the stormwater management system have been removed;
22. 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;
23. any vegetation associated with post-construction BMPs is suitably established to withstand erosion.
24. 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 Completion, the responsible party 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:
25. the O&M Plan is complete and will be implemented upon receipt of the Certificate of Completion, and
26. 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.
27. 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 the Stormwater Pollution Prevention.

28. 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 22 through 26 with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 21 through 26 with respect to that BMP shall be a violation of the Stormwater Management Permit or Certificate of Completion. 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.
29. 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 and the Yarmouth Stormwater Bylaw.
30. The responsible party shall:
31. 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);
32. Make the maintenance log available to the Department of Municipal Inspections and/or the Conservation Commission ("Commission") upon request; and
33. Allow members and agents of the Department of Municipal Inspections and/or 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.
34. Submit an annual certification, due November 1st each year, documenting 1) how non-structural and good housekeeping practices over the last 12 months adhered to the O&M Plan; and 2) the work that has been done over the last 12 months to properly operate and maintain the stormwater control measures. The certification shall be signed by the owner. Once every five years, beginning on the fifth year of maintenance, such certification must be prepared by a registered Professional Engineer and signed by both the Engineer and the Owner.
35. 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.
36. Illicit discharges to the stormwater management system as defined in Chapter 145 Section 1.02 are prohibited.
37. 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.
38. 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.

D. Special Conditions

See attached page 5A

Special Conditions:

1. Inspections shall be carried out according to the Stormwater Bylaw Regulations:
   a) Commission Inspections. The Commission and/or Department of Municipal Inspections shall make inspections as hereinafter required and shall either approve that portion of the work completed or shall notify the permittee wherein the work fails to comply with the Stormwater Management Permit, as approved. The Permit and associated Stormwater Management Plan, Erosion and Sediment Control Plan, and Operation and Maintenance Plan, bearing the signature of approval of the Commission, shall be maintained at the site during the progress of the work. In order to obtain inspections, the permittee shall notify the Commission at least two (2) working days before each of the following:
      - Erosion and sediment control measures are in place;
      - Bury Inspections: prior to backfilling of any underground drainage, stormwater structures or BMPs.
      - Close of the Construction Season if applicable;
      - Final Inspection. After the stormwater management system has been constructed and before the surety has been released, the Applicant must file the reports as provided in Section 2.09 of these regulations.
   b) Permittee Erosion and Sediment Control Inspections. The permittee shall conduct and document inspections of all erosion and sediment control measures no less than weekly or as specified in the Permit, and prior to and following anticipated storm events. The purpose of such inspections will be to determine the overall effectiveness of the erosion and sediment control plan, and the need for maintenance or additional control measures. The permittee shall submit certified monthly erosion and sediment control reports to the Commission using the most recent Construction General Permit Inspection Report Template format.

   In particular the Commission and/or Department of Municipal Inspections shall make an inspection to confirm removal of unsuitable soils prior to construction of drainage.

2. Bi-annual sweeping of the parking lots areas shall be carried out to ensure adequate TSS removal rates are achieved.
3. The owner shall provide quarterly inspections of catch basins and retain records to identify the depth of sediment below the outlet pipe. Based on those results, the owner shall clean the catch basins upon 50% sediment depth or once every two years, whichever occurs first.
4. A well-draining gravel or equivalent beneath the reinforced turf and stabilized aggregate pathway are required to ensure these surfaces remain permeable.

Town of Yarmouth Stormwater By-Law Chapter 145
Stormwater Management Permit

Yarmouth File Number:
SW2023-001

E. Issuance

This Permit is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

2/22/23
1. Date of Issuance

Please indicate the number of members who will sign this form:
This Permit must be signed by a majority of the Conservation Commission.

6
2. Number of Signers

The Permit must be mailed by certified mail (return receipt requested) or hand delivered to the applicant and the property owner, if different from applicant.

Signatures:

Thomas J. Durham Jr.
David E. Boggis

This Permit is issued to the applicant as follows:

☑ by hand delivery on 2/22/23
Date

on

☐ by certified mail, return receipt requested,
Date

Section F, Recording Information is available on the following page.

Town of Yarmouth Stormwater By-Law Chapter 145
Stormwater Management Permit

Yarmouth File Number: SW2023-001

F. Recording Information

This Stormwater Management Permit 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 Stormwater Management Permit shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Permit. In the case of registered land, this Permit shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Permit. The recording information on this page shall be submitted to the Conservation Commission listed below.

Yarmouth
Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

.....

To:

Yarmouth
Conservation Commission

Please be advised that the Permit for the Project at:

669 Route 28
Project Location

SW2023-001
Permit Number

Has been recorded at the Registry of Deeds of:

Barnstable
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 Permit 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

Site Plan Review

TOWN OF YARMOUTH
PLANNING BOARD
VCOD Site Plan Review

YARMOUTH TOWN CLERK

'23FEB6PM3:44 REC

FILED WITH TOWN CLERK:	February 6, 2023
PETITION:	**VCOD 2023-1**
MEETING DATE:	February 1, 2023
PETITIONER:	Town of Yarmouth, c/o Community Development
OWNER:	Town of Yarmouth
PROPERTY:	669 Route 28, West Yarmouth Assessor's Map 32, Parcel 122 Zoning District - VCOD VC1

MEMBERS PRESENT AND VOTING: Susan Brita, William Rubenstein, James Saben, Kenneth Smith, and Joanne Crowley.

Notice of the Public Meeting was posted with the Town Clerk and on the Town website, as required by law. Village Center Overlay District (VCOD) Site Plan Review (SPR) does not require a formal Public Hearing. Site Plan Review for VCOD projects is done through the Planning Board in accordance with Section 414.3.2 of the Zoning Bylaw.

PROJECT SUMMARY:

The Town of Yarmouth is proposing to create a public park at the 23-acre vacant town-owned property at 669 Route 28 utilizing Zoning Bylaw Section 414 – Village Centers Overlay District (VCOD). The entire property is located in VCOD Village Center 1 (VC1). The proposed public park will include walking trails, native landscaping, children's play area, kayak launch, space for artist shanties and public art, parking, restrooms, and a large open area for periodic special events, along with associated landscaping, utilities, and site improvements. Although being funded and constructed separately, the permit application includes the future municipal wastewater Pump Station #3 located near Route 28. The existing shellfish upweller on the property will remain.

All the proposed uses for the Park, including the Pump Station and periodic Special Events are allowed by-right uses within the VCOD VC1. These include N9 – Municipal Recreation Use; N3 – Theatrical Productions, including bands, orchestras and entertainers; N11 – Other miscellaneous amusement & recreation services; and P10 – Municipal use (for the pump station).

Although the overall project also includes an elevated boardwalk on the property to the south, this is not part of the VCOD SPR and will require a Special Permit from the ZBA for a Municipal Recreation Use in a residential zone.

PLANS AND INFORMATION FOR VCOD 2023-1:

1. **November 22, 2022 Site Plan Review Comments and 11/22/22 e-mail from the Yarmouth Police Department**
2. **January 24, 2023 Design Review Committee Comments**
3. **VCOD Site Plan Review Application and Narrative dated January 2023**
4. **Site Plans:** Prepared by BETA Group with issue date of January 18, 2023 unless otherwise noted:
   - G.1: Cover, issue date January 19, 2023
   - G.2: General Notes
   - G.3: Legend and Abbreviations
   - OM.1 – OM.2: Overall Master Plan 1-2
   - C.1.1 – C.1.2: Existing Condition Plan 1-2
   - C.2.1 – C.2.2: Site Erosion Control Plan 1-2
   - C.4.3: Site Sections
   - C.5.1 – C.5.2: Materials and Layout Plan 1-2
   - C.5.3 – C.5.4: Enlargements 1-2
   - C.6.1 – C.6.2: Grading & Drainage 1-2
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DISCUSSION:

No letters related to the project were received and no one from the public spoke in favor or in opposition to the project at the Public Meeting.

Arek Galle of BETA gave a PowerPoint presentation highlighting the information in the application including an overview of the zoning and the various elements within the park including the future municipal pump station, access driveway, parking, restrooms/office, kayak launch, play area, artist shanty village, walking trails and loops, and space for periodic events. Mr. Galle touched on the elevated boardwalk on the property to the south which is not located

in the VCOD VC1. He reviewed in more detail the architectural elements and layout of the restrooms and municipal pump station, as well as the future artist shanty sheds.

Planning Board members had some general questions related to the materials for the 6' wide elevated boardwalk and staffing of the office. The office/flex space is not anticipated to be staffed on a regular basis but available for use during special events. The Board discussed in more detail the recommendation from the Design Review Committee to modify the siding on the Restrooms to be all clapboard style and modify the siding on the Pump Station to be all shingles. After discussion on flexibility and availability of materials, the Planning Board decided to retain the siding materials as presented in the VCOD application.

Kathy Williams, Town Planner, briefly reviewed suggested conditions for consideration by the Board.

VOTE: On a motion by Jim Saben, and seconded by Susan Brita, the Planning Board voted (5-0) that the Riverwalk Park Project, VCOD 2023-1, in accordance with the plans and materials submitted and presented at the Planning Board meeting of February 1, 2023, is in compliance with the VCOD Design Standards, and subject to the following conditions, with Susan Brita, William Rubenstein, James Saben, Kenneth Smith, and Joanne Crowley voting in favor:

1. **Install a new fire hydrant near the Courtland Way emergency access.**
2. **Reduce the footcandles at the property line along Route 28 at the main entrance to 0.5 footcandles in accordance with Section 414.8.10.7.**

Joanne Crowley, Chair
Yarmouth Planning Board

Zoning Board of Appeals

TOWN OF YARMOUTH
BOARD OF APPEALS
DECISION

FILED WITH TOWN CLERK: **March 10, 2023**

PETITION NO: **5003**

HEARING DATE: **February 23, 2023**

PETITIONER: **Town of Yarmouth**

PROPERTY: **Un-numbered Town-owned lot**
abutting 669 Route 28, West Yarmouth, MA
Map 24, Parcel 92
Zoning District: R-25
Title: Book 5742, Page 175

MEMBERS PRESENT AND VOTING: Steven DeYoung, Sean Igoe, Richard Martin, and Jay Fraprie

Notice of the hearing has been given by sending notice thereof to the Petitioner and all those owners of property as required by law, and to the public by posting notice of the hearing and publishing in *The Cape Cod Times*, the hearing opened and held on the date stated above.

The Petitioner is the Town of Yarmouth which seeks approval for a Special Permit in connection with unnumbered lots abutting 669 Route 28, West Yarmouth, MA (part of the old Drive-In property). This property is in an R-25 zoning district and the Petitioner seeks to change its use to N-9, municipal recreation use. On behalf of the Town, Kathy Williams, Town Planner, appeared along with the landscape architect and planner for the proposed project, Arek Galle. The Town proposes that it be allowed to install 1300 linear feet of a six-foot-wide walkway which will include handicap access ramps, overlooks and benches. In order to do so, the Town needs a Special Permit to allow for municipal recreation use within this zoning district.

The presentation by the Town's representatives was well done. Pictures/drawings and renderings have been provided to the Board and the public had the opportunity to review these materials prior to the meeting. Ms. Williams pointed out that similar uses are allowed within the zoning district VCOD-1.

There were several people in opposition to the petition. Read into the record was a letter from Judy Lass and a letter from Bob and Dianne Autenzio, both setting forth that they had concerns that the boardwalk would interfere with the peace and enjoyment of their property and their spectacular view would be compromised.

Jim Saben, Chair of the Drive-In Site Utilization Committee, spoke well of the proposed project as being the best use for this property particularly after several years of attempting to identify its use.

Kevin Deschene, a neighbor to the site, raised concerns in opposition primarily relating to what he thought would be a compromise of his view and indicated that he paid $1 million dollars for his property and wasn't intending to give the view away.

Michael Wolinsky, a neighbor to the location, also spoke in opposition citing his concerns relating to the view, particularly being compromised by a 13-foot-high boardwalk. He also expressed concerns about the impact to the marsh.

Another neighbor, Richard Bilski, spoke in favor of the project generally, but expressed caution as to the process that needs to be completed at the state level. As well, he expressed concern that it was only at the 11th hour that a topographical and vegetation plan was provided to the Board shortly before the meeting.

After all who wished to speak had the opportunity to do so, the Board then began its deliberations. The general consensus was that the project was a benefit to the Town and that the change of use designation from R-25 to N-9 for the parcels at issue would not create any undue hazard, nuisance nor congestion and was an appropriate and good use of municipal property which would allow all residents of the Town and guests to enjoy the views from the property. It would not change the character of the neighborhood or Town, either now or in the future. The Board members concurred that the use of this Town owned property, as proposed, was a good use and would not have a negative impact as those who spoke in opposition fear. It would open this wonderful vista to all people of the Town of Yarmouth and guests.

A motion was made by Mr. Igoe, seconded by Mr. Martin, to grant the relief as prayed for subject to there being a 1-year review after completion of the boardwalk so as to consider limitations on hours of operation and the possible need for additional plantings. A roll call vote was taken on this motion, with the stated condition, with all members voting in favor of the motion. Accordingly, this Special Permit was therefore granted.

No permit shall issue until 20 days from the filing of this decision with the Town Clerk. Appeals from this decision shall be made pursuant to MGL c40A section 17 and must be filed within 20 days after filing of this notice/decision with the Town Clerk. Unless otherwise provided herein, the Variance shall lapse if a substantial use thereof has not begun within 12 months. (See MGL c40A §10)

Steven DeYoung, Chair

CERTIFICATION OF TOWN CLERK

I, Mary A. Maslowski, Town Clerk, Town of Yarmouth, do hereby certify that **20 days** have elapsed since the filing with me of the above Board of Appeals Decision **#5003** that no notice of appeal of said decision has been filed with me, or, if such appeal has been filed it has been dismissed or denied. All appeals have been exhausted.

_____

Mary A. Maslowski

Health Inspector
Disposal System Construction

TOWN OF YARMOUTH, MASSACHUSETTS

YARMOUTH RIVERWALK PARK

PROPOSED PARK RESTROOM FACILITY
DISPOSAL SYSTEM PERMIT SET

JUNE 2023

APPLICANT: TOWN OF YARMOUTH
1146 ROUTE 28, SOUTH YARMOUTH, MA 02664

TOWN ADMINISTRATOR
ROBERT WHRITENOUR

LOCATION MAP
1" = 250'-0"

PLAN INDEX

SHEET NO.	DESCRIPTION
1	COVER
2	PARK OVERALL PLAN
3	PROPOSED PARK RESTROOM FACILITY - DETAIL PLAN
4	PROPOSED PARK RESTROOM FACILITY - PROPOSED BUILDING
5	PROPOSED PARK RESTROOM FACILITY - PUMP CHAMBER DETAILS

REGIONAL LOCUS MAP
SCALE: 1" = 3000'

PREPARED BY:

BETA

www.BETA-Inc.com

BETA GROUP, INC.
701 GEORGE WASHINGTON HWY.
LINCOLN, RHODE ISLAND 02865
PHONE: 401-333-2382

ISSUE DATE: 6/13/2023

Yarmouth Health Department
APPROVED
6/28/23

Cape Cod Commission Development of Regional Impact Decision

3225 MAIN STREET • P.O. BOX 226
BARNSTABLE, MASSACHUSETTS 02630

(508) 362-3828 • Fax (508) 362-3136 • www.capecodcommission.org

CAPE COD COMMISSION

CERTIFIED MAIL – RETURN RECEIPT REQUESTED
TRACKING NUMBER: 7022 0410 0000 9817 3093

October 3, 2023

Kathy Williams, P.E.
Town of Yarmouth
1146 Route 28
South Yarmouth, MA 02664

RE: Yarmouth Riverwalk Park, CCC File No: 22031

Dear Ms. Williams,

Enclosed please find a copy of the Development of Region Impact (DRI) Decision for the Yarmouth Riverwalk Park project that was approved, with conditions, by the Cape Cod Commission at its regular meeting on Thursday, September 28, 2023. After the 30-day appeal period has elapsed and no appeals have been filed (or if such an appeal is filed, after it has been dismissed or adjudicated in the applicant's favor), the Cape Cod Commission will record the original decision with the Barnstable County Registry of Deeds.

Thank you for your attention to this matter and should you have any questions, please do not hesitate to call.

Sincerely,

Lisa Dillon
Commission Clerk

Enclosure

CC w/enc: Certified Mail: Mary Maslowski, Town Clerk,
Mark Grylls, Building Commissioner
Regular Mail: Steven DeYoung, Chair, Zoning Board of Appeals
Brittany DiRienzo, Conservation Administrator
Julie Mockabee, Chair, Historical Commission
Jay Gardiner, Health Director

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CAPE COD COMMISSION

CAPE COD COMMISSION
DEVELOPMENT OF REGIONAL IMPACT (DRI) DECISION

Date:	September 28, 2023
Project:	Yarmouth Riverwalk Park (CCC File No. 22031)
Project Applicant/ Property Owner:	Town of Yarmouth
Project Location:	669 Route 28, Yarmouth 0 Nearmeadows Road, Yarmouth
Assessor's ID:	Map 32 Parcel 122 Map 24 Parcel 92
Title Reference:	BCRD Book 4985 Page 181 BCRD Book 5742 Page 175
Subcommittee:	Committee on Planning and Regulation

SUMMARY

Pursuant to a vote of the Commission at its meeting on September 28, 2023, the Cape Cod Commission ("Commission") hereby grants Development of Regional Impact ("DRI") approval, with Conditions, for the "Yarmouth Riverwalk Park Project," to improve the former Yarmouth Drive-In Theatre at 669 Route 28 into a public park with a large central event space and an elevated boardwalk loop over Lewis Pond salt marsh areas west of the Parkers River.

FINDINGS

F1. The Project is proposed to utilize two Town-owned properties to provide accessible active and passive recreation to the public within a natural setting. Planned improvements to redevelop the properties are designed to offer a wide range of outdoor recreation and

entertainment opportunities as well as to restore degraded riverfront areas. The Town seeks to provide a scenic public park for residents and tourists.

F2. The Project consists of:

- The conversion of the vacant Drive-In property into a public park featuring a central four-acre grassed multi-use field area for periodic outdoor events encircled with field and walking paths;
- a nature-based play area for children near the Parkers River that is planned with play structures, lawn games, and shade sails;
- a pile- supported boardwalk to a float for launching canoes, kayaks and paddleboards on Parkers River;
- a woodland path that will connect the park to a 1,400 linear foot, 6-foot-wide elevated boardwalk loop over salt marsh, including a pedestrian bridge, three overlook areas, and four bench areas;
- a porous paving parking lot for 88 new parking spaces with lighting;
- a small park office and restroom building (1,130 sf);
- up to nine artist shanties (at 140 sf each);
- a kiosk near the kayak launch; and
- associated utilities.

DRI JURISDICTION

F3. The Project requires mandatory DRI review pursuant to Section 2(d)(i) of the Commission's Chapter A: Enabling Regulations Governing Review of Developments of Regional Impact ("Enabling Regulations"), revised November 2021, because the Project required the preparation of an Environmental Impact Report ("EIR") pursuant to the Massachusetts Environmental Policy Act, M.G.L. c. 30, §§ 61-62I ("MEPA").

PROCEDURAL HISTORY

F4. The Project required an Environmental Notification Form ("ENF") under MEPA because it requires state agency actions and will involve the alteration of 10 or more acres of any other wetlands. It also required an ENF because it will result in the alteration of 1,000 or more square feet of Salt Marsh and the alteration of one half or more acres of any other wetlands.

F5. The Project required preparation of an Environmental Impact Report ("EIR") pursuant to 301 CMR 11.06(7)(b) because it is located within a Designated Geographic Area around an Environmental Justice ("EJ") population.

F6. The Project received the Secretary's certificate on its Single Environmental Impact Report ("SEIR") stating that the project properly and fully complies with MEPA on June 23, 2023.

F7. A staff hearing officer opened the DRI hearing period procedurally on August 7, 2023. The Applicant submitted a DRI application for the Project to the Commission on August 15, 2023.

F8. A substantive public hearing on the Project was opened by the Committee on Planning and Regulation on September 21, 2023.

F9. The Committee on Planning and Regulation held a public meeting on September 26, 2023 to review a draft DRI decision and recommend approval of the Project to the full Cape Cod Commission.

F10. The full Cape Cod Commission held a hearing on the Project at its meeting on September 28, 2023. It considered the recommendation of the Committee on Planning and Regulation, including the draft written DRI decision. At the hearing on September 28, 2023 the Commission voted to adopt the draft written DRI decision, and approve the Project, with the Conditions set out in said decision.

DRI REVIEW STANDARDS

F11. Section 6(c)(viii) of the Commission's Enabling Regulations contains the standards to be met for DRI approval, which include, as applicable, consistency with the Cape Cod Commission Act, the Cape Cod Regional Policy Plan ("RPP"), municipal development bylaws, District of Critical Planning Concern ("DCPC") implementing regulations and Commission-certified Local Comprehensive Plans ("LCP"). The Commission must also find that the probable benefit from the Project is greater than its probable detriment.

F12. DRI review of the Project is subject to the 2018 Regional Policy Plan ("RPP"), as amended in March 2021, which is the version of the RPP in effect at the time of the Commission's first substantive public hearing on the Project. The Commission determines the Project's consistency with the Act and RPP by determining whether the Project is consistent with the Goals and Objectives in Section 6 of the 2018 RPP, as particular goals and objectives are deemed applicable and material to the Project.

CAPE COD REGIONAL POLICY PLAN

Applicable and Material RPP Goals

F13. The following RPP Goals are applicable, material, and regionally significant and are thus subject to RPP consistency review: Water Resources (Objectives WR1, WR3, WR4), Wetlands Resources, Wildlife and Plan Habitat, Open Space (Objectives OS1 and OS2), Coastal Resiliency, Community Design, Cultural Heritage (Objective CH2), Transportation, and Climate Mitigation. The Commission makes the following findings relative to the Project's consistency with these RPP Goals and relevant Objectives and Technical Bulletin guidance.

Water Resources

F14. The Water Resources Goal of the RPP is to maintain a sustainable supply of high-quality untreated drinking water and protect, preserve, or restore the ecological integrity of Cape Cod's fresh and marine surface water resources.

F15. The following Objectives are applicable and material to the Project:

- **WR1** – protect and preserve groundwater quality
- **WR3** – protect, preserve and restore marine water resources
- **WR4** – manage and treat stormwater to protect and preserve water quality

F16. The Project is consistent with Objective WR1. The Project is not within a Wellhead Protection Area (WPA) or Potential Public Water Supply (PPWSA) and there are no downgradient drinking water wells, thus the Project must have a site-wide nitrogen loading concentration less than 5 ppm-N. The Project does not propose the use of fertilizer, and wastewater will be handled temporarily by a "tight tank" until connection to sewer is available. The Project has a site-wide nitrogen load of 0.965 ppm as calculated under the Commission's Water Resources Technical Bulletin, meeting this standard.

F17. The Project is consistent with Objective WR3. The Project plans to connect to sewer, consistent with the Town's CWMP and overall conditions are improved by the Project due to stormwater treatment.

F18. The site is within a Marine Water Recharge Area (MWRA) for the adjacent Parkers River, which is a nitrogen impaired embayment and has an established Total Maximum Daily Load (TMDL). The Project may only add nitrogen to the MWRA if the Town has a Comprehensive Wastewater Management Plan (CWMP) that has been approved as consistent with the Section 208 Area Wide Water Quality Management Plan and that calls for initiation of nutrient reduction actions or strategies sufficient to offset nutrient contributions from the Project within five years of project approval. The Project is located in an area that is to be sewered within the next five years, and the CWMP is on target to exceed nitrogen reduction goals established by the TMDL (Yarmouth Notice of Project Change 2022, Appendix C: 2021 Parkers River Nitrogen Balance Memo).

F19. Due to the CWMP and near-term sewering, the Project may add nitrogen to the MWRA. The Project will result in a de minimus additional sitewide nitrogen loading concentration of .06 ppm over existing conditions due to an increase in impervious area. However, existing conditions result in untreated stormwater flowing into Parkers River, and overall conditions are improved by the Project due to stormwater treatment.

F20. Wastewater from on-site restroom facilities will be temporarily stored in a 5,000 gallon underground "tight tank" and pumped regularly by a contracted sanitary sewer service for off-site treatment. Sewer main hook ups will also be installed and available for use when the Town of Yarmouth's pump station is online and a final force main sewer connection to

the pump station can be made, which has received funding and is proposed for 2026. This plan is consistent with Yarmouth's CWMP phase 1, and therefore, with Objective WR3.

F21. The Project is consistent with Objective WR4. The Project will increase the impervious surface from 1.08 acres to 1.75 acres. While increasing impervious surface area, the Project proposes stormwater management strategies that will effectively manage and treat stormwater better than existing conditions. Stormwater management strategies include a drainage swale, underground infiltration systems, a sediment forebay, grass filter strips, and use of porous pavers. The entrance drive and parking are proposed on the south side of the property near the river. Alternatives to decrease impervious cover and move impervious surfaces further away from the riverfront were explored but not chosen due to further increasing the area of impervious surface, noise concerns, and access preference developed through the Town's planning process. To ensure runoff is not directly entering and impacting the river or nearby wetlands, stormwater runoff from impervious driveway areas is directed to infiltration management systems. Additionally, the Applicant has been responsive to concerns regarding compaction of the grass field from vehicular traffic and has proposed maintenance solutions to promote filtration of stormwater in this area. The proposed stormwater management practices promote treatment and groundwater recharge through low impact design (LID) methods consistent with the Massachusetts Stormwater Handbook and Objective WR4.

Wetland Resources

F22. The Wetlands Resources Goal of the RPP is to protect, preserve, or restore the quality and natural values and functions of inland and coastal wetlands and their buffers.

F23. The following Objective is applicable and material to the Project:

- **WET1 -** protect wetlands and their buffers from vegetation and grade changes
- **WET2** - protect wetlands from changes in hydrology
- **WET3** - protect wetlands from stormwater discharges
- **WET4** - promote the restoration of degraded wetland resource areas

F24. The Project is consistent with WET1. The application materials include an assessment of wetlands present on the site including a comprehensive resource area boundary delineation report and a site plan showing delineation of all wetland resources and the 100-foot buffer to those delineations. While the Project results in unavoidable impacts to wetlands, for the reasons noted below, impacts have been minimized and mitigated to the maximum extent practicable.

F25. The Project will result in impacts to the 100-foot buffer zone to vegetated wetlands, including impacts to salt marsh. Most of these impacts are within previously degraded wetland buffer zones. New alteration of undeveloped land associated with the project is limited to clearing for the proposed woodland paths and construction of the boardwalk over salt marsh.

F26. While the RPP prohibits most alteration of wetland resource areas, alteration may be allowed where the Applicant can show that there is a public benefit, there is no feasible alternative to alteration, and the impacts are minimized and mitigated. Specifically allowable are redevelopment of previously disturbed areas, water-dependent structures and uses, and pedestrian access paths. The Project meets these requirements as there is a clear public benefit due to the public access it provides, most of the site was previously developed, there is no feasible alternative to the alteration, elements within the wetland buffer can be categorized as water-dependent structures and uses, and it includes pedestrian access paths, and the alteration will be minimized and mitigated.

F27. The Project is consistent with additional methods to meet WET1. Much of the existing vegetation within the 100-foot buffer will be maintained and the boardwalk and kayak launch have been designed to provide sufficient light penetration to the salt marsh below and to allow for unimpeded flow of water and resource migration. Mitigation for impacts to salt marsh and the buffer zone includes restoring wetland resource areas through removal of refuse and debris, planting with native vegetation, and invasive species management. Mitigation measures during construction will also be used including timing the salt marsh work in the winter, using swamp mats to prevent soil compaction and minimize impacts to salt marsh vegetation, and implementation of a Storm Water Pollution Prevention Plan.

F28. No stormwater management currently exists on the site. Consistent with WET2, the Project proposes a stormwater management system that meets requirements of the Massachusetts Stormwater Standards. As shown on the project plans, stormwater overflows have been located as far from wetland resources as possible with the closest overflow discharge located roughly 100 feet from the limits of salt marsh. Stormwater runoff from impervious driveway areas is directed to infiltration systems to ensure runoff is not directly entering and impacting the river or wetlands and the runoff does not alter wetland hydrology. The stormwater management system will improve stormwater discharge quality compared to existing conditions.

F29. No new groundwater withdrawals are proposed as part of the project.

F30. Consistent with WET3, the Project's stormwater management system has been designed to fully comply with the Massachusetts Stormwater Standards and stormwater overflows have been located as far from wetland resources and their 100-foot buffers as possible. The Project will result in a total of 1.75 acres of impervious area with new impervious area totaling 0.67 acres. All impervious surfaces will be treated in accordance with the Massachusetts Stormwater Standards.

F31. Stormwater management on the site has been designed to direct runoff from impervious surfaces towards the proposed infiltration Best Management Practices (BMPs). Stormwater BMPs include low impact development approaches, infiltration basins, porous pavement, a collection trench, vegetated filter strips, and vegetated swales. Peak flow rates and runoff volumes towards Parkers River will be significantly reduced.

F32. The Project is consistent with WET4. Over 60,000 square feet of wetland resource areas will be restored as part of the proposed project including removal of invasive species and planting of native species. Restoration will also include removal of pavement to promote infiltration and restore the soil profile and removal of debris from previous development. As noted in the application, native vegetation proposed for restoration will enhance wetland resource area functions by improving wildlife habitat, flood control, storm damage and pollution prevention, and protection of land containing shellfish.

Wildlife and Plant Habitat

F33. The Wildlife and Plant Habitat Goal of the RPP is to protect, preserve, or restore wildlife and plant habitat to maintain the region's natural diversity.

F34. The following Objectives are applicable and material to the Project:

- **WPH1** – to maintain existing plant and wildlife populations and species diversity
- **WPH2** – restore degraded habitats through the use of native plant communities
- **WPH3** – protect and preserve rare species habitat, vernal pools, 350-foot buffers to vernal pools
- **WPH4** – manage invasive species
- **WPH5** – promote best management practices to protect wildlife and plant habitat from the adverse impacts of development

F35. The Project is consistent with WPH1. A detailed resource area report was prepared for the site, documenting natural resources present including the locations of wildlife habitats and native vegetation communities within undisturbed areas of the site, mainly the forest and salt marsh where the path and boardwalk are proposed. The other areas of the site consist primarily of degraded areas that provide limited and low-quality plant and wildlife habitat due to the former use as a drive-in movie theater.

F36. Consistent with WPH1, the Project has been carefully designed to concentrate development within areas of previous disturbance and minimize clearing and grading in other areas. The vegetation along the perimeter of the site and in the forested area south of the event space will remain, except invasives species. Most of the proposed development and intensive use areas are located within existing degraded areas void of trees and the walking path routes have been selected to avoid clearing large caliper trees. Tree protection is proposed in areas not to be disturbed.

F37. Impacts to areas of existing vegetation along the perimeter of the site are limited, and restoration between existing areas of habitat fragmentation should improve habitat connectivity along the Parkers River. No continuous fencing is proposed, therefore wildlife will be allowed to move unimpeded through the site.

F38. Much of the site is mapped BioMap Critical Natural Landscape and a portion of the site is mapped Natural Heritage and Endangered Species Program (NHESP) rare species habitat. The Project avoids other sensitive resource areas such as Important Bird Areas and

Areas of Critical Environmental Concern. Correspondence from NHESP indicates the Project will not adversely affect rare species habitat, and it will not result in a "take" of rare species. The Project will not negatively impact the function of the BioMap Critical Natural Landscape as the project area within this much larger landscape block will remain minimally impacted by development and will enhance connectivity and resilience.

F39. Consistent with WPH2, over 60,000 square feet of resource areas will be restored as part of the Project. Restoration includes removal of invasive species and planting of native species appropriate to the site's ecological conditions. Restoration will also include removal of pavement and debris to promote infiltration and assist in restoring the soil profile.

F40. A planting plan (which includes types, quantities, and sizes) proposes use of native species appropriate to the site. Also included was a draft invasive species management plan.

F41. The southern portion of the site is mapped habitat for three rare migratory tern species, but the Project measures to avoid direct impacts to rare species include constructing the boardwalk in the winter months when the terns are not present. The Project is consistent with Objective WPH3 as NHESP determined the project will not result in a "take" of rare species.

F42. The site is not located within proximity to any vernal pools.

F43. Inspections of the site revealed extensive growth of several invasive plant species in approximately 90,500 square feet of previously disturbed areas along the Parkers River. Consistent with WPH4, a draft invasive species control plan outlining potential methods of control including manual, mechanical and chemical options has been provided. The plan requires the selected contractor to provide a detailed invasive species control plan and that plan, in addition to detailing control methods, should include best management practices during construction (e.g., truck washing) to avoid introduction and spread of invasive species. Monitoring should occur for at least three growing seasons to ensure infestations are controlled. As conditioned herein the Project is consistent with Objective WPH4 subject to Commission staff review of a final invasive species management plan incorporating these elements prior to construction.

F44. Consistent with WPH5, the Applicant proposes several best management practices to protect wildlife and plant habitat from the adverse impacts of development including: removal of invasive species; restoration of impacted areas with native plants; construction fencing, erosion, sedimentation and turbidity controls; and using mats and light-weight rubber tracked equipment on the salt marsh and timing marsh work in the winter to minimize soil compaction and impacts to marsh vegetation and rare birds.

Open Space

F45. The Open Space Goal of the RPP is to conserve, preserve, or enhance a network of open space that contributes to the region's natural and community resources and systems.

F46. The following Objectives are applicable and material to the Project:

- **OS1** – protect and preserve natural, cultural, and recreational resources
- **OS2** – maintain or increase the connectivity of open space

F47. The Project is consistent with OS1. As noted in the application, the site is and will remain permanently protected open space protected for public use under Article 97 and as committed in 1986 when the land was purchased.

F48. The Project is consistent with OS2. The Lewis Pond Marsh Conservation Area abuts the drive-in parcel and is protected for conservation purposes. Proposed project elements are both passive and active in nature and were designed to provide recreation opportunities appropriate for each area of the site.

F49. Consistent with OS2, the Project has been designed to protect and enhance wildlife habitat through locating the boardwalk around stands of existing forested areas and developing paths that minimize clearing. In addition, proposed restoration activities will enhance opportunities for the movement of wildlife. The proposed shared-use path will connect to MassDOT-planned bicycle/pedestrian accommodations along Route 28, which will connect the site to other green spaces throughout Yarmouth.

Coastal Resiliency

F50. The Coastal Resiliency Goal of the RPP is to prevent or minimize human suffering and loss of life and property or environmental damage resulting from storms, flooding, erosion, and relative sea level rise.

F51. The following Objectives are applicable and material to the Project:

- **CR1** – minimize development in the floodplain
- **CR2** – plan for sea level rise, erosion, and floods
- **CR3** – reduce vulnerability of built environment to coastal hazards

F52. The Project Site is within the 100-year floodplain (A zone), with base flood elevation ranging from 11 to 13 feet. Consistent with CR1, there is no development proposed in V zones. While the project includes development in the A zone has been limited, it is mostly redevelopment, there is no feasible alternative and the impacts have been minimized and mitigated and, as a municipal open space project, it will have an overriding public benefit.

F53. To mitigate floodplain impacts and prevent future damage, the Project includes native vegetation along the banks of the Parkers River to minimize erosion. In addition, stormwater runoff from the site will be managed in accordance with local and state standards to provide enhanced treatment compared to existing conditions.

F54. The proposed restroom building and artist shanties are designed to be flood resistant. Fill and grading on the drive-in site will elevate the restroom, driveway, and parking, which will reduce the area of localized flooding and velocity of flood waters during smaller events.

While fill is required, this enables the design to incorporate stormwater management features that will enhance water quality protection and incorporate flood protection for project elements.

F55. The Project is consistent with CR2. According to the resource area delineation report, there is no coastal bank on the site. Appropriately designed and sited pedestrian walkways and elevated decks with appropriate orientation, height, and spacing between planks will allow sufficient sunlight penetration to maintain underlying vegetation. Extensive alternatives analyses and public input by the Town has designed and sited the proposed boardwalk appropriately while balancing ADA requirements that limit spacing between deck boards to ½" in width, which still allows some light penetration to the salt marsh vegetation. The Project locates development as far landward of resource and coastal hazard areas as is feasible within the site while still meeting project goals and includes restoration of degraded wetlands, including salt marsh, consistent with CR2.

F56. To accommodate sea level rise, structures within A zones should be elevated at least one foot above base flood elevation or two feet above existing grade, whichever is higher. Accordingly, the proposed restroom will be elevated and dry flood-proofed to two feet above base flood elevation, with the ability to add flood protection as sea levels rise. The drive and parking lot surfaces will also be elevated by several feet by re-grading the area and creating an earthen berm limiting the effects of flood waters. The boardwalk is elevated a minimum of 6 feet above the salt marsh, so increases in sea level should not impact the function of the boardwalk over the anticipated 40-year life span.

F57. The Town completed a flood study demonstrating the Project will not impact flow rates and velocities of the flood path. According to the study, the proposed fill will decrease flooding conditions during smaller events for abutters, which are more likely to be frequent. Further protecting the site from sea level rise, the proposed restoration of vegetation associated with the project should help to reduce wave heights and erosion across the site. To further minimize erosion, the design minimizes hard structures on the site. During the MEPA review process, refinement of the project's overall design and grading was completed, which included removal of areas of reinforced turfgrass in the event space and large landscape boulders in flood flow paths to decrease risk of dislodging, flood debris and erosion.

F58. Regarding salt marsh migration, the Applicant reviewed the Sea Level Affecting Marshes Model (SLAMM) to explore how the salt marsh on site might respond to anticipated sea level rise during the lifespan of the Project. According to SLAMM, in 2050, marsh migration is anticipated to occur on the site along the Parkers River in the vegetated areas that will remain following project construction. In 2070, under a higher sea level rise scenario, there is potential for brackish / transitional marsh extending onto the site. While the Project would prevent salt marsh migration onto the former drive-in at the northern limit of the site at that time, the salt marsh migration pathway south of the site would be maintained.

F59. Consistent with CR3, the Project's portions within coastal resource areas are primarily redevelopment. Additionally, the Project includes removing pavement and other debris from the site and restoration of degraded wetland resource areas, including salt marsh.

F60. The Project has been designed to minimize impacts to natural functions of coastal resources and address anticipated sea level rise through setting the development as landward as possible while still meeting project goals, elevating project elements, and restoring vegetation along the Parkers River to improve the storm damage and pollution prevention functions of these areas.

Community Design

F61. The Community Design Goal of the RPP is to protect and enhance the unique character of the region's built and natural environment based on the local context.

F62. The following Objectives are applicable and material to the Project:

- **CD1** – promote context sensitive building and site design
- **CD2** – minimize the amount of newly disturbed land and impervious surfaces

F63. The Project is consistent with CD1. The proposed bathroom facility and artist shanty buildings are small, low structures designed with traditional pitched roof forms and appropriate siding materials that will not impact scenic views or neighborhoods in the vicinity. The proposed future wastewater pump station on the Route 28 frontage is modest in scale and landscaped so it can serve as an effective frontage building appropriate for the streetscape. Lighting is proposed to be dark-sky compliant and no higher than 15 feet. Together, these design features respond to the surrounding context and make the project consistent with Objective CD1.

F64. The Project is consistent with CD2. In addition to the small buildings proposed, the Project involves construction of new parking areas, mostly clustered in narrow configurations at the edges of the open area and partially screened by existing vegetation. Some portions of the parking areas will use pervious pavement, and additional parking needed for large events will be provided on grassed areas, limiting the amount of pavement proposed. The fact that the site was previously developed and that all proposed impervious areas will be clustered together makes the project consistent with Objective CD2.

Cultural Heritage

F65. The Cultural Heritage Goal of the RPP is to protect and preserve the significant cultural, historic, and archaeological values and resources of Cape Cod.

F66. The following Objective is applicable and material to the Project:

- **CH2** – protect and preserve archaeological resources and assets from alteration or relocation

F67. The Project is consistent with CH2. There are no historic structures on the proposed project site, and no inventoried historic buildings in the project vicinity that would be impacted by the proposal. Given the site's location adjacent to Parker's River and extensive wetland areas, some portions of the property that were not previously disturbed could be determined archaeologically sensitive. The Applicant submitted a Project Notification Form ("PNF") to Massachusetts Historical Commission and several Tribal Historic Preservation Officers on October 31, 2022. On November 21, 2022, MHC determined that the project was unlikely to affect significant historic or archaeological resources.

Transportation

F68. The Transportation Goal of the RPP is to provide and promote a safe, reliable, and multi-modal transportation system.

F69. The following Objective is applicable and material to the Project:

- **TR1** – improve safety and eliminate hazards for all users of Cape Cod's transportation system
- **TR2** – provide and promote a balanced and efficient transportation system that includes healthy transportation options and appropriate connections for all users
- **TR3** – provide an efficient and reliable transportation system that will serve the current and future needs of the region and its people

F70. The Project has been designed to provide safe accommodations for both vehicular and non-vehicular (pedestrian/bicyclist) movements throughout the site. The existing site driveway will be repaved to provide two exit lanes and one entry lane separated by a center median, which will provide a pedestrian refuge for the crosswalk across the site driveway. A second access point for emergency vehicles only is proposed via Courtland Way and will be gated. Based on the Traffic Memorandum dated August 8, 2022, the site driveway will meet the minimum safety requirements to provide safe stopping sight distance and the Applicant has ensured that the proposed sewer pump station and landscaping will not obstruct driver sight lines when pulling onto Route 28. The Applicant performed a crash analysis within the study area and reviewed a recent Road Safety Audit (RSA) report performed by MassDOT for the future Route 28 Corridor Improvement project. Although the site driveway is not considered a high crash location, a segment within Route 28 in the vicinity of the site is considered above average. The MassDOT Route 28 project proposes five-foot wide shoulders, a shared use path on the southern side of the road and sidewalk upgrades on the northern side of the road and is currently at the 75% design level. Since funding for the MassDOT project is not slated until late 2028, the Applicant should locate a mid-block crosswalk on Route 28 and install ADA-compliant ramps in the interim to provide safe access to and from the Project Site for pedestrians, bicyclists, and transit riders. Subject to conditions included herein, the Project is consistent with Objective TR1.

F71. The Project is consistent with Objective TR2 subject to the Town to relocating the Route 28 mid-block crosswalk and installing ADA-compliant ramps ahead of the future MassDOT Route 28 project, as conditioned herein.

F72. The Project Site includes a complete internal path network connecting to existing sidewalk and transit facilities on Route 28. Bike racks are proposed at various locations within the site to promote alternate modes of transportation. The Project Site is located along the existing CCRTA H2O transit route which operates with flag stops along Route 28. It may be desirable to install a bench along the Route 28 frontage for transit riders as an amenity.

F73. The Project is consistent with TR3. Based on the BETA Traffic Memorandum, the Project is expected to generate a moderate amount of traffic associated with the park uses (artist shanties, boardwalk, canoe launch, playground) during the peak season with approximately 32 to 100 vehicle trips generated during a weekday afternoon or Saturday midday peak hour based on activity levels. The memorandum states these estimates are conservative as they do not account for trips arriving by walking, biking or a transit bus. The traffic analysis results concluded that the additional traffic from the Riverwalk project will not significantly degrade traffic operations on Route 28 and the site driveway will operate under capacity. The Traffic Memorandum states that the Police Department will coordinate with event sponsors to implement traffic management strategies (i.e. parking within the turf field, traffic control officers, message boards, traffic cones and reversible enter/exit lanes) for special larger events and is an appropriate mitigation approach to traffic management during special events.

Climate Mitigation

F74. The Climate Mitigation Goal of the RPP is to support, advance, and contribute as a region to the Commonwealth's interim and long-term greenhouse gas reduction goals and initiatives, including a state-wide net zero carbon target by 2050.

F75. The following Objectives are applicable and material to the Project:

- **CM1** – promote low or no carbon transportation alternatives and technologies
- **CM2** – promote low or no carbon technologies for building energy use, including appliances, lighting, and heating, ventilation, and cooling (HVAC) systems
- **CM3** – promote carbon sequestration and other emissions removal practices and technologies as appropriate to context
- **CM4** – promote low or no carbon energy generation technologies as appropriate to context

F76. Consistent with Objective CM1, the Project proposes an internal shared use path that connects to existing Route 28 sidewalks as well as a future proposed shared use path on Rte. 28, which will promote walking and biking into the park. The Applicant should work with state agencies to install a crosswalk at the site drive prior to the future reconstruction

of Route 28. Additionally, a pedestrian actuated beacon is planned for the site drive as a part of the Route 28 Corridor Improvement project.

F77. The Project incorporates dedicated EV parking spaces. EV charging was deemed infeasible due to concerns over flooding and other practical concerns. Thus, the Project is consistent with Objective CM1

F78. The proposed restroom and shanties will not be heated or air conditioned, thus the Project is consistent with Objective CM2.

F79. The Project is consistent with Objective CM3. As discussed previously under multiple RPP issue areas (see WET1, WET4, WPH1, WPH2, WPH5, CR1), the Project will significantly restore the site through the planting of native species and other measures, includes aspects of low impact design, and protects existing vegetation.

F80. The Project is consistent with Objective CM4. The only portion of the Project that involves a building with utilities is the unheated and unairconditioned bathroom building. The roof of the bathroom building is small due to the small footprint of (+/- 1100 sf), but the roof will be solar ready.

OTHER DRI REVIEW STANDARDS

Consistency with applicable Municipal Development Bylaws

F81. The Project requires Site Plan Review by the Planning Board, a Special Permit for Use from the Zoning Board of Appeals, a permit for the restroom septic system from the Board of Health, and an Order of Conditions and Stormwater Management Permit from the Conservation Commission. These permits were all approved during the first half of 2023. Additionally, the Project will require a Building Permit from the Building Department.

DCPC Implementing Regulations

F82. There are no DCPC implementing regulations that apply to the Project.

Consistency with CCC-certified Yarmouth LCP

F83. Chapter 4 of Yarmouth's LCP identifies the Town's goals to improve economic development. These goals include promoting new business in the Town that are compatible with the Town's environmental, cultural, and economic strengths while minimizing impacts and enhancing quality of life. The Project is intended to create a new recreational area for the Town that restores natural areas and provides public access. The proposed park provides opportunities for economic growth by adding artist shanties for local vendors and food truck access during events.

F84. Chapter 16 of Yarmouth's LCP aims to ensure facilities are adequate to meet community and regional needs. The Project is consistent with this goal, as it does not propose a significant increase on demands for water and power utilities given that the

proposed restrooms will only require approximately 800 gallons per day except during sporadic events and electricity use is limited to streetlights and the restroom.

F85. Chapter 6 of Yarmouth's LCP lists three main goals associated with Recreation and Open Space. These goals include promoting conservation, open space for the community, and recreation for residents and visitors. The Project is consistent with the Open Space Chapter of the LCP as the Project will restore a previously unused Town-owned property into an important source of outdoor recreation opportunities. The LCP also discusses the importance of redeveloping the Drive-In property as a public park. Efforts to restore the riverfront along the Parkers River will improve habitat for several known endangered and common wildlife species.

F86. Chapter 8 of Yarmouth's LCP identifies the goals for land use growth and management for the Town. These goals aim to improve quality of life, preserve natural areas and historic areas, and encourage employment and business consistent with the Town's resources and character. The Project, located adjacent to a residential neighborhood and several local businesses, improves the local economy by attracting nearby residents and tourists to the area. The Project is consistent with these goals as it will improve the quality of life through providing residents with increased recreation opportunities and will preserve areas along the coastline.

Probable Project Benefit versus Probable Project Detriment

F87. The probable benefit of the Project outweigh the probable detriment of the Project, from a regional perspective.

F88. The probable benefits of the Project are:

- The Project will provide a multiple-use recreational park for public use through the improvement of an underutilized and previously developed site.
- The Project will provide public access to the Lewis Pond salt marsh while minimizing impacts to the greatest extent practicable.
- The Project will provide opportunities for local artists to exhibit and sell work at a community scale.
- The Project provides new public access to Parkers River for canoers, kayakers, and paddleboarders.

F89. The probable detriments of the Project are:

- The Project will impact salt marsh, particularly during the construction of the boardwalk.

CONCLUSION

Based on the Findings above and subject to the Conditions set out below, the Commission further determines, finds, and concludes that the Project is consistent with the 2018 Cape Cod Regional Policy Plan, applicable provisions from the Yarmouth Local Comprehensive

Plan, and applicable municipal development bylaws; the probable benefit of the Project is greater than the probable detriment; and the Commission hereby grants DRI approval for the Yarmouth Riverwalk Park Project (File No. 22031).

CONDITIONS

General Conditions

C1. This Decision shall be final when the appeal period set out in Section 17 of the Cape Cod Commission Act has elapsed without appeal (or if such an appeal has been filed, when the appeal has been finally settled, dismissed, adjudicated, or otherwise disposed of in favor of the Applicant). Thereafter, this Decision shall be valid and in effect, and local development permits may be issued pursuant hereto for a period of seven years from the date of this Decision, or for such extended period as may be permitted by the Commission pursuant to the Enabling Regulations.

C2. A copy of the Decision, when final and prior to commencement of the Project, shall be recorded with the Barnstable Registry of Deeds.

C3. This Decision shall be appurtenant to and run with the Property. The Decision shall bind and be enforceable against, and inure to the benefit of, the Applicant, its heirs, successors, and assigns.

C4. The Applicant shall obtain all required federal, state, and local permits, licenses, and approvals. The Project's consistency with required Municipal Development Bylaws shall be ratified and confirmed by the Applicant obtaining the required municipal development permits.

C5. The Applicant shall provide or otherwise ensure that the Commission is copied on all state and local permits, licenses, and approvals.

C6. The Project shall be constructed, operated, and maintained consistent with the following documents ("Approved Project Plans"). Plans, protocols, and other documents received or required to be submitted as Conditions of this Decision shall be treated as incorporated into the Approved Project Plans once received, reviewed, and approved for consistency with this Decision by Commission staff, and the Project shall thereafter be constructed, operated, and maintained consistent with the Approved Project Plans, as so supplemented:

- *Town of Yarmouth, Massachusetts, Yarmouth Riverwalk Park, Single Environmental Impact Report MEPA Plan Set*, consisting of 61 pages, prepared by Beta Group, Inc., dated April 2023

C7. Prior to and as a condition to issuance of a final building permit close out for the Project from the Town of Yarmouth Building Department, the Applicant shall request and obtain from the Commission a Certificate of Compliance; the issuance of such Final

Certificate of Compliance evidences that the Applicant has satisfied all Conditions in this Decision required to have been satisfied prior to the issuance of a local final building permits close out, and shall confirm that the Project was constructed or implemented in accordance with this Decision.

C8. The Applicant hereby authorizes Commission staff to make site visits as necessary, at reasonable times and upon reasonable notice to the Applicant, to confirm that the Project has been implemented in accordance with this Decision, including upon an Applicant's request for a Certificate of Compliance hereunder.

C9. Any changes to the Project resulting from other review processes may require modification of this Decision.

Transportation

C10. Prior to completion of the Project, the Applicant shall coordinate with state and other agencies, as necessary, to install a mid-block crosswalk and ADA-compliant ramps on Route 28 proximate to the site drive.

Natural Resources

C11. The Applicant shall submit a final Stormwater Pollution Prevention Plan for review and approval by Commission staff.

C12. The Applicant shall submit a final Invasive Species Management Plan for review and approval by Commission staff.

C13. The Applicant shall maintain all landscaping with native species consistent with those listed on the proposed Landscape Plan and/or on the Commission's list of approved species.

SIGNATURE PAGE FOLLOWS

Executed this 28 day of September 2023

For the Cape Cod Commission by:

Signature

Frederick Chirgotis

Print Name and Title

COMMONWEALTH OF MASSACHUSETTS

Barnstable, ss

September 28, 2023

Before me, the undersigned notary public, personally appeared Frederick Chirgotis, in his/her capacity as Vice Chair and on behalf of the Cape Cod Commission, whose name is signed on the preceding or attached document, and such person acknowledged to me that he/she signed such document voluntarily for its stated purpose. The identity of such person was proved to me through satisfactory evidence of identification, which was [ ] photographic identification with signature issued by a federal or state governmental agency, [ ] oath or affirmation of a credible witness, or [X] personal knowledge of the undersigned.

Notary Public

My Commission Expires: 8-28-26

LISA P. DILLON
NOTARY PUBLIC
Commonwealth of Massachusetts
My Commission Expires
August 28, 2026

Water Quality Certification

WQC NO. WW10-0000042

MassDEP
Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Southeast Regional Office • 20 Riverside Drive, Lakeville MA 02347 • 508-946-2700

Maura T. Healey
Governor

Kimberley Driscoll
Lieutenant Governor

Rebecca L. Tepper
Secretary

Bonnie Heiple
Commissioner

NOV 0 2 2023

Town of Yarmouth
ATTN: Robert L. Whritenour, Jr.
1146 Route 28
South Yarmouth, MA 02664

RE: **401 WATER QUALITY CERTIFICATION**
APPLICATION FOR WW 10
Major Project Certification

AT: 669 Route 28, Yarmouth, MA, Parkers River

401 WQC Application №: 22-WW26-0013-APP
401 WQC №: WW10-0000042
Chapter 91 License №: WW01-0000271
Wetlands File №: SE 83-2372
ACoE Application №: NAE-22-02890

Dear Mr. Whritenour:

The Department of Environmental Protection ("MassDEP") has reviewed your application for a 401 Water Quality Certification and Chapter 91 License ("Combined Application"), as referenced above. In accordance with the provisions of Section 401 of the Federal Clean Water Act as amended (33 U.S.C. §1251 et seq.), MGL c.21, §§ 26-53, and 314 CMR 9.00, MassDEP has determined there is reasonable assurance the project or activity will be conducted in a manner which will not violate applicable Massachusetts Surface Water Quality Standards (314 CMR 4.00) and other applicable requirements of state law. The Chapter 91 License associated with this project will be issued as a separate document.

Project Description:
The Yarmouth Riverwalk Park Project is proposed along Parkers River and seeks to provide accessible active and passive recreation to the public through the following activities:

- Boardwalk Construction: A raised boardwalk loop is proposed over salt marsh and bordering vegetated wetlands (BVW). The boardwalk will be supported by helical anchors, feature three overlook areas, four bench areas and a footbridge over a tidal stream. Matting

will be placed on salt marsh and BVW to distribute the load of the drill-rig to minimize impacts to the wetlands.

- Public Access to Parkers River: The project also proposes to construct a pier, two ramps, a landing, a float and piles for launching canoes, kayaks and paddleboards. The piles associated with the launch will not be installed within salt marsh. There is a section of the launch that is proposed over salt marsh.

The proposed project will result in temporary and permanent alterations to wetlands. Approximately 8,160 square feet (sf) of salt marsh (310 CMR 10.32) and 930 sf of bordering vegetated wetland (BVW, 310 CMR 10.55) will be temporarily altered during construction through the use of a drill-rig for pile installation and the placement of construction mats. Approximately 17 square feet of salt marsh, 3 square feet of BVW, and 6 sf of land under ocean (310 CMR 10.25) will be permanently altered during pile driving activities.

Best management practices were proposed to minimize disturbances to wetland resource areas. Turbidity and erosion controls will be implemented in the project area to prevent sediment and siltation from entering wetland resource areas and minimizing adverse effects to marine fisheries and wildlife habitats.

Rare Species and Wildlife Habitat: The site is located within Priority Habitat of Rare Species and Estimated Habitat of Rare Wildlife as indicated in the Massachusetts Natural Heritage Atlas, 15th Edition, effective August 1, 2021. The Massachusetts Natural Heritage and Endangered Species Program determined in a letter, dated December 7, 2022, that the construction of the boardwalk loop and kayak launch to Parkers River will not adversely affect the Resource Area Habitat of state-protected rare wildlife species and will not result in a prohibited take of state-listed rare species.

Public Notice: The Combined Application public notice was published in the Cape Cod Times on July 26, 2023, with a notification date of July 26, 2023.

Section 61 Findings: Pursuant to M.G.L. Chapter 30, Sections 61 to 62H inclusive [the Massachusetts Environmental Policy Act ("MEPA")], this project was reviewed as EOEEA #16623. In the Certificate issued on June 23, 2023, on the Single Environmental Impact Report (SEIR), the Secretary of Energy and Environmental Affairs (the "Secretary") determined that the "SEIR adequately and properly complies with MEPA and its implementing regulations. The project may proceed to permitting."

With the implementation of certain requirements, the Department is satisfied that adequate measures have been taken to avoid, minimize and mitigate for wetland impacts.

Therefore, based on information currently in the record, MassDEP grants a Water Quality Certification (WQC) for this project, subject to the following conditions to maintain water quality; to minimize impact on waters and wetlands; and to ensure compliance with appropriate state law.

MassDEP further certifies in accordance with 314 CMR 9.00 that there is reasonable assurance the project or activity will be conducted in a manner which will not violate applicable water quality standards (314 CMR 4.00) and other applicable requirements of state law.

Finally, MassDEP has determined that upon satisfying the conditions and mitigation requirements of this approval, the project provides a level of water quality necessary to protect existing uses and accordingly finds that the project to be implemented satisfies the Surface Water Quality Standards at 314 CMR 4.00.

1. Pursuant to 314 CMR 9.05(1), all work shall be performed in accordance with the following documents and plans:

    - Application for Combined License and Water Quality Certification, Application No. 22-WW26-0013-APP, dated as received 2/24/23.
    - Plan titled: "Town of Yarmouth, Massachusetts, Yarmouth Riverwalk Park, Notice of Intent - Riverwalk Park and Event Space", consisting of 60 sheets, various scales, prepared by Beta Group, Inc., dated 12/1/22.
    - Chapter 91 Plan titled: "Plan Accompanying Petition of Town of Yarmouth, to Construct and Maintain a Pile Supported Boardwalk and Kayak Launch with a Float System within Flowed Tidelands of the Parkers River at 669 Main Street, Yarmouth, Massachusetts", consisting of 13 sheets, various scales, dated 7/26/23, later revised 10/27/23.
    - Plan titled: "Yarmouth Riverwalk Park, Town of Yarmouth, Massachusetts, Pre-Construction Notification Plans", consisting of 26 sheets, various scales, prepared by Beta Group, Inc., dated December 2022, unstamped.
    - Order of Conditions SE 83-2372, issued by the Yarmouth Conservation Commission on 1/26/23.
    - Order of Conditions SE 83-2373, issued by the Yarmouth Conservation Commission on 2/3/23
    - Letter from Daniel J. McKiernan, Director of the Commonwealth of Massachusetts Division of Marine Fisheries to Secretary Rebecca L. Tepper, dated 6/8/23, consisting of 2 sheets.
    - Letter from Amanda Davis, Environmental Analyst, Commonwealth of Massachusetts Division of Marine Fisheries to the Wetlands and Waterways Program, dated 8/9/23, consisting of 2 sheets.
    - Letter from Everose Schluter, Assistant Director of the Division of Fisheries and Wildlife to Robert Whritenour, Town of Yarmouth, dated 12/7/2022, consisting of 2 sheets.

    This condition is necessary to assure that any project changes comply with the Massachusetts Surface Water Quality Standards, as provided in 314 CMR 9.00, to protect the public health and restore and maintain the chemical, physical, and biological integrity of the water resources of the Commonwealth.

2. This Water Quality Certification (WQC) is issued upon the express condition that any and all other applicable authorizations necessitated due to the provisions hereof shall be secured by the applicant prior to the commencement of any activity hereby authorized.

3. This WQC shall be revocable by MassDEP for noncompliance with the terms and conditions set forth herein. This WQC may be revoked after MassDEP has given written notice of the alleged noncompliance to the applicant or his agent and those persons who have filed a written request with MassDEP for such notice; and has afforded the applicant a reasonable opportunity to correct said noncompliance.

4. This WQC is issued subject to all applicable federal, state, county, and municipal laws, ordinances, by-laws, and regulations, including but not limited to, a valid Order of Conditions issued pursuant to the Wetlands Protection Act, M.G.L. Chapter 131, §.40.

5. The applicant shall 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, audits, damages, costs and expenses incurred by reason thereof.

6. Pursuant to 314 CMR 9.01(3) and 9.09(1), the contractor shall take all steps necessary to assure that the proposed activities will be conducted in a manner that will avoid violations of the anti-degradation provisions of the Massachusetts Surface Water Quality Standards that protect all waters, including wetlands. This condition is necessary to assure that any discharge from the project complies with the Massachusetts Surface Water Quality Standards, as provided in 314 CMR 9.00, to protect the public health and restore and maintain the chemical, physical, and biological integrity of the water resources of the Commonwealth.

7. Pursuant to 314 CMR 9.09(2), prior to start of work or any other portion of the work thereafter, the MassDEP Wetlands and Waterways Program in the Lakeville office (Cally Harper, cally.harper@mass.gov) shall be notified of any change(s), modifications, or deletions of work as specified in the proposed project plans that may affect water quality or wetlands. Depending on the nature and the scope of any change, the Department will determine whether the change(s) requires further approvals or revision to this Certification. The applicant is required to receive written approval from MassDEP prior to undertaking any work not authorized by this permit. This condition is necessary to assure that any project changes comply with the Massachusetts Surface Water Quality Standards, as provided in 314 CMR 9.00, to protect the public health and restore and maintain the chemical, physical, and biological integrity of the water resources of the Commonwealth.

8. Pursuant to 314 CMR 9.09(1)(e), activities conducted in accordance with this WQC may begin following the 21-day appeal period and once all other permits have been received. This condition is necessary to ensure that the work does not begin if an appeal is filed.

9. In the furtherance of 314 CMR 9.06(2) and 9.07(1), the Department shall be notified in writing (email, attention Cally.Harper@mass.gov) one week prior to the start of work so that MassDEP staff may inspect the work for compliance with the terms and conditions of this Combined

Certification. 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.

10. Pursuant to 314 CMR 9.05(4), the applicant and its contractor shall allow agents of MassDEP to enter the project sites, subject to the contractor's health and safety protocols, to verify compliance with the conditions of this Combined Certification. 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.

11. Pursuant to 314 CMR 9.01(3), 9.04(5), the term of this Combined Certification remains in effect for the same duration as the federal permit that requires it. This condition is necessary to provide consistency between the federal permit and the state water quality certification.

12. The Certification can be amended and/or extended in accordance with 314 CMR 9.09(2) and (3).

13. In furtherance of 314 CMR 9.06(2) and 9.07(1), prior to start of work, the applicant shall provide MassDEP with the name, address, and phone number(s) of the person responsible for ensuring that all work complies with the conditions of this Water Quality Certification.

14. In the furtherance of 314 CMR 9.06(2), a copy of this Certification and referenced plans and other documents shall be provided to the contractor(s) prior to the start of construction and shall be kept available on the work site during all phases of construction.

15. Pursuant to 314 CMR 9.06(2), prior to the start of construction, erosion and sedimentation control barriers detailed in the plans below shall be installed as necessary to protect the wetland and other sensitive areas during construction activities: plans titled: "Town of Yarmouth, Massachusetts, Yarmouth Riverwalk Park, Notice of Intent - Riverwalk Park and Event Space", consisting of 60 sheets, various scales, prepared by Beta Group, Inc., dated 12/1/22. This condition is necessary to assure that any discharge from the project complies with the Massachusetts Surface Water Quality Standards to protect the public health and restore and maintain the chemical, physical, and biological integrity of the water resources of the Commonwealth.

16. All erosion control barriers shall be installed and maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. 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. The applicant shall provide to the Department and the local Conservation Commissions, the name and phone number of an individual (Construction Supervisor) responsible for repair and maintenance of the erosion control barrier. This condition is necessary to assure that any discharge from the project complies with the Massachusetts Surface Water Quality Standards, as provided in 314 CMR 9.00, to protect the public health and restore and maintain the chemical, physical, and biological integrity of the water resources of the Commonwealth.

17. When possible, construction shall be undertaken when the ground is sufficiently frozen or otherwise stable and with the assistance of swamp mats to support the construction equipment within the wetland areas in order to avoid creating ruts. Any swamp mats shall be removed upon completion of the project. Wetland areas that are temporarily disturbed for access shall be restored to pre-existing conditions.

18. In furtherance of 314 CMR 9.06(2), all equipment/machinery shall be stored above the mean high water and outside any wetland resource areas when not in use.

19. In furtherance of 314 CMR 9.06(2) and 9.07(1), any supplies, debris, fill or other materials stockpiled within roadways and temporary workspaces shall be stored in a manner so as to prevent such materials from entering the wetland resource areas beyond the erosion control barrier unless otherwise approved by MassDEP.

20. The construction window for the work in salt marsh shall be from October 15th to April 1st to avoid direct impacts to salt marsh during the growing season, per the recommendation from the Division of Marine Fisheries in their comment letter dated 6/8/23.

21. Any in-water, silt-producing activities shall be prohibited from February 15th to June 15th of any year in order to protect diadromous fish species per the recommendation from the Division of Marine Fisheries in their comment letter dated 8/9/23.

Failure to comply with this certification is grounds for enforcement, including civil and criminal penalties, under MGL c.21 §42, 314 CMR 9.00, MGL c. 21A §16, 310 CMR 5.00, MGL c.91, 310 CMR 9.00 or other possible actions/penalties as authorized by the General Laws of the Commonwealth.

This certification 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 Notice of Intent, Combined Application or supplemental documents will require further notification to MassDEP.

This Certification is not final until all administrative appeal periods from this permit have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed. The appeal period is for twenty-one (21) days. No work shall be undertaken until the certification has become final.

Please note that MassDEP may revoke this Certification for non-compliance with the terms and conditions set forth. Therefore, it is recommended that you contact MassDEP prior to performing any alterations or use modifications for review and, if necessary, approval.

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401 WQC Appeal Process (314 CMR 9.10):

Certain persons shall have a right to request an adjudicatory hearing concerning Combined Permits by the Department 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 (10) 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 (10) 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 the Department, with the appropriate filing fee specified within 310 CMR 4.10 along with a DEP Fee Transmittal Form within twenty-one (21) days from the date of issuance of this Certificate.

Case Administrator
Department of Environmental Protection
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 and Waterways Program at:

Department of Environmental Protection
Southeast Regional Office (SERO)
20 Riverside Drive
Lakeville, MA 02347

A Notice of Claim for Adjudicatory Hearing shall comply with the Department'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 Water Quality Certification Application Number and DEP Wetlands Protection Act File Number;
b. the complete name of the applicant and address of the project;
c. the complete name, address, and fax and telephone numbers of the party filing the request, and, if represented by counsel or other representative, the name, fax and telephone numbers, and address of the attorney;

d. if claiming to be a party aggrieved, the specific facts that demonstrate that the party satisfies the definition of "aggrieved person" found at 314 CMR 9.02;
e. a clear and concise statement that an adjudicatory hearing is being requested;
f. a clear and concise statement of (1) the facts which are grounds for the proceedings, (2) the objections to this Certificate, including specifically the manner in which it is alleged to be inconsistent with the Department'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 Combined Permit; 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 Environmental Management (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
P.O. 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. The Department 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 permit, please contact Cally Harper (617) 549-3598, or by e-mail at cally.harper@mass.gov

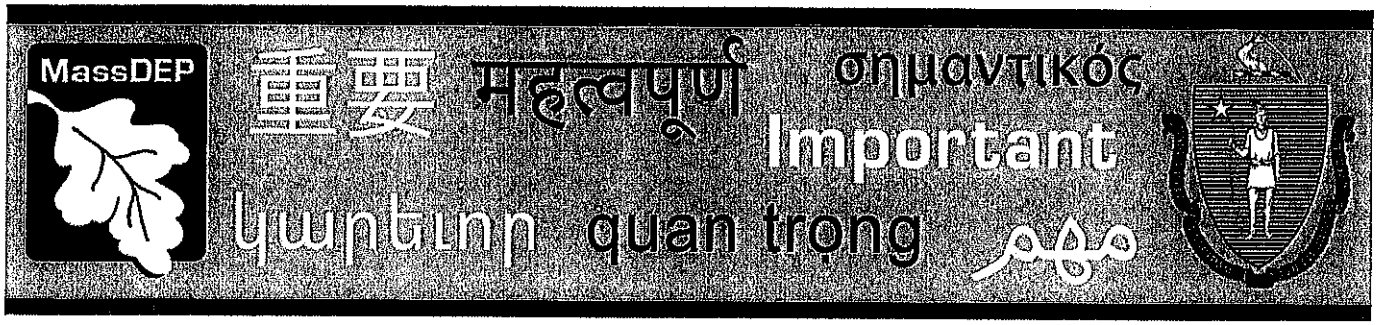
Sincerely,

Brendan C. Mullaney
Environmental Analyst
Wetlands and Waterways Program

BM/cjh

ecc: Yarmouth Conservation Commission

Brittany DiRienzo, Yarmouth Conservation Administrator
Brittany DiRienzo, Yarmouth Harbormaster
Beta Group, Inc., Attn: Laura Krause
David Wong, MassDEP-Boston Office
MEPA office
Patrice Bordonaro, CZM
Amanda Davis, Division of Marine Fisheries
Emily Holt, Natural Heritage and Endangered Species Program
Christine Jacek, U.S. Army Corps of Engineers



Communication for Non-English-Speaking Parties

This document is important and should be translated immediately.

If you need this document translated, please contact MassDEP's Director of EJ at the telephone number listed below.

Español Spanish

Este documento es importante y debe ser traducido de inmediato. Si necesita este documento traducido, comuníquese con la Directora de Diversidad de MassDEP al número de teléfono que aparece más abajo.

Português Portuguese

Este é um documento importante e deve ser traduzido imediatamente. Se precisar de uma tradução deste documento, entre em contato com o Diretor de Diversidade da MassDEP nos números de telefone listados abaixo.

繁體中文 Chinese Traditional

本文件非常重要，應立即翻譯。如果您需要翻譯這份文件，請用下面列出的電話號碼聯絡 MassDEP 多元化負責人。

简体中文 Chinese Simplified

本文件非常重要，应立即翻译。如果您需要翻译这份文件，请用下面列出的电话号码与 MassDEP 的多元化主任联系。

Ayisyen Kreyòl Haitian Creole

Dokiman sa-a se yon bagay enpòtan epi yo ta dwe tradwi l imedyatman. Si ou bezwen dokimar sa a tradwi, tanpri kontakte Direktè Divèsite MassDEP la nan nimewo telefòn endike anba.

Việt Vietnamese

Tài liệu này rất quan trọng và cần được dịch ngay lập tức. Nếu quý vị cần dịch tài liệu này, xin liên lạc với Giám đốc Đa dạng của MassDEP theo các số điện thoại ghi dưới đây.

ប្រទេសកម្ពុជា Khmer/Cambodian

ឯកសារនេះគឺសំខាន់ហើយគួរត្រូវបានបកប្រែភ្លាមៗ។ ប្រសិនបើអ្នកត្រូវការឲ្យគេបកប្រែឯកសារនេះ
សូមទាក់ទងមកនាយកផ្នែកពិពិធកម្មរបស់ MassDEP តាមលេខទូរស័ព្ទខាងក្រោម។

Kriolu Kabuverdianu Cape Verdean

Kel dukumentu li é inpurtánti y debe ser traduzidu imidiatamenti. Se bu meste di kel dukumentu traduzidu, pur favor kontakta Diretor di Diversidádi di MassDEP na numeru abaxu indikadu.

Contact Deneen Simpson 857-406-0738
Massachusetts Department of Environmental Protection
100 Cambridge Street 9th Floor Boston, MA 02114
TTY# MassRelay Service 1-800-439-2370 • https://www.mass.gov/environmental-justice
(Version revised 4.21.2023) 310 CMR 1.03(5)(a)

Русский Russian

Это важный документ, и он должен быть безотлагательно переведен. Если вам нужен перевод данного документа, пожалуйста, свяжитесь с директором по вопросам многообразия (Diversity Director) компании MassDEP по указанному ниже телефону.

العربية Arabic

هذه الوثيقة مهمة ويجب ترجمتها على الفور. اذا كنت بحاجة الى هذه الوثيقة مترجمة، يرجى الاتصال بمدير التنوع PMassDE على أرقام الهواتف المدرجة أدناه.

한국어 Korean

이 문서는 중요하고 즉시 번역해야 합니다. 이 문서의 번역이 필요하시다면, 아래의 전화 번호로 MassDEP 의 다양성 담당 이사에 문의하시기 바랍니다.

հայերեն Armenian

Այս փաստաթուղթը կարևոր է և պետք է անմիջապես թարգմանվի:
Եթե Ձեզ անհրաժեշտ է այս փաստաթուղթը թարգմանել, դիմեք MassDEP-ի բազմազանության տնօրենին ստորև նշված հեռախոսահամարով:

فارسی Farsi Persian

این سند مهم است و باید فورا ترجمه شود.
اگر به ترجمه این سند نیاز دارید، لطفا با مدیر بخش تنوع نژادی MassDEP به شماره تلفن ذکر شده در زیر تماس بگیرید.

Français French

Ce document est important et devrait être traduit immédiatement. Si vous avez besoin de ce document traduit, veuillez communiquer avec le directeur de la diversité MassDEP aux numéros de téléphone indiqués ci-dessous.

Deutsch German

Dieses Dokument ist wichtig und sollte sofort übersetzt werden. Sofern Sie eine Übersetzung dieses Dokuments benötigen, wenden Sie sich bitte an den Diversity Director MassDEP unter der unten aufgeführten Telefonnummer.

Ελληνική Greek

Το παρόν έγγραφο είναι σημαντικό και θα πρέπει να μεταφραστεί αμέσως. Αν χρειάζεστε μετάφραση του παρόντος εγγράφου, παρακαλούμε επικοινωνήστε με τον Διευθυντή Διαφορετικότητας του MassDEP στους αριθμούς τηλεφώνου που αναγράφονται παρακάτω.

Italiano Italian

Comunicazione per parti che non parlano inglese. Questo documento è importante e dovrebbe essere tradotto immediatamente. Se avete bisogno di questo documento tradotto, potete contattare il Direttore di Diversità di MassDEP al numero di telefono elencato di seguito.

Język Polski Polish

Dokument ten jest ważny i powinien zostać natychmiast przetłumaczony. Jeśli potrzebujesz przetłumaczonej wersji dokumentu, prosimy o kontakt z dyrektorem ds. różnorodności MassDEP pod jednym z numerów telefonu wymienionych poniżej.

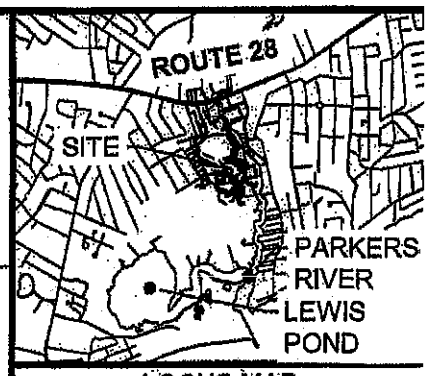
हिन्दी Hindi

यह दस्तावेज महत्वपूर्ण है और इसका तुरंत अनुवाद किया जाना चाहिए. यदि आपको इस दस्तावेज़ का अनुवाद करने की आवश्यकता है, तो कृपया नीचे सूचीबद्ध टेलीफोन नंबरों पर मासडेप्स डाइवर्सिटी के निदेशक से संपर्क करें.

Contact 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 4.21.2023) 310 CMR 1.03(5)(a)

LEGEND

- MEAN HIGH WATER (MHW, EL. 2.05' NAVD88)
- MEAN LOW WATER (MLW, EL. -0.70' NAVD88)
- FEMA FLOODPLAIN ZONE AE BOUNDARY
- EXISTING CONTOURS
- PROPERTY LINE



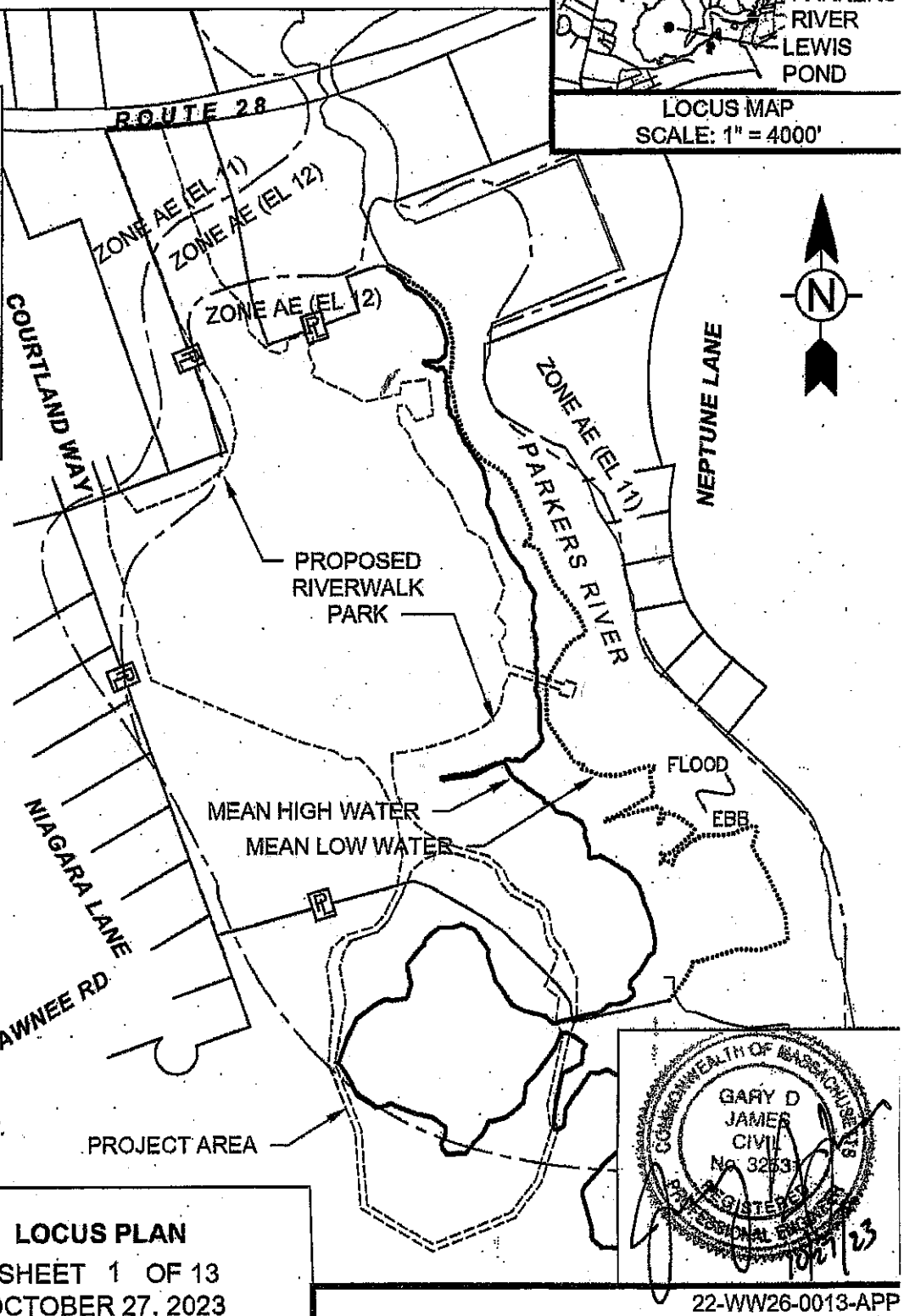
LOCUS MAP
SCALE: 1" = 4000'

DRAWING INDEX

NOTES:

1. PLAN PREPARED BY: BETA GROUP, INC., DECEMBER 28, 2022. THIS PLAN IS FOR PERMITTING PURPOSES ONLY.
2. TOPOGRAPHIC SURVEY IS BASED ON AN ON-THE-GROUND SURVEY PERFORMED BY ALPHA SURVEY GROUP, LLC BETWEEN MARCH 7 & APRIL 3, 2017 AND BETWEEN AUGUST 9 & AUGUST 12,2021.
3. SOUNDINGS COLLECTED BY BETA GROUP ON MARCH 25, 2022 BETWEEN THE HOURS OF 11 AM AND 1 PM. PER WWW.USHARBORS.COM: SOUTH YARMOUTH, MA TIDES WERE AS FOLLOWS, AM HIGH: 9:11 AM +2.8', PM LOW: 3:33 PM -0.1. PER THE NATIONAL WEATHER SERVICE, WEATHER ON MARCH 25, 2022 WAS OVERCAST, HIGH TEMP: 43° LOW TEMP: 28°.

NOTES CONTINUED ON SHEET 2 OF 13.



COMMONWEALTH OF MASSACHUSETTS
GARY D JAMES
CIVIL
No. 32533
REGISTERED PROFESSIONAL ENGINEER
10/27/23

0 300' 600'

SCALE IN FEET
SCALE: 1"=300'

LOCUS PLAN

SHEET 1 OF 13
OCTOBER 27, 2023

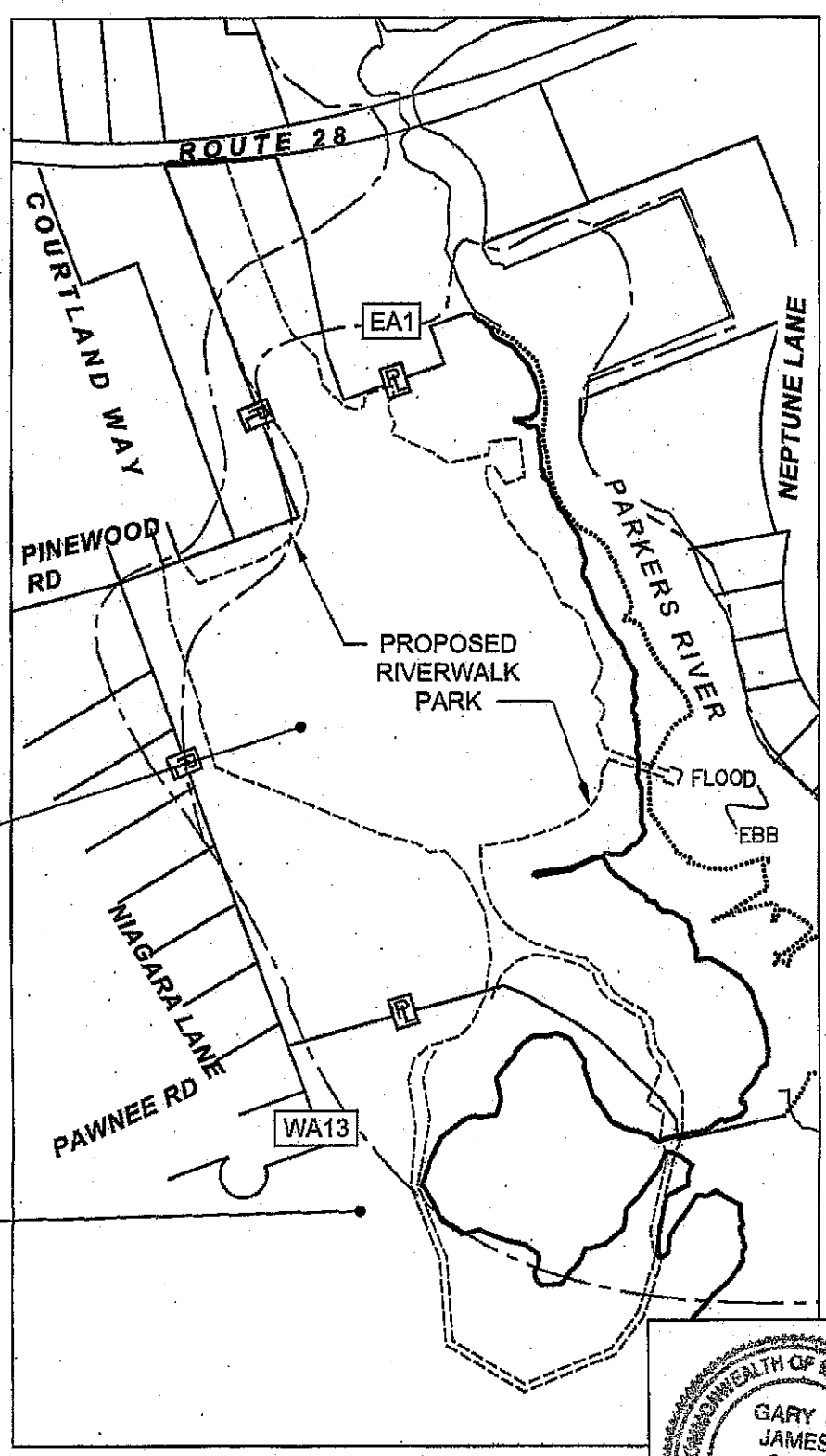
22-WW26-0013-APP

PLAN ACCOMPANYING PETITION OF TOWN OF YARMOUTH, TO CONSTRUCT AND MAINTAIN A PILE SUPPORTED BOARDWALK AND KAYAK LAUNCH WITH A FLOAT SYSTEM WITHIN FLOWED TIDELANDS OF THE PARKERS RIVER AT 669 MAIN STREET, YARMOUTH, MASSACHUSETTS

ABUTTER INFORMATION		
ID	NAME	ADDRESS
WA13	MILES NANCY J TR SELIN REALTY TRUST	139 PILGRIM TRAIL PLYMOUTH, MA 02360
EA1	GOLD VILLAGE WATERSIDE LLC	681 ROUTE 28 WEST YARMOUTH, MA 02673

NOTES (CONTINUED):

4. COORDINATES ARE BASED ON THE MASSACHUSETTS MAINLAND STATE PLANE COORDINATE SYSTEM NAD 1983. ELEVATIONS ARE SHOWN IN FEET AND TENTHS BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
5. TIDAL ELEVATION SOURCED FROM NOAA STATION ID 8447605, HYANNIS PORT, HYANNIS HARBOR, VM 2063, PID AR7943.
6. TIDAL ELEVATIONS ARE:
   MEAN HIGH WATER (MHW) 2.05'
   MEAN LOW WATER (MLW) -0.7'



TOWN OF YARMOUTH
669 ROUTE 28
ASSESS. MAP 32
PARCEL ID: 32/122
DEED BK 4985
PAGE 181
23.32 ACRES

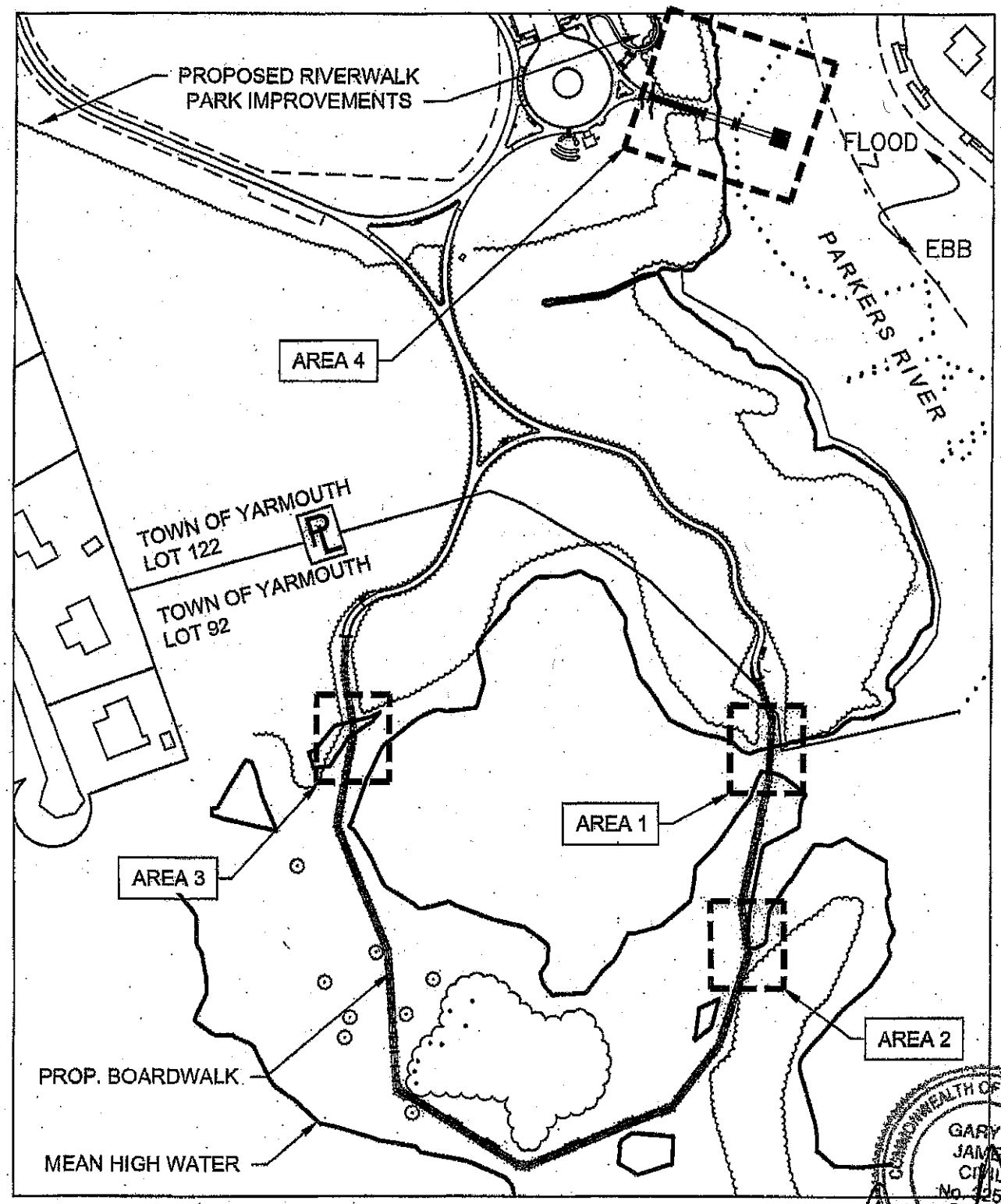
TOWN OF YARMOUTH
1146 ROUTE 28
ASSESS. MAP 18
PARCEL ID: 24/92
DEED BK 8979
PAGE 44
122.28 ACRES

COMMONWEALTH OF MASSACHUSETTS
GARY D JAMES
CIVIL
No. 32581
REGISTERED PROFESSIONAL ENGINEER

10/27/23

0 300' 600'
SCALE IN FEET
SCALE: 1"=300'

ABUTTERS PLAN
SHEET 2 OF 13
OCTOBER 27, 2023



COMMONWEALTH OF MASSACHUSETTS
GARY D JAMES
CIVIL
No. 43531
REGISTERED PROFESSIONAL ENGINEER
10/27/23

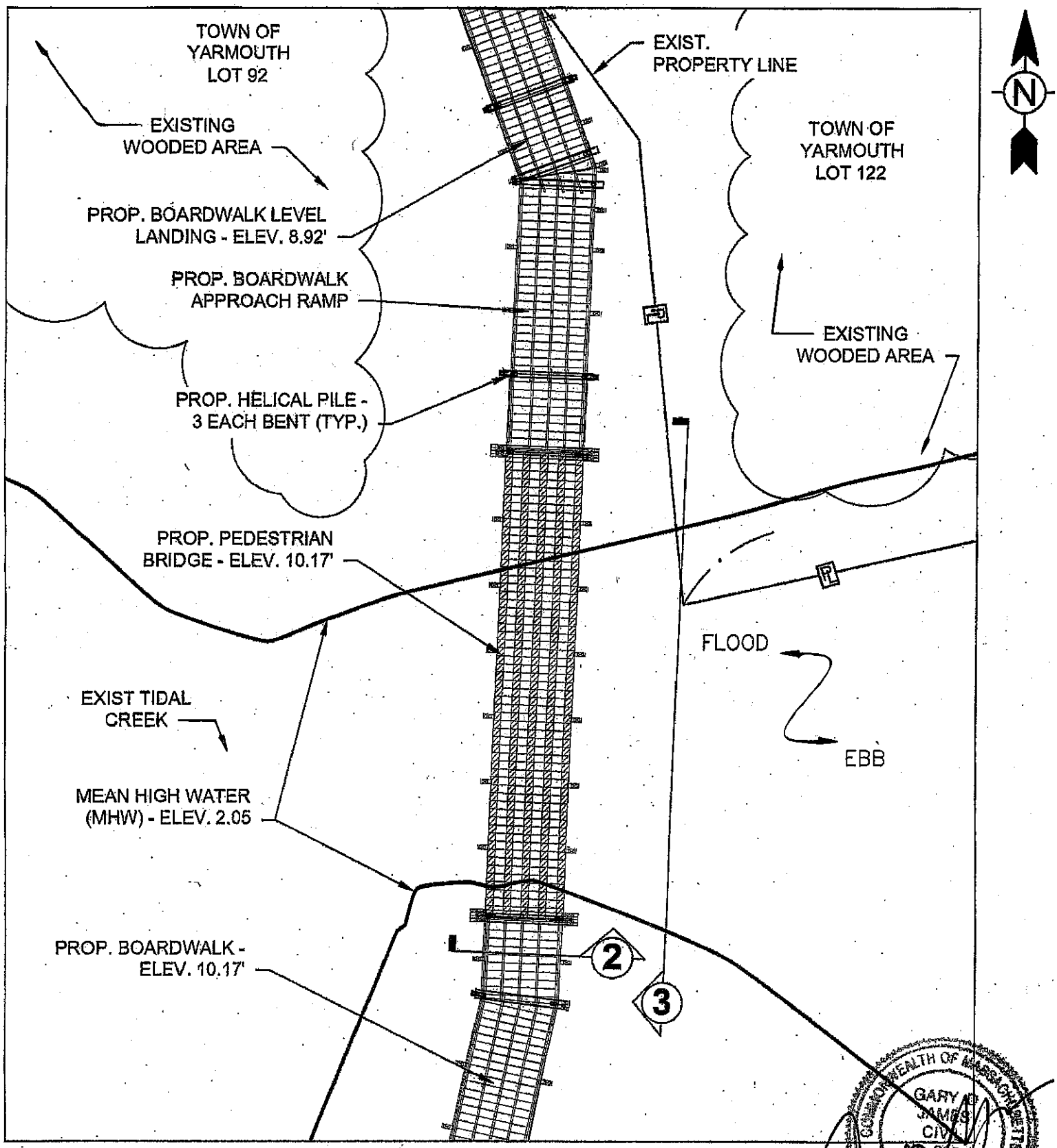
0 150' 300'

SCALE IN FEET
SCALE: 1"=150'

OVERALL SITE PLAN

SHEET 3 OF 13

OCTOBER 27, 2023

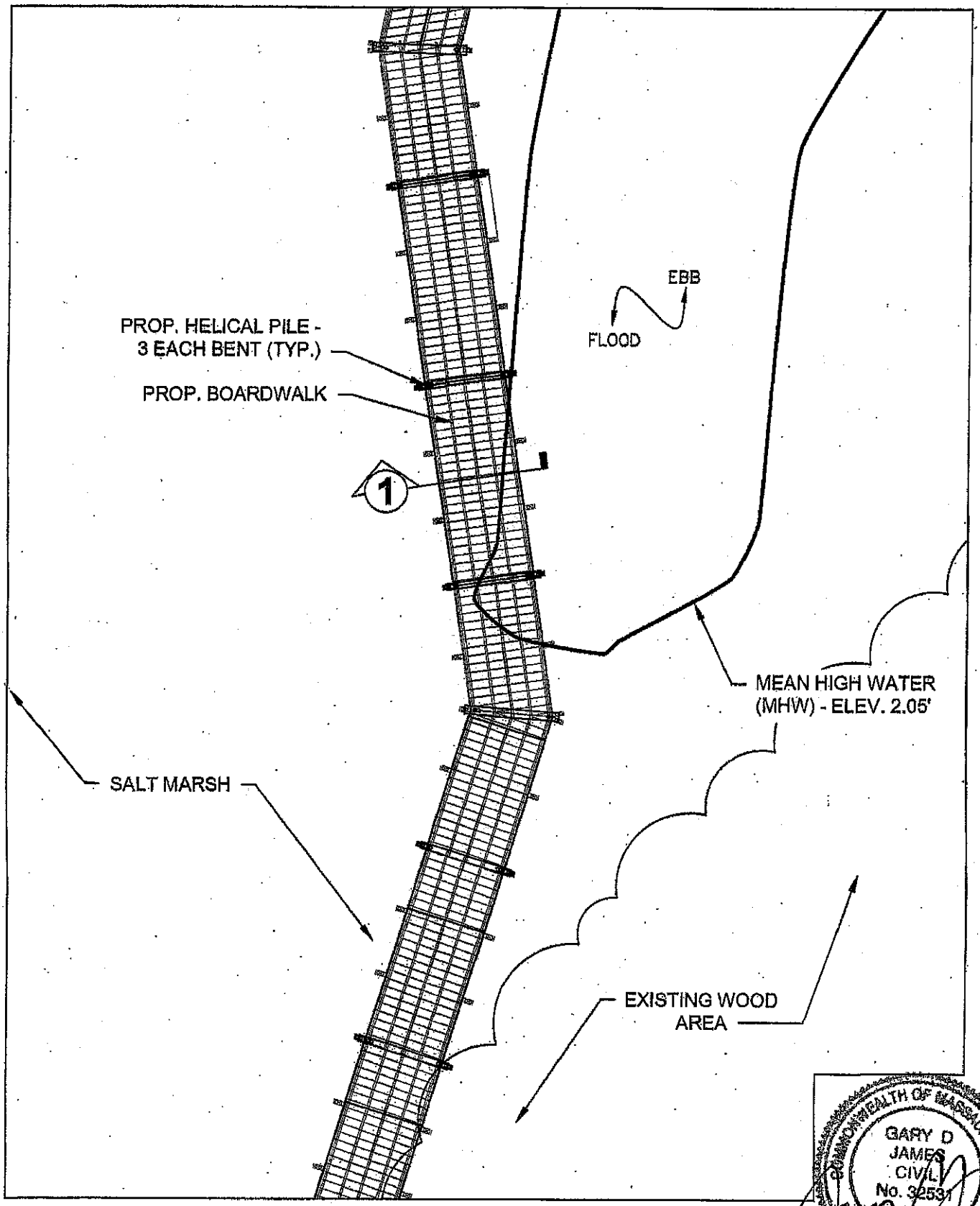


0 10' 20'

SCALE IN FEET
SCALE: 1"=10'

SITE PLAN - AREA 1

SHEET 4 OF 13
OCTOBER 27, 2023



COMMONWEALTH OF MASSACHUSETTS
GARY D
JAMES
CIVIL
No. 32531
REGISTERED
PROFESSIONAL ENGINEER
10/27/23

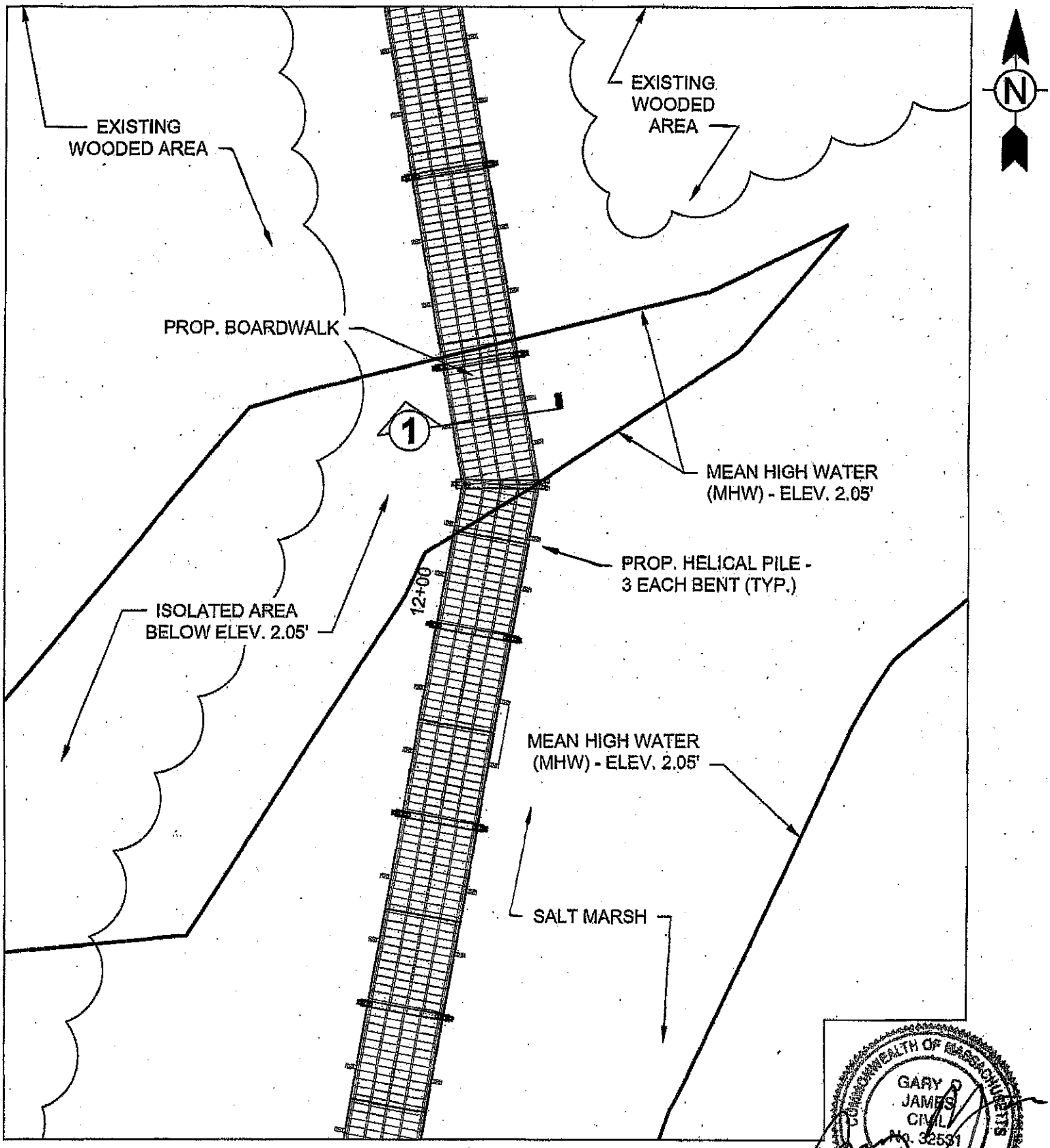
0 10' 20'

SCALE IN FEET
SCALE: 1"=10'

SITE PLAN - AREA 2

SHEET 5 OF 13

OCTOBER 27, 2023



COMMONWEALTH OF MASSACHUSETTS
GARY D JAMES
CIVIL
No. 32531
REGISTERED PROFESSIONAL ENGINEER
10/27/23

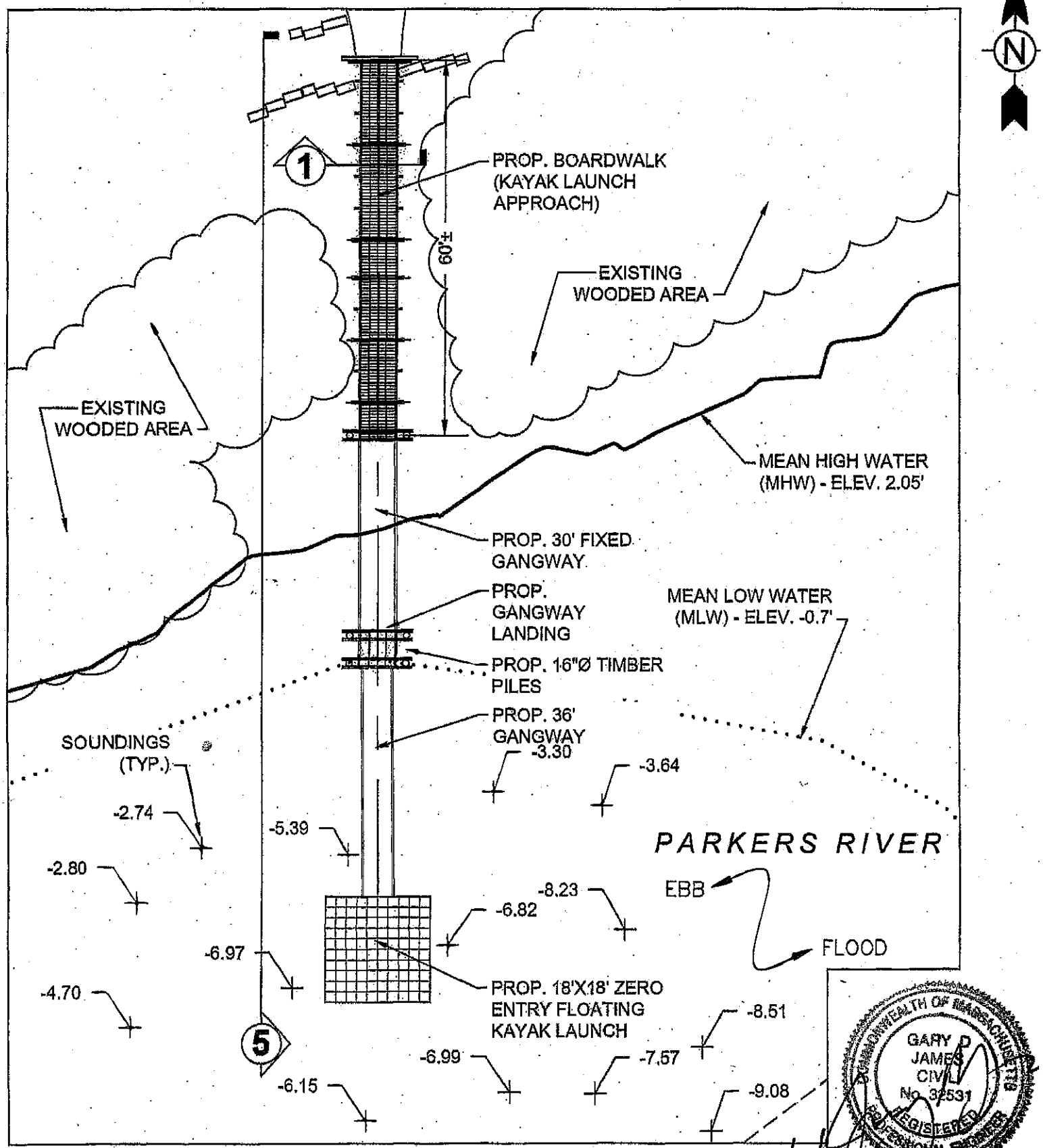
0 10' 20'

SCALE IN FEET
SCALE: 1"= 10'

SITE PLAN - AREA 3

SHEET 6 OF 13

OCTOBER 27, 2023



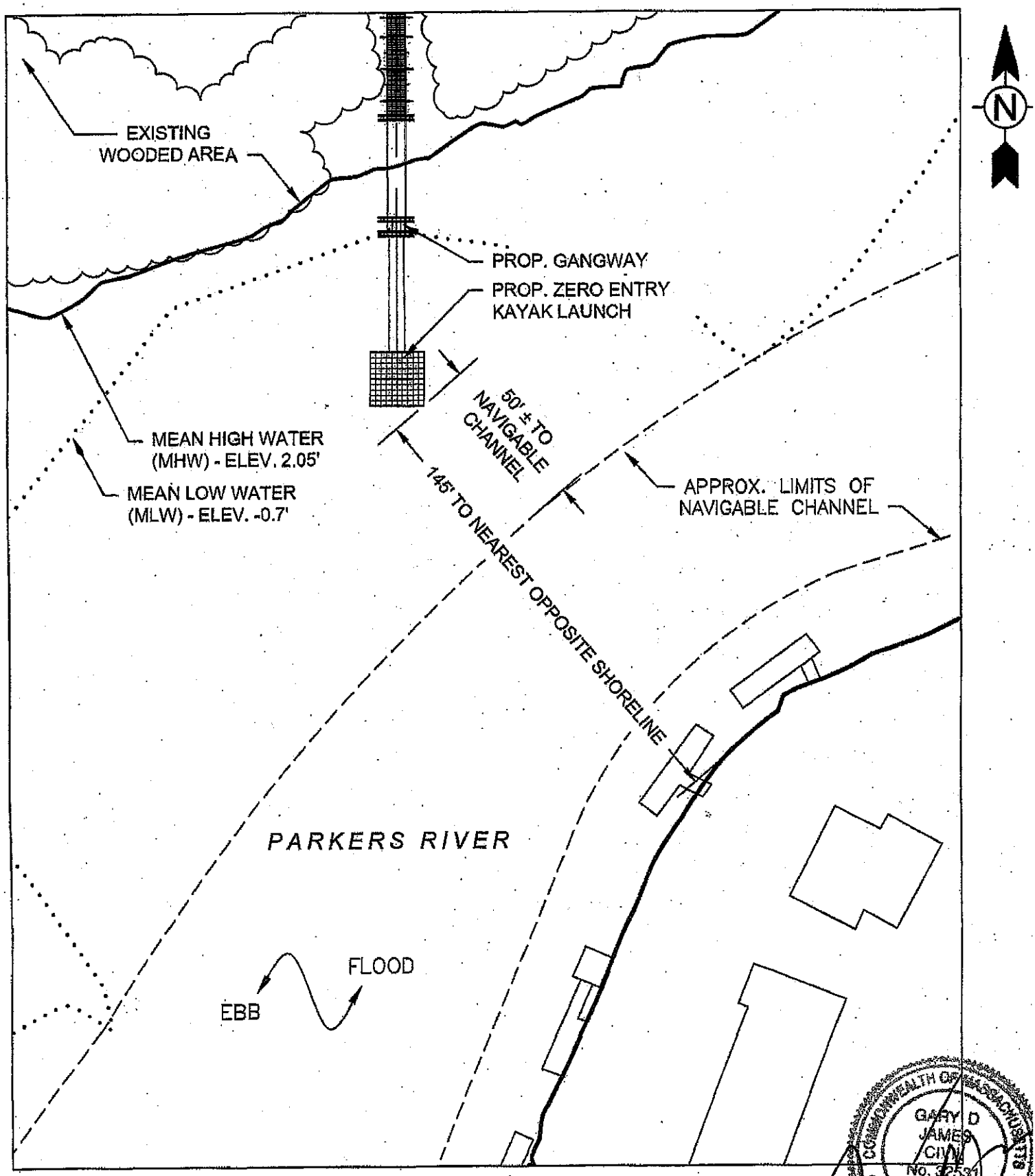
COMMONWEALTH OF MASSACHUSETTS
GARY D JAMES
CIVIL
No. 32531
REGISTERED PROFESSIONAL ENGINEER

10/27/23

SITE PLAN - AREA 4

SHEET 7 OF 13

OCTOBER 27, 2023



COMMONWEALTH OF MASSACHUSETTS
GARY D JAMES CIVIL No. 32531 REGISTERED PROFESSIONAL ENGINEER

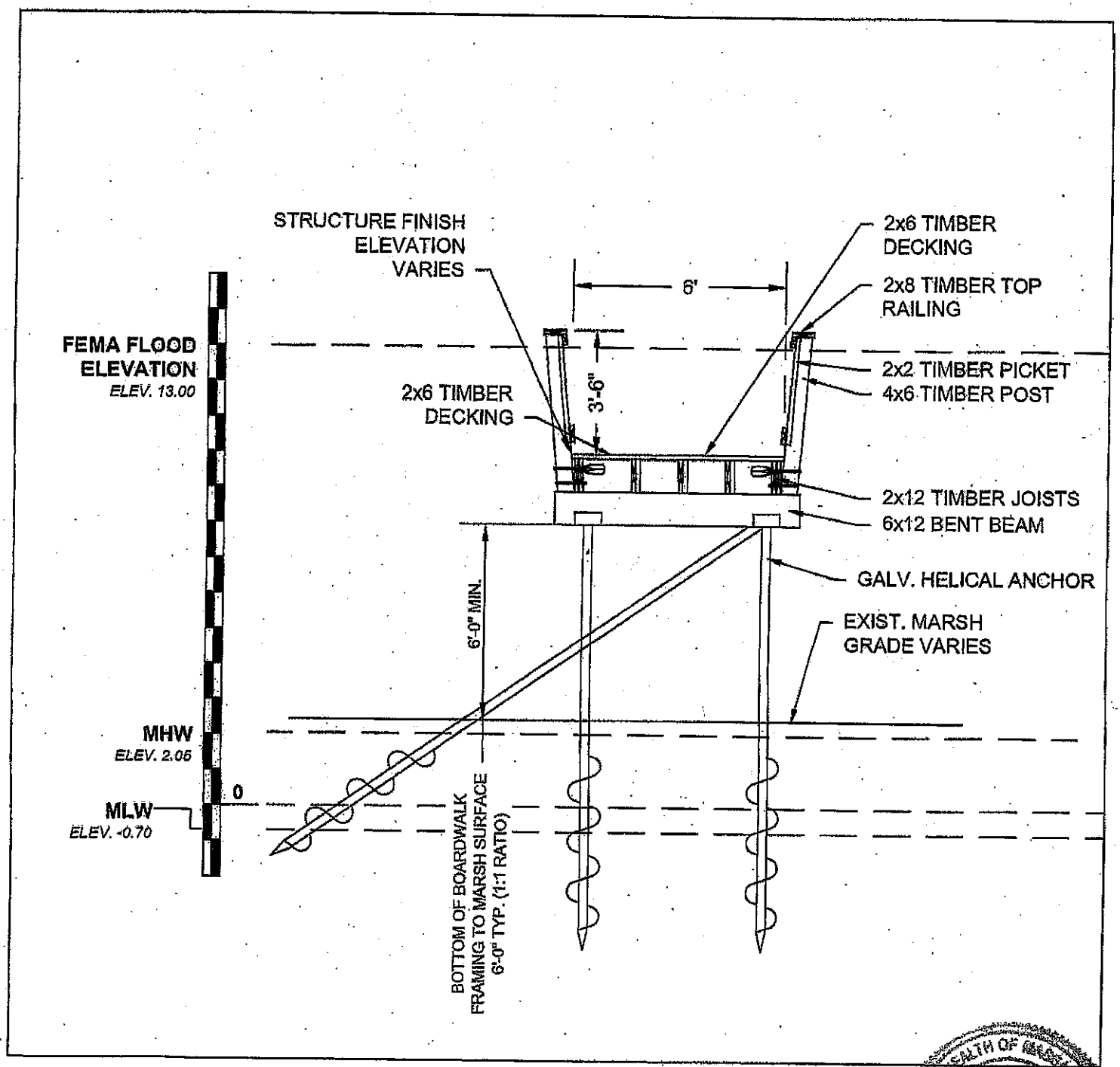
10/27/23

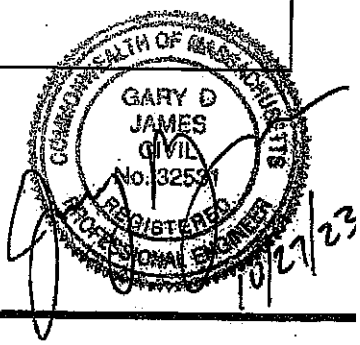
0 40' 80'

SCALE IN FEET
SCALE: 1"= 40'

SITE PLAN - KAYAK LAUNCH - CONTEXT PLAN

SHEET 8 OF 13
OCTOBER 27, 2023



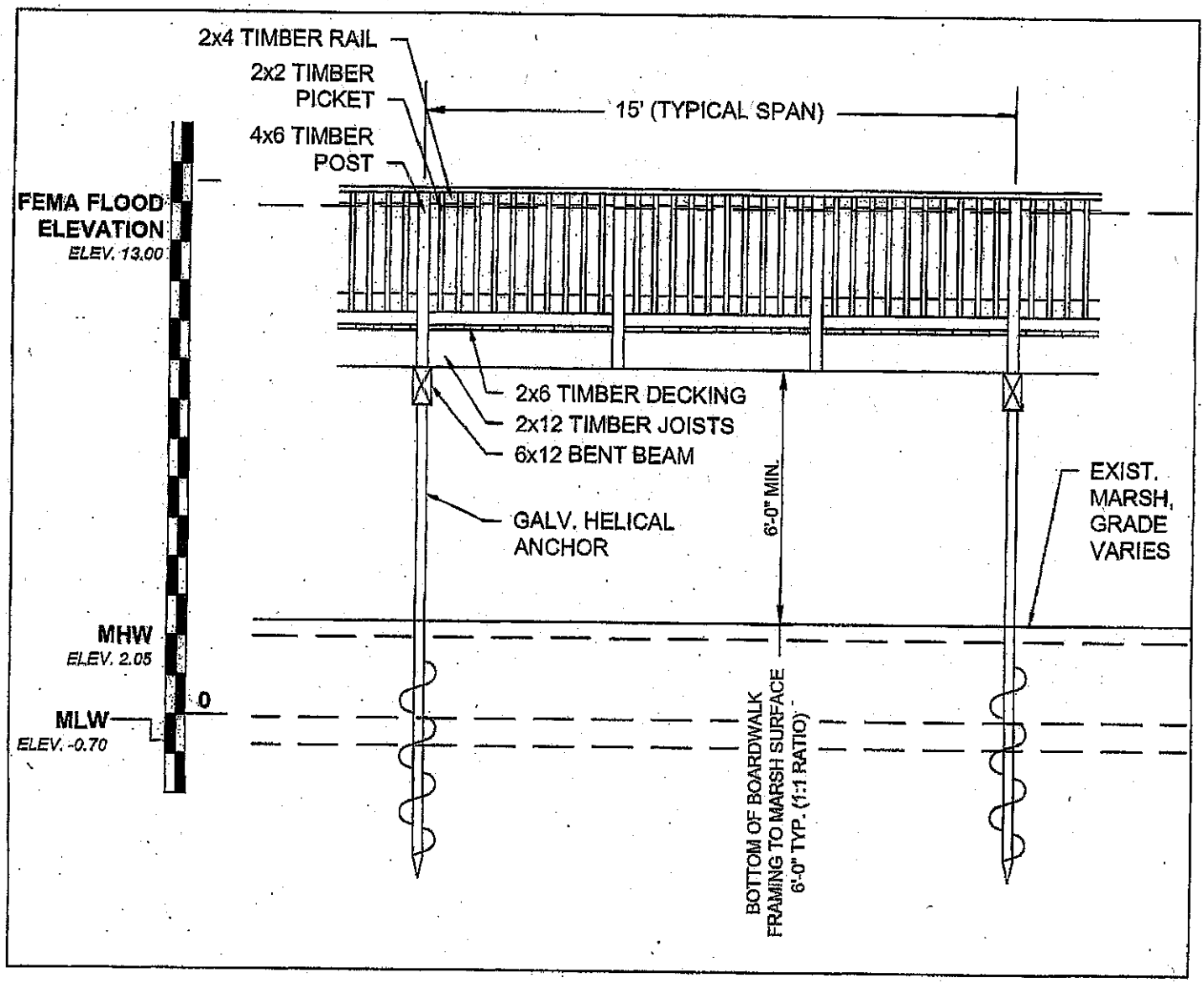


0 4' 8'

SCALE IN FEET
SCALE: 1"= 4'

SECTION 1 - BOARDWALK

SHEET 9 OF 13
OCTOBER 27, 2023

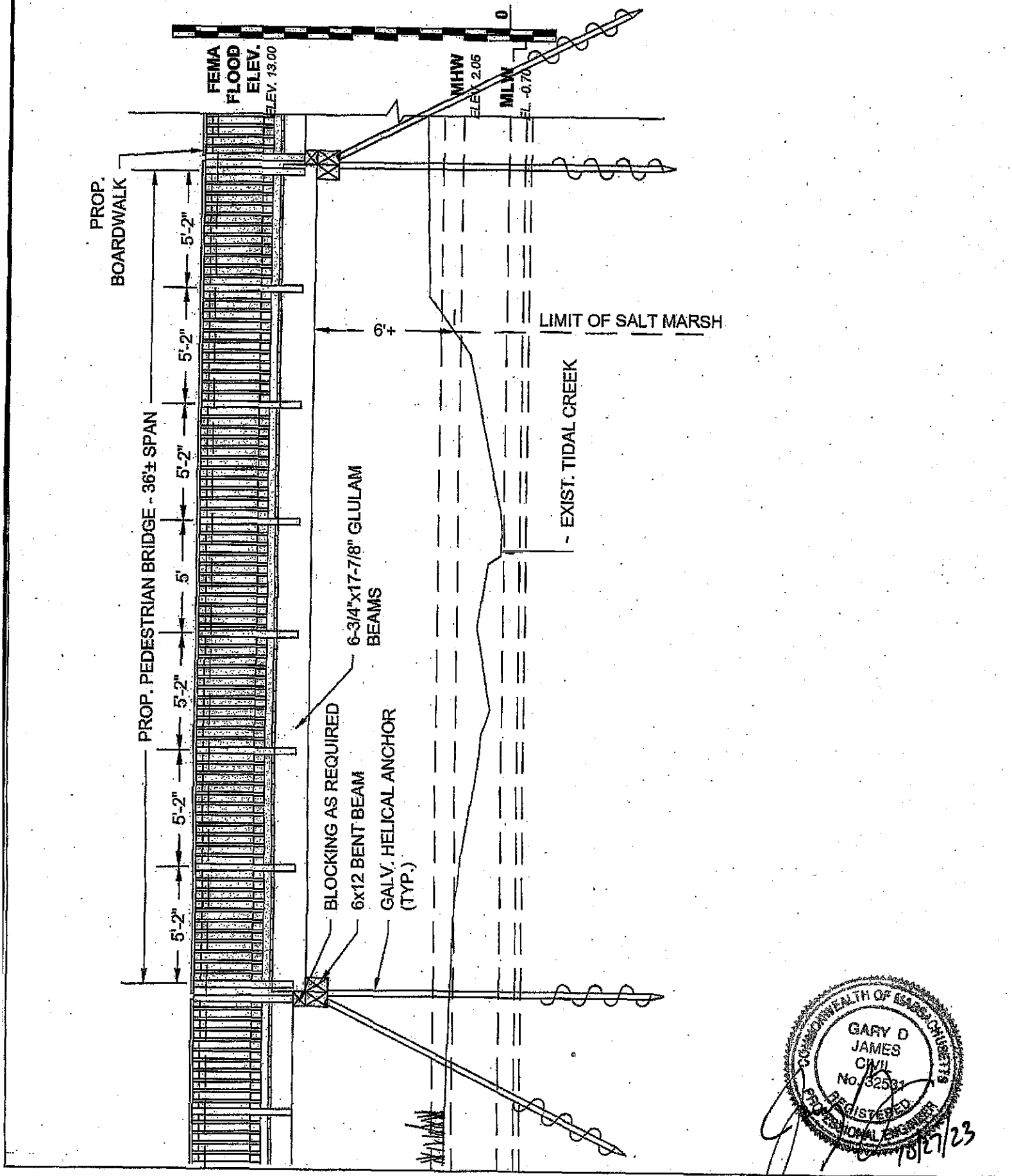


COMMONWEALTH OF MASSACHUSETTS
GARY D JAMES
CIVIL
No. 32581
REGISTERED PROFESSIONAL ENGINEER
10/27/23

0 4' 8'
SCALE IN FEET
SCALE: 1"=4'

SECTION 2 - BOARDWALK

SHEET 10 OF 13
OCTOBER 27, 2023

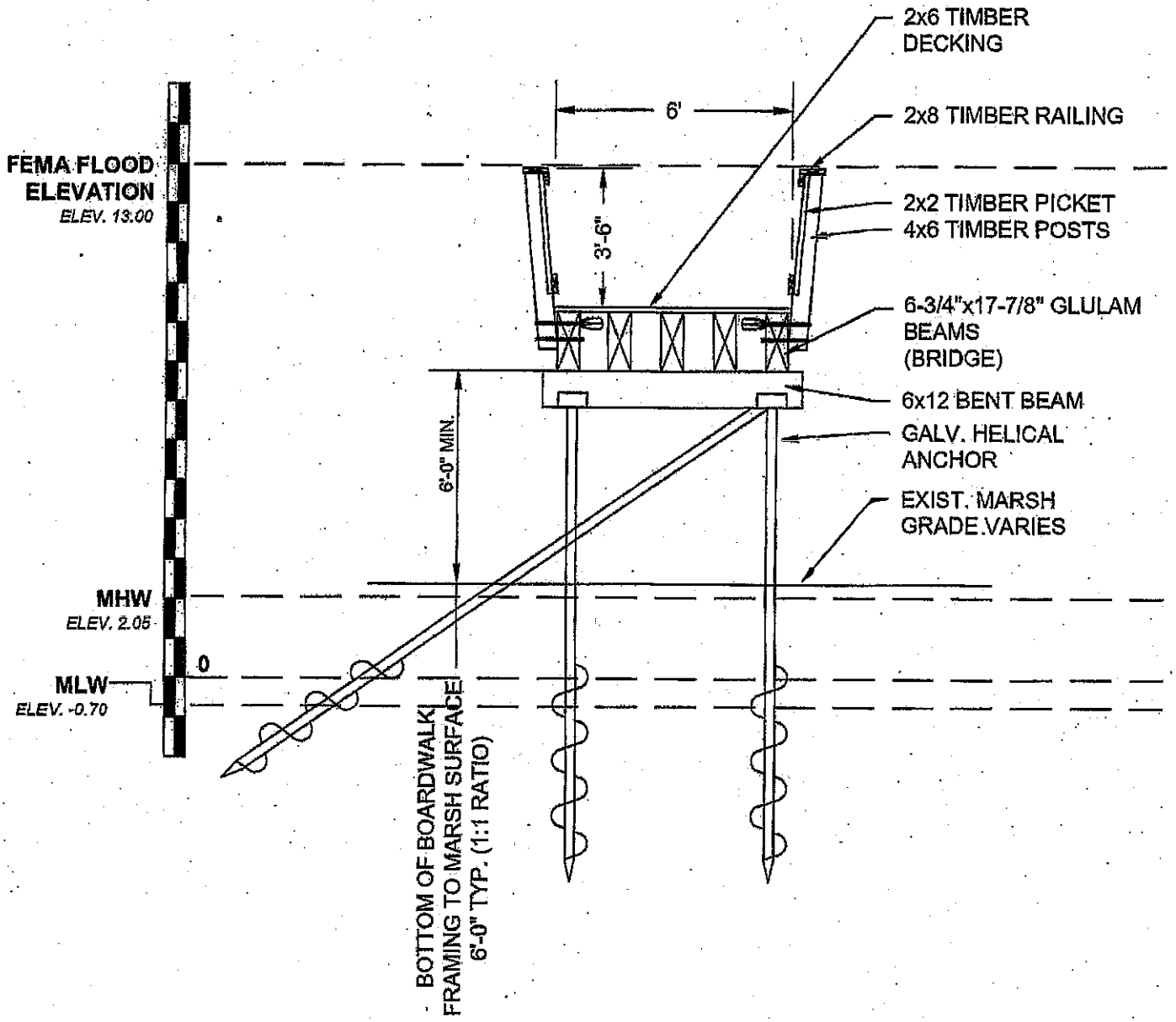


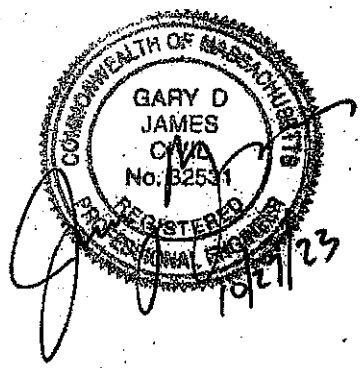
COMMONWEALTH OF MASSACHUSETTS
GARY D JAMES
CIVIL
No. 32581
REGISTERED PROFESSIONAL ENGINEER
10/27/23

0 4' 8'
SCALE IN FEET
SCALE: 1"=4'

SECTION 3 - PEDESTRIAN BRIDGE

SHEET 11 OF 13
OCTOBER 27, 2023





0 4' 8'

SCALE IN FEET
SCALE: 1"=4'

SECTION 4 - PEDESTRIAN BRIDGE

SHEET 12 OF 13

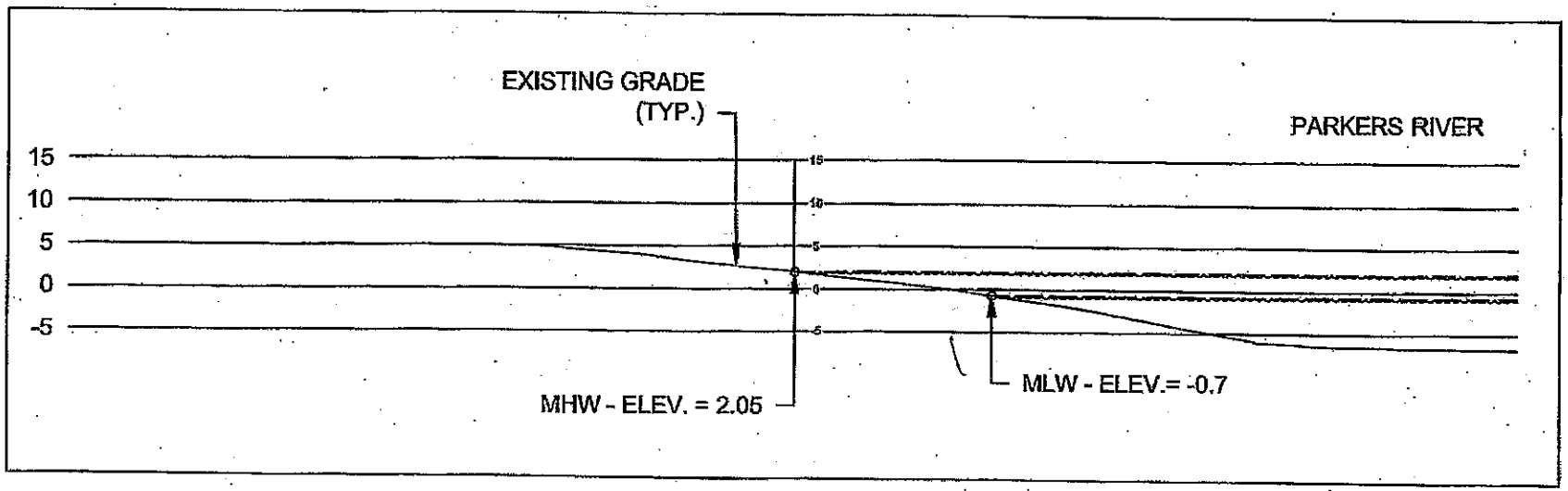
OCTOBER 27, 2023

SCALE IN FEET
SCALE: 1"= 20'

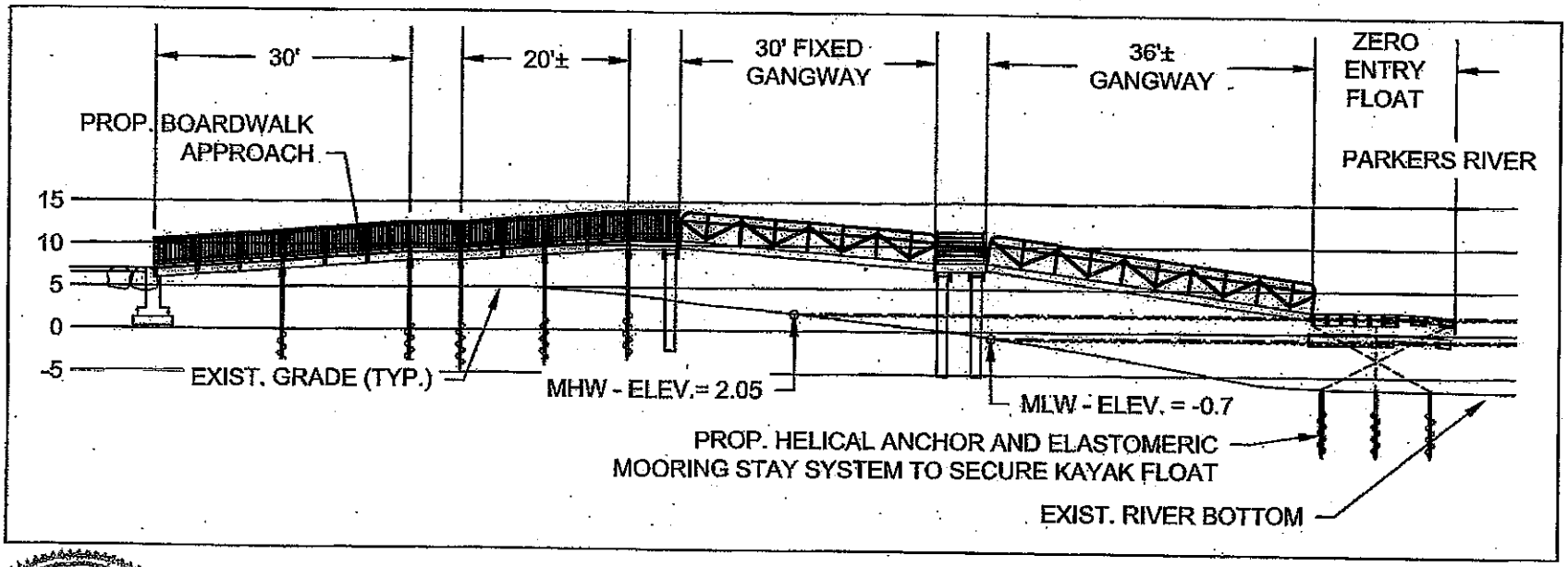
0 20' 40'

SECTION 5 - KAYAK LAUNCH

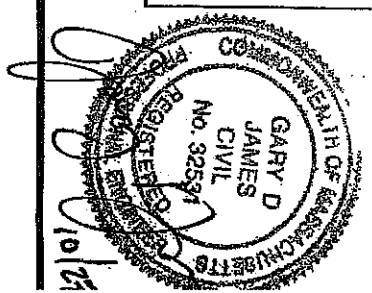
SHEET 13 OF 13
OCTOBER 27, 2023



EXISTING CONDITIONS



PROPOSED CONDITIONS



10/27

PENDING PERMITS

Massachusetts DEP Chapter 91 License

DEP Application No. WW01-0000271

IMPROVING COMMUNITIES TOGETHER

December 28, 2022

Mr. Daniel Padien
Waterways / Chapter 91
Massachusetts Department of Environmental Protection
1 Winter Street
Boston, MA 02108

Mr. Dan Gilmore
SERO Wetlands
Massachusetts Department of Environmental Protection
20 Riverside Drive
Lakeville, MA 02347

Re: Application for a Combined Chapter 91 / 401 WQC License (BRP WW26)
Yarmouth Riverwalk Park
669 Route 28 and portion of un-numbered parcel to the south
Yarmouth, Massachusetts

Dear Mr. Padien and Mr. Gilmore:

On behalf of the Town of Yarmouth, BETA Group, Inc. respectfully submits the attached application for a Combined Chapter 91 Waterways License and Section 401 Water Quality Certification for work associated with redevelopment and improvements to the former Yarmouth Drive-In Theatre (the Project) at 669 Route 28 and an un-numbered parcel to the south in Yarmouth, Massachusetts (the Site).

The purpose of this Project is to activate two Town-owned properties to provide accessible active and passive recreation to the public within a natural setting. Planned improvements to redevelop the properties are designed to offer a wide range of outdoor recreation and entertainment opportunities as well as to restore, in the case of one lot, degraded riverfront areas. The Town seeks to provide the public with a unique and immersive experience within the natural beauty of Cape Cod by restoring the unused property to provide a scenic park for residents and tourists in the area. Specifically, work below the High Tide Line and Mean High Water Elevation aims to:

- Provide the public with visual access to the Salt Marsh
- Provide the public with educational information regarding bird, fish and wildlife and the natural environs thru interpretive panels
- Provide visual and physical public access to the Parkers River.

Improvements include construction of a boardwalk leading to a float for launching canoes, kayaks and paddleboards on the Parkers River; construction of a 1,300 linear foot, 6-foot-wide boardwalk loop, including a pedestrian bridge over a tidal creek, constructed as an elevated walkway over Salt Marsh; and Salt Marsh restoration. The boardwalk, supported on helical anchors, includes three overlook areas and four bench areas, offering expansive views of the sky and marsh below.

As a result of proposed work associated with the driving of piles to support the kayak launch and boardwalk, approximately 12 square feet (sf) of permanent impact to flowed tidelands below the mean high water mark, 2 sf of permanent vegetated wetland impact, and 17 sf of permanent Salt Marsh impact.

Additional temporary impacts are associated with construction of the boardwalk and kayak launch are associated with access and installation of helical piles to support these structures. There are no proposed impacts to filled tidelands associated with the Project.

Draft paper plans have been included with the application. Final Mylar plans will be prepared once your review is complete and any necessary plan revisions have been made. A copy of this application has been submitted to the Yarmouth Planning Board for their review in accordance with 310 CMR 9.11(3)(c)(3).

A Notice of Intent was filed on December 1, 2022 with the Yarmouth Conservation Commission, though an Order of Conditions has not yet been issued at the time of this submittal.

We look forward to your review of this application and trust that the following application provides adequate information to facilitate the issuance of a Chapter 91 License. Should you have any additional questions, please do not hesitate to contact us.

Very truly yours,
BETA Group, Inc.

Tyler Drew
Staff Scientist

Laura Krause
Lead Scientist

cc: Robert Whritenour, Town Administrator
Yarmouth Planning Board
Yarmouth Zoning Board
Yarmouth Conservation Commission
MassDEP Southeast Regional Office

Job No: 21.10056.00

Yarmouth, Massachusetts

Yarmouth Riverwalk Park

669 Route 28 and a portion of an un-numbered parcel to the south

December 2022

CHAPTER 91 LICENSE / 401 WATER QUALITY CERTIFICATION APPLICATION

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Yarmouth Riverwalk Park

Yarmouth, Massachusetts

669 Route 28 and a portion of an un-numbered parcel to the south

CHAPTER 91 LICENSE / 401 WATER QUALITY CERTIFICATION APPLICATION

Prepared by: BETA GROUP, INC.
Prepared for: Town of Yarmouth

December 2022

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Narrative

1.0 INTRODUCTION

The Town of Yarmouth (the Proponent) is proposing to redevelop the town-owned properties located at 669 Route 28 and a portion of the un-numbered parcel to the south in the Town of Yarmouth, Massachusetts (the Site) into a Riverwalk Park including a Boardwalk and Kayak/Paddleboard Launch for use by residents and visitors. The purpose of this Project is to provide new active and passive outdoor recreation opportunities along the coast of Yarmouth, while redeveloping the existing degraded waterfront. Improvements proposed under this Combined Chapter 91 License and Section 401 Water Quality Certification include construction of an elevated boardwalk over Salt Marsh, a pedestrian bridge over a tidal stream, and construction of a non-motorized boat launch to the Parkers River (the Project).

Upgradient of the onsite Salt Marsh and Mean High Water Elevation, additional improvements are proposed. The Project includes rehabilitation of the currently vacant property and conversion into a public park featuring a central four-acre grassed multi-use field area for periodic outdoor events, encircled with field and woodland walking paths. Near the Parkers River, a nature-based play area for children is planned with play structures and lawn games, shade sails, and artist shanties displaying work from various artists or other vendors. Other improvements include a porous paving parking lot with lighting for 88 new parking spaces, a small park office and restroom building (1,130 sf), and up to nine artist shanties (at 140 sf each), a kiosk near the kayak launch (permitted separately), and associated utilities. None of the proposed structures will be conditioned, as they will be seasonal.

The purpose of this Project is to activate two Town-owned properties to provide accessible active and passive recreation to the public within a natural setting. Planned improvements to redevelop the properties are designed to offer a wide range of outdoor recreation and entertainment opportunities as well as to restore, in the case of one lot, degraded Riverfront Areas. The Town seeks to provide the public with a unique and immersive experience within the natural beauty of Cape Cod by restoring the unused property to provide a scenic park for residents and tourists in the area. Specifically, the Project aims to:

- Provide the public with visual access to the Salt Marsh
- Provide the public with educational information regarding bird, fish and wildlife and the natural environs thru interpretive panels
- Provide visual and physical public access to the Parkers River.

This Project proposes work within flowed tidelands associated with construction of the raised boardwalk tidal stream crossing and construction of the kayak launch into the Parkers River. Accordingly, the Project requires a Chapter 91 License. Further, the Project will result in temporary and/or permanent alteration of Salt Marsh, Bordering Vegetated Wetlands, Coastal Beach, and Land Under the Ocean. Due to the impacts associated with the Project, the Project will require a Section 401 Water Quality Certification.

BETA Group, Inc. (BETA) has prepared this application for a Combined Chapter 91 License / Section 401 Water Quality Certification Review Process on behalf of the Town of Yarmouth under the provisions of the Massachusetts Public Waterways Act (MGL Chapter 91) and the Waterways Regulations at 310 CMR 9.00, as well as under the 401 Water Quality Certification Regulations at 314 CMR 9.00.

Due to the Site location and nature of the Project, the Project will also require the following reviews and permits:

- A Secretary's Certificate is required under the Massachusetts Environmental Policy Act (MEPA). The Certificate issued for the EENF is included in Appendix D.
- Section 106 Historic Review, as the Project requires compliance with the USACE Massachusetts General Permits. This review is complete, and the Project received an "Unlikely to affect significance historic or archeological resources" finding (Appendix F).
- Portions of the Project are below the High Tide Elevation, therefore the Project requires US Army Corps of Engineers authorization under Section 404.
- Work within wetland Resource Areas requires submittal of a Notice of Intent to the Yarmouth Conservation Commission.
- The boardwalk portion of the Project is located within mapped NHESP Estimated Habitat for Rare Wildlife. Massachusetts Endangered Species Act (MESA) has been completed by NHESP, with a "No Take" Finding (Appendix E).
- The kayak launch is proposed below the Mean High Water (MHW) elevation and has been reviewed by the Mass. Division of Marine Fisheries (Appendix E).

2.0 Site Description

2.1 Project Locus

The Site, located in South Yarmouth, MA consists of two parcels including a 23-acre former Drive-In located along the Parkers River, and 8 acres of the 170 acre Lewis Pond Marsh Conservation Area to the south. The Site is bordered by the Parkers River which flows north/ south along the eastern side of the Site. Residential housing borders the Site to the west and commercial developments are located along Route 28 to the north. The entire Site is located with Land Subject to Coastal Storm Flowage.

2.1.1 Drive-In Parcel

The Yarmouth Drive-In formerly operated at the site with a footprint of approximately 7-acres of paved parking, with a paved driveway connecting to Route 28. The majority of the former paved surfaces have degraded and crumbled, and the area now supports sparse vegetation. Since the Drive-In's closing, the property has been used by the Town for the temporary storage of storm debris, as a temporary staging area in the northwest corner for construction of the nearby Parkers River Bridge along Route 28, and for occasional special events. Throughout the former Drive-In property, there are areas of previous disturbance. Specifically:

- Debris consisting of wood piles, steel, tires, household rubbish, and marine debris are located directly along the Bank of the Parkers River and in wooded areas around the open area that was the Drive-In Theater Site,
- An existing driveway leads to the Town-owned and operated upweller structure located on the west Bank of the Parkers River,
- Metal, plastic, glass, and asphalt can be found throughout the Site,
- The foundation of the former Drive-In Theater projector house remains onsite,
- Jeep and walking trails are present throughout the woods to the south of the open area, and,
- Walking trails and other evidence of human activity in the salt marsh to the south.

Presently, no stormwater management infrastructure exists currently at the Site.

2.1.2 Lewis Pond Marsh Conservation Area

The Lewis Pond Marsh Conservation Area is an extensive 170-acre Salt Marsh owned by the Town of Yarmouth. The northeast portion of the property abuts the Yarmouth Drive-In, where the proposed boardwalk will be constructed. Within the proposed boardwalk alignment, this area consists of high salt marsh, primarily vegetated with hightide bush (*Iva frutescens*) and *Spartina patens* surrounding a tidally-influenced Salt Marsh Pan that drains east to the Parkers River via a tidal creek (which will be crossed by a bridge structure). A portion of this area is listed as an NHESP estimated and priority habitat for rare wildlife and supports a wide range of local wildlife.

2.2 Existing Conditions

A Site inspection was conducted by BETA Group, Inc. (BETA) on August 3, 2021 to identify existing resource areas on and in the immediate vicinity of the Site. In addition, the MassGIS database was used to further identify critical areas on or within proximity of the Site. A detailed assessment of these resource areas is provided in Appendix G.

2.2.1 Waters of the Commonwealth

Resource area boundaries were identified in accordance with methods developed by the Massachusetts Department of Environmental Protection and Office of Coastal Zone Management's Applying the Massachusetts Coastal Wetlands Regulations, dated 2017, as well as definitions set forth in the Wetland Regulations, 310 CMR 10.00.

- Land Under the Ocean – Located below the Mean Low Water elevation (-0.7 feet, NAVD88) of the Parkers River;
- Intertidal Zone – Located between the Mean Low Water elevation (-0.7 feet, NAVD88) and the Mean High-Water elevation (2.05 feet NAVD88) of the Parkers River;
- Salt Marsh – Located where flagged in the field, generally found between the Mean Low Water elevation (-0.7 feet, NAVD88) and the High Tide Elevation (2.91 feet NAVD88) of the Parkers River;
- Vegetated Wetlands – Areas of vegetated wetlands are present throughout the Site, including an isolated wetland near the entrance driveway, another isolated wetland within the woods southwest of the event space, and within the Salt Marsh where the topography is above the High Tide Elevation;
- Land Containing Shellfish – Coincident with Land Under the Ocean;
- Land under an Anadromous Fish Run – Coincident with Land Containing Shellfish;

2.2.2 Waters of the U.S

In addition to Waters of the Commonwealth, existing federally jurisdictional areas within, or immediately adjacent to, the limit of work includes:

- Tidal waters of the US;
- Tidal wetlands;
- Vegetated wetlands; and;
- Intertidal and subtidal zones of the Parkers River.

In the location of work proposed within the Waters of the US, site investigations and research have determined the following:

- Suitable shellfish habitat is present;

- An anadromous fish run is present and mapped by the Massachusetts Division of Marine Fisheries;
- The streambed of the Parkers River consists of coarse sand and gravel, and the streambank consists of salt marsh and coarse tidal flats; and;
- No known rooted Submerged Aquatic Vegetation (SAV) is present.

In addition, the Site is located within Zone AE, defined as an area subject to inundation by the 1% annual chance flood (100-year flood) with a Base Flood Elevation ranging from 12-13 Feet (NAVD88).

2.2.3 Threatened and Endangered Species

According to the latest MassGIS data the southern portion of the Project, within the Lewis Pond Marsh Conservation Area, is located within NHESP mapped Priority Habitat of Rare Species and Estimated Habitat of Rare Wildlife. There were no NHESP Certified Vernal Pools, Potential Vernal Pools, or Areas of Critical Environmental Concern (ACEC) located in the vicinity of the Site.

The Site is located within an area mapped as suitable for Quahog (*Mercenaria mercenaria*) and Blue Mussel (*Mytilus edulis*). In addition, Essential Fish Habitat of 11 species are designated/mapped within the Parkers River. The EFH report can be found in Appendix F.

The Project exists within the range of the federally Endangered Northern Long-eared Bat (*Myotis septentrionalis*), Endangered Sandplain Gerardia (*Agalinis acuta*), and Candidate Monarch Butterfly (*Danaus plexippus*).

The Parkers River is also a mapped anadromous fish run and is mapped by the NOAA Greater Atlantic Region Fisheries Office's ESA Section 7 Mapper as providing migrating and foraging habitat for alewife (*Alosa pseudoharengus*), American eel (*Anguilla rostrata*), white perch (*Morone americana*), Atlantic tomcod (*Microgadus tomcod*), and winter flounder (*Pseudopleuronectes americanus*). No "Habitat Areas of Particular Concern" (HAPC) were identified in the vicinity of the Site.

3.0 Project Description

The Town of Yarmouth proposes the Yarmouth Riverwalk Park, Boardwalk and Event Space to redevelop and enhance a town-owned property for public use. The facility has been designed to provide event space and outdoor recreational opportunities to residents and visitors. Improvements are separated into several categories including an event space, recreational areas, public amenities, and restoration as listed below.

Recreational Areas

Recreational areas along the Parkers River and nearby salt marsh will include the following elements:

- Walking pathways throughout the park, event space and woodland
- ADA accessible picnic tables and benches
- Nature-based play area
- Shade structure
- Kayak and paddleboard float/launch
- Kayak/paddleboard rental kiosk
- Walking trails
- Elevated 6' wide boardwalk, with overlooks and benches
- Educational and interpretive graphic panels
- Large open areas for flexible use

- Outdoor 'rooms' -spaces in the park for public art installations, displays and exhibits.

Special Event Space

The large grass field at the center of the Property will include space for:

- A special event portable stage area
- 200' x 200' Periodic special event space primary audience seating area
- Space for Food Truck parking
- Special event parking
- Space for portable restrooms
- Reinforced turf for special event parking and emergency vehicle access paths
- Space and utility connections for vendors

Public Amenities and Infrastructure Improvements

Other improvements that will provide additional services to residents and visitors include:

- A permanent park office and restroom building with an interim 5,000 gallon tight tank with pump chamber and sewer force main connection to future pump station on Main St.
- A paved entrance driveway with a parallel, offset Shared-Use Path connection the park to Main St./Rte. 28.
- Porous-pavement parking areas
- An 8" diameter water line to connect to an existing service to the Site, with water service for events
- Electrical utility service to the restroom building and Site.
- Upgraded utilities and access to the existing upweller facility
- Lighting fixtures along the driveway and parking lot
- Nine (9) artist shanties with concrete pads
- Stormwater management systems including drainage swales, two underground infiltrations systems, and a stormwater basin.

Restoration

The previously degraded waterfront along the Parkers River will be improved through:

- Removing existing debris throughout the Site
- Removing existing pavement in several areas along the water
- Native plantings along the walking paths and buildings
- Drainage improvements

Site Access

A 1,270+ linear foot paved access driveway will be provided from the edge of pavement on Route 28 to the proposed cul-de-sac. The driveway will be a minimum of 22 feet wide throughout this length and will expand to three lanes at the entrance at Route 28 (one entering and two exiting, divided by a landscaped median). The driveway will include two circles; the first will be centered at Station 6+50 and the second will be at the end of the road at Station 13+00. The proposed parking, surfaced with porous pavement, will be on either side of the access driveway between Stations 7+00 and 12+50.

The entire Project layout is depicted in the Stormwater Report attachments (Appendix I).

3.1 SUMMARY OF WORK WITHIN CHAPTER 91 JURISDICTION

The Project includes construction of a pedestrian bridge over a tidal stream associated with the raised boardwalk over the nearby Salt Marsh. The proposed crossing will be constructed above the MHW elevation and therefore will not impact flowed tidelands. This bridge will also be constructed to meet the Massachusetts Stream Crossing Standards fully (Area 1 on License Plan Sheet 3). In addition, two areas of the Boardwalk extend over the Mean High-Water Elevation (Areas 2 and 3 on License Plan Sheet 3).

Construction of the Kayak launch will occur below the Mean High-Water level of the Parkers River (Area 4 on License Plan Sheet 3). This work is associated with the installation of an anchor system for the kayak launch float, and installation of several piles to support the kayak launch boardwalk and gangways. The proposed float has been located where there will be a minimum of four feet of water depth between the float and substate at Mean Lower Low Water.

The work will result in approximately 6 sf of permanent alteration below the Mean Low Water Elevation associated with installation of the anchoring system for the kayak launch float. Proposed work within the intertidal zone includes placement of four wood piles to support the proposed kayak launch gangway system. This work will result in approximately 8 sf of permanent alteration of the intertidal zone and will result in approximately 173 sf of shading. Note, the kayak launch was designed to avoid placement of piles within Salt Marsh.

As a water-dependent Project, installation of the proposed anchor system will be conducted using best available measures to minimize adverse effects to marine fisheries and wildlife habitat, including the use of turbidity controls. It is anticipated that work within subtidal zone may result from construction by water and/or by land. In addition, installation of the proposed piles will be conducted using best available measures to minimize adverse effects to marine fisheries and wildlife habitat, including the use of turbidity or erosion controls, as appropriate.

This work is depicted in Appendix A – License Plans.

3.2 SUMMARY OF WORK SUBJECT TO SECTION 401

Two Project elements are proposed to be constructed below the High Tide Line and vegetated wetland boundary: the raised boardwalk over salt marsh and the non-motorized vessel launch into the Parkers River.

Construction of the boardwalk and kayak launch will occur within Tidal wetland - Salt Marsh, vegetated wetland, coastal beach/intertidal zone, and riverbed/subtidal zone of the Parkers River. These improvements have been designed to minimize impacts to Resource Areas to the maximum extent practicable while still meeting the goals of the Project.

3.2.1 TIDAL WETLAND – SALT MARSH

Proposed work within Salt Marsh includes placement of approximately 255 helical piles to support the proposed 6-foot-wide elevated boardwalk. In order to construct the boardwalk in the preferred alignment, the Project requires approximately 17 sf of permanent alteration to Salt Marsh (associated with the piles). The Project also requires approximately 8,696 sf of temporary Salt Marsh alteration associated with accessing the Marsh with the drill-rig to install the piles. Mats will be placed on the Salt Marsh to distribute the load of the drill-rig to minimize impacts to the soil. It is anticipated that this work will be conducted in the winter to further minimize compaction of the soil profile and impacts to Salt Marsh vegetation.

The proposed boardwalk provides a minimum of 1:1 height to width ratio for the proposed boardwalk when in a north-south orientation, and a 1.25:1 height to width ratio for the proposed boardwalk where it follows an east-west orientation. The higher boardwalk in this area also allows for the 1:1 ratio to be maintained at the locations where benches and overlooks are located. As the boardwalk is higher, increased width in these areas is accommodated and the 1:1 clearance ratio is maintained. Due to solar orientation and the sun's path of travel, increasing the height to width ratio in the east-west direction minimizes shading impacts below on the Salt Marsh and Wetlands, while also decreasing Project costs and construction duration. If considering sunlight directly over the boardwalk, the preferred alignment will result in approximately 6,139 sf of shading over the Salt Marsh.

The construction of the proposed launch will not directly impact salt marsh, as the boardwalk to the launch will span the existing marsh. This boardwalk will provide a minimum of 1:1 height to width ratio, and salt marsh shading impacts total 70 square feet.

3.2.2 Vegetated Wetland

Because there are areas of hydrophytic vegetation above the High Tide Elevation within the Salt Marsh south of the Project, these areas are defined as vegetated wetland. Based on the proposed boardwalk alignment, the Project will cross four areas of vegetated wetland. In total, approximately 30 helical anchors will be installed within vegetated wetland, resulting in approximately 2 sf of permanent vegetated wetland alteration. Similar to the work in Salt Marsh, the Project also requires approximately 452 sf of temporary vegetated wetland alteration associated with accessing the boardwalk location with the drill-rig to install the piles. Mats will also be placed on vegetated wetland to distribute the load of the drill-rig to minimize impacts to the soil. Temporary wetland impact locations will be fully restored in place. A native salt-tolerant seed mix will be used within the temporary impact area to restore the type of wetland altered.

3.2.3 Land Under the Ocean

The Project will result in approximately 6 sf of permanent alteration below the Mean Low Water Elevation associated with installation of the anchoring system for the kayak launch float. As a water-dependent Project, installation of the proposed anchor system will be conducted using best available measures to minimize adverse effects to marine fisheries and wildlife habitat, including the use of turbidity controls. It is anticipated that work within subtidal zone may result from construction by water and/or by land.

The proposed float has been located where there will be a minimum of four feet of water depth between the float and substate at Mean Lower Low Water.

3.2.4 Intertidal Zone

Proposed work within the intertidal zone includes placement of four wood piles to support the proposed kayak launch boardwalk. This work will result in approximately 8 sf of permanent alteration of the intertidal zone and will result in approximately 173 sf of shading. Note, the kayak launch was designed to avoid placement of piles within Salt Marsh.

No solid fill structures or beach nourishment is proposed for this Project. As a water-dependent project, installation of the proposed piles will be conducted using best available measures to minimize adverse effects to marine fisheries and wildlife habitat, including the use of turbidity or erosion controls, as appropriate.

The Project also includes construction of a pedestrian bridge over a tidal stream. This bridge will be constructed to meet the Massachusetts Stream Crossing Standards fully.

3.2.5 Summary of Impacts

In total, approximately 27 square feet (sf) of permanent impacts to waters of the U.S. will occur associated with installation of approximately 259 piles that support the boardwalk and launch ramp. These structures will also result in 6,805 sf of shading impacts to tidal wetlands, which have been minimized through orientation and dimensions of the proposed structures. The anchor system for the kayak launch will also result in 6 sf of permanent impacts to the subtidal zone.

Construction activities will temporarily impact 9,148 sf of waters of the US access the work area. These impacts result from placement of mats through the salt marsh to provide access for the drilling rig. Impact mitigation measures are outlined below in Section 5.0.

This work is depicted in Appendix B – Project Plans.

4.0 Sediment and Erosion Control

The areas beyond the limit of work area will be protected during construction through installation of erosion controls. A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan has been provided as part of the stormwater report and a final Stormwater Pollution Prevention Plan will be prepared by the contractor prior to construction. Erosion, sedimentation, and turbidity controls will be installed and maintained where activities are proposed adjacent to vegetated wetland, waterways or floodplain. The erosion and sediment controls will provide a limit of work barrier while preventing silt and sediments from migrating into or towards the coastal waters of the U.S. These measures include installation of compost filter tubes, silt sacks (catch basin inlet protection measures), and turbidity curtains. During construction, the contractor will also be required to minimize airborne particulate matter through dust control to prevent impacts to public health.

5.0 Legislative Authorization and License History

The previous Yarmouth Drive-in property did not include any structures below the Mean High-Water elevation of the Parkers River, therefore there are no known previous Chapter 91 Licenses for this property.

6.0 Jurisdictional Limits

Portions of the Project area are within and/or above flowed tidelands (below the contemporary Mean High Water line); therefore, the Project is within Chapter 91 jurisdiction and requires licensing under Chapter 91. The limits of Chapter 91 jurisdiction for flowed tidelands extends seaward of the Mean High Water (MHW) elevation to the state limit of territorial jurisdiction (Figure 4 – Ch 91 Jurisdiction Map).

Jurisdictional limits under Section 401 include areas below the High Tide Elevation and Vegetated Wetlands.

7.0 Determination of Water-Dependency

In accordance with the provisions of 310 CMR 9.12 (Determination of Water-Dependency), the installation of a floating boat launch qualifies as water-dependent. In accordance with 310 CMR 9.12.(2)(a)2 and 310 CMR 9.12.(2)(a)4:

> 2. Marinas, boat basins, channels, storage areas, and other commercial or recreational facilities;
>
> 4. parks, esplanades, boardwalks, and other pedestrian facilities that promote use and enjoyment of the water by the general public and are located at or near the water's edge, including but not limited to any park adjacent to a waterway and created by a public agency.

The comment letter issued by MassDEP on the Expanded Environmental Notification Form has confirmed the Water-Dependency of this Project.

8.0 Existing and Proposed Conditions for Project Elements to be Licensed

8.1.1 Existing Conditions

Yarmouth Riverwalk Park is currently a degraded former drive-in property proposed to be rehabilitated by the town of Yarmouth to improve the coastline. No structures are currently present within land under water along the Parkers River associated with these parcels.

8.1.2 Proposed Conditions

Filled tidelands were not identified in the vicinity of the Site, however flowed tidelands exist along the eastern and southern portions of the Site. The following Project elements require licensing:

1. The proposed footbridge over a tidal stream, which is located over the Mean High Water Elevation. This bridge is 6 feet wide and will span 36 feet. Bankfull width of this stream is 27 feet. This bridge will be supported on piles with helical anchors (Area 1).
2. A section of the proposed 6-foot-wide boardwalk crosses over the Mean High Water Elevation just south of the proposed foot bridge (Area 2).
3. Another section of the proposed 6-foot-wide boardwalk crosses over the Mean High Water Elevation on the western side of the boardwalk (Area 3).
4. The proposed kayak launch boardwalk, gangway and float system (Area 4).

9.0 Anticipated Construction Impacts and Schedule

9.1.1 Construction Impacts

Increases in turbidity may occur briefly during pile installation, however, these increases will have a short duration and will only be temporary. To mitigate this potential impact, a “soft start” approach will be used for pile driving to allow opportunity for present marine life in the project vicinity to leave before noise levels increase. Per General Condition 11 as set forth in the Department of the Army General Permits for the Commonwealth of Massachusetts, effective April 16, 2018, “Installation of ≥12-inch-diameter piles … in tidal waters … must use a soft start each day of pile driving, building up power slowly from a low energy

start-up over a period of 20-40 minutes to provide adequate time for fish and marine mammals to leave the vicinity."

In addition, turbidity controls will be installed downgradient of the float installation area to minimize water quality changes during construction.

The Project has been designed to incorporate various mitigation measures to offset environmental impacts. Impacts to waters of the Commonwealth have been mitigated to the maximum extent practicable, while still achieving the purpose and need of the Project. Extensive Site restoration is proposed in degraded areas along the Parkers River, including invasive species control, and addition of native plantings.

Impacts to wildlife habitat will be mitigated through adherence to Time of Year restrictions to protect anadromous fish and migratory bird species, as well as, installation of turbidity and sediment control measures during construction within the water and in the Salt Marsh. The boardwalk alignment has also been selected to generally follow an existing footpath within the Salt Marsh. By following an existing footpath, the boardwalk will direct visitors to walk on the durable boardwalk surface, decreasing foot traffic on the marsh. Accordingly, construction of the boardwalk will provide additional protection for the Salt Marsh. Impacts to fisheries have also been minimized through requiring a minimum water depth between the proposed kayak launch float and the substrate at Mean Low Water.

9.1.2 Construction Schedule

The contractor will be responsible for finalizing the design and selecting the means and methods to be used in the construction execution of the Project, however, the Project is anticipated to be constructed as follows:

1. Install erosion controls as necessary for work on land;
2. Coordinate with local agencies prior to the start of work;
3. Construct the park and event space portion of the Project;
4. Conduct Riverfront restoration along the Parkers River;
5. Use mats to traverse salt marsh to prepare for boardwalk and kayak launch installation;
6. Construct kayak launch;
7. Construct Boardwalk; and
8. Complete final grading and site stabilization.

10.0 Basic License Requirements

In accordance with the requirements of 310 CMR 9.31(1), the Project complies with the basic requirements for license issuance. The proposed Project:

a) Includes only structures for uses that have been categorically determined to be eligible for a license, according to the provisions of 310 CMR 9.32(a)2, and 310 CMR 9.32(a)3.

b) Complies with applicable environmental regulatory programs of the Commonwealth, according to the provisions of 310 CMR 9.33:

- A Notice of Intent (DEP File No. Not Yet Issued) was filed with the Yarmouth Conservation Commission on December 1, 2022. An Order of Conditions has not been issued as of this filing.

- A Secretary's Certificate is required under the Massachusetts Environmental Policy Act (MEPA), as the Project exceeds the threshold for alteration of ten or more acres of alteration to any other wetland, and is located within 1-mile of an Environmental Justice Population. The Expanded ENF Certificate was issued on 12/16/2022, requiring an Environmental Impact Report.
- A Pre-Construction Notification was submitted to MassDEP and the US Army Corps of Engineers on December 19, 2022.

c) The Project area is not part of a municipal harbor plan, and therefore is in compliance with the provisions of 310 CMR 9.34.

d) Complies with applicable standards governing the preservation of water-related public rights, according to the provisions of 310 CMR 9.35. The Project will not impact navigation within the Parkers River, as all work is proposed within 70 feet of the Mean High Water elevation and there is no existing public access to the water at the Site. The Project will also not interfere with passage over and through the Parkers River.

e) Complies with applicable standards governing the protection of water-dependent uses, according to the provisions of 310 CMR 9.36. The Project will not impact private access to littoral or riparian areas. The Project does not include any non-water-dependent uses and will not displace any existing or former water-dependent uses on the site. The Project is not located in a Designated Port Area and will not permanently interfere with any water-dependent uses currently in operation or previously occurring within the Parkers River.

f) Complies with applicable standards governing engineering and construction of structures according to the provisions of 310 CMR 9.37.

g) Will not interfere with public recreational or commercial boating facilities and is in compliance with the applicable provisions of 310 CMR 9.38 and 9.39.

h) The Project does not include dredging, and therefore is in compliance with the provisions of 310 CMR 9.40.

i) Does not deny access to its services and facilities to any person in a discriminatory manner, as determined in accordance with the constitution of the Commonwealth of Massachusetts, of the United States of America, or with any statute regulation, or executive order governing the prevention of discrimination.

This anticipated water-dependent project also serves a proper public purpose providing public access to, and enjoyment of, the waterfront.

11.0 Invasive Species Control

Previous inspections of the Site revealed extensive invasive vegetation growing along the Parkers River, in previously degraded areas. The Project proposes removing invasive species, including:

- Autumn olive (*Elaeagnus umbellate*)
- Bush honeysuckle (*Lonicera spp.*)
- Asiatic bittersweet (*Celastrus orbiculatus*)
- Porcelain berry (*Ampelopsis brevipedunculata*)

- Multiflora rose (*Rosa multiflora*)
- Japanese knotweed (*Fallopia japonica*)

While the contractor will be responsible for providing a detailed Invasive Species Control Plan, it is anticipated that the methods of control will include mechanical removal, and use of herbicides if necessary. No storage of cut invasive plant material will be allowed onsite. Following removal of the invasive species, these areas will be stabilized with native vegetation, as detailed on the Project plans.

12.0 Stormwater Management

The Stormwater Management System on the Site has been designed to direct runoff from impervious surfaces towards the proposed infiltration Best Management Practices (BMPs). The design meets all the requirements of the Massachusetts Stormwater Standards (the Standards) without considering the issues of redevelopment, and there will be a significant reduction in peak flow rates and runoff volumes towards the River than under existing conditions. No runoff from any impervious surfaces as defined by the Standards will flow untreated towards the River under proposed conditions

The following Stormwater BMPs have been incorporated into the Project Design:

- The proposed grassed field/open space has been graded to include two low points that will function as infiltration basins that will collect and treat runoff from the perimeter walkway around the Site. Pretreatment for these “basins” will be provided by the surrounding grass which will act as a vegetated filter strip.
- The parking areas will be surfaced with porous pavement that will also treat access driveway runoff. A collection trench will be provided at the outside edge to collect excess runoff and direct it into the reservoir.
- An infiltration basin with two forebays is proposed at the southern limit of the southern cul-de-sac, near Sta. 13+00 to treat runoff from the cul-de-sac, kayak storage area, and rental kiosk.
- A vegetated swale is proposed along the southern limit of access driveway from Sta. 2+50 to 6+00 that will collect stormwater and provide pretreatment prior to discharge into a subsurface infiltration chamber system that will be located beneath the entrance driveway to treat runoff from this area.
- A second sub-surface infiltration system is proposed south of the office building/restroom. This system will treat runoff from the roof of the building and surrounding walkways.

See Appendix i – Stormwater Report for the detailed Stormwater Analysis.

13.0 Alternatives Analysis

The Town has spent years evaluating public uses for the 22-acre town-owned former drive-in property at 669 Route 28, which was originally purchased in 1986 for recreational purposes. The Town of Yarmouth and their consultants continued to analyze Project alternatives through the *Riverwalk Park and Boardwalk Feasibility/Concept Design Study Report,* prepared by BETA Group, Inc., dated August 2018[1] (the 2018

[1] https://www.yarmouth.ma.us/DocumentCenter/View/12980/Yarmouth-MA-Riverwalk-Park-and-Boardwalk-Feasibility--Concept-Design-Study-Report-w-Appendices

Study). The 2018 Study identified alternatives to improve the Town-owned former drive-in property to evaluate the recommendations made by the Drive-In Site Utilization Committee (DISUC) to create a riverwalk park along the Parkers River, a Boardwalk extending over the marsh to Seagull Beach, and use of the Site for interim uses such as concerts and festivals.

The goals of the Project include the following:

1. Improve access to views of the Salt Marsh,
2. Provide space and amenities for periodic events,
3. Improve access to the Parkers River for small non-motorized watercrafts,
4. Provide parking with views of the Parkers River,
5. Provide ADA-Compliant walking paths along the Parkers River, and
6. Provide public restroom facilities for visitors of the park.

13.1 Design Alternatives and Selection

During the Design-Phase of the Project, additional alternatives were considered for the proposed Yarmouth Riverwalk Boardwalk and Kayak Launch. The Town of Yarmouth and the Design Team analyzed a number of Project alternatives that have been presented to the Town and key stakeholders at various times. The alternatives for this Project were analyzed based on the following evaluation criteria:

1. Impacts to coastal and inland Resource Areas;
2. Impacts to rare species and unique wildlife habitat;
3. Ability to meet the Project goals;
4. Impacts to neighboring properties – including noise, traffic, and views;
5. Construction, maintenance, and cost; and,
6. Resiliency.

The following design alternatives were evaluated for various Project elements:

1. No-Build Alternative,
2. Dimensions, supports and alignment alternatives for the proposed boardwalk, and
3. Location alternatives for the proposed Kayak Launch.

13.1.1 No-Build Alternative

If the No Build Alternative was selected, the Site would remain under-utilized and continue to degrade over time. Additionally, the public health benefits that would result from the Project would not occur, as the walking paths and water access would not be provided. This alternative was not selected as it does not meet the purpose and need of the Project. The No Build Alternative is also in conflict with the Municipal Goal of providing a needed public amenity at a site that has been under evaluation for over a decade and for which extensive resources have been expended to determine the most beneficial use of the property for the community.

13.1.2 Boardwalk Concept Selection

The 2018 Study also presented alternative alignments for the proposed boardwalk, which were also presented to the public at the public outreach meetings. The concepts included:

1. Option 1 – A boardwalk loop and short spur from the southern end of the Drive-In property that would not extend to Seagull Beach,
2. Option 2 – A boardwalk loop and spur that extended to Seagull Beach, and,
3. Option 3- A boardwalk that did not include a loop but extended from the southern limit of the Drive-In Site to Seagull Beach.

The public meetings resulted in a number of concerns being raised related to the visual impacts of the boardwalk on the nearby Gateway Isles neighborhood located across Parkers River. To better understand the potential visual impacts, a photo representation was prepared showing what the three Boardwalk Options would look like from the end of Cape Isle Drive. The results of this exercise-initiated evaluation of another alternative (Option 1C), which eliminated the spur that extended to the south from the loop under Option 1. The Preferred Concept (Option 1C) was selected, as it had the least impact on neighbors' views.

13.1.2.1 BOARDWALK ALIGNMENT

Possible boardwalk locations have been researched extensively over the course of the feasibility study and design phases to minimize impacts while providing the best viewing opportunities for park visitors. While several alignment alternatives were dismissed during the Concept phase (as described above), additional alternatives were evaluated during the Design phase.

Concept 1C provided the basis for the initial design of the boardwalk, which was generally evenly looped to provide the best views of the surrounding Salt Marsh, however, this alignment required clearing of several trees growing within a wetland hummock present in the Salt Marsh. The Design Team determined that Concept 1C (loop) would result in extensive impacts on existing unique wildlife habitat and the proposed layout was shifted to the south to avoid clearing trees (Alternative BA1). The alignment for Alternative BA1 was also weaved around stands of trees to provide screening between the boardwalk and neighbors. While Alternative BA1 has an irregular shape, it was selected as the preferred alternative, because it avoids removal of these stands of trees, while providing scenic views to several areas of the Salt Marsh and screening from neighbors.

Alternative BA1 was further refined as the preferred alternative by adding plantings along the western side of the western portion of the boardwalk based on feedback during public meetings.

13.1.2.2 BOARDWALK SUPPORTS

In addition to the proposed alignment, alternative boardwalk supports were evaluated. While a number of sizes and materials have been reviewed, two boardwalk support systems were determined to be viable structural options. Alternative BS1 consisted of the use of a combination of 12-inch-diameter dual and 14-inch-diameter mono composite piles, where the dual piles would be required where the boardwalk height to width ratio is 1.25:1 and mono piles would be installed where the height to width ratio is 1:1. This Alterative would have resulted in a total Salt Marsh permanent alteration of approximately 125 square feet. Alternative BS2 includes the use of helical piles, where three 3.5-inch-diameter helical piles are proposed at each bent location, resulting in approximately 25 square feet of permanent Salt Marsh impact. Alternative BS2 was selected as the preferred alternative because it resulted in the smallest area of impact to Salt Marsh. Impacts associated with the preferred supports were further refined during final design.

13.1.2.3 BOARDWALK DIMENSIONS

A 1:1 height to width ratio (Alternative BD1) and a 1.25:1 height to width ratio (Alternative BD2) for the boardwalk were evaluated. Alternative BD1 would result in increased shading impacts to the Salt Marsh compared to BD2. The preferred design (Alternative BD3) provides a combined approach, with a minimum of 1:1 height to width ratio for the proposed kayak launch boardwalk and for the boardwalk over the salt marsh when in a north-south orientation, and a 1.25:1 height to width ratio for the proposed boardwalk where it follows an east-west orientation. The higher boardwalk in this area also allows for the 1:1 ratio to be maintained at the locations where benches and overlooks are located. As the boardwalk is higher, increased width in these areas is accommodated and the 1:1 clearance ratio is maintained. Due to solar orientation and the sun's path of travel, increasing the height to width ratio in the east-west direction minimizes shading impacts below on the Salt Marsh and Wetlands, while also decreasing Project costs and construction duration.

A third alternative was also reviewed for the Project (Alternative BD3), which provided a 1.5:1 height to width ratio based on the

13.1.2.4 KAYAK LAUNCH LOCATION

The location of the kayak launch was selected to minimize impacts to Salt Marsh, while avoiding interference with the navigable channel of the Parkers River. The proposed location was selected because it is aligned to follow an existing clearing in the vegetation, providing access to the water and provides sufficient space to construct the kayak launch outside of the navigable channel of the Parkers River. Due to the slope, existing structures and resource areas along the Parkers River, this is the only feasible location to construct the kayak launch that would avoid clearing trees and would place the launch outside the navigable channel. The location of the float was also selected to provide a minimum of four feet of clearance between the bottom of the float and the river bottom substrate at low tide.

The preferred location of the kayak launch also allows for the construction of the boardwalk to span the Salt Marsh in this location, with support piles proposed above and below the limits of Salt Marsh.

14.0 SUMMARY

The proposed Yarmouth Riverwalk Park will create a new source of ADA accessible outdoor recreational opportunities, as well as hold public events and contribute to the town's goal of improving the coastline. The Project has been designed to meet all standards where feasible during and following construction and has avoided and minimized impacts to the greatest extent practical, while still meeting the Town's coastal redevelopment goals. Work within tidal waters of the Commonwealth is solely associated with the installation of piles, which will ultimately allow for increased access to and enjoyment of the Parkers River by the public.

The Town of Yarmouth is requesting a Chapter 91 License for the installation of piles to support the proposed kayak launch boardwalk and anchor the floating kayak launch. The proposed work is considered water dependent pursuant to 310 CMR 9.12.(2)(a)2 and 4. Work will not adversely affect the Parkers River, nor will it interfere with the public right of free passage over and through the water. The Project will improve public access to and enjoyment of the waterfront and, in combination with ongoing recreational, ecological and stormwater improvements to Yarmouth Riverwalk Park, providing an overall benefit to the community and therefore qualify for licensure under M.G.L. Chapter 91 and its regulations (310 CMR 9.00).

FIGURES

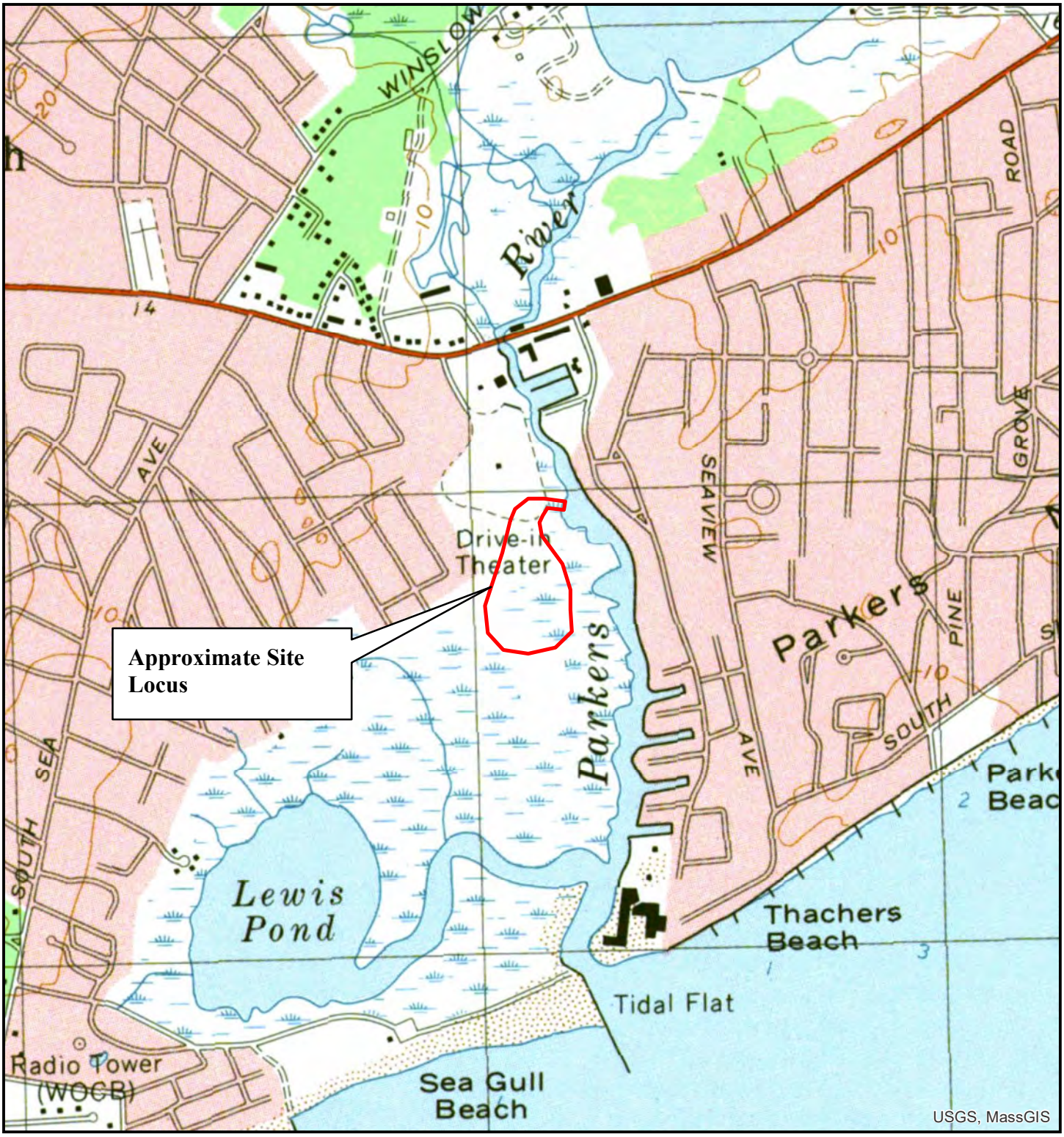


Figure 1
Site Locus
Yarmouth Riverwalk Park
Yarmouth, MA

BETA
IMPROVING COMMUNITIES TOGETHER

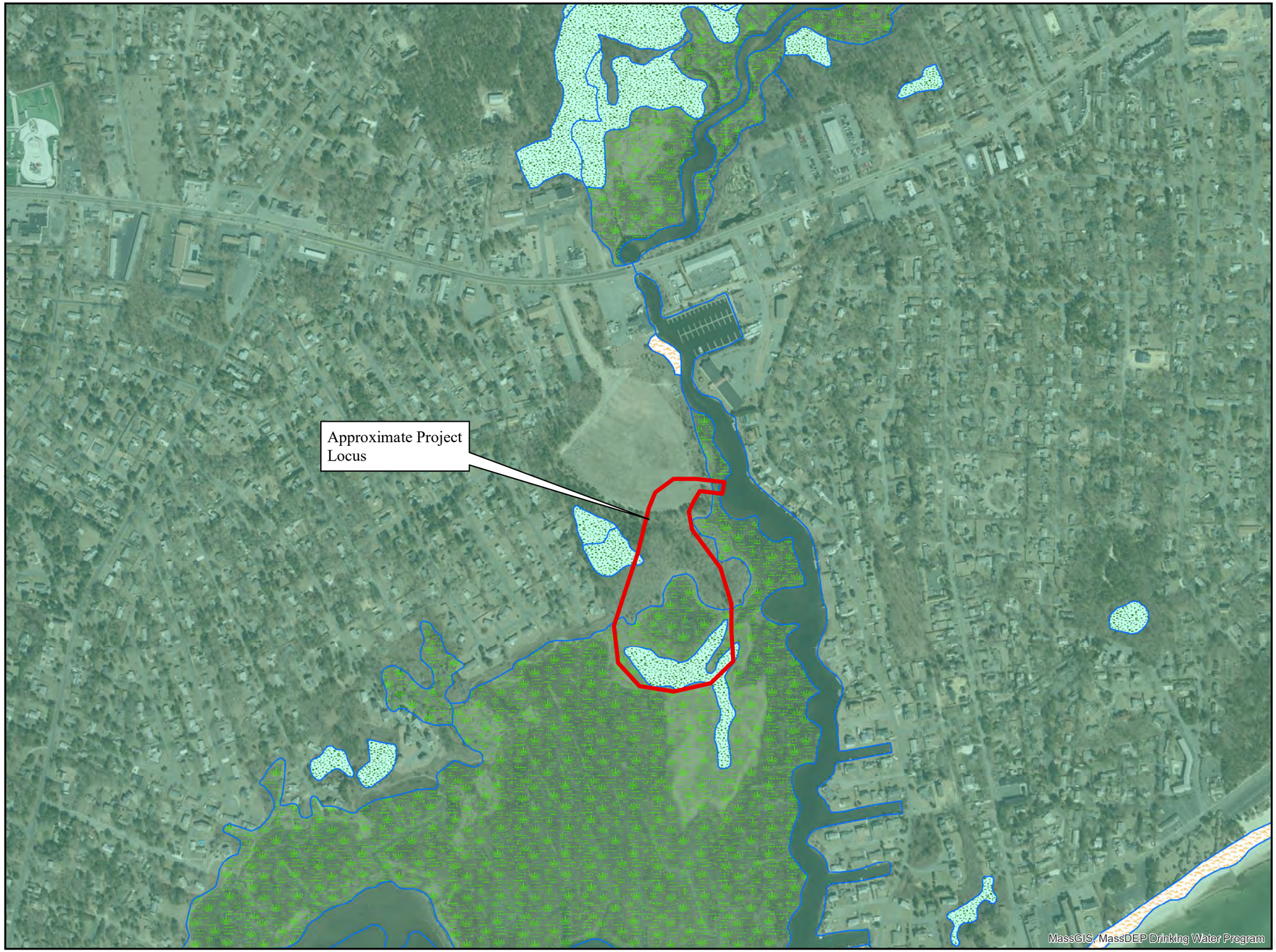
N
W E
S

0 1,000 2,000 Feet

1 inch = 1,000 feet

Data Source: USGS Topographic Map

Figure 2
Environmental Resources
Yarmouth Riverwalk Park
Yarmouth, MA



Legend

- MassDEP Hydrologic Feature
- Bog
- Inland Wetlands
- Barrier Beach
- Coastal Beach/Coastal Dune
- Deep Marsh
- Salt Marsh
- Zone A
- Zone B
- ZONE C
- Outstanding Resource Water
- MassDEP Zone I
- MassDEP Zone II
- MassDEP IWPA
- CZM Coastal Zone
- Area of Critical Environmental Concern
- NFHL 100 Year Flood Zone

N
W E
S

0 500 1,000 Feet

1 inch = 500 feet

Data Source: MassGIS USGS Color Ortho Imagery (2014), MassDEP Wetlands (1:12000) (2009), Tidelands Jurisdiction Data (2011), Surface Water Protection Areas, MassDEP Grounwater Protection Zones.

BETA
IMPROVING COMMUNITIES TOGETHER

Figure 3
Wildlife Habitat Resources
Yarmouth Riverwalk Park
Yarmouth, MA

Legend

- Anadromous Fish Presence
- American Oyster
- Bay Scallop
- Blue Mussel
- European Oyster
- Ocean Quahog
- Quahog
- Razor Clam
- Sea Scallop
- Soft-shelled Clam
- Surf Clam
- NHESP Potential Vernal Pool
- NHESP Certified Vernal Pool
- NHESP Priority Habitat of Rare Species
- NHESP Estimated Habitats of Rare Wildlife

N
W E
S

0 500 1,000 Feet

1 inch = 500 feet

Data Source: MassGIS USGS Color Ortho Imagery (2014), MassDEP Wetlands (1:12000) (2009), Tidelands Jurisdiction Data (2011), Surface Water Protection Areas, MassDEP Grounwater Protection Zones.

BETA
IMPROVING COMMUNITIES TOGETHER

National Flood Hazard Layer FIRMette

FEMA

70°13'42"W 41°38'57"N

70°13'5"W 41°38'30"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 7/27/2021 at 12:57 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

PHOTOGRAPHIC DOCUMENTATION

Photo 1

View of high marsh and Coastal Dune north of the proposed kayak launch—facing northwest

Photo 2

View of the proposed kayak launch access area—facing east

PHOTOGRAPHIC DOCUMENTATION

669 MA-28 and portion of un-numbered parcel to the south

Yarmouth, Massachusetts

Photographs Documented September 2021 through March 2022

Photo 3

View of the proposed boardwalk location's western extent—facing south

Photo 4

View of the proposed boardwalk location's eastern extent—facing north

PHOTOGRAPHIC DOCUMENTATION

669 MA-28 and portion of un-numbered parcel to the south

Yarmouth, Massachusetts

Photographs Documented September 2021 through March 2022

Photo 5

View of the proposed boardwalk stream crossing location—facing east

Photo 6

View of the interior portion of the salt marsh where the boardwalk is proposed—facing west

PHOTOGRAPHIC DOCUMENTATION

669 MA-28 and portion of un-numbered parcel to the south

Yarmouth, Massachusetts

Photographs Documented September 2021 through March 2022

United States Army Corps of Engineers

USACE application No. NAE-22-02890

Yarmouth, Massachusetts

Yarmouth Riverwalk Park

669 Route 28 and a portion of an un-numbered parcel to the south

December 2022

PRE-CONSTRUCTION NOTIFICATION

89 Shrewsbury Street
Suite 300
Worcester, MA 01604
508.756.1600
www.BETA-Inc.com

Yarmouth Riverwalk Park

Yarmouth, Massachusetts

PRE-CONSTRUCTION NOTIFICATION

Prepared by: BETA GROUP, INC.
Prepared for: The Town of Yarmouth

December 2022

TABLE OF CONTENTS

ENG FORM 4345

LIST OF APPENDICES

U.S. Army Corps of Engineers (USACE)

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

33 CFR 325. The proponent agency is CECW-CO-R

Form Approved - OMB No. 0710-0003 Expires: 02-28-2022

The public reporting burden for this collection of information, OMB Control Number 0710-0003, is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR APPLICATION TO THE ABOVE EMAIL.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned. System of Record Notice (SORN). The information received is entered into our permit tracking database and a SORN has been completed (SORN #A1145b) and may be accessed at the following website: http://dpcld.defense.gov/Privacy/SORNsIndex/DOD-wide-SORN-Article-View/Article/570115/a1145b-ce.aspx

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required)
First - Robert Middle - Last - Whritenour Jr.	First - Laura Middle - Last - Krause
Company - Town of Yarmouth	Company - BETA Group, Inc.
E-mail Address - rwhritenour@yarmouth.ma.us	E-mail Address - lkrause@beta-inc.com
6. APPLICANT'S ADDRESS:	9. AGENT'S ADDRESS:
Address- 1146 Route 28	Address- 89 Shrewsbury Street, Suite 300
City - South Yarmouth State - MA Zip - 02664 Country - USA	City - Worcester State - MA Zip - 01604 Country - USA
7. APPLICANT'S PHONE NOs. w/AREA CODE	10. AGENTS PHONE NOs. w/AREA CODE
a. Residence b. Business 508-398-2231 x1271 c. Fax	a. Residence b. Business 844-800-2382 x7113 c. Fax

STATEMENT OF AUTHORIZATION

11. I hereby authorize, Laura Krause to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

SIGNATURE OF APPLICANT 1/13/22 DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)
Yarmouth Riverwalk Park

13. NAME OF WATERBODY, IF KNOWN (if applicable)	14. PROJECT STREET ADDRESS (if applicable)
Parkers River	Address 669 Route 28 and an un-numbered parcel to the south
15. LOCATION OF PROJECT	City - Yarmouth State- MA Zip- 02673
Latitude: •N 41.64608 Longitude: •W -70.22311	

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)

State Tax Parcel ID Map 32 and 24 Lot 122 and 92 Municipality Yarmouth

Section - Township - Range -

17. DIRECTIONS TO THE SITE

Take Route 93 south to exit 43B for Route 3 south. Continue on Route 3 south for 44 miles to the Sagamore Bridge where it becomes Route 6. Continue on Route 6 south and take exit 72 for Willow Street south. Take a left onto Higgins Crowell Road, then take the first exit at the traffic circle to continue on Higgins Crowell Road. Take a left on Main Street (Route 28) and continue for 1 mile. The Site will be on the right at 669 Route 28.

18. Nature of Activity (Description of project, include all features)

The Project will create outdoor recreation opportunities for residents. Project improvements include construction of an outdoor event space, restroom facility, driveway and parking lots, artist shanties, a boat launch for non-motorized vessels, walking trails and a raised boardwalk over the nearby salt marsh. Improvements with USACE jurisdiction include construction of a boardwalk leading to a float for launching canoes, kayaks and paddleboards on the Parkers River; construction of a 1,300 linear foot, 6-foot-wide boardwalk loop, including a pedestrian bridge over a tidal creek, constructed as an elevated walkway over Salt Marsh; and Salt Marsh restoration. The boardwalk, supported on helical anchors, includes three overlook areas and four bench areas, offering expansive views of the sky and marsh below.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

The purpose of this Project is to activate two Town-owned properties to provide accessible active and passive recreation to the public within a natural setting. Planned improvements to redevelop the properties are designed to offer a wide range of outdoor recreation and entertainment opportunities as well as to restore, in the case of one lot, degraded riverfront areas. The Town seeks to provide the public with a unique and immersive experience within the natural beauty of Cape Cod by restoring the unused property to provide a scenic park for residents and tourists in the area. Specifically, the Project aims to provide the public with visual access to the Salt Marsh; provide the public with educational information regarding bird, fish and wildlife and the natural environs thru interpretive panels; and, provide visual and physical public access to the Parkers River. Improvements will be ADA-accessible.

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

No fill material will be placed below the HTL or below the boundary of vegetated wetlands. Work within salt marsh and vegetated wetlands is limited to installation of piles to support the elevated boardwalks. Work below the MHW includes installation of turbidity controls around the proposed float, and installation of float anchors.

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type Amount in Cubic Yards	Type Amount in Cubic Yards	Type Amount in Cubic Yards

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres salt marsh: 17 sf perm., 8696 sf temp; vegetated wetland: 2 sf perm., 452 temp; intertidal area: 8 sf perm.; subtidal area: 6 sf perm.

or

Linear Feet

23. Description of Avoidance, Minimization, and Compensation (see instructions)

The layout and dimensions of the raised boardwalk structures have been designed to minimize shading impacts to wetlands below the structure. Helical piles will be used to support the boardwalk and kayak launch to minimize the footprint within waters of the US. Pile locations along the kayak launch have also been placed to span the salt marsh to avoid additional impacts. Mats will be installed within tidal wetlands to allow access by the pile drilling machine, and work will take place in winter to further reduce impacts. Native plantings are proposed throughout the Project to replace cleared vegetation.

24. Is Any Portion of the Work Already Complete? ☐ Yes ☒ No IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list)

a. Address- 679 and 681 Route 28

City - West Yarmouth State - MA Zip - 02673

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED
Yarmouth CC	Order of Conditions		2022-12-01		
MEPA	SEIR Certificate	EEA 16623			
MassDEP Ch. 91	License				
MESA	Project Review	03-13002	2022-12-01	2022-12-05	

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT — DATE: 12/13/22

SIGNATURE OF AGENT — DATE: 12/13/2022

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

December 19, 2023

Regulatory Division
File Number: NAE-2022-02890

Town of Yarmouth
Attn: Robert Writenour Jr.
146 Route 28
South Yarmouth, Massachusetts 02664
Sent by email: rwhritenour@yarmouth.ma.us

Dear Mr. Writenour Jr.:

The U.S. Army Corps of Engineers (USACE) has reviewed your application to perform work below the mean high water mark and discharges of fill below the high tide line/within wetlands within waters of the United States in order to place 9,148 square feet of temporary construction mats and construct a 465 square foot kayak launch/float as part of the Yarmouth Riverwalk Park Project. The project also includes the construction of an elevated boardwalk under the jurisdiction of the U.S. Coast Guard as the structure is considered a bridge (33 CFR 115.70). This project is located in Parker River and associated tidal and non-tidal wetlands at 669 Route 28, Yarmouth, Massachusetts. The work is shown on the enclosed plans titled "YARMOUTH RIVERWALK PARK TOWN OF YARMOUTH, MASSACHUSETTS," on twenty six sheets, and dated "December 2022."

Based on the information that you have provided, we verify that the activity is authorized under General Permit # 4 and 24 of the June 2, 2023, federal permit known as the Massachusetts General Permits (GPs). The GPs are available at https://www.nae.usace.army.mil/Missions/Regulatory/State-General-Permits/Massachusetts-General-Permit.

Please review the GPs carefully, in particular the general conditions beginning on page 35, and ensure that you and all personnel performing work authorized by the GPs are fully aware of and comply with its terms and conditions. A copy of the GPs and this verification letter shall be available at the work site as required by General Condition 17. You must perform this work in compliance with the following special condition:

Turbidity causing work shall not be conducted during the time of year (TOY) restriction of 15 January to 15 June of any year in order to minimize adverse impacts to winter flounder, alewife, American eel, white perch, and Atlantic tomcod.

This authorization expires on June 1, 2028. You must commence or have under contract to commence the work authorized herein by June 1, 2028, and complete the

work by June 1, 2029. If not, you must contact this office to determine the need for further authorization and we recommend you contact us *before* the work authorized herein expires. Please contact us immediately if you change the plans or construction methods for work within our jurisdiction as we must approve any changes before you undertake them. Performing work within our jurisdiction that is not specifically authorized by this determination or failing to comply with the special condition(s) provided above or all the terms and conditions of the GPs may subject you to the enforcement provisions of our regulations.

This authorization does not obviate the need to obtain other federal, state, or local authorizations required by law. Applicants are responsible for applying for and obtaining any other approvals.

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. To better serve you, we would appreciate your completing our Customer Service Survey located at https://regulatory.ops.usace.army.mil/customer-service-survey.

Please contact Christine Jacek of my staff at (978) 318-8026 or Christine.M.Jacek@usace.army.mil if you have any questions.

Sincerely,

Paul Maniccia

Paul Maniccia
Chief, Massachusetts Branch
Regulatory Division

Enclosures

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YARMOUTH RIVERWALK PARK

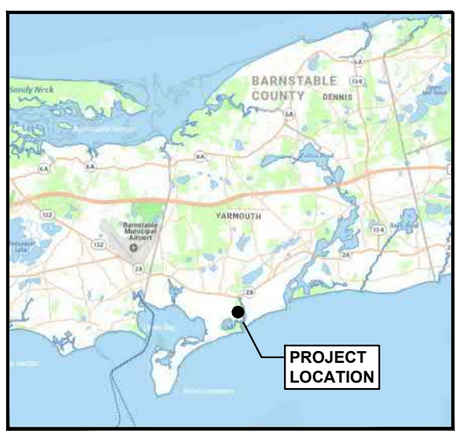
TOWN OF YARMOUTH, MASSACHUSETTS

PRE-CONSTRUCTION NOTIFICATION PLANS

DECEMBER 2022

TOWN OF YARMOUTH
1146 ROUTE 28
SOUTH YARMOUTH, MA 02664

TOWN ADMINISTRATOR
ROBERT L. WHRITENOUR, JR.



TOWN OF YARMOUTH LOCUS MAP
SCALE: NOT TO SCALE

LOCATION MAP
1" = 500' - 0"

PREPARED BY:

BETA
www.BETA-Inc.com

PLAN INDEX

DATUM:
HORIZONTAL: NAD83, VERTICAL: NAVD88

CRITICAL ELEVATIONS

HIGH TIDE LINE (HTL) = ELEV. 2.91

MEAN HIGH WATER (MHW) = ELEV. 2.05

MEAN LOW WATER (MLW) = ELEV. -0.70

MEAN LOW LOW WATER (MLLW) = ELEV. -0.98

Station ID: 8447605
Hyannis Port , Hyannis Harbor, VM 2063, PID AR7934

*DATA SOURCED FROM NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

GENERAL NOTES:

1. ALL WORK SHALL CONFORM TO THE MASSACHUSETTS STATE BUILDING CODE AND ITS APPLICABLE REFERENCED STANDARDS.

2. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS AS THEY RELATE TO NEW CONSTRUCTION. REPORT TO THE OWNER'S REPRESENTATIVE ALL OBSERVATIONS AND ANY DISCREPANCIES BEFORE PROCEEDING WITH WORK.

3. WORK WITHIN THE LOCAL RIGHT-OF-WAY SHALL CONFORM TO LOCAL MUNICIPAL STANDARDS. WORK WITHIN THE STATE RIGHT-OF-WAY SHALL CONFORM TO THE LATEST EDITION OF THE STATE HIGHWAY DEPARTMENTS STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.

4. CONTRACTOR SHALL NOTIFY "DIG-SAFE"(1-888-344-7233) AT LEAST 72 HOURS BEFORE EXCAVATING. THE CONTRACTOR SHALL RECORD THE LOCATION OF ANY/ALL DIG-SAFE UTILITY MARKINGS ON PROJECT RECORD DOCUMENTS.

5. THE LOCATION, SIZE, AND MATERIAL OF EXISTING UTILITIES ARE SHOWN AS APPROXIMATE REPRESENTATIONS ONLY. THE OWNER OR ITS REPRESENTATIVE HAVE NOT INDEPENDENTLY VERIFIED THIS INFORMATION. THE UTILITY INFORMATION SHOWN DOES NOT GUARANTEE THE ACTUAL EXISTENCE, SERVICEABILITY, OR OTHER DATA CONCERNING THE UTILITIES THAT MAY BE PRESENT. PRIOR TO ORDERING MATERIALS AND BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY AND DETERMINE THE EXACT LOCATIONS, SIZES, AND ELEVATIONS OF THE POINTS OF CONNECTIONS TO EXISTING UTILITIES AND SHALL CONFIRM THAT THERE ARE NO INTERFERENCES WITH EXISTING UTILITIES WITHIN PROJECT LIMITS AND THE PROPOSED UTILITY ROUTES, INCLUDING ROUTES WITHIN THE PUBLIC RIGHT-OF-WAY.

6. THE CONTRACTOR SHALL TAKE EVERY PRECAUTION TO PREVENT DAMAGE TO ALL UTILITIES (BOTH ABOVE AND BELOW GRADE) WITHIN THE PROJECT AREA. DAMAGE TO ANY UTILITIES AS A RESULT OF ACTIONS BY THE CONTRACTOR SHALL BE RESTORED BY THE CONTRACTOR, AT THE CONTRACTOR'S EXPENSE, TO CONDITIONS EQUAL TO CONDITIONS PRIOR TO THE DAMAGE.

7. UPON AWARD OF CONTRACT, CONTRACTOR SHALL MAKE NECESSARY CONSTRUCTION NOTIFICATIONS AND APPLY FOR AND OBTAIN NECESSARY PERMITS, PAY FEES, AND POST BONDS ASSOCIATED WITH THE WORK INDICATED ON DRAWINGS, IN THE SPECIFICATIONS, AND IN THE CONTRACT DOCUMENTS. DO NOT CLOSE OR OBSTRUCT ROADWAYS, SIDEWALKS, AND FIRE HYDRANTS, WITHOUT APPROPRIATE PERMITS.

8. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.

9. THE CONTRACTOR SHALL PREVENT DUST, SEDIMENT, AND DEBRIS FROM EXITING THE SITE AND SHALL BE RESPONSIBLE FOR CLEAN-UP, REPAIRS, AND CORRECTIVE ACTION IF SUCH OCCURS.

10. DAMAGE RESULTING FROM CONSTRUCTION LOADS SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

11. ANY DAMAGE TO EXISTING PAVEMENT, BRIDGES, SIDEWALKS, FENCES, ETC. CAUSED BY THE CONTRACTOR SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
12. TOPOGRAPHIC SURVEY IS BASED ON AN ON-THE-GROUND SURVEY PERFORMED BY ALPHA SURVEY GROUP, LLC BETWEEN MARCH 7 & APRIL 3, 2017 AND BETWEEN AUGUST 9 & AUGUST 12, 2021.

13. THE PROJECT IS HORIZONTALLY REFERENCED TO THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD83), CORS ADJUSTMENT (NA2011/GEOID 12a) AS DETERMINED BY REDUNDANT GPS OBSERVATIONS MADE ON MARCH 7, 2017.

14. THIS PROJECT IS VERTICALLY REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), BASED ON THE FOLLOWING BENCHMARKS: MASSDOT BM#8149 BRASS RIVET IN PARKER RIVER BRIDGE WITH A PUBLISHED ELEVATION OF 6.11 FT.; CB/TOWN OF YARMOUTH DISK STATION NO. 8, ELEV.= 5.20 FT; CHISELED SQUARE ON N.E. CORNER OF PARKER RIVER CONC. BRIDGE WALL ELEV.=6.18 FT. (LOUIS BERGER DRAINAGE & UTILITY PLAN 75% DESIGN SHEET 8 OF 20 YARMOUTH MAIN STREET (RTE. 28) PROJECT).

15. LAND OUTSIDE THE PROPOSED LIMIT OF WORK SHALL NOT BE DISTURBED BY THE CONTRACTOR.

16. ALL WORK AND MATERIALS SHALL COMPLY WITH ALL CITY OF PROVIDENCE REGULATIONS AND CODES AND O.S.H.A. STANDARDS.

17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING ALL CONTROL POINTS AND BENCH MARKS NECESSARY FOR THE WORK.

18. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND PAYING FOR ANY PERMITS AND/OR CONNECTION FEES REQUIRED TO CARRY OUT THE WORK INCLUDING BUT NOT LIMITED TO DEMOLITION.

19. ALL DIMENSIONS AND RADII ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.

20. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL OF RELOCATIONS THAT CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE DRAWINGS, INCLUDING BUT NOT LIMITED TO, ALL UTILITIES, STORM DRAINAGE, SIGNS, TRAFFIC SIGNALS & POLES, ETS. AS REQUIRED. ALL COSTS SHALL BE BORNE BY THE CONTRACTOR.

CONSTRUCTION NOTES:

1. THE CONTRACTOR SHALL CALL "DIG-SAFE" AT 1-888-344-7233 AT LEAST 72 HOURS PRIOR TO EXCAVATION IN ACCORDANCE WITH STATE OF MASSACHUSETTS, GENERAL LAWS.

2. THE CONTRACTOR SHALL NOTIFY ALL APPROPRIATE AGENCIES AND UTILITY COMPANIES IN WRITING 48 HOURS PRIOR TO ANY CONSTRUCTION WITHIN 15 FEET OF A UTILITY LINE.

3. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL SAFETY CODES, REGULATIONS, LEGAL REQUIREMENTS, PERMIT CONDITIONS, ETS.

4. THE CONTRACTOR SHALL TAKE ADEQUATE PRECAUTIONS TO PROTECT ALL WALKS, STREETS, PAVEMENTS, HIGHWAY GUARDS, CURBING, EDGING, TREES AND PLANTINGS ON OR OF THE PREMISES, AND SHALL REPAIR AND REPLACE OR OTHERWISE MAKE GOOD AT HIS/HER OWN EXPENSE AS DIRECTED BY THE ENGINEER ANY ITEMS DAMAGED AS A RESULT OF THE CONTRACTOR'S WORK.

5. THE CONTRACTOR SHALL PROVIDE ADEQUATE BRACING AND SHORING OF ALL EXCAVATIONS IN ACCORDANCE WITH THE REQUIREMENTS OF GOVERNING CODES AND REGULATIONS.

6. ALL SURFACES OUTSIDE THE LIMIT OF WORK THAT ARE DISTURBED SHALL BE RESTORED TO THEIR ORIGINAL CONDITION, AS DETAILED, OR AS SPECIFIED BY THE ENGINEER.

7. ALL EXISTING PIPING AND STRUCTURES EXPOSED DURING EXCAVATION SHALL BE ADEQUATELY SUPPORTED, BRACED, OR OTHERWISE PROTECTED DURING CONSTRUCTION ACTIVITIES.

8. WHERE NEW PAVEMENT MEETS EXISTING PAVEMENT (INCLUDING DRIVEWAYS), SAW CUT EXISTING PAVEMENT SMOOTH AND STRAIGHT. WHERE NEW BITUMINOUS CONCRETE MEETS EXISTING BITUMINOUS CONCRETE SURFACES, SAW CUT EDGES ARE TO BE SEALED WITH BITUMEN AND BACK SANDED.

9. WORK WITHIN PUBLIC WAYS SHALL COMPLY WITH APPLICABLE MUNICIPAL AND STATE REQUIREMENTS.

10. IF ANY EXISTING STRUCTURES TO REMAIN ARE DAMAGED DURING CONSTRUCTION IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR AND/OR REPLACE THE EXISTING STRUCTURE AS NECESSARY TO RETURN IT TO EXISTING CONDITIONS OR BETTER.

11. THE CONTRACTOR SHALL RE-USE EXISTING GRANITE CURB IN GOOD CONDITION THAT IS RECOVERED FROM DEMOLITION ACTIVITIES.

DATUM:
HORIZONTAL: NAD83, VERTICAL: NAVD88

RIVERWALK PARK
YARMOUTH, MA

SHEET NO. 2 OF 26

GENERAL NOTES - 1

SITE PREPARATION & DEMOLITION NOTES:

1. ALL ITEMS DESIGNATED TO BE REMOVED AND DISPOSED (R&D) SHALL BE TAKEN FROM THE SITE AND LEGALLY DISPOSED.

2. ALL ITEMS DESIGNATED TO BE REMOVED AND STOCKPILED (R&S) SHALL BE DISASSEMBLED AND STOCKPILED AT A LOCATION DETERMINED BY THE OWNER'S REPRESENTATIVE.

3. DEBRIS OF ANY NATURE SHALL NOT BE ALLOWED TO ACCUMULATE IN THE STREETS, PARKING LOT, SIDEWALK AREAS OR GROUNDS SURROUNDING THE PROJECT AREA.

4. FOR ALL HOLES, PITS OR OTHER HAZARDOUS DEPRESSIONS ADJACENT TO OR WITHIN EIGHT (8) FEET OF ANY SIDEWALK AREA AND ARE UNPROTECTED, A TEMPORARY GUARD FENCE SHALL BE IMMEDIATELY ERECTED FOR THE PROTECTION OF PEDESTRIANS. THE FENCING MATERIAL SHALL BE FREE FROM NAILS, FASTENINGS OR SPLINTERS AND SHALL PRESENT A REASONABLY SMOOTH SURFACE ON THE SIDES OF POSSIBLE CONTACT. SUCH TEMPORARY FENCES SHALL BE LEFT IN PLACE AND SHALL BE PROPERLY MAINTAINED UNTIL THE HOLES, PITS OR DEPRESSIONS HAVE BEEN PROPERLY FILLED.

5. ALL STUMPS AND ROOTS OF TREE AND SHRUBS INDICATED TO BE REMOVED AND DISPOSED SHALL BE LEGALLY DISPOSED OF OFF SITE. IN SPECIFIC LOCATIONS, STUMPS MAY BE GROUND IN PLACE, AS SHOWN.

6. ALL EXISTING VEGETATION (TREES, SHRUBS, GRASSES, ETC.) TO REMAIN SHALL BE PROTECTED FROM INJURY. INDIVIDUAL TREES AND SHRUBS TO BE SAVED WITHIN THE DESIGNATED WORK AREA SHALL BE PROTECTED AS SPECIFIED HEREIN. THE CONTRACTOR SHALL REMOVE ALL PROTECTIVE BARRIERS ONLY AS DIRECTED BY THE OWNER'S REPRESENTATIVE.

7. THE CONTRACTOR SHALL STRIP AND STOCKPILE EXISTING LOAM FROM THOSE AREAS WHICH ARE TO BE EXCAVATED OR FILLED. STOCKPILED LOAM SHALL NOT BE MIXED WITH ANY SUBSOIL OR OTHER UNSUITABLE MATERIAL UNLESS DIRECTED BY THE OWNER'S REPRESENTATIVE. ALL STOCKPILED LOAM REMAINS THE PROPERTY OF THE OWNER.

8. ALL STOCKPILED LOAM OR OTHER SOIL MATERIAL SHALL BE SURROUNDED BY EROSION CONTROL DEVICES.

9. THE CONTRACTOR IS RESPONSIBLE FOR KEEPING THE SITE CLEAN OF MISCELLANEOUS DEBRIS THROUGHOUT THE CONSTRUCTION PERIOD. ALL WASTE MATERIALS SHALL BE DISPOSED OF IMMEDIATELY TO A LEGAL, OFF-SITE LOCATION UNLESS OTHERWISE INDICATED ON THE PLAN.

10. DURING THE DEMOLITION PROCESS THE CONTRACTOR SHALL USE SUFFICIENT WATER OR NON-SALVABLE MATERIALS TO PREVENT EXCESSIVE SPREADING OF DUST DURING OPERATIONS.

11. THE REMOVAL AND DISPOSAL OF ALL MATERIALS SHALL BE DONE IN ACCORDANCE WITH THE APPROPRIATE STATE AND TOWN ORDINANCES, RULES AND REGULATIONS.

12. UNVEGETATED SLOPES SHALL NOT BE UNATTENDED OR EXPOSED FOR PERIODS IN EXCESS OF TWO (2) WEEKS OR THROUGH THE INACTIVE WINTER SEASON.

13. ALL SIDEWALK AND DRIVEWAYS DESIGNATED FOR REPLACEMENT SHALL BE CUT AND MATCHED AT LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY THE OWNER'S REPRESENTATIVE.

14. PRUNING STANDARDS:

14.A. PRUNE TREE ACCORDING TO ANSI A300.

14.B. EXPERIENCED WORKMEN UNDER THE IMMEDIATE SUPERVISION OF A LICENSED ARBORIST SHALL PERFORM ALL TREE TRIMMING.

14.C. CLIMBING IRONS OR OTHER EQUIPMENT INJURIOUS TO TREES SHALL NOT BE PERMITTED.

14.D. CUT BRANCHES WITH SHARP PRUNING INSTRUMENTS; DO NOT BREAK OR CHOP.

14.E. PRUNE TREES TO REMAIN THAT ARE AFFECTED BY TEMPORARY AND PERMANENT CONSTRUCTION.

14.F. ALL DOWNED AND CUT PLANT MATERIAL TOGETHER WITH MISCELLANEOUS DEBRIS FROM THIS WORK SHALL BE REMOVED BY THE CONTRACTOR FROM THE PROJECT ON A DAILY BASIS. MATERIALS FROM THE WORK WILL NOT BE PERMITTED TO REMAIN ON SITE RESULTING IN DELAYING OR IMPEDING OTHER WORK ON PROJECT SITE.

14.G. NO MATERIAL OR DEBRIS SHALL BE DUMPED WITHIN THE LIMITS OF THE SITE OR ABUTTING PROPERTY.

SOIL EROSION AND SEDIMENTATION CONTROL NOTES:

1. ALL REFERENCED SOIL EROSION AND SEDIMENTATION CONTROLS INCLUDING MATERIALS USE, APPLICATION RATES, AND THE INSTALLATION PROCEDURES SHALL BE PERFORMED IN ACCORDANCE WITH THE MASSACHUSETTS DEP SPECIFICATIONS.

2. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN ALL SOIL EROSION AND SEDIMENT CONTROLS ON THE PROJECT FOR THE ENTIRE DURATION OF THE CONSTRUCTION PERIOD. THE CONTRACTOR SHALL FOLLOW THE DIRECTION OF THE OWNER'S REPRESENTATIVE WITH REGARD TO INSTALLATION, MAINTENANCE, AND REPAIR OF ALL SOIL EROSION AND SEDIMENTATION CONTROLS ON THE PROJECT SITE. TEMPORARY SOIL EROSION AND SEDIMENTATION CONTROLS (HAY BALES, SILT FENCE, ETC.) SHALL BE MAINTAINED UNTIL ALL EXPOSED SOILS ARE SATISFACTORILY STABILIZED.

3. THE HAY BALE / SILT FENCE LINE ILLUSTRATED ON THESE PLANS, IS TO BE STAKED IN THE FIELD PRIOR TO CONSTRUCTION AND SHALL SERVE AS THE STRICT LIMIT OF DISTURBANCE FOR THE PROJECT. NO ALTERATIONS, INCLUDING VEGETATIVE CLEARING OR SURFACE DISTURBANCE, SHALL OCCUR BEYOND THE HAY BALE / SILT FENCE LINE.

4. SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSPECTED AT LEAST ONCE EVERY SEVEN (7) CALENDAR DAYS AND WITHIN TWENTY-FOUR (24) HOURS AFTER AN EVENT WHICH GENERATES .25 INCHES OF RAIN IN A TWENTY-FOUR (24) HOUR PERIOD. MAINTENANCE SHALL INCLUDE CLEAN OUT OF ACCUMULATED SEDIMENT BEHIND THE BALES IF ½ THE ORIGINAL HEIGHT OF THE BALES / FENCE BARRIER BECOMES FILLED WITH SEDIMENT. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE HAS BEEN REMOVED SHOULD BE ADDRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED, AND SEEDED.

5. THE TOE OF ANY FILL SLOPE IS TO REMAIN AT LEAST ONE (1) FOOT INSIDE OF ALL EROSION CONTROLS. UNDER NO CIRCUMSTANCE SHALL THE CONTRACTOR COVER ANY PORTION OF THE EROSION CONTROLS WITH FILL MATERIAL. ANY FILL MATERIAL WHICH IS PLACED ON ANY EROSION CONTROLS BY THE CONTRACTOR, SHALL BE IMMEDIATELY REMOVED BY THE CONTRACTOR, AND ANY NECESSARY REPAIRS TO THE EROSION CONTROLS ACCOMPLISHED, AT NO COST TO THE OWNER.

6. THE CONTRACTOR SHALL INSTALL ALL EROSION CONTROL DEVICES FOR OUTLET PROTECTION PRIOR TO CLEANING AND FLUSHING STORM WATER DRAINAGE. EROSION CONTROL DEVICES SHALL REMAIN IN PLACE UNTIL ALL FLUSHED SEDIMENTS ARE REMOVED. AT ALL OUTFALL LOCATIONS WHERE PIPES ARE TO BE CLEANED AND FLUSHED, OUTLET PROTECTION SHALL BE INSTALLED TO TRAP SEDIMENTS. THESE SEDIMENTS SHALL THEN BE REMOVED AND DISPOSED OF LEGALLY BEFORE THE OUTLET PROTECTION DEVICES ARE REMOVED. IF OUTLET PROTECTION AT THE OUTFALL IS NOT FEASIBLE, THEN THE OUTLET PIPE OF THE LAST DRAINAGE STRUCTURE TO BE CLEANED SHALL BE PLUGGED TO CAPTURE ALL MATERIALS FLUSHED FROM PIPES. AFTER THE MATERIALS ARE REMOVED FROM THE DRAINAGE STRUCTURES, THE OUTLET SHALL BE UNPLUGGED TO RESUME NORMAL FUNCTIONING.

CRITICAL ELEVATIONS

HIGH TIDE LINE (HTL) = ELEV. 2.91

MEAN HIGH WATER (MHW) = ELEV. 2.05

MEAN LOW WATER (MLW) = ELEV. -0.70

MEAN LOW LOW WATER (MLLW) = ELEV. -0.98

Station ID: 8447605
Hyannis Port , Hyannis Harbor, VM 2063, PID AR7934

*DATA SOURCED FROM NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

DATUM:
HORIZONTAL: NAD83, VERTICAL: NAVD88

RIVERWALK PARK
YARMOUTH, MA

SHEET NO. 3 OF 26

GENERAL NOTES - 2

LEGEND

GENERAL SYMBOLS

EXISTING	PROPOSED	
		CURB OR BERM (TYPE AS NOTED)
		EDGE OF PAVEMENT
CB	CB	CATCH BASIN (OR GUTTER INLET, LEACHING BASIN, DROP INLET, CATCH BASIN CURB INLET)
EHH	EHH	ELECTRIC HANDHOLE (NUMBER AS NOTED)
E	EMH	ELECTRIC MANHOLE
T	TMH	TELEPHONE MANHOLE
W	WMH	WATER MANHOLE
S	SMH	SEWER MANHOLE
D	DMH	DRAINAGE MANHOLE
GG	GG	GAS GATE
WG	WG	WATER GATE
CS	CS	CURB STOP
HYD.	HYD	HYDRANT
FA	FAB	FIRE ALARM BOX
PM	PM	PARKING METER
LP		STREET LIGHT POLE
UP	UP	UTILITY POLE
UPL	UPL	UTILITY POLE w/ LIGHT
		SIGN
GUY	GUY	GUY POLE
12" RCP (D)	10'-12" RCP	DRAIN PIPE (SIZE AS NOTED)
8" VCP (S)	10'-8" PVC	SEWER MAIN (SIZE AS NOTED)
	10'-8" PVC	ELECTRIC DUCT
4" HP (G)	10'-4" HP	GAS MAIN (SIZE AS NOTED)
8" CI (W)	10'-8" DI	WATER MAIN (SIZE AS NOTED)
(T)	10'-8" PVC	TELEPHONE DUCT (SIZE AS NOTED)
	OHW	OVERHEAD WIRE
MB	MB	MAIL BOX

	WOOD GUARD RAIL STEEL BEAM GUARD, WOOD OR STEEL POSTS (TYPE AS NOTED)
	STEEL GUARD RAIL, STEEL POSTS (TYPE NOTED)
	STONE WALL
	RETAINING WALL (TYPE NOTED)
BND	BND — HIGHWAY/PROPERTY BOUND (TYPE AS NOTED)
SHLO (Date of Layout)	STATE HIGHWAY LAYOUT LINE (SHLO)
	CITY, TOWN OR COUNTY LAYOUT LINE (R.O.W.)
Boundary Name	CITY, TOWN, COUNTY OR STATE BOUNDARY LINE
℄	PROPERTY LINE
	EASEMENT LINE (TYPE NOTED)
2+00	CONSTRUCTION BASELINE
N00°00'00"E 000.00'	SURVEY LINE
	RAILROAD OR STREET RAILWAY TRACKS WITH SIDELINES
	WHEELCHAIR RAMP
24" PINE	TREE (SIZE AND TYPE AS NOTED)
	HEDGE/SHRUBS
X WF-1 X	FENCE (SIZE AND TYPE AS NOTED)
	EDGE OF WETLAND W/ FLAGGED NUMBER
	EDGE OF RIVER/STREAM LINE
	100-FT. WETLAND BUFFER LIMIT
	100-FT. RIVER FRONT LIMIT
	200-FT. RIVER FRONT LIMIT
	WOODED AREA / LIMIT OF CLEARING
x 00.0	x 00.00 — SPOT GRADE
	SAW CUT LINE
	TP-1 — TEST PIT
	B-1 — BORING
	EROSION CONTROL BARRIER/COMPOST FILTER TUBES

DATUM:
HORIZONTAL: NAD83, VERTICAL: NAVD88

RIVERWALK PARK
YARMOUTH, MA

LEGEND

SHEET NO. 4 OF 26

G:\PLANNING\LANDSCAPE\10000S\10056 - YARMOUTH, MA\RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLAN SET\PCSC - 4COB SUBMISSION\1_GEN NOTES\LEGEND.DWG

N/F
TOWN OF YARMOUTH
1146 ROUTE 28
ASSESS. MAP 18
PARCEL ID: 24/92
DEED BK 8979
PAGE 44

122.28 ACRES

PROJECT AREA 2
ELEVATED BOARDWALK

NIAGARA LANE

N/F
NANCY MILES
42 & 44 NIAGARA LN
PARCEL ID: 20/R114
L.C. D777621

N/F
MAYNARD MARGARET
38&40 NIAGARA LN
ASSESS. MAP 24
PARCEL ID: 24 / 84
L.C. D972391

N/F
OCALLAGHAN JAMES C
32 NIAGARA LN
ASSESS. MAP 24
PARCEL ID: 24/84
L.C. D1164350

N/F
SIKONSKI EDWARD M TRS
28 NIAGARA LN
ASSESS. MAP 24
PARCEL ID: 24/ 82
L.C. D1233726

N/F
DASILVA JANICE
24 NIAGARA LN
ASSESS. MAP 24
PARCEL ID: 24/ 81
L.C. D1282677

N/F
WILLIAMS ROBERT J
18 NIAGARA LN
ASSESS. MAP 24
PARCEL ID: 24/ 80
L.C. D806694

N/F
KASS BRADLEY S
14 NIAGARA LN
ASSESS. MAP 24
PARCEL ID: 24/ 79
L.C. D1318233

N/F
PERRY JOHN D
8 NIAGARA LN
ASSESS. MAP 24
PARCEL ID: 24/ 78
L.C. D998674

N/F
NYAGOLOV LYUBOMIR
2 & 4 NIAGARA LN
ASSESS. MAP 24
PARCEL ID: 24/ 77
L.C. C218079

N/F
SILVA THATIANA D
41 PINEWOOD RD
ASSESS. MAP 32
PARCEL ID: 32/ 144
DEED BK 27868
PAGE 193

N/F
HOLT DAVID R
31 &33 COURTLAND WAY
ASSESS. MAP 32
PARCEL ID: 32/ 129
DEED BK 11516
PAGE 200

COURTLAND WAY

N/F
STAMULI GREGORY T
32 &34 COURTLAND WAY
ASSESS. MAP 32
PARCEL ID: 32/ 128
DEED BK 26635
PAGE 18

MAP 32 LOT 123
N/F NAFSAKA E MITROKOSTAS TR
& S & N REALTY TRUST
657 ROUTE 28
DB 12694 PG 113
AREA

N/F
TOWN OF YARMOUTH
669 ROUTE 28
ASSESS. MAP 32
PARCEL ID: 32/122
DEED BK 4985
PAGE 181

23.32 ACRES

PROPOSED
RIVERWALK PARK

BENCHMARK
(10 SPK)
N: 2698559.23
E: 1005299.16
EL: 6.88

PROJECT AREA 1
KAYAK LAUNCH

MARSH

H.T.L. = ELEV. 2.91'

M.H.W. = ELEV. 2.05'

M.L.W. = ELEV. -0.7'

EBB

FLOOD

PARKERS RIVER

NEPTUNE LANE

MA - ROUTE 28

N/F
MANNING GERALD TRS
668 ROUTE 28
ASSESS. MAP 32
PARCEL ID: 32/ 91
DEED BK 30321
PAGE 158

N/F
GOLD VILLAGE WATERSIDE LLC
679 & 681 ROUTE 28
ASSESS. MAP 32
PARCEL ID: 32/ 121
DEED BK 20345
PAGE 145

DATUM:
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*DATA SOURCED FROM NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

AERIAL IMAGERY SOURCE: NEARMAP
DATE FLOWN - SEPTEMBER 2021

RIVERWALK PARK
YARMOUTH, MA

OVERALL PROJECT
AERIAL - 1

SHEET NO. 5 OF 26

0 100 200 300

SCALE IN FEET: 1"=150'

G:\PLANNING\ENVSC\PE10000S\10056 - YARMOUTH, MA\RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLAN SET\PCN - JCO\SUBMISSION\OVERALL PROJECT AERIAL - 2.DWG

PROJECT AREA 2
ELEVATED BOARDWALK

N/F
TOWN OF YARMOUTH
669 ROUTE 28
ASSESS. MAP 32
PARCEL ID: 32/122
DEED BK 4985
PAGE 181

23.32 ACRES

DATUM:
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Station ID: 8447605
Hyannis Port , Hyannis Harbor, VM 2063, PID AR7934

*DATA SOURCED FROM NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

PROPOSED
RIVERWALK PARK

PROJECT AREA 1
KAYAK LAUNCH

H.T.L. = ELEV. 2.91'
M.H.W. = ELEV. 2.05'
M.L.W. = ELEV. -0.7'
BVW ISLAND
WETLAND AREA "S"
ZONE AE (EL 12)
ZONE AE (EL 13)
MARSH
BOTTOM OF BANK PROPERTY LINE
EBB
FLOOD
PARKER'S RIVER

AERIAL IMAGERY SOURCE: NEARMAP
DATE FLOWN - SEPTEMBER 2021

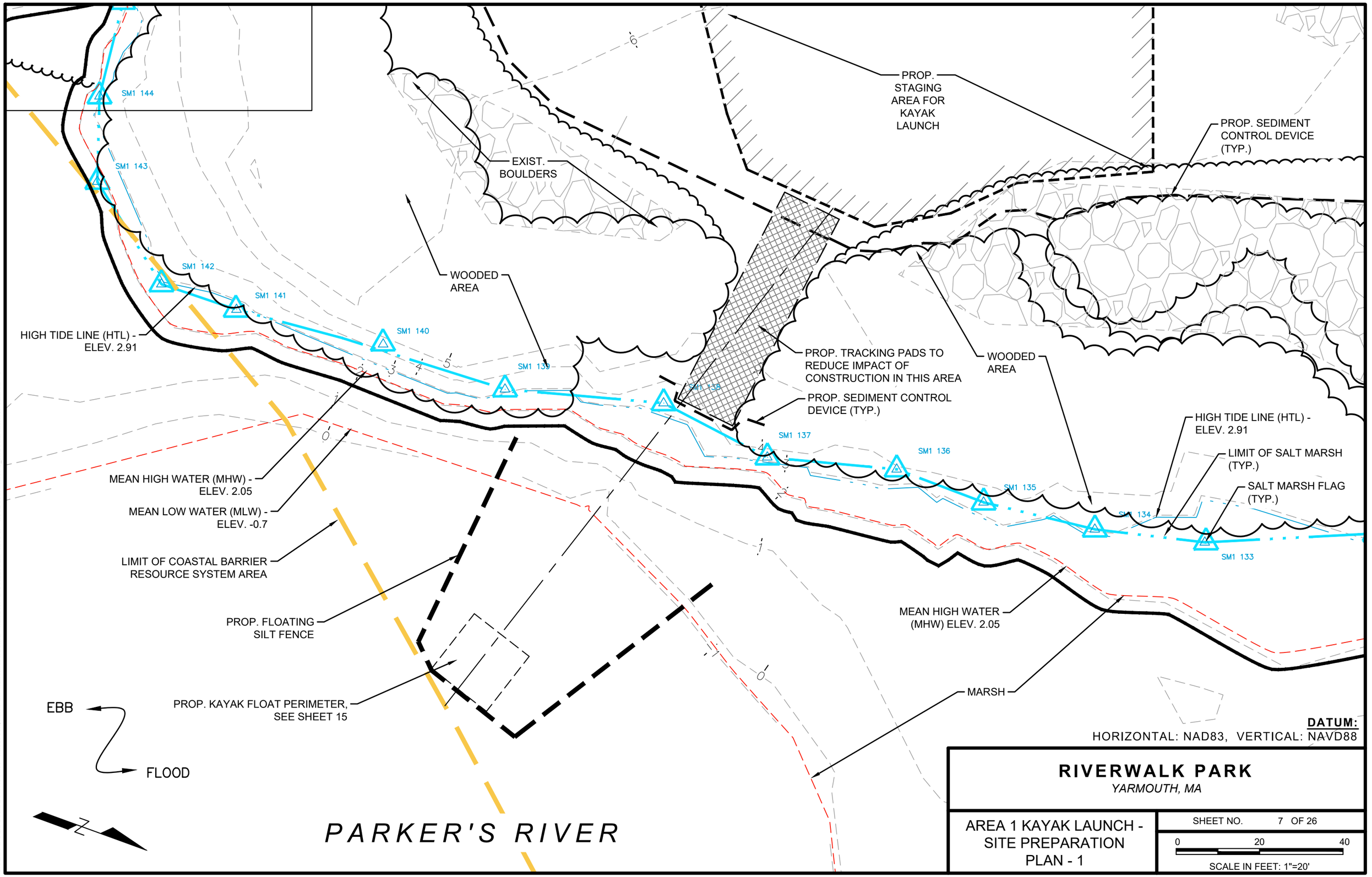
RIVERWALK PARK
YARMOUTH, MA

OVERALL PROJECT AERIAL - 2

SHEET NO. 6 OF 26

0 100 200
SCALE IN FEET: 1"=100'

G:\PLANNING\ENGR\APE\10000\10056 - YARMOUTH, MA RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLAN SET\PCN - 2COE SUBMISSION\OVERALL PROJECT AERIAL - 2.DWG



DATUM:
HORIZONTAL: NAD83, VERTICAL: NAVD88

RIVERWALK PARK

YARMOUTH, MA

AREA 1 KAYAK LAUNCH - SITE PREPARATION PLAN - 1

SHEET NO. 7 OF 26

0 20 40

SCALE IN FEET: 1"=20'

G:\PLANNING\LANDSCAPE\100005\0006 - YARMOUTH MA\RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLAN SET\PCN - 4COB SUBMISSION\3_SITE PREPARATION PLANS.DWG

PROP. BOARDWALK ALIGNMENT - CONSTRUCTION SHALL UTILIZE PROTECTIVE MATTING

MEAN HIGH WATER (MHW) - ELEV. 2.05

LIMIT OF COASTAL BARRIER RESOURCE SYSTEM AREA

N/F
TOWN OF YARMOUTH
1146 ROUTE 28
ASSESS. MAP 18
PARCEL ID: 24/92
DEED BK 8979
PAGE 44

122.28 ACRES

EXIST. PROPERTY LINE

PROP. PROTECTIVE FENCING FOR EXIST. VEGETATION (TYP.)

PROP. SEDIMENT CONTROL DEVICE (TYP.)

WETLAND AREA "3"

WOODED AREA

LIMIT OF SALT MARSH (TYP.)

MEAN HIGH WATER (MHW) - ELEV. 2.05

HIGH TIDE LINE (HTL) - ELEV. 2.91

PROP. LIMIT OF CLEARING (TYP.)

MARSH

MEAN HIGH WATER (MHW) - ELEV. 2.05

HIGH TIDE LINE (HTL) - ELEV. 2.91

WOODED AREA

WOODED AREA

WOODED AREA

PARKER'S RIVER

EBB

FLOOD

DATUM:
HORIZONTAL: NAD83, VERTICAL: NAVD88

RIVERWALK PARK
YARMOUTH, MA

AREA 2 - ELEVATED BOARDWALK - SITE PREPARATION PLAN - 2

SHEET NO. 8 OF 26

0 60 120

SCALE IN FEET: 1"=60'

G:\PLANNING LANDSC\PE\10000S\10056 - YARMOUTH, MA\RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLAN SET\PCN - ACOE SUBMISSION\3 SITE PREPARATION PLANS.DWG

WOODED AREA

MARSH

HIGH TIDE LINE (HTL)
ELEV. 2.91

MEAN HIGH WATER (MHW) -
ELEV. 2.05

MEAN LOW WATER (MLW) -
ELEV. -0.7

LIMIT OF COASTAL BARRIER
RESOURCE SYSTEM AREA

INTERTIDAL HABITAT
SHADING IMPACT
173 SF

INTERTIDAL HABITAT
PERMANENT IMPACT - TIMBER PILES
8 SF

SUBTIDAL HABITAT
PERMANENT IMPACT - MOORING SYSTEM
6 SF

SUBTIDAL HABITAT
SHADING IMPACT
470 SF

EBB

FLOOD

PARKER'S RIVER

WOODED AREA

HIGH TIDE LINE (HTL)
ELEV. 2.91

LIMIT OF SALT MARSH
(TYP.)

SALT MARSH FLAG
(TYP.)

SALT MARSH IMPACT
SHADING IMPACT
70 SF

MEAN HIGH WATER
(MHW) ELEV. 2.05

MARSH

MEAN LOW WATER (MLW) -
ELEV. -0.7

DATUM:
HORIZONTAL: NAD83, VERTICAL: NAVD88

RIVERWALK PARK
YARMOUTH, MA

AREA 1 - KAYAK LAUNCH
- IMPACT PLAN

SHEET NO. 9 OF 26

0 20 40

SCALE IN FEET: 1"=20'

G:\PLANNING\ENVSC\PE\10000S\10056 - YARMOUTH, MA\RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLAN SET\PCN - ACOE SUBMISSION\AREA 2 - ELEVATED BOARDWALK - IMPACT PLAN.DWG

BORDERING VEG. WETLAND -
TEMPORARY IMPACT (TYP.)
452 SF

SALT MARSH -
TEMPORARY IMPACTS (TYP.)
8,696 SF

SALT MARSH
SHADING IMPACTS (TYP.)
6,139 SF

H.T.L. = ELEV. 2.91'

BORDERING VEG. WETLAND
SHADING IMPACTS
603 SF

BVW ISLAND

BORDERING VEG. WETLAND -
PERMANENT IMPACT - HELICAL PILES
2 SF

BVW ISLAND

H.T.L. = ELEV. 2.91'

ZONE AE (EL 12)

ZONE AE (EL 13)

SALT MARSH
PERMANENT IMPACT - HELICAL PILES
17 SF

H.T.L. = ELEV. 2.91'

WETLAND AREA "3"

H.T.L. = ELEV. 2.91'

BVW ISLAND

MARSH

H.T.L. = ELEV. 2.91'

BVW ISLAND

H.T.L. = ELEV. 2.91'

ZONE AE (EL 12)

ZONE AE (EL 13)

EBB

FLOOD

PARKER'S RIVER

DATUM:
HORIZONTAL: NAD83, VERTICAL: NAVD88

RIVERWALK PARK
YARMOUTH, MA

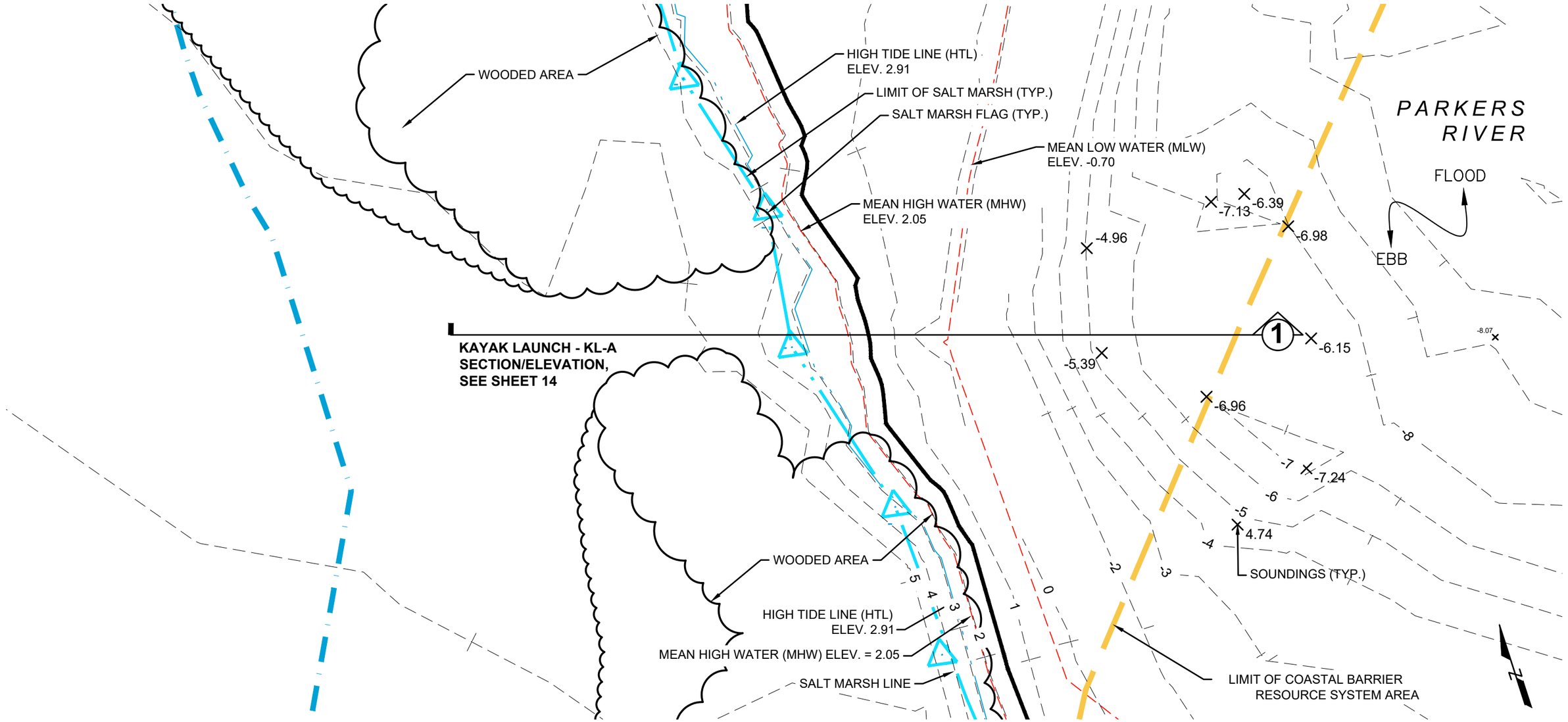
AREA 2 - ELEVATED BOARDWALK - IMPACT PLAN

SHEET NO. 10 OF 26

0 80 160

SCALE IN FEET: 1"=80'

G:\PLANNING\ENSC\PE\10000\10056 - YARMOUTH, MA RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLAN SET\PCN - ACOE SUBMISSION\AREA 2 - ELEVATED BOARDWALK - IMPACT PLAN.DWG



KAYAK LAUNCH SITE PLAN - EXISTING

SCALE: 1" = 20' - 0"

CRITICAL ELEVATIONS

HIGH TIDE LINE (HTL) = ELEV. 2.91

MEAN HIGH WATER (MHW) = ELEV. 2.05

MEAN LOW WATER (MLW) = ELEV. -0.70

MEAN LOW LOW WATER (MLLW) = ELEV. -0.98

Station ID: 8447605
Hyannis Port , Hyannis Harbor, VM 2063, PID AR7934

*DATA SOURCED FROM NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

NOTE:

1. KAYAK LAUNCH MEANT FOR USE OF NON-MOTORIZED VESSELS INCLUDING BUT NOT LIMITED TO KAYAKS, CANOES AND STAND UP PADDLE BOARDS.

SOUNDINGS NOTE:

1. SOUNDINGS COLLECTED BY BETA GROUP ON MARCH 25, 2022 BETWEEN THE HOURS OF 11 AM AND 1 PM.
2. PER WWW.USHARBORS.COM: SOUTH YARMOUTH, MA TIDES WERE AS FOLLOWS, *AM HIGH: 9:11 AM +2.8', PM LOW: 3:33 PM -0.1.* PER THE NATIONAL WEATHER SERVICE, WEATHER ON MARCH 25, 2022 WAS OVERCAST, HIGH TEMP: 43° LOW TEMP: 28°

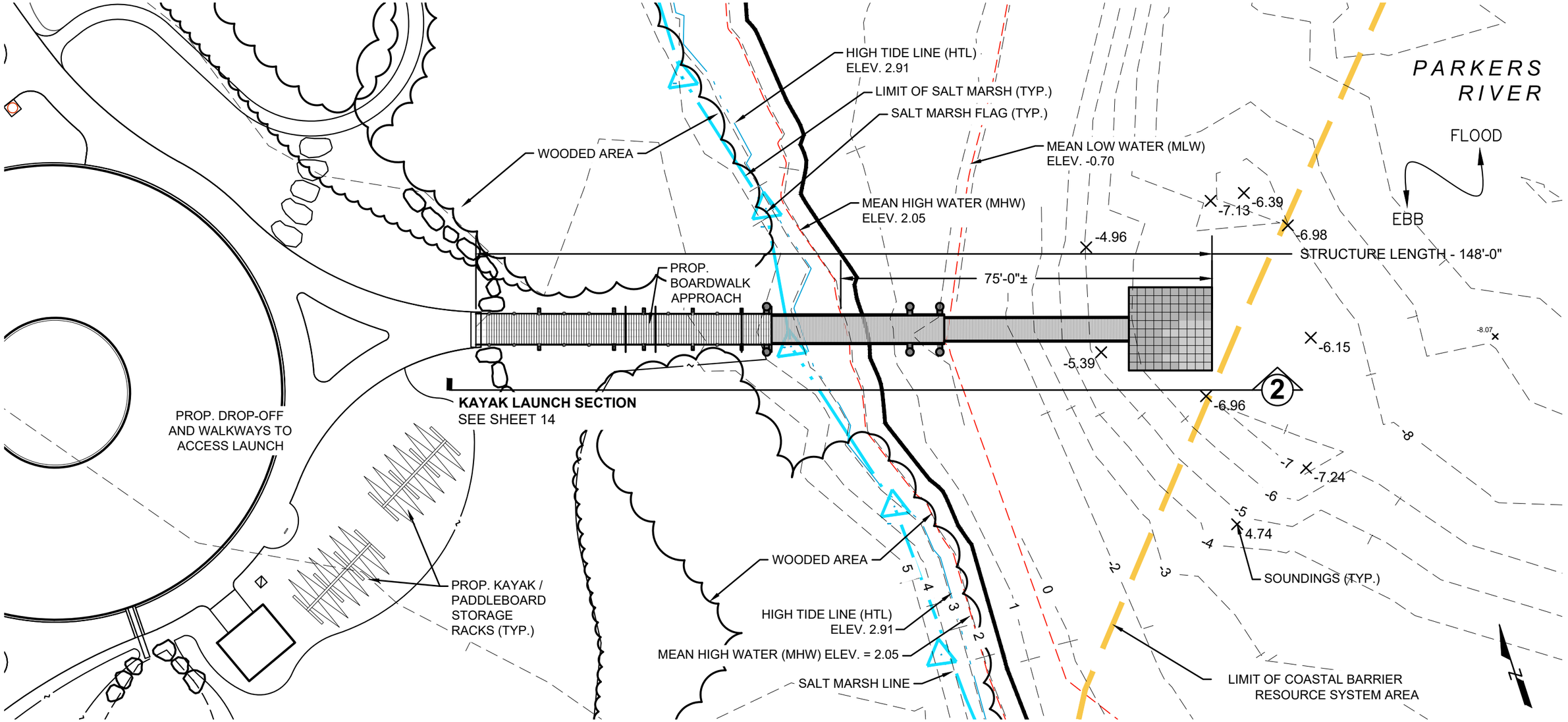
DATUM:
HORIZONTAL: NAD83, VERTICAL: NAVD88

RIVERWALK PARK
YARMOUTH, MA

AREA 1 - KAYAK LAUNCH - EXISTING CONDITIONS

SHEET NO. 11 OF 26

AS SHOWN



KAYAK LAUNCH SITE PLAN - PROPOSED

SCALE: 1" = 20' - 0"

CRITICAL ELEVATIONS

HIGH TIDE LINE (HTL) = ELEV. 2.91

MEAN HIGH WATER (MHW) = ELEV. 2.05

MEAN LOW WATER (MLW) = ELEV. -0.70

MEAN LOW LOW WATER (MLLW) = ELEV. -0.98

Station ID: 8447605
Hyannis Port , Hyannis Harbor, VM 2063, PID AR7934

*DATA SOURCED FROM NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

NOTE:

1. KAYAK LAUNCH MEANT FOR USE OF NON-MOTORIZED VESSELS INCLUDING BUT NOT LIMITED TO KAYAKS, CANOES AND STAND UP PADDLE BOARDS.

SOUNDINGS NOTE:

1. SOUNDINGS COLLECTED BY BETA GROUP ON MARCH 25, 2022 BETWEEN THE HOURS OF 11 AM AND 1 PM.
2. PER WWW.USHARBORS.COM: SOUTH YARMOUTH, MA TIDES WERE AS FOLLOWS, *AM HIGH: 9:11 AM +2.8', PM LOW: 3:33 PM -0.1.* PER THE NATIONAL WEATHER SERVICE, WEATHER ON MARCH 25, 2022 WAS OVERCAST, HIGH TEMP: 43° LOW TEMP: 28°

DATUM:
HORIZONTAL: NAD83, VERTICAL: NAVD88

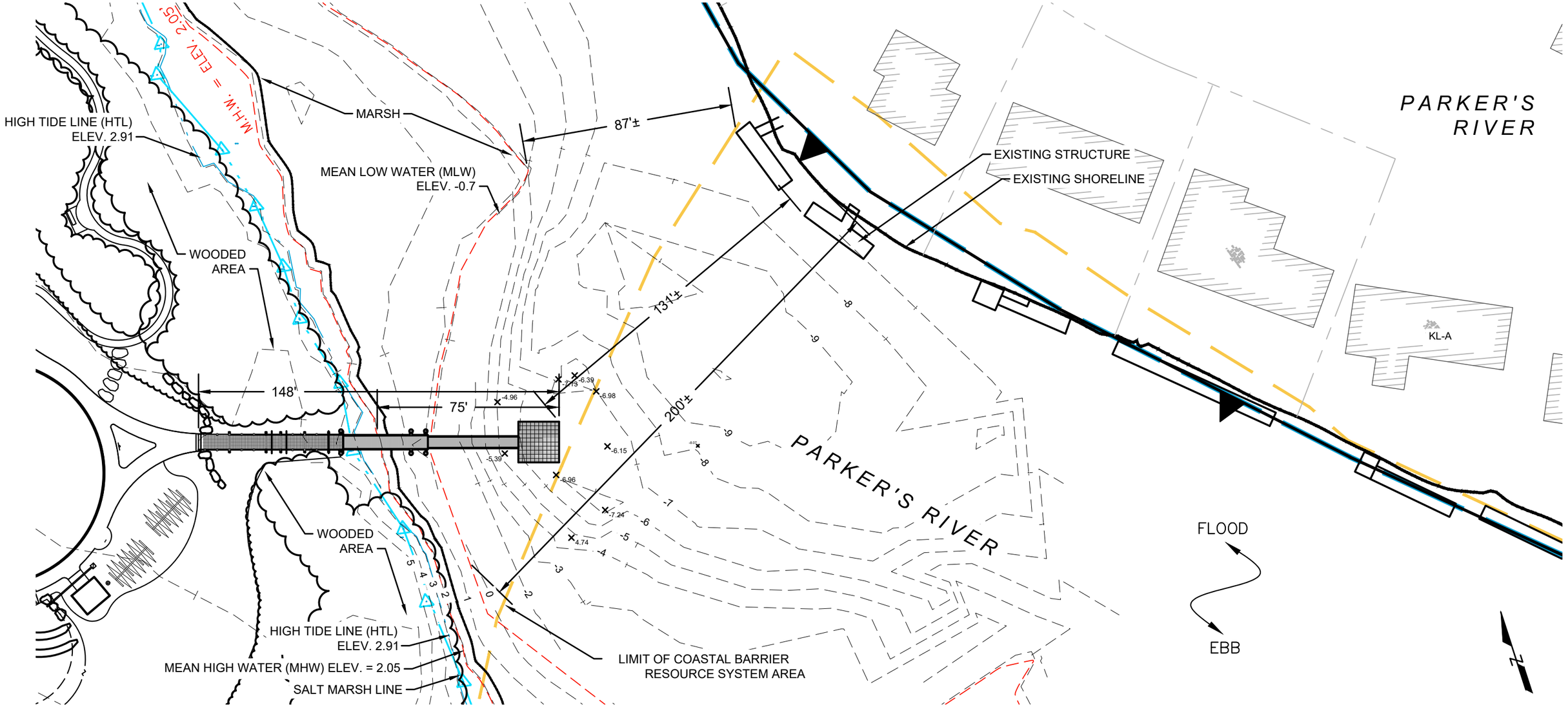
RIVERWALK PARK
YARMOUTH, MA

AREA 1 - KAYAK LAUNCH - PROPOSED CONDITIONS

SHEET NO. 12 OF 26

AS SHOWN

G:\PLANNING\ANDC\PC\19005\19056 - YARMOUTH MA RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLANSETPCN - ACOE SUBMISSION\AREA 1 - KAYAK LAUNCH - DETAILS.DWG



KAYAK LAUNCH - CONTEXT PLAN

SCALE: 1" = 40' - 0"

CRITICAL ELEVATIONS

HIGH TIDE LINE (HTL) = ELEV. 2.91

MEAN HIGH WATER (MHW) = ELEV. 2.05

MEAN LOW WATER (MLW) = ELEV. -0.70

MEAN LOW LOW WATER (MLLW) = ELEV. -0.98

Station ID: 8447605
Hyannis Port , Hyannis Harbor, VM 2063, PID AR7934

*DATA SOURCED FROM NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

SOUNDINGS NOTE:

1. SOUNDINGS COLLECTED BY BETA GROUP ON MARCH 25, 2022 BETWEEN THE HOURS OF 11 AM AND 1 PM.
2. PER WWW.USHARBORS.COM: SOUTH YARMOUTH, MA TIDES WERE AS FOLLOWS, *AM HIGH: 9:11 AM +2.8', PM LOW: 3:33 PM -0.1.* PER THE NATIONAL WEATHER SERVICE, WEATHER ON MARCH 25, 2022 WAS OVERCAST, HIGH TEMP: 43° LOW TEMP: 28°

DATUM:
HORIZONTAL: NAD83, VERTICAL: NAVD88

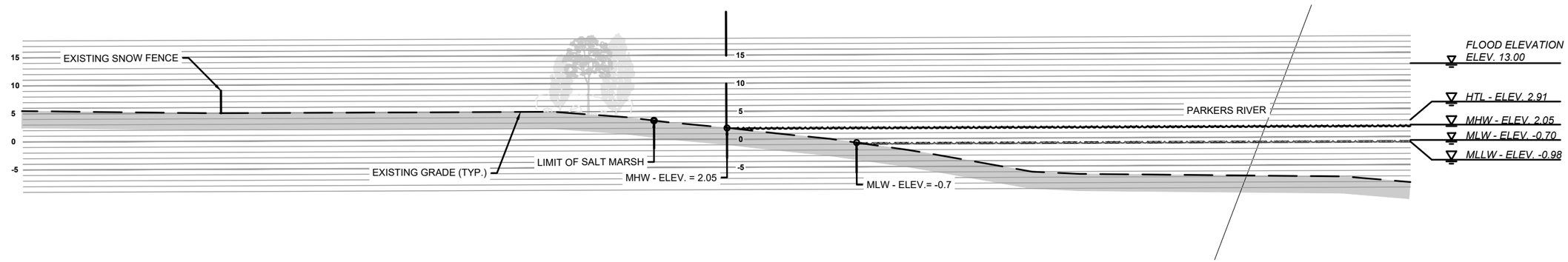
RIVERWALK PARK
YARMOUTH, MA

AREA 1 - KAYAK LAUNCH - CONTEXT PLAN

SHEET NO. 13 OF 26

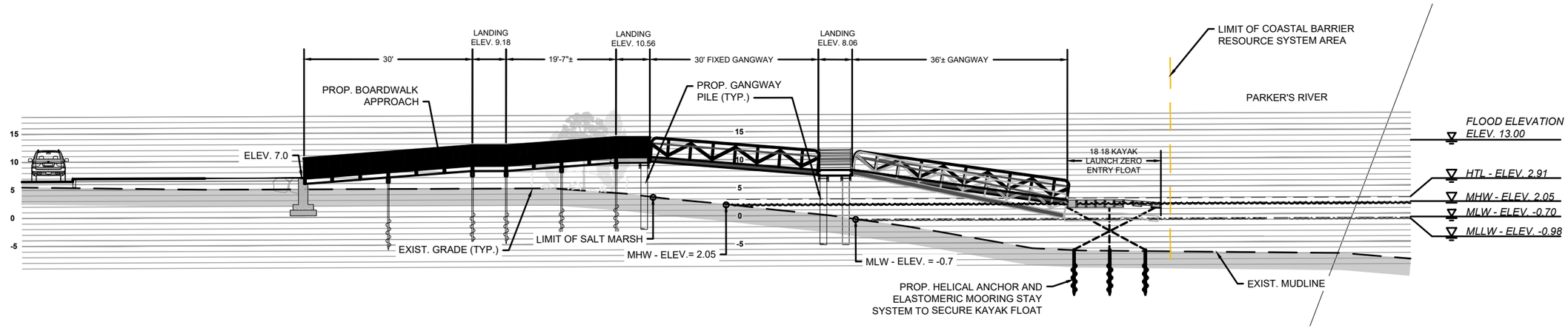
AS SHOWN

G:\PLANNING\ENVSC\PROJ\0005\0056 - YARMOUTH, MA\RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLAN SET\PCN - 4COE SUBMISSION\AREA1 - KAYAK LAUNCH - DETAILS.DWG



KAYAK LAUNCH - SECTION 1 - EXISTING

SCALE: 1" = 20' - 0"



KAYAK LAUNCH - SECTION 2 - PROPOSED

SCALE: 1" = 20' - 0"

CRITICAL ELEVATIONS

HIGH TIDE LINE (HTL) = ELEV. 2.91

MEAN HIGH WATER (MHW) = ELEV. 2.05

MEAN LOW WATER (MLW) = ELEV. -0.70

MEAN LOW LOW WATER (MLLW) = ELEV. -0.98

Station ID: 8447605
Hyannis Port , Hyannis Harbor, VM 2063, PID AR7934

*DATA SOURCED FROM NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

DATUM:
HORIZONTAL: NAD83, VERTICAL: NAVD88

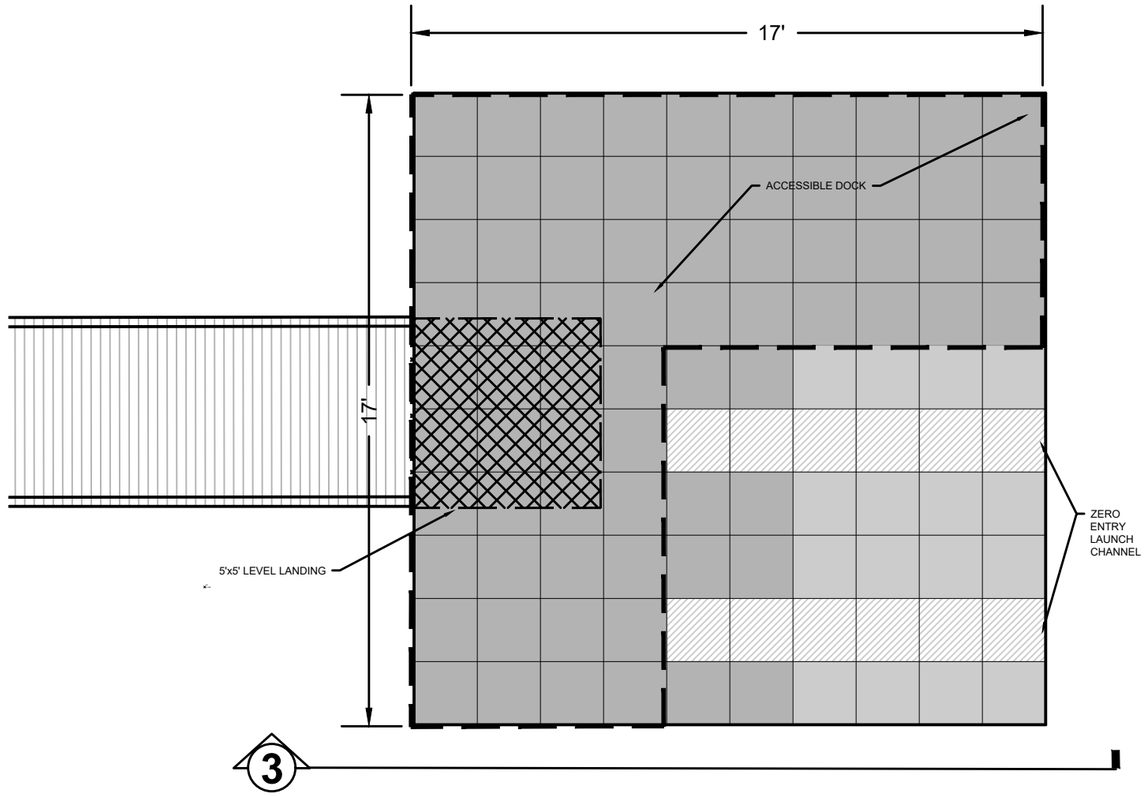
RIVERWALK PARK
YARMOUTH, MA

AREA 1 - KAYAK LAUNCH - SECTIONS

SHEET NO. 14 OF 26

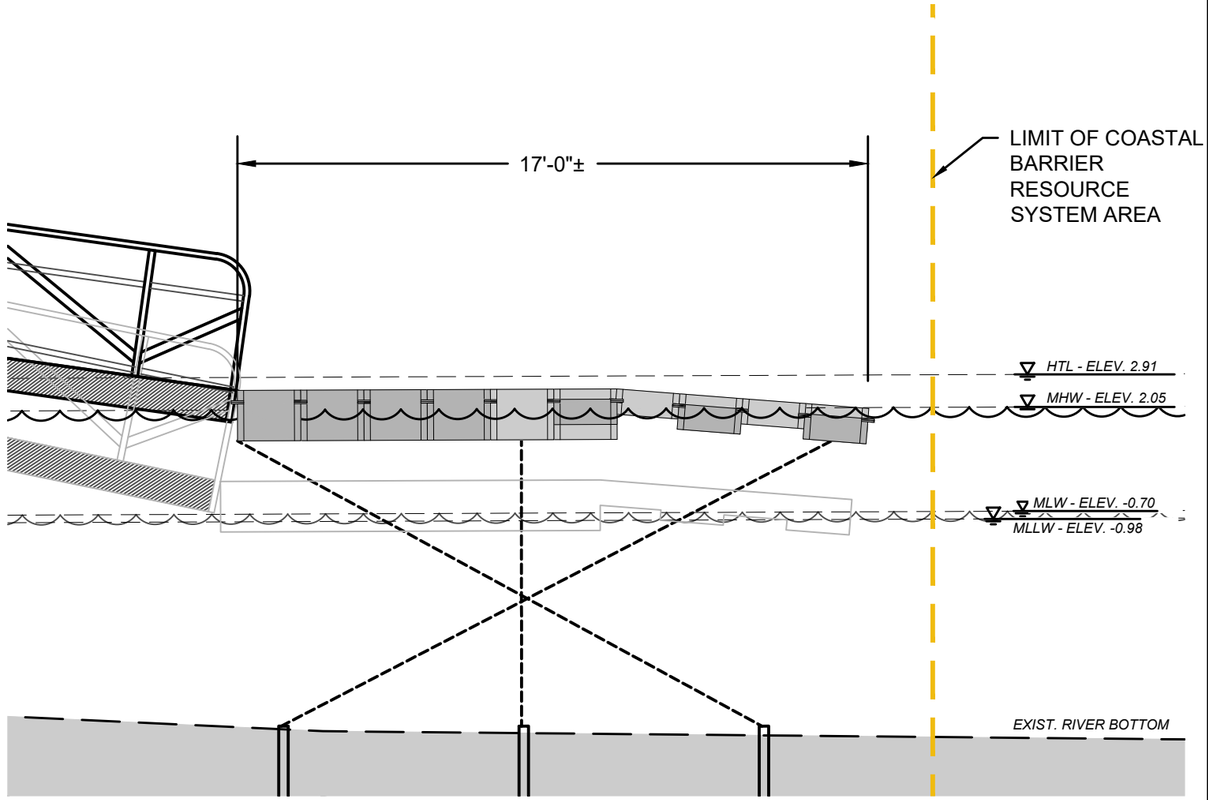
AS SHOWN

G:\PLANNING\NDSC\PE\10000S\10056 - YARMOUTH MA RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLAN SET\PCN - 4COE SUBMISSION\AREA 1 - KAYAK LAUNCH - DETAILS.DWG



KAYAK LAUNCH - ENLARGEMENT PLAN

SCALE: $\frac{1}{2}$" = 1' - 0"



KAYAK LAUNCH - SECTION / ELEVATION 3 - PROPOSED

SCALE: $\frac{1}{2}$" = 1' - 0"

CRITICAL ELEVATIONS

HIGH TIDE LINE (HTL) = ELEV. 2.91

MEAN HIGH WATER (MHW) = ELEV. 2.05

MEAN LOW WATER (MLW) = ELEV. -0.70

MEAN LOW LOW WATER (MLLW) = ELEV. -0.98

Station ID: 8447605
Hyannis Port , Hyannis Harbor, VM 2063, PID AR7934

*DATA SOURCED FROM NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

DATUM:
HORIZONTAL: NAD83, VERTICAL: NAVD88

RIVERWALK PARK
YARMOUTH, MA

AREA 1 - KAYAK LAUNCH - DETAILS

SHEET NO. 15 OF 26

AS SHOWN

G:\PLANNING LANDSCAPE\19005\19056 - YARMOUTH, MA RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLAN SET\PCN - ACOE SUBMISSION AREA 1 - KAYAK LAUNCH - DETAILS.DWG

PROP. BOARDWALK - WESTERN SEGMENT

H.T.L. = ELEV. 2.91'

LIMIT OF COASTAL BARRIER RESOURCE SYSTEM AREA

EXIST. PROPERTY LINE

PROP. OVERLOOK 3

MEAN HIGH WATER (MHW) - ELEV. 2.05

PROP. BOARDWALK BENCH (TYP.)

BVW ISLAND

PROP. BOARDWALK APPROACH RAMP

PROP. BOARDWALK APPROACH PATH - WEST

WETLAND AREA "3"

ZONE AE (EL 12)

ZONE AE (EL 13)

PROP. OVERLOOK 2

WOODED AREA

LIMIT OF SALT MARSH (TYP.)

MEAN HIGH WATER (MHW) - ELEV. 2.05

HIGH TIDE LINE (HTL) ELEV. 2.91

PROP. BOARDWALK - CENTRAL SEGMENT

PROP. BOARDWALK BENCH (TYP.)

PROP. OVERLOOK 1

MARSH

H.T.L. = ELEV. 2.91'

PROP. BOARDWALK - EASTERN SEGMENT

EXIST. TIDAL CREEK

WOODED AREA

PROP. BOARDWALK APPROACH RAMP - EAST

PROP. BOARDWALK APPROACH PATH - EAST

WOODED AREA

PROP. PEDESTRIAN BRIDGE

WOODED AREA

PARKERS RIVER

EBB

FLOOD

DATUM:
HORIZONTAL: NAD83, VERTICAL: NAVD88

RIVERWALK PARK

YARMOUTH, MA

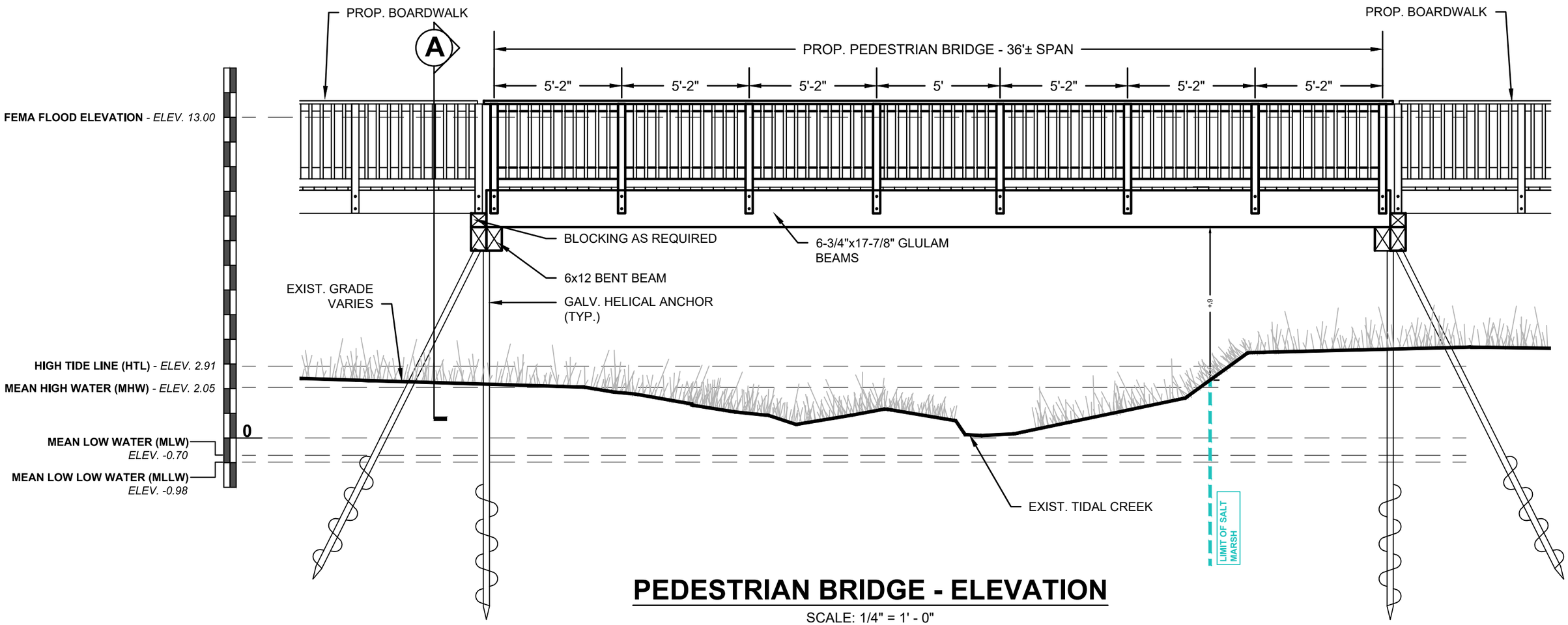
AREA 2 - BOARDWALK - OVERALL SITE PLAN

SHEET NO. 16 OF 26

0 60 120

SCALE IN FEET: 1"=60'

G:\PLANNING\LNDSCAPE\19000S\19006 - YARMOUTH, MA RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLAN SET\PCS - ACOE SUBMISSION\AREA 2 - BOARDWALK - OVERALL SITE PLAN.DWG



PEDESTRIAN BRIDGE - ELEVATION

SCALE: 1/4" = 1' - 0"

DATUM:
HORIZONTAL: NAD83, VERTICAL: NAVD88

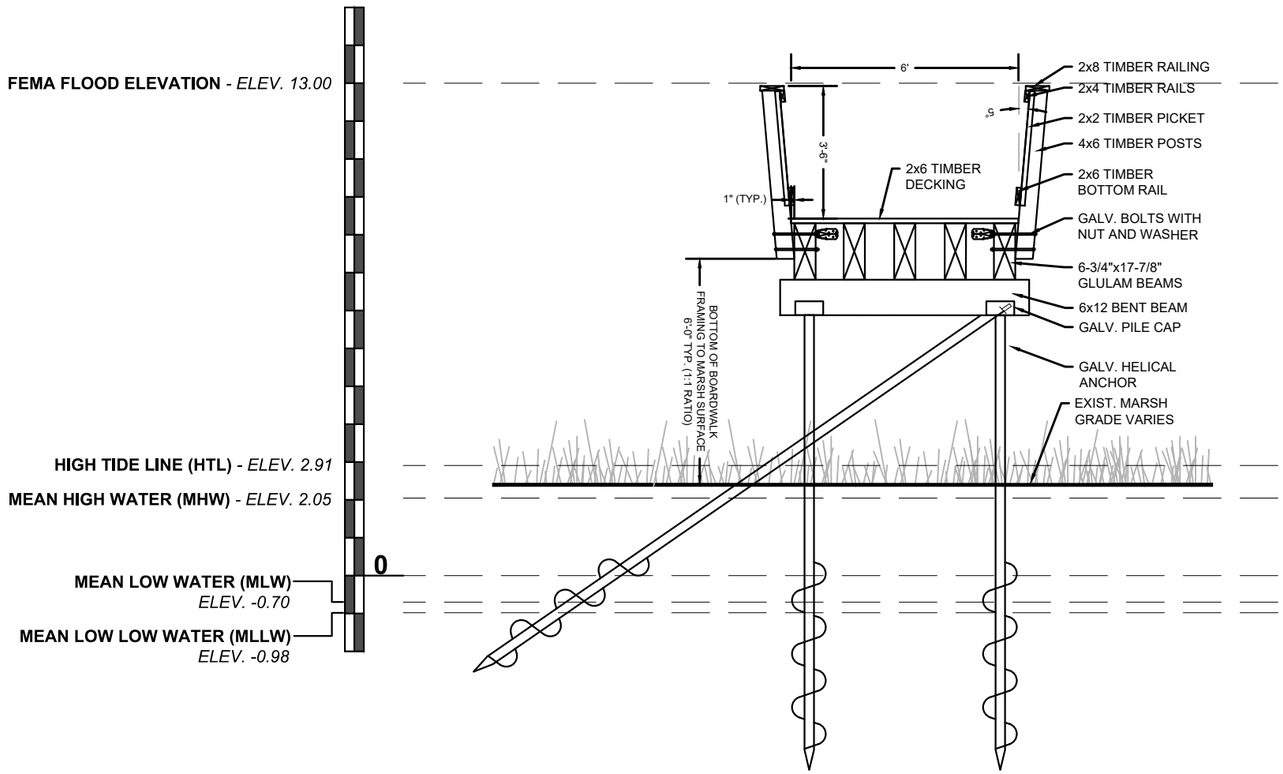
RIVERWALK PARK
YARMOUTH, MA

AREA 2 - BOARDWALK DETAILS - 1

SHEET NO. 17 OF 26

AS SHOWN

G:\PLANNING LANDSC\PROJ\0805\1056 - YARMOUTH, MA RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLAN SET\PCN - 4\COE SUBMISSION-AREA 2 - BOARDWALK DETAILS - 1.DWG



PEDESTRIAN BRIDGE - SECTION A @ SOUTH PIER BENT

SCALE: 1/4" = 1' - 0"

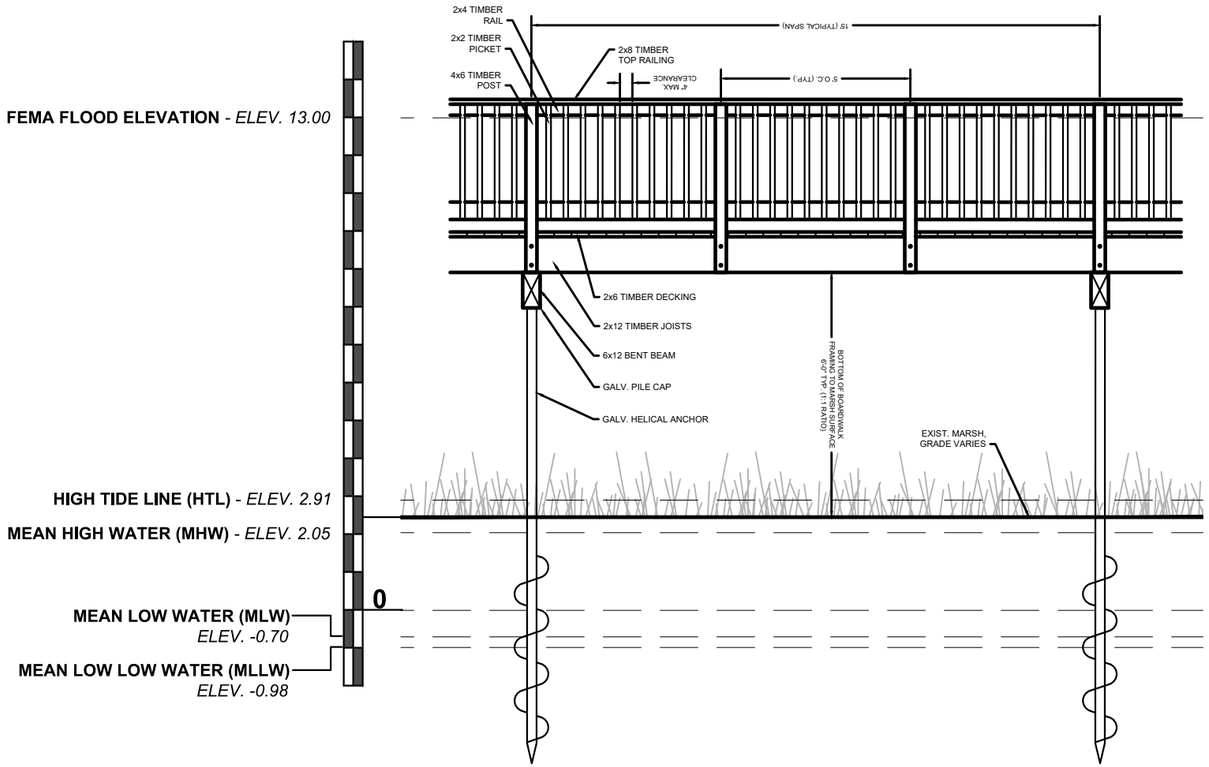
DATUM:
HORIZONTAL: NAD83, VERTICAL: NAVD88

RIVERWALK PARK
YARMOUTH, MA

AREA 2 - BOARDWALK DETAILS - 2

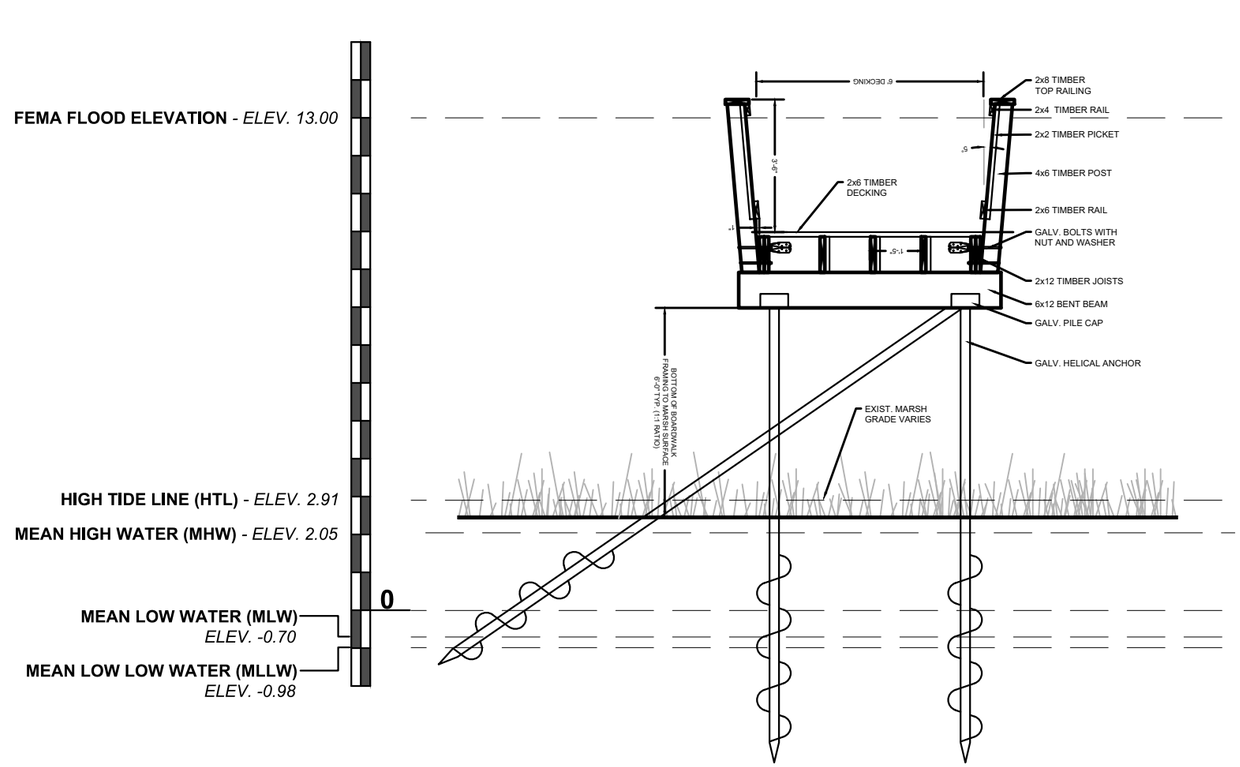
SHEET NO. 18 OF 26

AS SHOWN



BOARDWALK - TYPICAL ELEVATION

SCALE: 1/4" = 1' - 0"



BOARDWALK - TYPICAL SECTION

SCALE: 1/4" = 1' - 0"

DATUM:
HORIZONTAL: NAD83, VERTICAL: NAVD88

RIVERWALK PARK
YARMOUTH, MA

AREA 2 - BOARDWALK DETAILS - 3

SHEET NO. 19 OF 26

AS SHOWN

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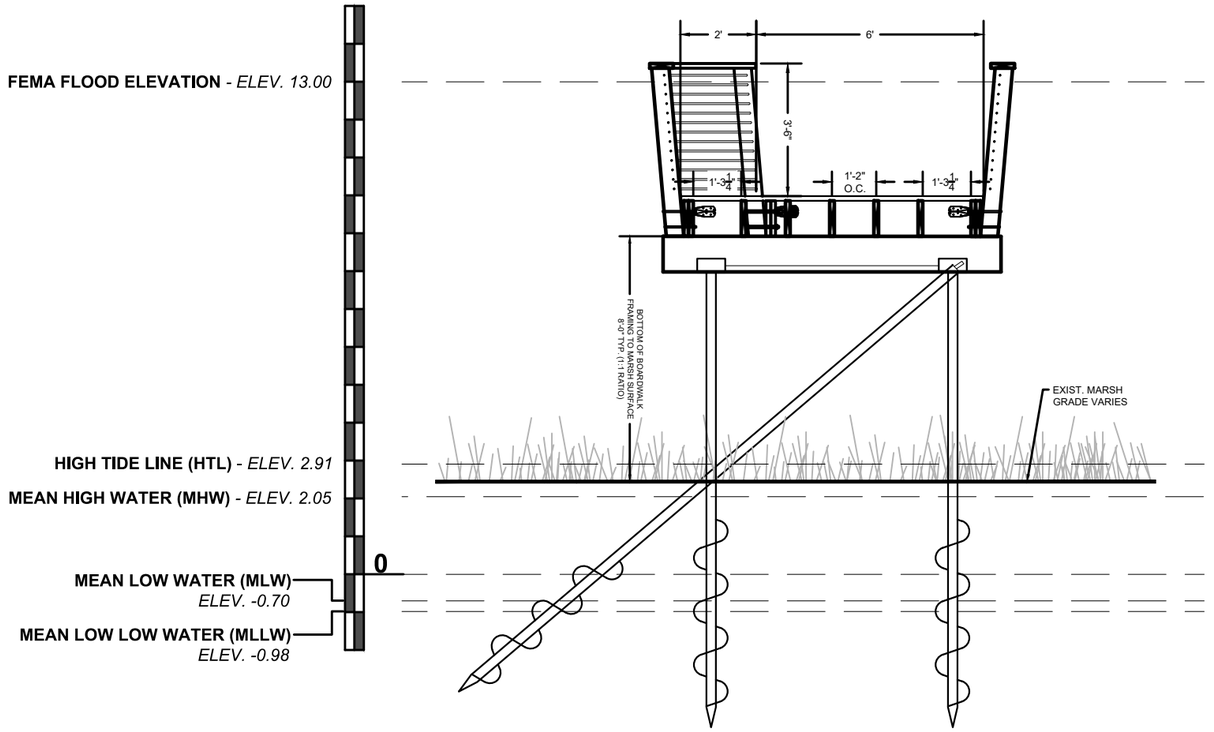


BOARDWALK OVERLOOK - TYPICAL SECTION

SCALE: 1/4" = 1' - 0"

NOTE:
1. SEE PLANS FOR OVERLOOK LOCATIONS

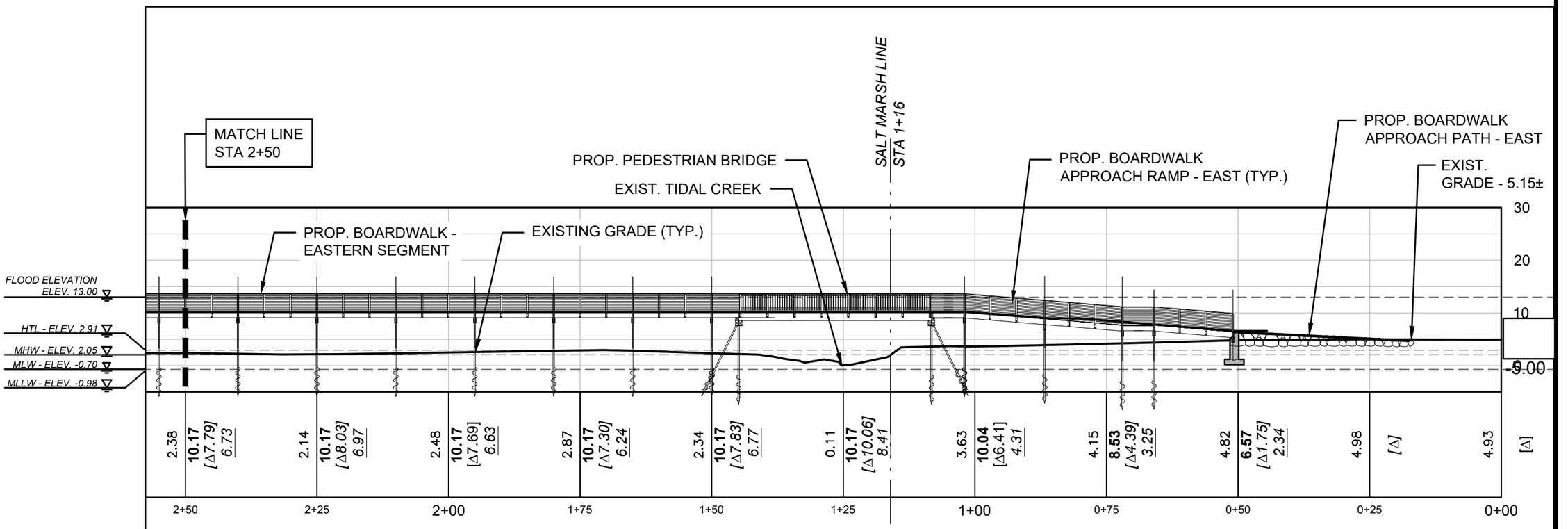
DATUM:
HORIZONTAL: NAD83, VERTICAL: NAVD88

RIVERWALK PARK
YARMOUTH, MA

AREA 2 - BOARDWALK DETAILS - 4

SHEET NO. 20 OF 26

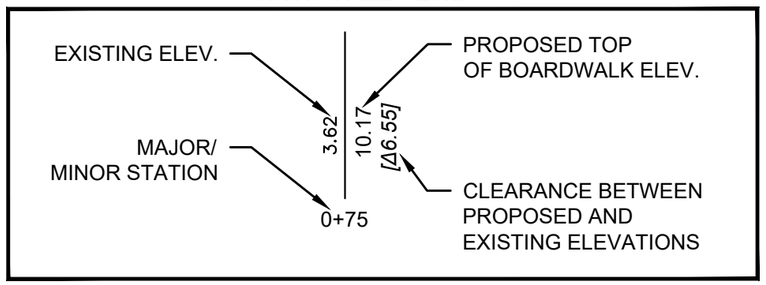
AS SHOWN



EASTERN SEGMENT OF BOARDWALK LOOP - PROFILE/ELEVATION A

SCALE: 1" = 20' - 0"

STATION LEGEND



MINIMUM 1:1 CLEARANCE

DATUM:
HORIZONTAL: NAD83, VERTICAL: NAVD88

CRITICAL ELEVATIONS

HIGH TIDE LINE (HTL) = ELEV. 2.91

MEAN HIGH WATER (MHW) = ELEV. 2.05

MEAN LOW WATER (MLW) = ELEV. -0.70

MEAN LOW LOW WATER (MLLW) = ELEV. -0.98

Station ID: 8447605
Hyannis Port , Hyannis Harbor, VM 2063, PID AR7934

*DATA SOURCED FROM NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

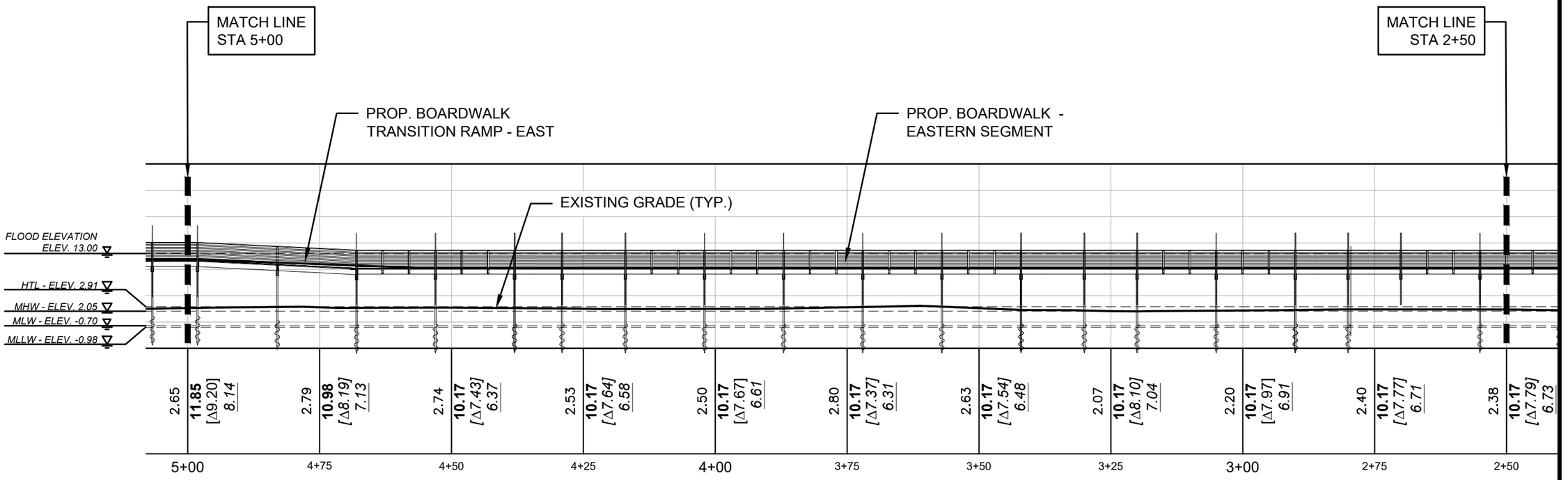
RIVERWALK PARK
YARMOUTH, MA

AREA 2 - BOARDWALK PROFILE - 1

SHEET NO. 21 OF 26

AS SHOWN

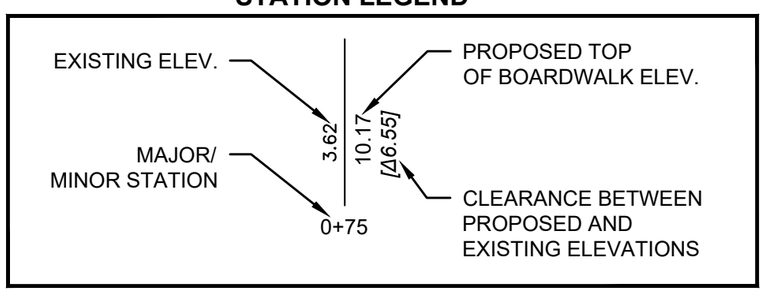
G:\PLANNING LAYOUT\PROJECTS\0005 19056 - YARMOUTH MA RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLAN SET\PCN - ACOE SUBMISSION\AREA 2 - BOARDWALK PROFILE - 6.DWG



EASTERN SEGMENT OF BOARDWALK LOOP - PROFILE/ELEVATION B

SCALE: 1" = 20' - 0"

STATION LEGEND



MINIMUM 1:1 CLEARANCE

DATUM:
HORIZONTAL: NAD83, VERTICAL: NAVD88

CRITICAL ELEVATIONS

HIGH TIDE LINE (HTL) = ELEV. 2.91

MEAN HIGH WATER (MHW) = ELEV. 2.05

MEAN LOW WATER (MLW) = ELEV. -0.70

MEAN LOW LOW WATER (MLLW) = ELEV. -0.98

Station ID: 8447605
Hyannis Port , Hyannis Harbor, VM 2063, PID AR7934

*DATA SOURCED FROM NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

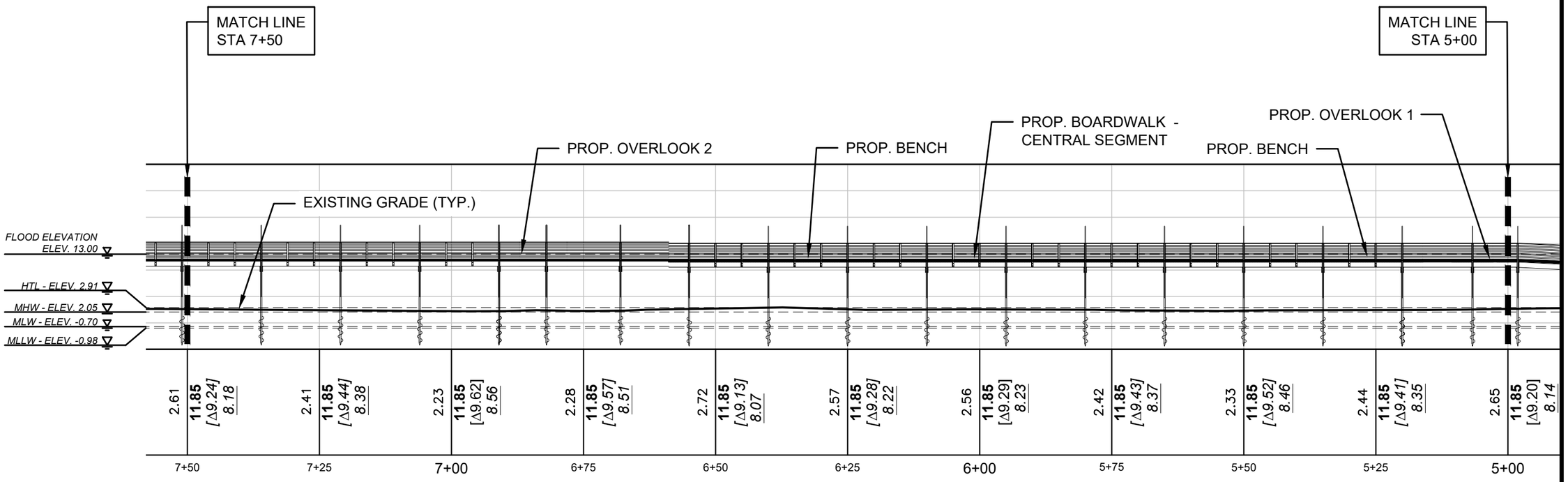
RIVERWALK PARK
YARMOUTH, MA

AREA 2 - BOARDWALK PROFILE - 2

SHEET NO. 22 OF 26

AS SHOWN

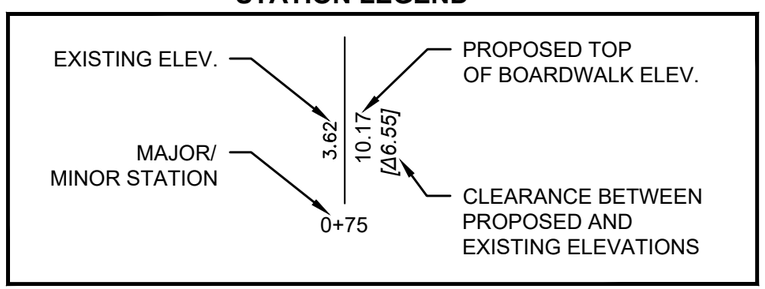
G:\PLANNING LANDSCAPE\19005\19006 - YARMOUTH, MA RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLAN SET\PCN - ACOE SUBMISSION AREA 2 - BOARDWALK PROFILE - 6.DWG



CENTRAL SEGMENT OF BOARDWALK LOOP - PROFILE/ELEVATION C

SCALE: 1" = 20' - 0"

STATION LEGEND



MINIMUM 1:1 CLEARANCE

DATUM:
HORIZONTAL: NAD83, VERTICAL: NAVD88

CRITICAL ELEVATIONS

HIGH TIDE LINE (HTL) = ELEV. 2.91

MEAN HIGH WATER (MHW) = ELEV. 2.05

MEAN LOW WATER (MLW) = ELEV. -0.70

MEAN LOW LOW WATER (MLLW) = ELEV. -0.98

Station ID: 8447605
Hyannis Port , Hyannis Harbor, VM 2063, PID AR7934

*DATA SOURCED FROM NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

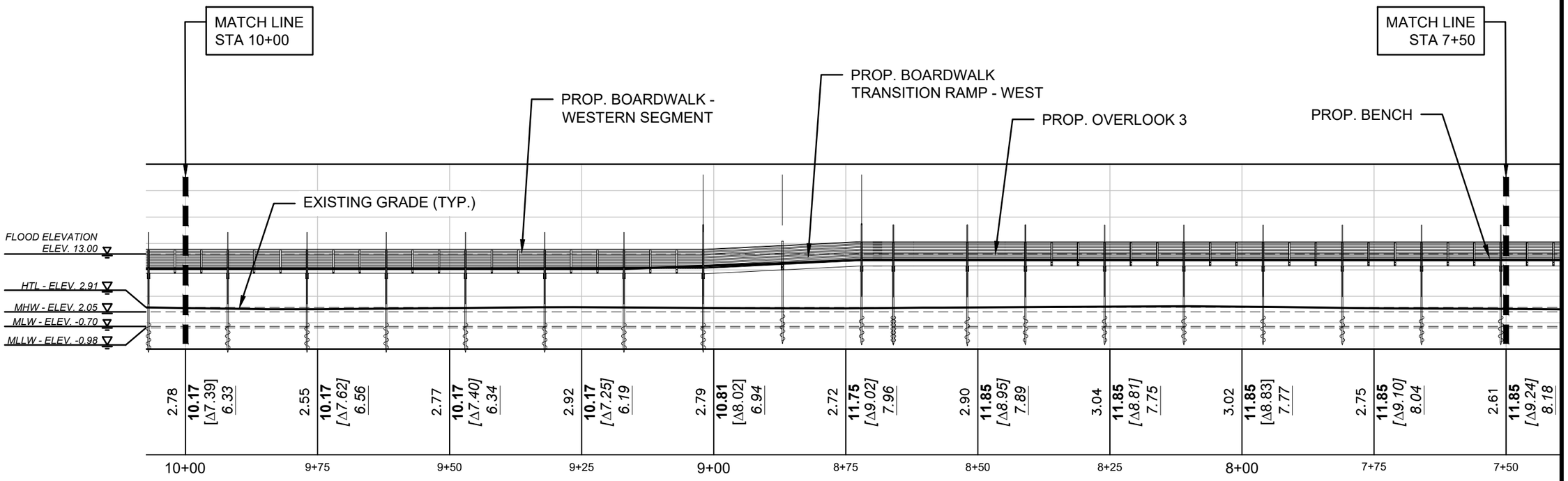
RIVERWALK PARK
YARMOUTH, MA

AREA 2 - BOARDWALK PROFILE - 3

SHEET NO. 23 OF 26

AS SHOWN

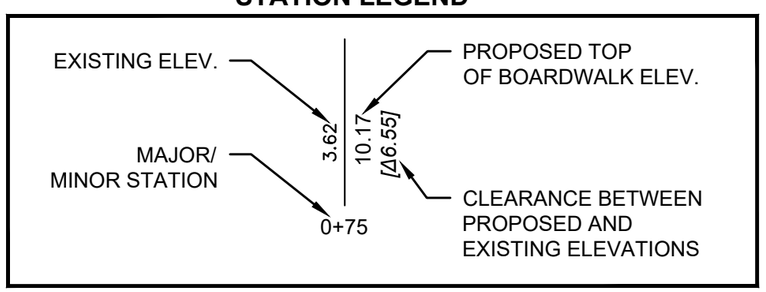
G:\PLANNING LANDSCAPE\1000S\1006 - YARMOUTH, MA RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLAN SET\PCN - 3\CDE SUBMISSION\AREA 2 - BOARDWALK PROFILE - 6.DWG



CENTRAL SEGMENT OF BOARDWALK LOOP - PROFILE/ELEVATION D

SCALE: 1" = 20' - 0"

STATION LEGEND



MINIMUM 1:1 CLEARANCE

DATUM:
HORIZONTAL: NAD83, VERTICAL: NAVD88

CRITICAL ELEVATIONS

HIGH TIDE LINE (HTL) = ELEV. 2.91

MEAN HIGH WATER (MHW) = ELEV. 2.05

MEAN LOW WATER (MLW) = ELEV. -0.70

MEAN LOW LOW WATER (MLLW) = ELEV. -0.98

Station ID: 8447605
Hyannis Port , Hyannis Harbor, VM 2063, PID AR7934

*DATA SOURCED FROM NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

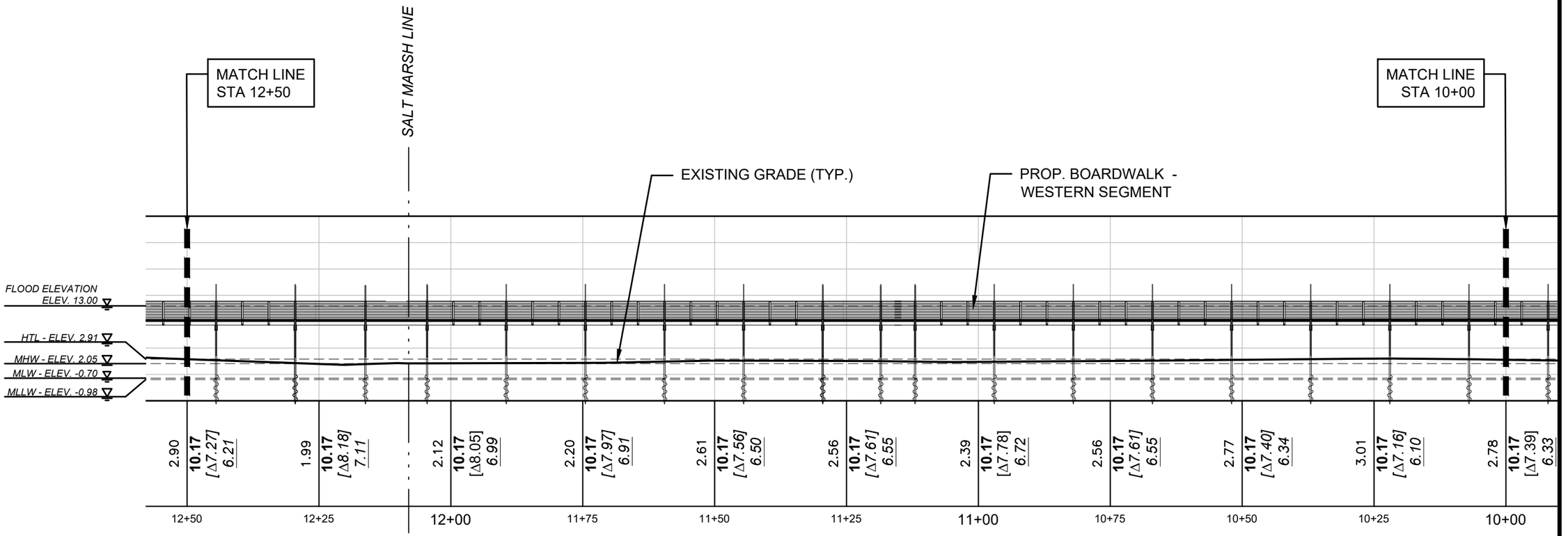
RIVERWALK PARK
YARMOUTH, MA

AREA 2 - BOARDWALK PROFILE - 4

SHEET NO. 24 OF 26

AS SHOWN

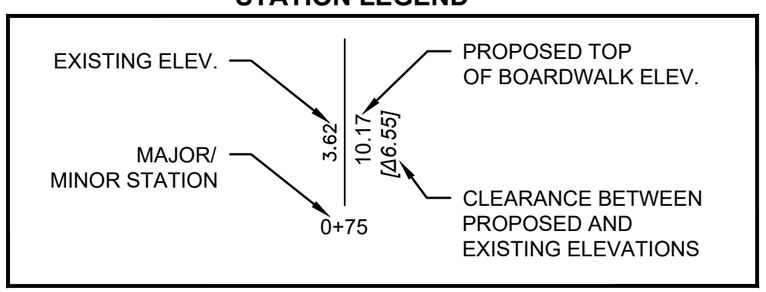
G:\PLANNING LANDSCAPE\10005\10006 - YARMOUTH, MA RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLAN SET\PCN - ACOE SUBMISSION AREA 2 - BOARDWALK PROFILE - 6.DWG



CENTRAL/WESTERN SEGMENT OF BOARDWALK LOOP - PROFILE/ELEVATION E

SCALE: 1" = 20' - 0"

STATION LEGEND



MINIMUM 1:1 CLEARANCE

DATUM:
HORIZONTAL: NAD83, VERTICAL: NAVD88

CRITICAL ELEVATIONS

HIGH TIDE LINE (HTL) = ELEV. 2.91

MEAN HIGH WATER (MHW) = ELEV. 2.05

MEAN LOW WATER (MLW) = ELEV. -0.70

MEAN LOW LOW WATER (MLLW) = ELEV. -0.98

Station ID: 8447605
Hyannis Port , Hyannis Harbor, VM 2063, PID AR7934

*DATA SOURCED FROM NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

RIVERWALK PARK
YARMOUTH, MA

AREA 2 - BOARDWALK PROFILE - 5

SHEET NO. 25 OF 26

AS SHOWN

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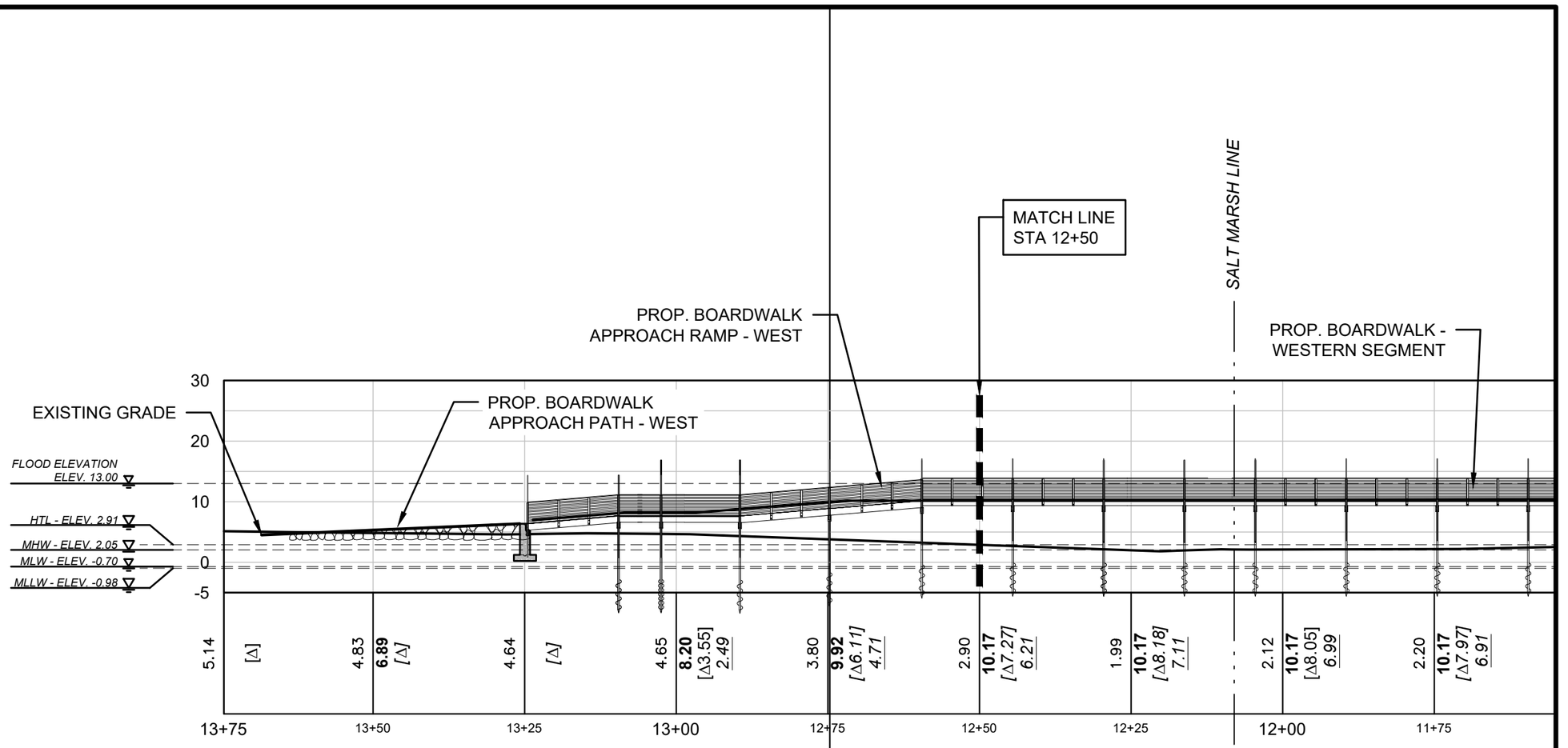
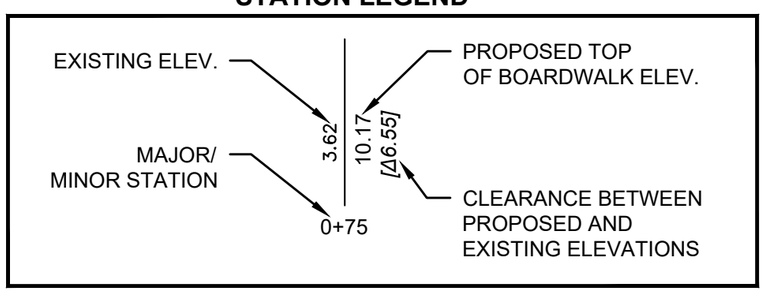


WESTERN SEGMENT OF BOARDWALK LOOP - PROFILE/ELEVATION F

SCALE: 1" = 20' - 0"

STATION LEGEND



MINIMUM 1:1 CLEARANCE

DATUM:
HORIZONTAL: NAD83, VERTICAL: NAVD88

CRITICAL ELEVATIONS

HIGH TIDE LINE (HTL) = ELEV. 2.91

MEAN HIGH WATER (MHW) = ELEV. 2.05

MEAN LOW WATER (MLW) = ELEV. -0.70

MEAN LOW LOW WATER (MLLW) = ELEV. -0.98

Station ID: 8447605
Hyannis Port , Hyannis Harbor, VM 2063, PID AR7934

*DATA SOURCED FROM NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

RIVERWALK PARK
YARMOUTH, MA

AREA 2 - BOARDWALK PROFILE - 6

SHEET NO. 26 OF 26

AS SHOWN

G:\PLANNING LANDSCAPE\10005\10006 - YARMOUTH, MA RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLAN SET\PCN - ACOE SUBMISSION\AREA 2 - BOARDWALK PROFILE - 6.DWG

Massachusetts Department of Transportation

Region 5 Highway Division

Permit # 5-2023-0263

5-2023-0263

PERMIT - YARMOUTH

Subject to all terms, conditions, and restrictions printed or written below, permission is hereby granted to **YARMOUTH PLANNING**, Kathy Williams, 1146 Route 28, Yarmouth, MA 02664 to enter upon State Highway in the Town of **YARMOUTH** on Auto Route 28, locally known as Main Street, for the purpose of constructing a driveway to their property between approximate Stations 134+86 and 135+32 at the southerly line of the State Highway Layout (SHLO) Line, flaring to Stations 134+66 and 135+52 at the edge of the hardened surface, with light grading within the project limits as shown on the attached sketch. The work will include installing vertical granite curbing, a crosswalk across the driveway opening, cement concrete sidewalk, wheelchair ramps, and loam and seed.

PLEASE BE ADVISED THAT THIS PERMIT WILL NOT TAKE EFFECT UNTIL A COPY OF THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) CONSTRUCTION GENERAL PERMIT (CGP) HAS BEEN UPLOADED IN SHAPS.

This Permit is being granted to provide access for the redevelopment and restoration of a 23-acre parcel site previously utilized for the Yarmouth Drive-In Theater, owned by the Town of Yarmouth, into a park to be known as Riverwalk Park, which will include open grassed areas, walking paths, a kayak launch, and an elevated boardwalk over the salt marsh to be located at #669 Main Street. The project site is bordered by commercial developments associated with Route 28 to the north, residential housing to the west, the Parkers River to the east, and the remainder of the Lewis Pond Marsh Conservation Area to the south. A description of the project is outlined in the Commonwealth of Massachusetts, Certificate of the Secretary of Energy and Environmental Affairs on the Single Environmental Impact Report (E.E.A. #16623), dated June 10, 2023. This document is considered an integral part of this Permit, and conditions must be fulfilled as described in this document.

Access to the proposed Riverwalk Park will be provided by one (1) “Full-Access” driveway on Main Street (Route 28).

THIS PERMIT IS BEING ISSUED FOR WORK WITHIN THE SHLO ONLY. AUTHORIZATION TO PERFORM ASSOCIATED WORK OUTSIDE OF SHLO MUST BE GRANTED BY IMPACTED PROPERTY OWNERS.

District 5, 1000 County Street Taunton, MA 02780
Tel: (857) 368-5000, FAX: (508) 880-6102
www.mass.gov/orgs/highway-division

The designer of this project, BETA Group Inc., is aware of the upcoming MassDOT, Highway Division Project #608264 - Yarmouth Corridor Improvements project which will encompass the frontage along the Town owned property at #669 Route 28, and the associated work along Route 28 proposed under this Permit. The 608264 project intends to build a 10' wide shared use path (SUP) with a 5' grass buffer strip between the SUP and the curb line along the frontage of #669 Main Street. If the construction of the proposed permit work shown on this plan occurs prior to the construction of MassDOT, Highway Division Project #608264, the work installed under this Permit will only serve in a temporary capacity and would likely be removed in order to build the 608264 project. Also, the location of the proposed wastewater pump station building, and/or the associated walls/grading/etc., may present conflicts with the future 608264 SUP as well. The proposed building project, and any potential conflicts with the 608264 SUP, will need to be fully explored and addressed. The construction of the proposed wastewater pump station should not conflict with or preclude the future SUP being designed for MassDOT by GPI. BETA and the Town of Yarmouth must coordinate the proposed design, and schedule of the work shown under this Permit, with MassDOT and GPI to ensure that all parties are aware of the intended project timetables, conflicts, and the potential required removal and reconstruction of portions of the work done under this Permit project.

Any change in design, or use of property, additional building or lot development will require the Grantee(s) to reapply online (*https://shaps.massdot.state.ma.us/*) for a new or amended Driveway Permit.

Please note that any Utility work within the SHLO requires a separate Permit. In the case of telephone/water/sewer/gas/electric/cable, the respective utility needs to apply online (*https://shaps.massdot.state.ma.us/*) under a separate Permit Application(s) and they must be listed as owner and applicant.

All work, including the traffic management plan, is to be done as described herein and as shown on the approved plan(s)/documentation as follows:

- "Permit to Access State Highway, Town of Yarmouth, Massachusetts – Yarmouth Riverwalk Park, 669 Main Street (Route 28), West Yarmouth, MA" as drafted by BETA-Inc. Chappell Engineering Associates, LLC, R.K. Executive Center, 201 Boston Post Road, West Marlborough, MA 01752, tel.: (508) 481-7400, and dated December 5, 2023.

- Stormwater Management System Report – Yarmouth Riverwalk Park, 669 Route 28, Yarmouth, Massachusetts, prepared for Town of Yarmouth, 1146 Route 28, Yarmouth, MA, prepared by BETA Group, Inc., and dated February 5, 2024.

States of Emergencies and Executive Orders

In addition to the conditions and restrictions contained herein, the Grantee is responsible for complying with any relevant Executive Orders or States of Emergencies that may be issued by the Governor's Office while this permit is active. The Governor may declare a State of Emergency in the event or imminent threat of natural or man-made disasters. A State of Emergency can cover a specific municipality, multiple communities, or the entire Commonwealth.

Detailed Information on States of Emergencies and Executive Orders can be found on the Mass.GOV website. *https://www.mass.gov/service-details/state-of-emergency-infomation* and *https://www.mass.gov/massachusetts-executive-orders*.

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Prior to any work being done within the SHLO, the Grantee(s) must upload/submit a Work Request in State Highway Access Permit System (SHAPS) to obtain approval for the proposed work schedule. Said form to be completed/uploaded can be found under the Forms and Sample Submission Documents tab and is entitled "Work Request Form D1 - D5". One (1) of these forms must be uploaded by the close of business every Thursday for the entire duration of the project in order to request approval for the following week's work schedule.

The Grantee(s) must adhere to 520 CMR 14.00: Excavation and Trench Safety as promulgated by the Department of Public Safety in conjunction with the Division of Occupational Safety pursuant to authority granted by M.G.L. c. 82a § 1. If not already approved, a Trench Permit Rider must be completed and uploaded to SHAPS before any trench work is performed under this Permit.

The Grantee or Applicant shall **record** any Vehicular Access Permit or any Non-Vehicular Access Permit involving drainage at the appropriate **Registry of Deeds**. Any Permit issued by MassDOT, Highway Division, that requires recording shall not be effective until recorded at the appropriate Registry of Deeds and a copy of the recorded document is submitted to the District Highway Director.

The Grantee(s) must strictly adhere to the following local approvals which are considered an integral part of this Permit:

1) Order of Conditions (MassDEP # 083-2372) and (MassDEP #083-2373) issued by the Yarmouth Conservation Commission.
2) Stormwater Management Permit, file Number SW2023-001 issued by the Yarmouth Conservation Commission.
3) A Notice of Decision, Petion No. 5003, issued by the Town of Yarmouth Board of Appeals
4) 401 Water Quality Certification (WQC) issued by the Department of Environmental Protection (MassDEP)
5) Chapter 91 (c.91) Waterways License issued by the Department of Environmental Protection.
6) General Permit, File Number: NAE-2022-02890, issued by the Department of the Army - U.S. Army Corps of Engineers (USACE) in accordance with Section 404 of the Federal Clean Water Act.

The Grantee(s) shall be responsible for all litter and debris generated from their property during the work as described herein and/or from all prospective residents, visitors, or patrons of all existing or proposed facilities mentioned herein. This responsibility shall remain in effect for the entirety of all current or future owners of said property. The Grantee(s) shall perform routine inspections and upkeep within the State Highway Layout. If conditions warrant an individual to enter in or within the proximity of a travelled way, the Grantee(s) shall assume all liability and responsibility for the removal of all litter and debris or the hiring of an appropriate party to perform such duties. Significant work within the travelled way may require a police detail. In consideration to all abutters, the Grantee(s) must take notice of the drifting of debris and the removal thereof. If it is found that this requirement is not being fulfilled in a satisfactory manner, MassDOT, Highway Division may decide to clean the area at the Grantee's expense.

PROPOSED SIDEWALK CONSTRUCTION

The Grantee(s) shall construct proposed sidewalks/wheelchair ramps as approved in Permit Plans.

To install the granite curbing, the roadway shall be sawcut in neat, true lines. The granite curbing shall be installed according to MassDOT, Highway Division standards. All abutting edges of the existing pavement shall be coated with RS-1 emulsion immediately prior to the placement of the permanent hot mix asphalt.

Sidewalks/wheelchairs ramps must be graded in such a manner that no ponding of water occurs within the Highway Layout. If such ponding results, the Grantee(s) shall be responsible for its correction.

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The Grantee(s) will construct sidewalks and handicap ramps in conformance with 521 CMR Rules and Regulations of the Architectural Access Board (AAB) and Americans with Disabilities Act (ADA) within all sidewalk areas included in this project. The approved driveway design, while depicting the detectable warning panels, is not an indication of conformance with AAB & ADA regulations. The Grantee(s) is solely responsible for ensuring the ramps, landing areas, and detectable panels are designed and constructed to meet AAB & ADA regulations.

In reference to poles located near wheelchair ramps or near the edge of the roadway, be advised that a minimum of 1-1/2' (feet) is required between the edge of the roadway and the face/front of the pole. Additionally, a minimum clear distance around poles shall be 3' (feet), excluding the width of curb.

The Grantee(s) shall be responsible for the maintenance and repair of the portion of the proposed sidewalk located within the State Highway Layout and shall routinely inspect the sidewalk for deficiencies such as settling, heaving, cracks, etc. This responsibility shall remain in effect until MassDOT, Highway Division reconstructs the sidewalk.

The Grantee(s) must contact the appropriate utility company to remove and reset any utility pole(s), hydrants or any other items located within the proposed sidewalk area. The Grantee(s) may be required to pay the utility company for all cost associated with relocating said items.

Upon completion of the work, the Grantee or Agent must upload into SHAPS, a letter from the local building inspector or governing authority, indicating the installed ramps and sidewalks are in conformance with AAB and ADA regulations.

TIME RESTRICTIONS AND NOTIFICATIONS

DUE TO HEAVY SUMMER TRAFFIC, NO WORK SHALL BE PERFORMED ON THIS PROJECT BETWEEN MEMORIAL DAY WEEKEND AND LABOR DAY WEEKEND WITHOUT PRIOR APPROVAL FROM THE DISTRICT HIGHWAY DIRECTOR.

No work shall be performed on the hardened surface of the roadway between November 15th and April 1st of any year without prior written approval from the District Highway Director.

No pavement shall be laid between November 15th and April 1st of any year without prior written approval from the District Highway Director.

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

No equipment, trucks, etc., shall occupy any part of the travelled way except between the hours of **9:00 a.m. and 3:00 p.m., Monday - Friday**. In no case will operations exceed the specified hours. This includes the placement of traffic control devices, equipment, or anything that restricts the flow of traffic through the construction zone. Any change in work hours will require prior written approval by the District Highway Director. The 12-minute rule will remain in effect for the duration of the permit.

All other work, off the pavement, on this project is restricted to a normal 8-hour day, Monday - Friday, with the prime Contractor and all subcontractors working on the same shift. Any change in work hours will require prior written approval by the District Highway Director.

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GENERAL TRAFFIC MANAGEMENT AND SAFETY REQUIREMENTS

If required by MassDOT, Highway Division District 5, variable message boards (VMBs) shall be utilized as part of the approved traffic management plan under this Permit which must be properly secured with regards to hacking and unauthorized tampering prevention. The Grantee(s) shall adhere to all appropriate security specifications and take all necessary precautions to mitigate the risk of the boards being hacked. All VMBs shall be stored in a secured area and shall have a lockable, weatherproof enclosure for the operator interface, removable local keyboards which shall be removed whenever possible, and a password protected controller with local administrative passwords changed on a regular basis.

When any portion of the roadway will be blocked with equipment to facilitate the proposed work, the Grantee(s) will be required to adhere to the approved Traffic Management Plan (TMP) for this permit. If the approved TMP is not appropriate or requires changes, then the Grantee will submit the requested changes to MassDOT- Highway, to be reviewed and approved by the District prior to working within or impacting the roadway. TMP's must include information relating to proper signing, traffic control device placement and police details.

It is imperative to maintain two-way traffic at all times and these operations are managed so that motorists' travel "delay" is minimized. At any time during the operation when a traffic delay of over twelve (12) minutes occurs and the situation is worsening, the Resident Engineer, Contractor, or Police Detail will begin to suspend operations. Continuously increasing "delays" of over twelve (12) minutes are not to be permitted.

If traffic must be "stopped", the duration shall not be more than five (5) minutes.

Uniformed State/Local Police Officer(s) and their official vehicle(s) may be necessary to provide protection for those installing and removing all temporary traffic warning signs and devices and to perform all traffic management as required.

The Grantee(s) will monitor the flow of traffic during peak traffic volumes and if necessary, shall suspend all operations. Work will resume at the discretion of the Police detail officer and/or to the satisfaction of the supervising MassDOT, Highway Division, and Engineer.

In the event of inclement weather or dense fog, which lessens the visibility of advance warning signs, vehicles and workers, the Grantee(s) will suspend all operations so as not to interfere with the safety of the motoring public and the operations of work. In the event of snow or icing conditions, all vehicles and equipment must be removed from the roadway and/or shoulder area so as not to interfere with Snow and Ice Operations.

The Grantee(s) shall provide safe and ready means of access and egress to all public and private roads and drive 24 hours per day. Every effort must be made so as not to interfere with or inconvenience all abutters throughout the duration of this project.

Signs and traffic control devices are required for advance notice of work and within the work area.
The Grantee(s) or Applicant will supply all required signs and traffic warning devices and shall be in accordance with the Massachusetts Manual on Uniform Traffic Control Devices. The number and location of all signs and devices shall be deemed necessary by the Engineer for the safe and efficient performance of the work and the safety of the travelling public.

All warning devices shall be subject to removal, replacement, and/or repositioning by the applicant as often as deemed necessary by the Engineer.

Cones or non-reflectorized warning devices shall not be left in operating position on the highway when the daytime operations have ceased. If it becomes necessary for MassDOT, Highway Division, to remove the construction warning devices or their appurtenances from the project due to negligence by the applicant, all costs for this work will be charged to the Grantee(s).

All vehicles, except passenger cars, which are assigned to the permitted project, and which operate on the site at speeds of 25 MPH or less, shall have an official SLOW-MOVING VEHICLE emblem displayed. All vehicles and equipment on this project must be equipped with back-up alarms.

All personnel who are working on the travelled way or breakdown lanes shall wear approved safety vests and hard hats.

GENERAL CONDITIONS AND APPROVED PROCEDURES

The Grantee(s) must contact the "Dig Safe" Center at 811 to obtain a "Dig Safe" number prior to starting the proposed excavation for the purpose of identifying the location of underground utilities.

In reference to poles located near wheelchair ramps or near the edge of the roadway, be advised that a minimum of 1-1/2' (feet) is required between the edge of the roadway and the face/front of the pole. Additionally, a minimum clear distance around poles shall be 3' (feet), excluding the width of curb.

The Grantee(s) must remove any granite curb/edging or berm located within the area of the proposed drive to facilitate the construction of the driveway. All material will then be removed from within the SHLO and properly stored or discarded at the expense of the Grantee(s) or Contractor. If the quality of the removed granite curb is in good condition, the Grantee(s) may reuse said pieces to close any existing drive mentioned herein. DO NOT return curbing to MassDOT, Highway Division.

The drive(s) must be constructed on a minus grade (unless special conditions are granted herein) from the edge of the hardened surface to the SHLO Line and graded in such a manner that no ponding of water occurs within the Highway Layout. The Grantee(s) shall be responsible for the disposal of all surface water from their property and the proposed drive(s). If such run-off or ponding occurs, the Grantee(s) shall be responsible for its correction at their expense.

The drive(s) shall have an 8" (inch) gravel base that has been machine compacted then paved with 4" (inches) of hot mix asphalt laid in two (2) courses consisting of a 2-1/2" (inch) intermediate course and a 1-1/2" (inch) surface course. Any hot mix asphalt berm or granite edging that exists in the driveway area must be sawcut and removed. The new pavement must butt into and not overlap the edge of the hardened surface of the roadway.

All abutting edges of the existing pavement shall be coated with a hot poured joint sealer immediately prior to the placement of the permanent bituminous concrete.

The Grantee(s) shall be responsible for the portion of the proposed drive(s) located within the SHLO and shall routinely inspect them for deficiencies such as settling, heaving, cracks, etc. Such deficiencies shall be corrected at the cost of the Grantee(s) and to the satisfaction of the Engineer.

If an existing or proposed sidewalk is included in this project, the Grantee(s) will install concrete wheelchair ramps in conformance with the Architectural Access Board Regulations.

If the integrity of any existing sidewalks, catch basins, manholes, or any other underground structures or equipment is compromised, the Grantee(s) will reconstruct and/or replace all items according to MassDOT, Highway Division, Standards at the cost of the Grantee(s) and to the satisfaction of the Engineer.

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The Grantee(s) is responsible to ensure that the installation of the poles is in conformance with the rules and regulations of the Architectural Access Board (AAB), the Americans with Disabilities Act (ADA) and the MassDOT - Highway Division - Utility Accommodation Policy on State Highway Right of Way (May 2013). In reference to poles located near wheelchair ramps or near the edge of the roadway, be advised that a minimum of 1-1/2' (feet) is required between the edge of the roadway and the face/front of the pole. Additionally, a minimum clear distance around poles shall be 3' (feet), excluding the width of curb.

All traffic control signs installed on the Grantee(s) property, or any signs associated with said property, shall be maintained or replaced at the owner's expense. Furthermore, advertising signs and their structures whether portable or permanent, are not allowed within the State Highway Layout.

All present and future signs or structures located on the property of the Grantee(s) shall be at least 12' (feet) from all lines of the State Highway.

The Grantee(s) must not disturb or remove any MassDOT, Highway Division, bound(s) (MHB) associated with this project. If so disturbed or missing, the bound(s) must be reset/replaced by a Registered Land Surveyor. All procedures and materials must be in compliance with Massachusetts Design and Construction Standards. A copy of the paid bill must be submitted to this office upon completion of said work.

All disturbed areas within the SHLO must be graded and loamed and seeded to the Engineer's satisfaction.

The Grantee(s) shall be responsible for all litter and debris generated during the proposed construction as described herein.

DRAINAGE IMPACTS

Note that existing drainage lines are not located/marked out by Dig-Safe, therefore, care should be taken during excavation operations to ensure that drainage components located within the limit(s) of work are not impacted during work to be performed under this Permit. The Grantee may request drainage plans in anticipation of the work with the Highway Maintenance Section at (857) 368-5240. Be advised that if additional information is needed, the Grantee will require to perform survey work of the drainage structures to identify the location of the drainage components.

If the work under this Permit includes the installation or relocation of drainage structures or work alters the existing State drainage system, the Grantee shall be responsible to clean the drainage system, including any other structure/drainage line/outfall within the project limits to ensure the drainage system works adequately.

The Grantee(s) shall be responsible for any damage that occurs to said drainage components as a result of the work.

DRAINAGE AND UTILITY CASTINGS

"The use of risers to adjust drainage and utility structures will not be allowed. All adjustment work done to existing or new drainage structures shall conform to Section 220 of MassHighway Standard Specifications and according to Plates 201.3.0 and 202.9.0 of MassHighway Standards."

ENVIRONMENTAL LIABILITY AND COMPLIANCE

The Grantee(s) assumes all risk associated with any environmental condition within the subject property and shall be solely responsible for all costs associated with evaluating, assessing, and remediating, in accordance with all applicable laws, any environmental contamination (1) discovered during Grantee's work or activities under this Permit to the extent such evaluation, assessment or remediation is required for Grantee's work, or (2) resulting from the Grantee's work or activities under this Permit. The Grantee(s) shall notify MassDOT, Highway Division, of any such assessment and remediation activities.

The Grantee(s) is hereby held solely responsible for obtaining and maintaining any and all environmental compliance permits required by local, state, and federal laws and regulations when regular or emergency work is proposed in proximity to any wetland area. These environmental compliance requirements include, but are not limited to, a Negative Determination of Applicability or Order of Conditions from the local Conservation Commission, a Water Quality Certificate from the Department of Environmental Protection, and a Programmatic General Permit from the U.S. Army Corps of Engineers. The Grantee(s) shall forward to MassDOT, Highway Division, a copy of each such environmental compliance permit.

CLOSING CONDITIONS

ALL OF SAID WORK SHALL COMPLY WITH THE TERMS AND CONDITIONS HEREIN, AND MUST BE DONE AS DIRECTED BY AND TO THE SATISFACTION OF THE ENGINEER.

All work done under this contract shall be in conformance with the Massachusetts Highway Department "Standard Specifications for Highways and Bridges" 2024 Edition and any subsequent "Supplemental Specifications". All construction shall conform to the June 2017 edition of the Massachusetts Department of Transportation, Highway Division "Construction Standard Details (English Edition)"; the latest Manual on Uniform Traffic Control Devices with Massachusetts Amendments; the latest edition to the following: the 1996 Construction and Traffic Standard Details (as related to Traffic Standard details only); the 1990 Standard Drawings for Traffic Signs and Supports; the 1968 Standard Drawings for Traffic Signals and Highway Lighting; the latest edition of American Standard for Nursery Stock; the Plans and these Special Provisions. These publications can be accessed from the SHAPS dashboard of from the following link: *https://www.mass.gov/lists/miscellaneous-publications*.

The Grantee(s) shall indemnify and save harmless the Commonwealth and MassDOT, Highway Division, against all suits, claims or liability of every name and nature arising at the time out of or in consequence of the acts of the Grantee(s) in the performance of the work covered by this Permit and/or failure to comply with the terms and conditions of this Permit whether by themselves or their employees or subcontractors.

It is noted that the Grantee(s) will be responsible for future corrective actions resulting from defective work under the subject permit. Any damage to roadway and/or shoulder as a result of the permitted work is the Grantee's responsibility and shall be repaired at his/her expense.

District 5, 1000 County Street Taunton, MA 02780
Tel: (857) 368-5000, FAX: (508) 880-6102
www.mass.gov/orgs/highway-division

THE GRANTEE(S) SHALL SUBMIT A COMPLETION OF WORK FORM, BY REQUESTING A SIGN–OFF USING THE ACTION LINK IN THE SHAPS DASHBOARD, WHEN THE WORK REQUIRED UNDER THIS PERMIT HAS BEEN COMPLETED IN ORDER FOR A FINAL INSPECTION TO BE PERFORMED BY MASSDOT, HIGHWAY DIVISION. THE LIABILITY ASSUMED UNDER THIS PERMIT WILL CONTINUE UNTIL THE WORK HAS BEEN SIGNED OFF AS COMPLETE.

A COPY OF THIS PERMIT MUST BE ON THE JOB SITE AT ALL TIMES FOR INSPECTION. FAILURE TO HAVE THIS PERMIT AVAILABLE AT THE SITE WILL RESULT IN SUSPENSION OF THE RIGHTS GRANTED BY THE PERMIT.

"FOLLOWING CONDITIONS APPLY TO PERMITS"
Conditions Relating Particularly to Permits for the Laying of Pipes, Conduits, etc.

After any pipes, conduits, drains or other underground structures are laid, or any excavation is made in the roadway, the trenches or openings shall be properly backfilled with suitable material, the backfilling shall be thoroughly tamped, and the surface of the road over said structures shall be left even with the adjoining ground. If the work is done in cold weather no frozen material shall be used for backfilling.

Wherever the hardened surface of the roadway, gutters, or any part of the surface of the highway is disturbed it shall be replaced in as good condition as before it was disturbed, and if new materials are required, they shall correspond with those already in place on the road.

Where service pipes are to cross the highway, the connections shall be made without disturbing the hardened surface of the roadway, by driving the pipes under the roadway, or the service pipes shall be carried under and across the road in a larger pipe, unless otherwise ordered by the Director.

The Grantee shall maintain the surface of the roadway over said structures as long as MassDOT may deem necessary, until all signs of the trenches shall have been eliminated.

Conditions Relating Particularly to Permits for the Erection of Poles, Wires, and Overhead Structures, and the Cutting and Trimming of Trees

In the erection of pole lines, unless otherwise herein provided, no trees located within the limits of the State Highway shall be cut or trimmed. No guy wires shall be attached to trees without a special permit from MassDOT, and in no event shall they be so attached as to girdle the trees or in any way interfere with their growth. The wires shall be so protected at all times and places that they shall not interfere with or injure the trees either inside or outside the location of the highway.

Where the cutting or trimming of trees is authorized by this permit, only such cutting and trimming shall be done as may be designated by the Director.

District 5, 1000 County Street Taunton, MA 02780
Tel: (857) 368-5000, FAX: (508) 880-6102
www.mass.gov/orgs/highway-division

In the construction or reconstruction of pole lines no guy wires shall be erected nearer to the surface of the ground than 6’ (feet); provided, however, that the owners of such lines may maintain such guy wires at a lower elevation than 6’ (feet) from the ground until such time as MassDOT shall notify them to remove said wires or to the elevation first stated.

In order to protect the trees through which any wires may pass, said wires shall be insulated and such other tree guards used as may be directed by the Director.

Where high tension wires are erected under this permit, they shall be so located that, under conditions of maximum severity as regards a coating of ice or snow, there shall be a space of at least 8’ (feet) between such high-tension wires and other wires.

The Grantee shall, within sixty (60) days from the date of completion of the work, file in the office of MassDOT a plan showing the location of each pole erected in accordance with the permit, said plan to be of such size and in such form as MassDOT may direct.

General and Additional Conditions

Whenever the word "MassDOT" is used herein it shall mean the Massachusetts Department of Transportation of the Commonwealth of Massachusetts.

Whenever the word "Director" is used herein it shall mean the District Highway Director or other authorized representative of MassDOT.

Whenever the word "Grantee" is used herein it shall mean the person or persons, corporation, or municipality to whom this permit is granted, or their legal representatives.

During the progress of the work all structures underground and above ground shall be properly protected from damage or injury; such barriers shall be erected and maintained as may be necessary for the protection of the traveling public; the same shall be properly lighted at night; and the Grantee shall be responsible for the damages to persons or property due to or resulting from any work done under this permit.

Except as herein authorized, no excavation shall be made, or obstacle placed within the limits of the State highways in such a manner as to interfere unnecessarily with the travel over said road.

If any grading of sidewalk work done under this permit interferes with the drainage of the State highway in any way, such catch basins and outlets shall be constructed as may be necessary, in the opinion of the Director, to take proper care of such drainage.

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Wherever the hardened surface of the roadway is disturbed, and the Director may consider it necessary or advisable to do so, said surface will be restored by the employees of MassDOT, at such time as MassDOT may direct, and the expense thereof shall be borne by the Grantee, who shall purchase and deliver on the road the materials necessary for said work if and when directed by the Director. All payments to the supplier and to laborers, inspectors, etc., employed by MassDOT for or on account of the work herein contemplated shall be made by said Grantee forthwith on receipt of written orders, pay rolls, or vouchers approved by MassDOT.

IF THE GRANTEE DOES ANY WORK CONTRARY TO THE ORDERS OF THE DIRECTOR, AND, AFTER DUE NOTICE, FAILS TO CORRECT SUCH WORK OR TO REMOVE STRUCTURES OR MATERIALS ORDERED TO BE REMOVED, OR FAILS TO COMPLETE WITHIN THE SPECIFIED TIME THE WORK AUTHORIZED BY THIS PERMIT, MASSDOT MAY, WITH OR WITHOUT NOTICE, CORRECT OR COMPLETE SUCH WORK IN WHOLE OR IN PART, OR REMOVE SUCH STRUCTURES OR MATERIALS, AND THE GRANTEE SHALL REIMBURSE MASSDOT FOR ANY EXPENSE INCURRED IN CORRECTING AND/OR COMPLETING THE WORK OR REMOVING THE STRUCTURES OR MATERIALS.

ALL OF THE WORK HEREIN CONTEMPLATED SHALL BE DONE UNDER THE SUPERVISION AND TO THE SATISFACTION OF THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION, AND THE ENTIRE EXPENSE THEREOF SHALL BE BORNE BY THE GRANTEE.

On the completion of the work herein contemplated all rubbish and debris shall be removed and the roadway and roadsides shall be left neat and presentable and satisfactory to the Director.

MassDOT hereby reserves the right to order the change of location or the removal of any structure or' structures authorized by this permit at any time, said change or removal to be made by and at the expense of the Grantee or its / their successors or assigns.

This permit may be modified or revoked at any time by MassDOT without rendering said MassDOT or the Commonwealth of Massachusetts liable in any way.

The Grantee shall pay the salary, subsistence and travel expenses of any inspector appointed by MassDOT to supervise the work herein contemplated.

All of the above conditions shall be applicable to the work herein authorized, unless the same are inconsistent with the conditions on the face of the permit, in which case the conditions written or printed on the face of the permit shall apply.

The acceptance of this permit or the doing of any work thereunder shall constitute an agreement by the Grantee to comp with all of the conditions and restrictions printed or written herein.

District 5, 1000 County Street Taunton, MA 02780
Tel: (857) 368-5000, FAX: (508) 880-6102
www.mass.gov/orgs/highway-division

Maura Healey, Governor
Kimberley Driscoll, Lieutenant Governor
Monica Tibbits-Nutt, Secretary & CEO
Jonathan L. Gulliver, Highway Administrator

massDOT
Massachusetts Department of Transportation
Highway Division

5-2023-0263

Approved Signature

Mary-Joe Perry by D.V.
District Highway Director

Date of Issue: February 27, 2024

Permit Expiration: Thursday, February 27, 2025

District 5, 1000 County Street Taunton, MA 02780
Tel: (857) 368-5000, FAX: (508) 880-6102
www.mass.gov/orgs/highway-division

Draft Conditions State Highway Access Permit
5-2023-0263

Driveway -Mixed Use Modification

TIME RESTRICTIONS AND NOTIFICATIONS

DUE TO HEAVY SUMMER TRAFFIC, NO WORK SHALL BE PERFORMED ON THIS PROJECT BETWEEN MEMORIAL DAY WEEKEND AND LABOR DAY WEEKEND WITHOUT PRIOR APPROVAL FROM THE DISTRICT HIGHWAY DIRECTOR.

No work shall be performed in the hardened surface of the roadway between November 15th and April 1st of any year without prior written approval from the District Highway Director.

No pavement shall be laid between November 15th and April 1st of any year without prior written approval from the District Highway Director.

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

No equipment, trucks, etc., shall occupy any part of the travelled way except between the hours of **9:00 a.m. and 3:00 p.m., Monday - Friday**. In no case will operations exceed the specified hours. This includes the placement of traffic control devices, equipment, or anything that restricts the flow of traffic through the construction zone. Any change in work hours will require prior written approval by the District Highway Director. The 12-minute rule will remain in effect for the duration of the permit.

All other work, off the pavement, on this project is restricted to a normal 8-hour day, Monday - Friday, with the prime Contractor and all subcontractors working on the same shift. Any change in work hours will require prior written approval by the District Highway Director.

Comment and Resolution Form

PERMIT #: 5-2023-0263
PERMIT TYPE: Driveway - Mixed-Use - Modification
LOCATION: ,
APPLICANT: YARMOUTH Planning AGENT: Matthew Shute
SUBMITTAL: PS&E
SUBMITTED BY: Florcie St. Fleur-Jerome

DATE: Dec 12, 2023

NO.	SHEET OR ITEM	COMMENT	DOCUMENT UPLOADED?	INITIAL ACTION	RESPONSE	QC REVIEW INITIAL	FINAL ACTION VERIFIED
COMPLETED BY REVIEWER			COMPLETED BY DESIGNER				
		PERMITS (Florcie St. Fleur-Jerome) Submission Type/#: 1 - One					
1		Repeat comment: Submit a copy of the Chapter 91 (c.91) License and 401 Water Quality Certification (WQC) from the Massachusetts Department of Environmental Protection (MassDEP) once received.					
2		Repeat comment: Submit a copy of the General Permit from the U.S. Army Corps of Engineers (USACE) in accordance with Section 404 of the Federal Clean Water Act once received.					
3		Repeat comment: Submit a copy of the National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP) from the United States Environmental Protection Agency (EPA) once received.					
4		Repeat comment: The above approvals must be submitted to the permits office prior to a permit being issued.					
		PROJECT DEVELOPMENT (Faina Veinstein) Submission Type/#: 1 - One					
1	Construction Details on plan sheet 5 of 5	D5 Projects previous 75-100% Unresolved-Include a Construction Detail for the proposed curb installation within SHLO. Applicant Response-Detail has been added. D5 Projects PS&E Comment-Address the previous comment per response. Include a Construction Detail for the proposed curb installation within SHLO. Include a Construction Detail for the proposed curb installation within SHLO.					

COLUMN "NO." PREFIX FOR COMMENT NO'S - PLANS =P, SPEC. PROVS=S, EST.=E, CALC BOOK=C, BRIDGE CALCS=D, OTHER = O
"ACTION" A=WILL INCORPORATE, B=WILL EVALUATE, C=N/A

10056 COVER.DWG Plotted on 21-Nov-2023 8:23 AM

PERMIT TO ACCESS STATE HIGHWAY
TOWN OF YARMOUTH, MASSACHUSETTS

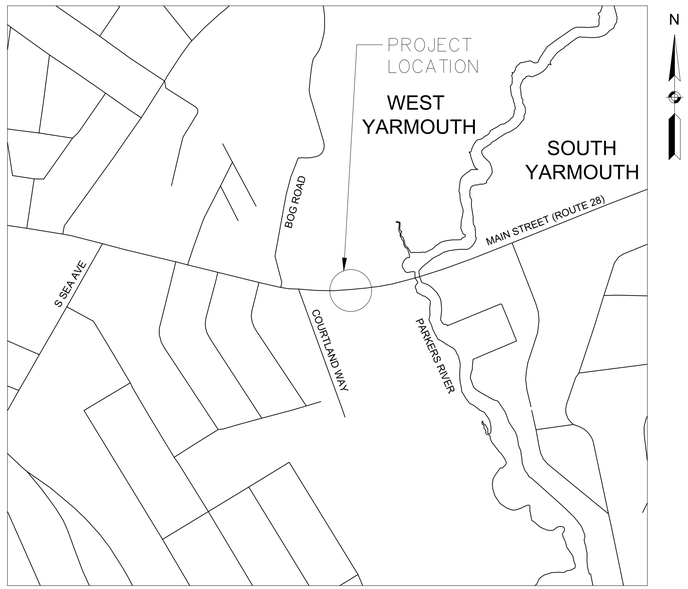
YARMOUTH RIVERWALK PARK

669 MAIN STREET (ROUTE 28), WEST YARMOUTH, MA

PERMIT APPLICATION NO. 5-2023-0263

PS&E SUBMITTAL

INDEX



LOCUS MAP

0 400 800 1200 1600

SCALE: 1" = 400'

THESE PLANS ARE SUPPLEMENTED BY THE 2023 MASSDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, OCTOBER 2017 CONSTRUCTION STANDARD DETAILS, THE 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS, THE 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING, AND THE LATEST EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK.

ISSUE DATE:
November 17, 2023

PREPARED BY:

BETA
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GENERAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
JB	JB	JERSEY BARRIER
CB	CB	CATCH BASIN
		CATCH BASIN CURB INLET
FP	FP	FLAG POLE
GP	GP	GAS PUMP
MB	MB	MAIL BOX
		POST SQUARE
		POST CIRCULAR
WELL	WELL	WELL
EHH	EHH	ELECTRIC HANDHOLE
		FENCE GATE POST
GG	GG	GAS GATE
BHL #	BHL #	BORING HOLE
MW #	MW #	MONITORING WELL
TP #	TP #	TEST PIT
		HYDRANT
		LIGHT POLE
CO.BD.		COUNTY BOUND
		GPS POINT
C	C	CABLE MANHOLE
D	D	DRAINAGE MANHOLE
E	E	ELECTRIC MANHOLE
G	G	GAS MANHOLE
M	M	MISC MANHOLE
S	S	SEWER MANHOLE
T	T	TELEPHONE MANHOLE
W	W	WATER MANHOLE
MHB	MHB	MASSACHUSETTS HIGHWAY BOUND
MON		MONUMENT
SB		STONE BOUND
TB		TOWN OR CITY BOUND
		TRAVERSE OR TRIANGULATION STATION
TPL or GUY	TPL or GUY	TROLLEY POLE OR GUY POLE
HTP		TRANSMISSION POLE
UFB	UFB	UTILITY POLE W/ FIREBOX
UPDL	UPDL	UTILITY POLE WITH DOUBLE LIGHT
ULT	ULT	UTILITY POLE W / 1 LIGHT
UPL	UPL	UTILITY POLE
		BUSH
SIZE & TYPE		TREE
		STUMP
		SWAMP / MARSH
WG	WG	WATER GATE
PM	PM	PARKING METER
		OVERHEAD CABLE/WIRE
		CURBING
100 99		CONTOURS (ON-THE-GROUND SURVEY DATA)
100 99		CONTOURS (PHOTOGRAMMETRIC DATA)
		UNDERGROUND DRAIN PIPE (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND ELECTRIC DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND GAS MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND SEWER MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND TELEPHONE DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND WATER MAIN (DOUBLE LINE 24 INCH AND OVER)
		BALANCED STONE WALL
		GUARD RAIL - STEEL POSTS
		GUARD RAIL - WOOD POSTS
		GUARD RAIL - DOUBLE FACE - STEEL POSTS
		GUARD RAIL - DOUBLE FACE - WOOD POSTS
		CHAIN LINK OR METAL FENCE
		WOOD FENCE
		HAY BALES/SILT FENCE
		TREE LINE
		SAWCUT LINE
		TOP OR BOTTOM OF SLOPE
		LIMIT OF EDGE OF PAVEMENT OR COLD PLANE AND OVERLAY
		BANK OF RIVER OR STREAM
		BORDER OF WETLAND
		100 FT WETLAND BUFFER
		200 FT RIVERFRONT BUFFER
		STATE HIGHWAY LAYOUT
		TOWN OR CITY LAYOUT
		COUNTY LAYOUT
		RAILROAD SIDELINE
		TOWN OR CITY BOUNDARY LINE
		PROPERTY LINE OR APPROXIMATE PROPERTY LINE
		EASEMENT

TRAFFIC SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
1	1	CONTROLLER PHASE ACTUATED
		TRAFFIC SIGNAL HEAD (SIZE AS NOTED)
		WIRE LOOP DETECTOR (6' x 6' TYP UNLESS OTHERWISE SPECIFIED)
		VIDEO DETECTION CAMERA
		MICROWAVE DETECTOR
		PEDESTRIAN PUSH BUTTON, SIGN (DIRECTIONAL ARROW AS SHOWN) AND SADDLE
		EMERGENCY PREEMPTION CONFIRMATION STROBE LIGHT
		VEHICULAR SIGNAL HEAD
		VEHICULAR SIGNAL HEAD, OPTICALLY PROGRAMMED
		FLASHING BEACON
		PEDESTRIAN SIGNAL HEAD, (TYPE AS NOTED OR AS SPECIFIED)
RRSG	RRSG	RAILROAD SIGNAL
OR		SIGNAL POST AND BASE (ALPHA-NUMERIC DESIGNATION NOTED)
	20'	MAST ARM, SHAFT AND BASE (ARM LENGTH AS NOTED)
		HIGH MAST POLE OR TOWER
		SIGN AND POST
		SIGN AND POST (2 POSTS)
	20'	MAST ARM WITH LUMINAIRE
		OPTICAL PRE-EMPTION DETECTOR
		CONTROL CABINET, GROUND MOUNTED
		CONTROL CABINET, POLE MOUNTED
		FLASHING BEACON CONTROL AND METER PEDESTAL
		LOAD CENTER ASSEMBLY
		PULL BOX 12"x12" (OR AS NOTED)
		ELECTRIC HANDHOLE 12"x24" (OR AS NOTED)
		TRAFFIC SIGNAL CONDUIT

PAVEMENT MARKINGS SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		PAVEMENT ARROW - WHITE
ONLY	ONLY	LEGEND "ONLY" - WHITE
	SL	STOP LINE
	CW	CROSSWALK
	SWL	SOLID WHITE LINE
	SYL	SOLID YELLOW LINE
	BWL	BROKEN WHITE LINE
	BYL	BROKEN YELLOW LINE
	DWL	DOTTED WHITE LINE
	DYL	DOTTED YELLOW LINE
	DWLEx	DOTTED WHITE LINE EXTENSION
	DYLEx	DOTTED YELLOW LINE EXTENSION
	DBWL	DOUBLE WHITE LINE
	DBYL	DOUBLE YELLOW LINE

ABBREVIATIONS

GENERAL

AADT	ANNUAL AVERAGE DAILY TRAFFIC
ABAN	ABANDON
ADJ	ADJUST
APPROX.	APPROXIMATE
A.C.	ASPHALT CONCRETE
ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE
BIT.	BITUMINOUS
BC	BOTTOM OF CURB
BD.	BOUND
BL	BASELINE
BLDG	BUILDING
BM	BENCHMARK
BO	BY OTHERS
BOS	BOTTOM OF SLOPE
BR.	BRIDGE
CB	CATCH BASIN
CBCI	CATCH BASIN WITH CURB INLET
CC	CEMENT CONCRETE
CCM	CEMENT CONCRETE MASONRY
CEM	CEMENT
CI	CURB INLET
CIP	CAST IRON PIPE
CLF	CHAIN LINK FENCE
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CSP	CORRUGATED STEEL PIPE
CO.	COUNTY
CONC	CONCRETE
CONT	CONTINUOUS
CONST	CONSTRUCTION
CR GR	CROWN GRADE
DHV	DESIGN HOURLY VOLUME
DI	DROP INLET
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DW	STEADY DON'T WALK - PORTLAND ORANGE
DWY	DRIVEWAY
ELEV (or EL.)	ELEVATION
EMB	EMBANKMENT
EOP	EDGE OF PAVEMENT
EXIST (or EX)	EXISTING
EXC	EXCAVATION
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FDN.	FOUNDATION
FLDSTN	FIELDSTONE
GAR	GARAGE
GD	GROUND
GG	GAS GATE
GI	GUTTER INLET
GIP	GALVANIZED IRON PIPE
GRAN	GRANITE
GRAV	GRAVEL
GRD	GUARD
HDW	HEADWALL
HMA	HOT MIX ASPHALT
HOR	HORIZONTAL
HYD	HYDRANT
INV	INVERT
JCT	JUNCTION
L	LENGTH OF CURVE
LB	LEACH BASIN
LP	LIGHT POLE
LT	LEFT
MAX	MAXIMUM
MB	MAILBOX
MH	MANHOLE
MHB	MASSACHUSETTS HIGHWAY BOUND
MIN	MINIMUM
NIC	NOT IN CONTRACT
NO.	NUMBER
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
PCR	PEDESTRIAN CURB RAMP
P.G.L.	PROFILE GRADE LINE
PI	POINT OF INTERSECTION
POC	POINT ON CURVE
POT	POINT ON TANGENT
PRC	POINT OF REVERSE CURVATURE
PROJ	PROJECT
PROP	PROPOSED
PSB	PLANTABLE SOIL BORROW
PT	POINT OF TANGENCY
PVC	POINT OF VERTICAL CURVATURE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
PVMT	PAVEMENT
PWW	PAVED WATER WAY

ABBREVIATIONS (cont.)

GENERAL

R	RADIUS OF CURVATURE
R&D	REMOVE AND DISPOSE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RDWY	ROADWAY
REM	REMOVE
RET	RETAIN
RET WALL	RETAINING WALL
ROW	RIGHT OF WAY
RR	RAILROAD
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
RT	RIGHT
SB	STONE BOUND
SHLD	SHOULDER
SMH	SEWER MANHOLE
ST	STREET
STA	STATION
SSD	STOPPING SIGHT DISTANCE
SHLO	STATE HIGHWAY LAYOUT LINE
SW	SIDEWALK
T	TANGENT DISTANCE OF CURVE/TRUCK %
TAN	TANGENT
TEMP	TEMPORARY
TC	TOP OF CURB
TOS	TOP OF SLOPE
TYP	TYPICAL
UP	UTILITY POLE
VAR	VARIES
VERT	VERTICAL
VC	VERTICAL CURVE
WG	WATER GATE
WIP	WROUGHT IRON PIPE
WM	WATER METER/WATER MAIN
X-SECT	CROSS SECTION

PREPARED BY

BETA
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REGISTERED PROFESSIONAL

REGISTERED PROFESSIONAL

PROJECT

PERMIT TO ACCESS STATE HIGHWAY

YARMOUTH RIVERWALK PARK

669 MAIN STREET (ROUTE 28)

West Yarmouth, MA

TITLE

LEGEND & ABBREVIATIONS

NO.	REVISIONS	DATE

DRAWN BY:	AP/AD
DESIGNED BY:	AG
CHECKED BY:	MS
ISSUE DATE:	8/30/2023
BETA JOB NO.:	10056

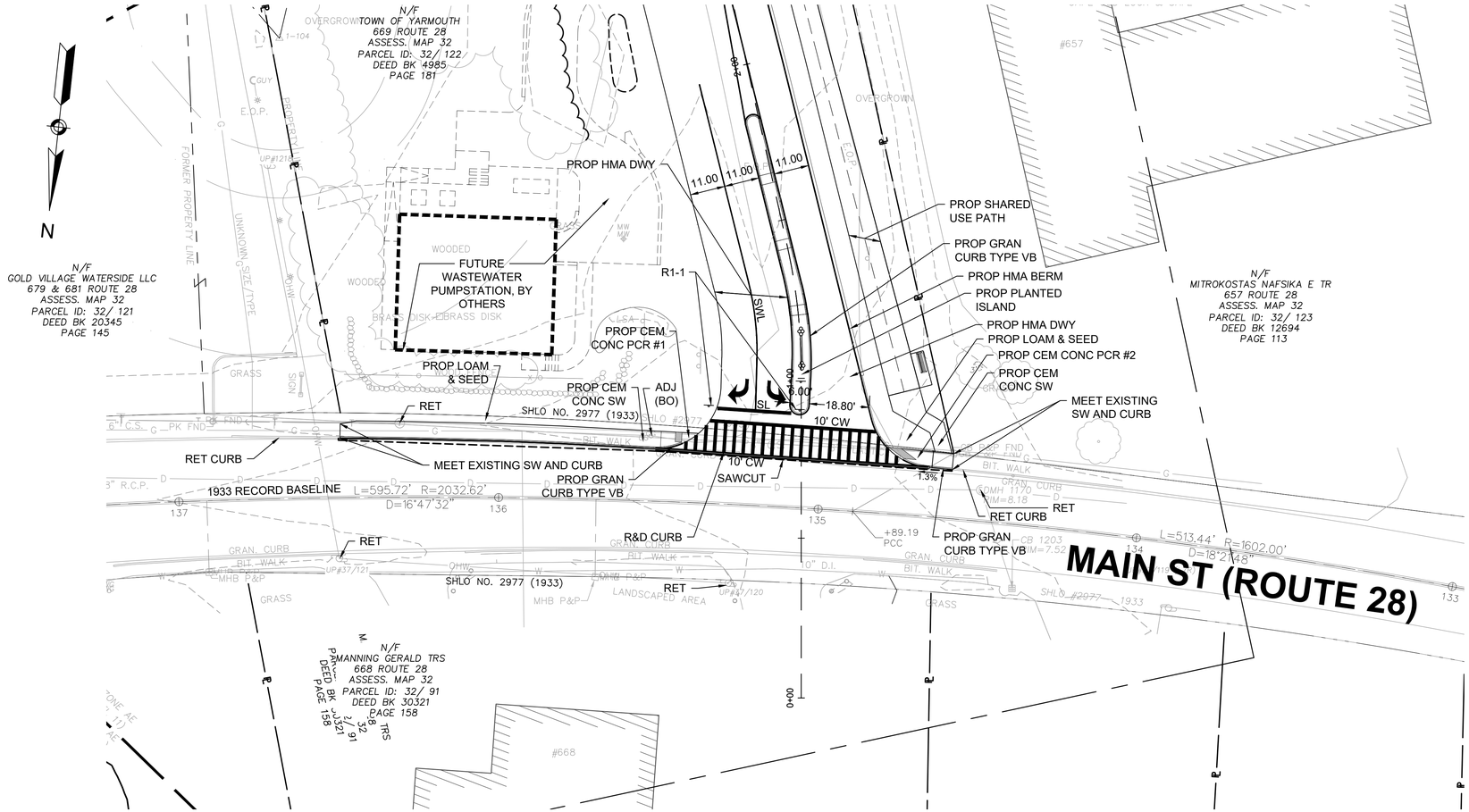
SCALE

NONE

For Review Only

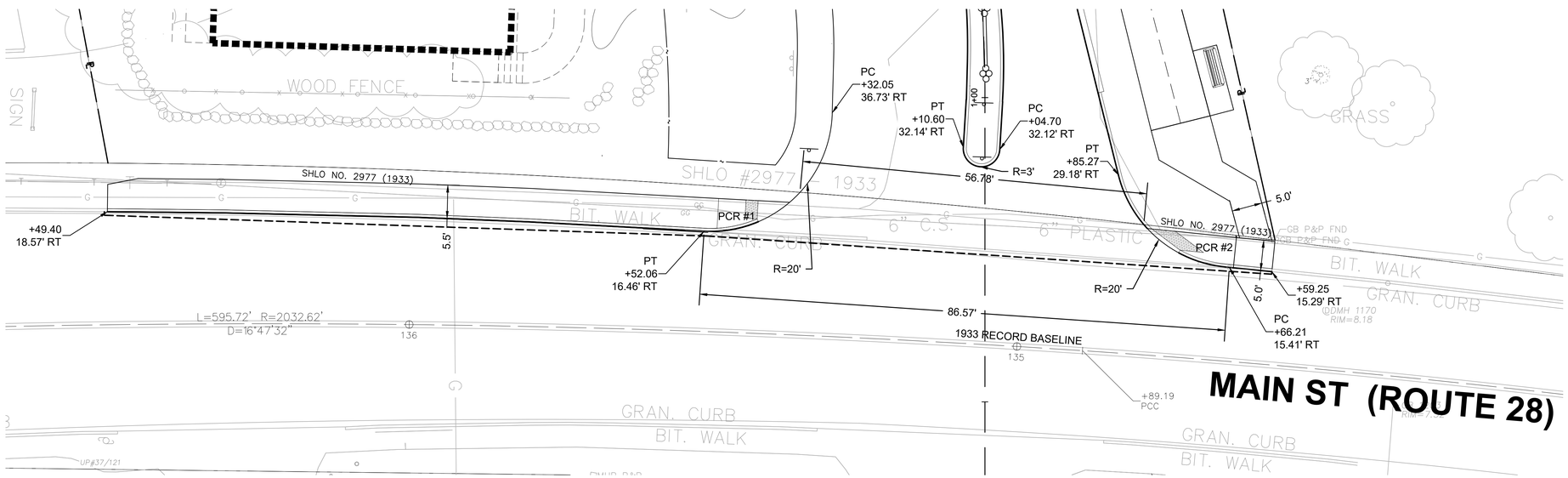
SHEET NO.

2



CONSTRUCTION PLAN

SCALE: 1"=20'



CURB TIE DETAIL

SCALE: 1"=10'

PREPARED BY

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REGISTERED PROFESSIONAL

REGISTERED PROFESSIONAL

PROJECT

PERMIT TO ACCESS STATE HIGHWAY

YARMOUTH RIVERWALK PARK

669 MAIN STREET (ROUTE 28)

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TITLE

CONSTRUCTION PLAN

NO.	REVISIONS	DATE

DRAWN BY:	AP/AD
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CHECKED BY:	MS
ISSUE DATE:	8/30/2023
BETA JOB NO.:	10056

SCALE

20 0 20 40

SCALE IN FEET: 1"=20'

For Review Only

SHEET NO.

3

1. ALL TEMPORARY TRAFFIC CONTROL WORK SHALL CONFORM TO THE 2009 EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND ALL REVISIONS.
2. ALL SIGN LEGENDS, BORDERS AND MOUNTING SHALL BE IN ACCORDANCE WITH THE MUTCD.
3. TEMPORARY CONSTRUCTION SIGNING AND ALL OTHER TRAFFIC CONTROL DEVICES SHALL BE IN PLACE PRIOR TO THE START OF ANY WORK.
4. TEMPORARY CONSTRUCTION SIGNING, BARRICADES AND ALL OTHER UNNECESSARY WORK ZONE TRAFFIC CONTROL DEVICES SHALL BE REMOVED FROM THE HIGHWAY OR COVERED WHEN THEY ARE NOT REQUIRED FOR CONTROL OF TRAFFIC.
5. SIGNS AND SIGN SUPPORTS LOCATED ON OR NEAR THE TRAVELED WAY, CHANNELIZING DEVICES, BARRIERS, AND CRASH ATTENUATORS MUST PASS THE CRITERIA SET FORTH IN NCHRP REPORT 350, 'RECOMMENDED PROCEDURES FOR THE SAFETY PERFORMANCE EVALUATION OF HIGHWAY FEATURES" AND/OR "MANUAL FOR ASSESSING SAFETY HARDWARE" (MASH).
6. CONTRACTORS SHALL NOTIFY EACH ABUTTER AT LEAST 24 HOURS IN ADVANCE OF THE START OF ANY WORK THAT WILL REQUIRE THE TEMPORARY CLOSURE OF ACCESS, SUCH AS CONDUIT INSTALLATION, EXISTING PAVEMENT EXCAVATION, TEMPORARY DRIVEWAY PAVEMENT PLACEMENT AND SIMILAR OPERATIONS.
7. THE FIRST TEN PLASTIC DRUMS OF A TAPER SHALL BE MOUNTED WITH SEQUENTIAL FLASHING LIGHTS.
8. THE ADVISORY SPEED LIMIT, IF REQUIRED, SHALL BE DETERMINED BY THE ENGINEER.
9. DISTANCES ARE A GUIDE AND MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER.
10. MAXIMUM SPACING OF TRAFFIC DEVICES IN A TAPER (DRUMS OR CONES) IS EQUAL IN FEET TO THE SPEED LIMIT IN MPH.
11. MINIMUM LANE WIDTH IS TO BE 11 FEET UNLESS OTHERWISE SHOWN. MINIMUM LANE WIDTH TO BE MEASURED FROM THE EDGE OF DRUMS OR MEDIAN BARRIER.
12. ALL SIGNS SHALL BE MOUNTED ON THEIR OWN STANDARD SIGN SUPPORTS.
13. TEMPORARY CONSTRUCTION SIGNING AND ALL OTHER NECESSARY WORK ZONE TRAFFIC CONTROL NOT COVERED IN THE PLAN SHALL REFER TO MASS HIGHWAY "STANDARD DETAILS AND DRAWINGS FOR THE DEVELOPMENT OF TRAFFIC MANAGEMENT PLANS".
14. EXISTING SIGNS THAT CONFLICT WITH TEMPORARY TRAFFIC CONTROL (TTC) SHALL BE COVERED OR REMOVED WHILE THE TTC ZONE IS IN EFFECT, AND SHALL BE UNCOVERED OR REPLACED WHEN EXISTING TRAFFIC PATTERNS ARE RESTORED.
15. CONTRACTOR IS RESPONSIBLE FOR FURNISHING, INSTALLING, MAINTAINING AND REMOVING ALL TRAFFIC MANAGEMENT DEVICES REQUIRED FOR MAINTENANCE OF TRAFFIC.

FORMULAS FOR DETERMINING TAPER LENGTHS

SPEED LIMIT (S)	TAPER LENGTH (L) FEET
40 MPH OR LESS	$L = \frac{WS^2}{60}$
45 MPH OR MORE	L = WS

WHERE: L = TAPER LENGTH IN FEET

W = WIDTH OF OFFSET IN FEET

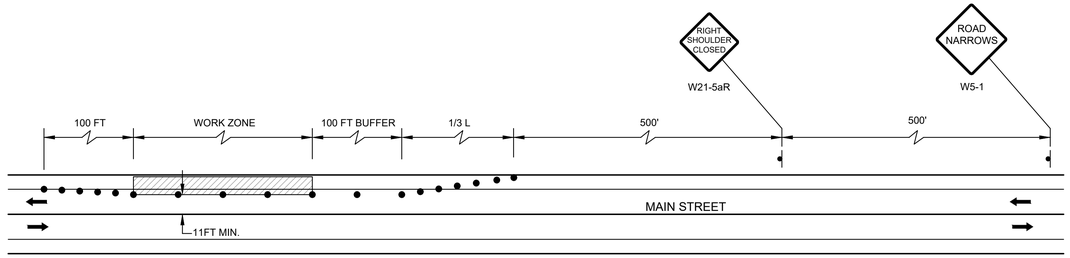
S = POSTED SPEED LIMIT, OR OFF-PEAK 85TH-PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED IN MPH

BASED ON: TABLE 6C-4 2009 MUTCD

TAPER LENGTH CRITERIA FOR TEMPORARY TRAFFIC CONTROL ZONES

TYPE OF TAPER	TAPER LENGTH (L)*
MERGING TAPER	AT LEAST L
SHIFTING TAPER	AT LEAST 0.5L
SHOULDER TAPER	AT LEAST 0.33L
ONE-LANE, TWO-WAY TRAFFIC TAPER	50 FT MINIMUM, 100 FT MAXIMUM
DOWNSTREAM TAPER	50 FT MINIMUM, 100 FT MAXIMUM

BASED ON: TABLE 6C-3 2009 MUTCD



TWO LANE ROAD SHOULDER CLOSED

NOT TO SCALE

LEGEND:

- REFLECTORIZED PLASTIC DRUM
- POLICE DETAIL
- TYPE III BARRICADE
- FLASHING ARROW PANEL
- FLASHING ARROW PANEL
- WORK ZONE
- DIRECTION OF TRAFFIC
- IMPACT ATTENUATOR
- MEDIAN BARRIER
- MEDIAN BARRIER WITH WARNING LIGHTS
- WORK VEHICLE
- TRUCK MOUNTED ATTENUATOR
- TRAFFIC OR PEDESTRIAN SIGNAL
- SIGN
- PORTABLE CHANGEABLE MESSAGE SIGN

SUGGESTED WORK ZONE WARNING SIGN SPACING

ROAD TYPE	DISTANCE BETWEEN SIGNS**		
	A	B	C
LOCAL OR LOW VOLUME ROADWAYS*	350	350	350
MOST OTHER ROADWAYS*	500	500	500
FREEWAYS AND EXPRESSWAYS*	1,000	1,500	2,640

* SPEED CATEGORY TO BE DETERMINED BY HIGHWAY AGENCY

** DISTANCES ARE SHOWN IN FEET. THE COLUMN HEADINGS A, B, AND C ARE THE DIMENSIONS SHOWN IN THE DETAIL/ TYPICAL SETUP FIGURES. THE A DIMENSION IS THE DISTANCE FROM THE TRANSITION OR POINT OF RESTRICTION TO THE FIRST SIGN. THE B DIMENSION IS THE DISTANCE BETWEEN THE FIRST AND SECOND SIGNS. THE C DIMENSION IS THE DISTANCE BETWEEN THE SECOND AND THIRD SIGNS. (THE "THIRD" SIGN IS THE FIRST ONE TYPICALLY ENCOUNTERED BY A DRIVER APPROACHING A TEMPORARY TRAFFIC CONTROL (TTC) ZONE.)

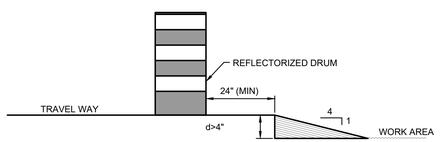
THE "THIRD" SIGN ABOVE IS TYPICALLY REFERRED TO AS AN "ADVANCE WARNING" SIGN ON THE TMP SETUPS. IT IS THE ONE WHICH MAY OFTEN HAVE THE "STANDARD RED OR RED—ORANGE FLAGS (16 in. X 16 in.)" MOUNTED ON IT. THESE ADVANCE WARNING SIGNS ARE LOCATED AT THE PROJECT LIMITS ON ALL APPROACHES (i.e. THE W20-1 SERIES (ROAD WORK XX FT) SIGNS), AND USUALLY REMAIN FOR THE DURATION OF THE PROJECT.

THE FIRST AND SECOND WARNING SIGNS ABOVE ARE REFERRED TO AS THE OPERATIONAL (DAY-TO-DAY) WORK ZONE SIGNS AND MAY BE MOVED DEPENDING ON WHERE THE SPECIFIC ROADWAY WORK FOR THAT DAY IS LOCATED.

MA-R2-10a SIGNS SHALL BE PLACED BETWEEN THE SECOND AND THIRD SIGNS AS DESCRIBED ABOVE.

MA-R2-10a, MA-R2-10e, AND W20-1 SERIES SIGNS ARE TO BE INCLUDED ON ALL DETAILS/TYPICAL SETUPS.

BASED ON: TABLE 6C-1 2009 MUTCD



LATERAL DROP-OFF DETAIL

NOT TO SCALE

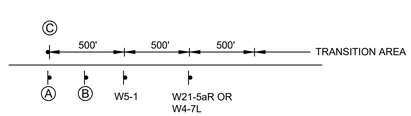
Ⓐ ROAD WORK AHEAD — W20-1B, 36" x 36"

Ⓑ WORK ZONE / SPEEDING FINES DOUBLED — MA-R2-10a, 48" x 36"

Ⓒ END ROAD WORK / DOUBLE FINES END — MA-R2-10e, 36" x 48"

TYPICAL MAINLINE ADVANCED SIGN SETUP

NOT TO SCALE



PREPARED BY

BETA
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REGISTERED PROFESSIONAL

REGISTERED PROFESSIONAL

PROJECT

PERMIT TO ACCESS STATE HIGHWAY

YARMOUTH RIVERWALK PARK

669 MAIN STREET (ROUTE 28)

West Yarmouth, MA

TITLE

TEMPORARY TRAFFIC CONTROL PLAN

NO.	REVISIONS	DATE

DRAWN BY:	AP/AD
DESIGNED BY:	AG
CHECKED BY:	MS
ISSUE DATE:	8/30/2023
BETA JOB NO.:	10056

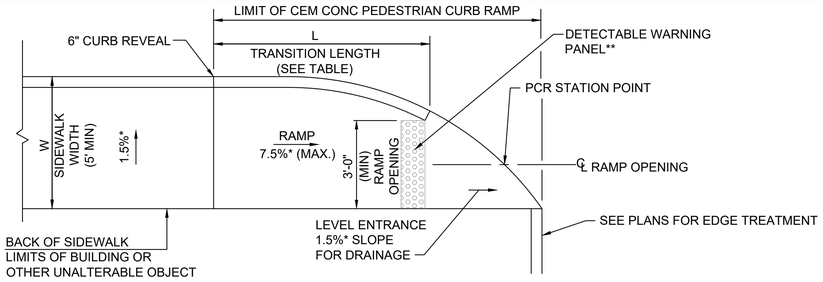
SCALE

AS SHOWN

For Review Only

SHEET NO.

4



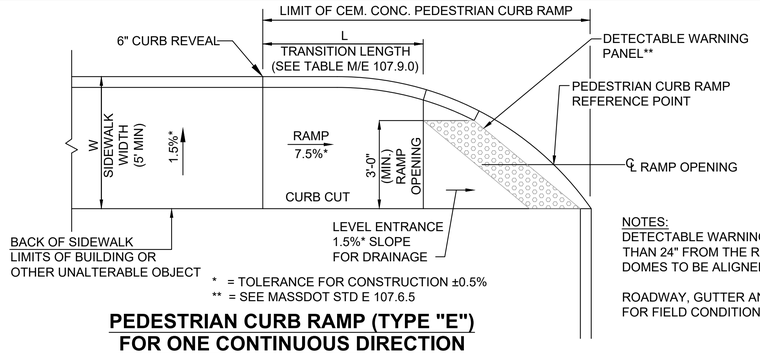
* = TOLERANCE FOR CONSTRUCTION ±0.5%
** = SEE MASSDOT STD E 107.6.5

PEDESTRIAN CURB RAMP (TYPE "B") FOR ONE CONTINUOUS DIRECTION OF PEDESTRIAN TRAVEL

NOT TO SCALE

NOTES:
DETECTABLE WARNING PANEL LOCATED NOT LESS THAN 6" OR MORE THAN 24" FROM THE ROADWAY EDGE (GUTTER LINE. TRUNCATED DOMES TO BE ALIGNED WITH DIRECTION OF TRAVEL.

ROADWAY, GUTTER AND FIRST 6" OF SIDEWALK TO BE ADJUSTED FOR FIELD CONDITIONS.



* = TOLERANCE FOR CONSTRUCTION ±0.5%
** = SEE MASSDOT STD E 107.6.5

PEDESTRIAN CURB RAMP (TYPE "E") FOR ONE CONTINUOUS DIRECTION OF PEDESTRIAN TRAVEL (LEVEL LANDING OVER 5')

NOT TO SCALE

NOTES:
DETECTABLE WARNING PANEL LOCATED NOT LESS THAN 6" OR MORE THAN 24" FROM THE ROADWAY EDGE (GUTTER LINE. TRUNCATED DOMES TO BE ALIGNED WITH DIRECTION OF TRAVEL.

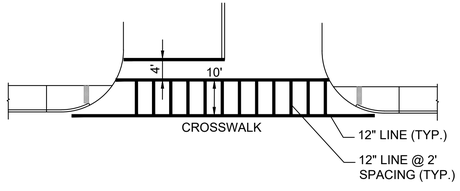
ROADWAY, GUTTER AND FIRST 6" OF SIDEWALK TO BE ADJUSTED FOR FIELD CONDITIONS.

TRANSITION LENGTH TABLE	
PROFILE GRADE %	HIGH SIDE TRANSITION LENGTH FOR 7.5% DESIGN SLOPE (FEET)
0	6'-6"
>0-1	7'-8"
>1-2	9'-0"
>2-3	11'-0"
>3-4	14'-0"
>4	15'-0" MAX.

PEDESTRIAN CURB RAMP HIGH SIDE TRANSITION LENGTHS

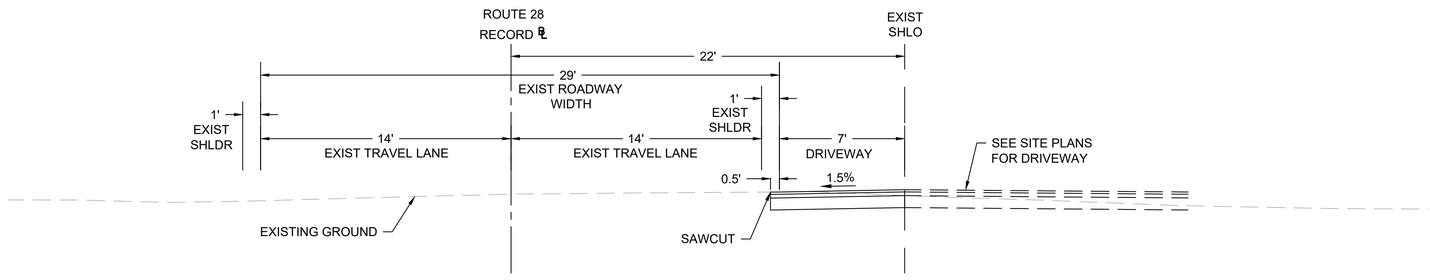
FIGURES ARE BASED ON A DESIGN SLOPE OF 7.5% AND A REVEAL OF 6".

PEDESTRIAN CURB RAMP DATA									
PCR #	LOCATION	RAMP REFERENCE POINT		W WIDTH OF SIDEWALK (FT)	WIDTH OF RAMP (FT)	ROADWAY GUTTER SLOPE (%)*	TRANSITION LENGTH		NOTES
		STATION	OFFSET				LEFT	RIGHT	
1	MAIN ST	135+40.1	19.9 R	5.5	3.0	1.2	6'-6"	N/A	TYPE "B"
2	MAIN ST	134+78.1	18.9 R	5.0	3.0	1.3	N/A	9'-0"	TYPE "E"



CROSSWALK DETAIL

NOT TO SCALE



ROUTE 28 TYPICAL SECTION AT DRIVEWAY

STA 135+00±

NOT TO SCALE

PAVEMENT NOTES

PROPOSED CEMENT CONCRETE SIDEWALK AND CEMENT CONCRETE PEDESTRIAN CURB RAMPS

SURFACE COURSE: 4" CEMENT CONCRETE (AIR ENTRAINED 4000 PSI, 3/4", 610) OVER

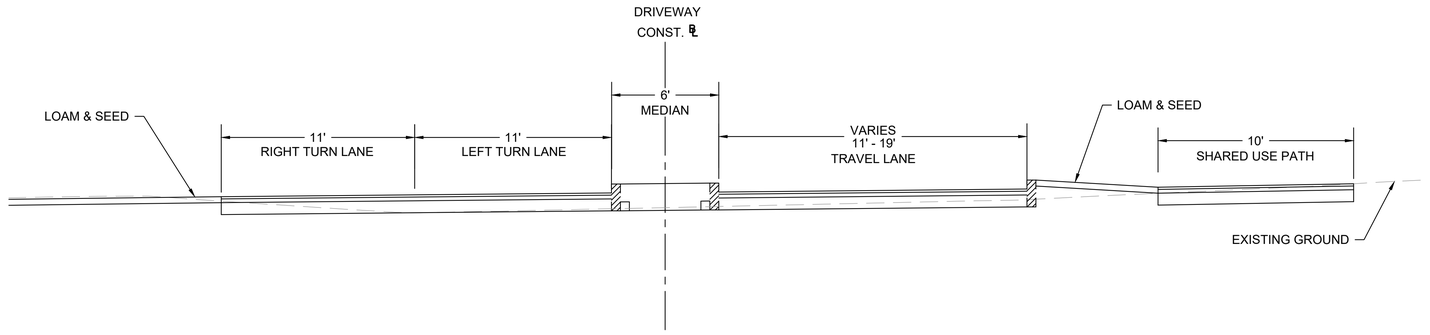
SUBBASE: 8" GRAVEL BORROW (TYPE B)

PROPOSED HMA DRIVEWAY

SURFACE COURSE: 1.5" SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5)

INTERMEDIATE COURSE: 2.5" SUPERPAVE INTERMEDIATE COURSE 19.0 (SIC-19.0)

SUBBASE: 8" GRAVEL BORROW (TYPE B)



TYPICAL SECTION DRIVEWAY

STA 0+97±

NOT TO SCALE

PREPARED BY

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REGISTERED PROFESSIONAL

PROJECT

PERMIT TO ACCESS STATE HIGHWAY

YARMOUTH RIVERWALK PARK

669 MAIN STREET (ROUTE 28)

West Yarmouth, MA

TITLE

CONSTRUCTION DETAILS

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SCALE

AS SHOWN

For Review Only

SHEET NO.

5

ATTACHMENT F

TECHNICAL SPECIFICATIONS ISSUED FOR BID

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APPENDIX F

TECHNICAL SPECIFICATIONS ISSUED FOR BID

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DIVISION 05

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DIVISION 32

DIVISION 33

DIVISION 35

SECTION 01 01 90

COORDINATION AND MEETINGS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Requirements for coordinating the various parts of Work under this Contract. Specific items are listed below for the Contractor's convenience and as a general listing but shall not be considered to be all inclusive. The Contractor shall coordinate all inter-related aspects of the Work as required to complete the Project.

B. Administrative and Procedural requirements for Project Meetings.

1.2 COORDINATION

A. Future Phases of Work

1. The Owner (Town of Yarmouth) anticipates advancing a separate phase of work for the construction of a restroom facility identified as Phase 2. This phase of work is entirely within the footprint of Phase 1. The estimated Phase 2 timeline forecasts a project start date and completion date within the overall duration of the Phase 1 contract. The Phase 1 Contractor shall accommodate site access needs and coordinate adjacent work with the planned restroom facility.

B. Wastewater Pump Station

1. The Owner (Town of Yarmouth) is in the process of completing the engineering design of a new wastewater pump station. The facility is sited fronting on Rte. 28 east of the proposed site access drive. It is anticipated work on the pump station will begin during the execution of this project. The Contractor shall coordinate work shown within this contract with Town of Yarmouth (Owner) as the pump station project is constructed, with an emphasis on maintaining access to the site, laydown areas, utility work, service connections, and limits of final improvements shown to be constructed as part of the Riverwalk Park project.

C. Site Utilities

1. A new primary electric service is proposed to the proposed Riverwalk Restroom Facility. The electric service connection will be made from an existing utility pole north of the site with the primary service crossing Rte. 28. Work performed by Eversource. Work Order No. 12408266.

2. Existing municipal water service and overhead electric service to the site are from Courtland Way. The project requires modification, discontinuance, and removal of some utility infrastructure. Coordinate the work to minimize disruption and inconvenience to the Owner and abutting property owners.

D. Shellfish Upweller Facility

1. The Owner (Town of Yarmouth) operates a Shellfish Upweller facility on the site. The Upweller requires electric power 24 hrs. a day, 7 days a week from May 1 through November 31 annually. Disruption of power for more-than one (1) hour in any 12 hours period is unacceptable. The Contactor shall maintain and coordinate the discontinuance of current power, installation of new, temporary power, and installation of new, permanent electric power to the Upweller facility. The Owner shall require light duty (pickup truck) vehicular access to the Shellfish Upweller facility as well as access on foot throughout the duration of Construction.

1.3 REQUIREMENTS

A. The Contractor shall:

1. Coordinate the Work, scheduling, submittals, and specific requirements of the various Sections of specifications to assure efficient and orderly sequence of installation of interdependent construction elements.

2. Coordinate the Project (Phase 1) with future Work (Phase 2). Verify that utilities serving Phase 1 are coordinated and configured to accommodate Phase 2. When timing permits, coordinate the Restroom Facility construction and water distribution system installation in a manner that provides access to water in areas of the site to support the installation of seeded areas and landscape plantings.

3. Coordinate completion and clean-up of Work in different trades in preparation for sequential arrival at Substantial Completion.

B. The Owner may require full or partial occupancy of premises. Coordinate access to site for correction of defective Work and Work not in accordance with the Contract Documents, to minimize disruption of Owner's activities. Continue to secure the site from public access.

C. Coordinate work with all utility companies necessary for completion of work under this contract.

1.4 MEETINGS

A. The Engineer will schedule and administer a Pre-construction Conference. The conference will be scheduled within fourteen days after issuance of the Notice to Proceed. The Contractor shall be prepared to address topics such as projected construction schedules, critical work areas, construction phasing, site facilities, shop drawings and product submittals.

B. The Engineer will schedule and administer Progress Meetings and specially called meetings throughout the duration of the Work, at a minimum of one per-month. Actual meeting frequency will vary based on overall need, production of the Work, types of work underway, and overall project progress. It should be anticipated that in the initial months of the project and during stages of Phase 2 construction there will be several months with meetings occurring on a weekly basis.

C. The time and the location of the meetings will be designated by the Engineer. The Engineer will prepare a meeting agenda with copies for participants, will preside at meetings, record minutes and distribute copies of the minutes to the participants.

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION NOT USED

END OF SECTION

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SECTION 01 11 00

SUMMARY OF WORK

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Work covered by the Contract, listing of Owner, Project location, Engineer. Sequence requirements, the Contractor's use of the premises, and the Owner's occupancy requirements.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work includes but is not necessarily limited to the following:

B. The project purpose is to construct a public park at the degraded former Drive-In theater Site. The park will be served by new water, sewer, and electric utilities. The park includes the construction of a park driveway and parking areas, an elevated boardwalk loop, a nature-based play area, a kayak launch facility, walking paths, landscape plantings and site lighting.

C. Site work includes clearing and grubbing, pulverizing asphalt, debris removal, as well as grading, shaping excavating, filling, setting curbing, forming, pouring, and placing concrete, installing conventional and porous HMA pavements, and stabilized aggregate pathways.

D. Construction includes new three phase primary electric conduits, with electric utility installation inclusive of electrical wiring and conduit, electric manholes and pull boxes, electric transformer pads, utility pads and load centers. Primary electric service conductor wiring and transformer cabinet shall be installed by Eversource.

E. Work includes installation of ornamental site lighting, as well as loaming, seeding, planting of perennials, shrubs, and trees, as well as invasive plant management, and the installation of various types of site amenities, play equipment, play area surfacing and signage.

F. Construction includes the installation of helical anchor piles, wood framing and decking and related railing carpentry work for the installation of an approximately 1,400 LF elevated boardwalk loop as well as for a separate boardwalk linked to gangways, to access kayak launch float, which requires the installation of driven wood piles and river-bottom mooring anchors to secure the float.

1.3 OWNER

The Town of Yarmouth
1146 Route 28
South Yarmouth, MA 02664
508.398.2231
Project Manager: Amanda Lima P.E.

1.4 PROJECT LOCATION

669 Route 28
Yarmouth MA 02664

1.5 ENGINEER

BETA Group Inc.
701 George Washington Highway
Lincoln Rhode Island 02865
401.333.2382
Project Manager Arek W Galle, RLA, AICP

1.6 WORK SEQUENCE

A. In order that Work may be conducted with minimum inconvenience to the public and, work under this Contract may be coordinated with other work which may be under construction or contemplated, and that Work under the Contract may conform to conditions which it has been undertaken or conditions attached to a right-of-way or particular location for this Work, the Engineer may determine the point or points and time or times when portions of Work will commence or be carried on and may issue orders pertaining to the work sequence, relative to the rate of progress on several portions of the work.

1.7 OWNER FURNISHED PRODUCTS

A. Owner's Responsibilities:

1. Arrange for and deliver Owner-reviewed Shop Drawings, Product Data, and Samples to Contractor.
2. Arrange and pay for delivery to Site.
3. Direct payment to Utility Companies.
4. Direct payment for Police Details required to conduct the Work.
5. Upon delivery, inspect products jointly with Contractor.
6. Submit claims for transportation damage and replace damaged, defective, or deficient items.
7. Arrange for manufacturers' warranties, inspections, and service.

B. Contractor's Responsibilities:

1. Coordination of the Work with future Phases
2. Review Owner-reviewed Shop Drawings, Product Data, and Samples.
3. Receive and unload products at Site; inspect for completeness or damage jointly with Owner.
4. Plan for, coordinate, and maintain traffic protection /police details at the site entrance.
5. Provide and maintain on-site job trailers for 1) Contractor and 2) Resident Engineer.
6. Execution of the Work shown on the plans and in the specifications.

7. Repair or replace items damaged after receipt or install prior to Final Acceptance.
8. Handle, store, install, and finish products.

C. Items furnished by Owner for installation by Contractor:
1. None.

1.8 CONTRACTOR USE OF PROJECT SITE / PREMISES

A. The Contractor's use of premises shall be within the limits shown on the Drawings and as defined in Section 00 50 00, OWNER CONTRACT AGREEMENT, for the performance of the Work.

B. Limit use of Project Site to areas within the Contract limits indicated. Do not disturb portions of the Project Site beyond the areas in which the Work is indicated.

C. The Contractor shall maintain access and utilities to the existing site and facilities at all times.

D. The Contractor shall assume full responsibility for security of all materials and equipment on the site, including those of his subcontractor's.

E. If directed by the Owner, the Contractor shall move any stored items that interfere with the operations of the Owner.

F. Obtain and pay for use of additional storage or work areas outside the Project Site if needed to perform the Work.

1.9 WORK RESTRICTIONS

A. Comply with restrictions on construction operations.
1. Comply with limitations on use of public streets, work on public streets, rights of way, and other requirements of authorities having jurisdiction (AHJ).

B. On-Site Work Hours: Limit Work to between 7:00 a.m. to 5:00 p.m., Monday through Friday, unless otherwise indicated. Work hours may be modified to meet Project requirements if approved in writing by Owner.

C. On-Site Work Day Restrictions: Do not perform Work resulting in utility shutdowns on Site during Work blackout days indicated by Owner.

D. Existing Utility Interruptions: Do not interrupt utilities serving the Shellfish Upweller facility or any other facilities occupied by Owner or others unless permitted under the following conditions, and only after arranging for temporary utility services according to requirements indicated:
1. Notify Engineer and Owner not less than two (2) days in advance of proposed utility interruptions.
2. Obtain Owner's written permission before proceeding with utility interruptions.

E. Noise, Vibration, Dust, and Odors: Coordinate with Owner in regard to work operations and that may result in high levels of noise and vibration, dust, odors, or other disruption.
1. Notify Engineer and Owner not less than [two] <_____> days in advance of proposed disruptive operations.

2. Obtain Owner's written permission before proceeding with disruptive operations.

F. Smoking and Controlled Substance Restrictions: Use of tobacco products, alcoholic beverages, marijuana, and other controlled substances on Project Site, is not permitted.

G. Employee Identification: If so, requested by the Owner, the Contractor shall provide identification tags for Contractor personnel working on Project Site.

H. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor personnel working on Project Site.

1. Maintain list of approved screened personnel with Owner's representative.

1.10 OWNER OCCUPANCY REQUIREMENTS

A. The Owner requires that access be maintained to the Shellfish Upweller Facility. This facility requires power 24hr/day x 7 days a week. Access to the upweller with a pickup truck is required. The Owner accesses the upweller daily.

B. The Owner anticipates initiating construction of a new Wastewater Pump Station No. 03 during the course of this project. The Contractor shall allow the Owner, and when necessary, other Contractors to access to the Pump Station No. 03 site via the park access drive.

PART 2 - MATERIALS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

SECTION 01 20 00

PRICE AND PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary

1. Conditions and other Division 01 GENERAL REQUIREMENTS Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

A. Unit Prices, Lump Sum Prices and Additive Alternates No. 1and No. 2.

1.3 BID ITEM 1 - PROJECT MOBILIZATION AND DEMOBILIZATION

A. Measurement

1. Measurement for payment under Item 1 on the Bid Form will be on a Lump Sum basis for work associated with mobilizing and demobilizing for the execution of the Work, with the exception of any work listed under Additive Alternates, as shown on the plans and as specified herein, complete and accepted in place to the full satisfaction of the Engineer.
2. This item may not exceed five (5%) of the total project cost.

B. Payment

1. Payment of the Lump Sum price bid for Item 1 in the Bid Form shall be as follows:
    a. Fifty percent (50%) maximum compensation for all labor, materials, equipment, and incidentals required for mobilizing for the project.
    b. Fifty percent (50%) maximum compensation for furnishing all labor, materials, equipment, and incidentals required to demobilize from the site.

1.4 BID ITEM 2 - SITE PREPARATION, EROSION AND SEDIMENT CONTROLS

A. Measurement

1. Measurement for payment under Item 2 on the Bid Form shall be on a Lump Sum basis for Site Preparation, Erosion and Sediment Controls including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Lump Sum price bid for Item 2 shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for Site Preparation, Erosion

and Sediment Controls, including but not project limit layout, pathway layout, clearing and grubbing, limited to removing existing pavement, marine debris and utility poles; work to furnish, install and maintain all erosion control measures as per approved SWPPP for the duration of the project; removal, hauling and stockpiling of materials; furnish, place, and maintain construction tracking pads and temporary construction fencing to protect existing vegetation and to provide a secure site, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.5 BID ITEM 3– INVASIVE PLANT MANAGEMENT PLAN

A. Measurement

1. Measurement for payment under Item 3 on the Bid Form shall be on a Lump Sum basis for Invasive Plant Management including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Lump Sum price bid for Item 3 shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for Invasive Plant Management operations, including all site reconnaissance, plant inventories, plant assessment, development of the Invasive Plant Management Strategy (IPMS) plan for eradication and management of invasive plants, mechanical removal of targeted plant species identified in the plans, applications of herbicides approved for initial use, as well as additional re-treatment applications, off site legal disposal of plant material designated for removal, as well as monitoring of the site for the duration of the contract and treatment for re-growth, and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.6 BID ITEM 4 - EARTHWORK

A. Measurement

1. Measurement for payment under Item 4 on the Bid Form shall be on a Lump Sum basis for conducting all earthwork activity for the duration of the project including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Lump Sum price bid for Item 4 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for conducting all earthwork activity for the during of the project, including stripping, loading, hauling, stockpiling, and placing on-site soil and fill; excavation, backfilling and compacting for all types of pavement, curbing, footings, foundations, pads, berms, structures, and electrical and communication conduit and structures; all rough and fine grading, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.7 BID ITEM 5 - IMPORTED ORDINARY FILL

A. Measurement

1. Measurement for payment under Item 5 on the Bid Form shall be on a Cubic Yard basis for installing all types of Borrow Fill (Imported Ordinary Fill) including any incidentals, as shown on the plans and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Cubic Yard price bid for Item 5 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for furnishing, placing and compacting, borrow fill to the line and grades, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.8 BID ITEM 6 – GRAVEL BORROW

A. Measurement

1. Measurement for payment under Item 6 on the Bid Form shall be on a Cubic Yard basis for installing all types of Gravel Borrow fill including any incidentals, as shown on the plans and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Cubic Yard price bid for Item 6 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for furnishing, placing and compacting gravel borrow to the line and grades, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.9 BID ITEM 7 – CRUSHED STONE – ALL TYPES

A. Measurement

1. Measurement for payment under Item 7 on the Bid Form shall be on a per Ton basis for furnishing and installing all types of crushed stone, including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Ton price bid for Item 7 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for furnishing, placing and compacting all types of crushed stone (3/8 inch pea stone, 3/4 inch crushed stone, 1 ½ inch crushed stone aggregate) to the line and grades, as shown on the plans

and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

2. Crushed Stone Aggregate Fill and Sand Borrow for Infiltration System No. 1 and No. 2 shall be paid for under the respective Infiltration System Bid Items.

3. Bedding utilized beneath drain and water utility pipes shall be paid for under the respective pipe Bid Items.

1.10 BID ITEM 8 – GEOTEXTILE FABRIC FOR SUBSURFACE DRAINAGE

A. Measurement

1. Measurement for payment under Item 8 on the Bid Form shall be on a Square Yard basis for furnishing and installing all types of geotextile fabric for sub-surface drainage including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Square Yard price bid for Item 8 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for furnishing and installing geotextile fabric for sub-surface drainage, as shown on the plans, and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

2. Geotextile Fabric for Infiltration System No. 1 and No. 2 shall be paid for under the respective Infiltration System Bid Items.

1.11 BID ITEM 9 – STONE FOR PIPE ENDS & CHECK DAMS

A. Measurement

1. Measurement for payment under Item 9 on the Bid Form shall be on a Square Yard basis for furnishing and installing stone for pipe ends & check dams including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Square Yard price bid for Item 9 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for furnishing and placing stone for pipe ends & check dams, bedding, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.12 BID ITEM 10 – AREA DRAIN – TYPE I & TYPE II

A. Measurement

1. Measurement for payment under Item 10 on the Bid Form shall be on a per Each basis for furnishing and installing all Area Drain – Type I and Type II including any incidentals,

as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Each price bid for Item 10 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Area Drain – Type I and Type II, including excavation, all structures, risers, frames, and grates, backfilling and compacting in place, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.13 BID ITEM 11 – CURB INLET, FRAME AND GRATE

A. Measurement

1. Measurement for payment under Item 11 on the Bid Form shall be on a per Each basis for furnishing and installing all Curb Inlet, Frame and Grate, including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Each price bid for Item 11 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing Curb Inlet, Frame and Grate, including excavation, forming, placing reinforcing, pouring concrete collar, drainage channel, sidewalls, including metal curb opening, frame and grate, compacting and backfilling in place, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.14 BID ITEM 12 – SANITARY SEWER MANHOLE

A. Measurement

1. Measurement for payment under Item 12 on the Bid Form shall be on a per Each basis for furnishing and installing all Sanitary Sewer Manholes, including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Each price bid for Item 12 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing Sanitary Sewer Manholes, including precast concrete structures, riser, frame and cover, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.15 BID ITEM 13 – 2-INCH DIA. HDPE FORCE MAIN SEWER PIPE

A. Measurement

1. Measurement for payment under Item 13 on the Bid Form shall be on a Linear Foot basis for furnishing and installing 2-Inch HDPE Force Main Sewer Pipe including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Linear Foot price bid for Item 13 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing HDPE Force Main Sewer including all excavation, sheeting, bedding, pipe, fittings of all types, cleanouts, welding and all other appurtenances, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.16 BID ITEM 14 – 4-INCH DIA. SOLID & PERFORATED HDPE DRAINPIPE

A. Measurement

1. Measurement for payment under Item 14 on the Bid Form shall be on a Linear Foot basis for furnishing and installing 4 Inch DIA. Solid & Perforated HDPE Drai pipe including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Linear Foot price bid for Item 14 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing 4-Inch DIA. Solid & Perforated HDPE Drain Pipe, inclusive of all excavation, bedding for solid pipe, solid and perforated pipe, pipe fittings of all types and appurtenances, backfilling and compacting in place, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

2. Crushed Stone and Geotextile Fabric utilized for perforated drainpipe shall be measured and paid for under the respective pipe Bid Items.

1.17 BID ITEM 15 – 6-INCH DIA. SOLID HDPE DRAINPIPE

A. Measurement

1. Measurement for payment under Item 15 on the Bid Form shall be on a Linear Foot basis for furnishing and installing 6 Inch DIA. Solid HDPE Drainpipe including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Linear Foot price bid for Item 15 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing 6-Inch DIA. Solid HDPE Drain Pipe, inclusive of all excavation, pipe bedding stone, solid pipe, pipe fittings of all types and appurtenances, backfilling and compacting in place, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.18 BID ITEM 16 – 12-INCH DIA. SOLID HDPE DRAINPIPE

A. Measurement

1. Measurement for payment under Item 16 on the Bid Form shall be on a Linear Foot basis for furnishing and installing 12 Inch DIA. Solid HDPE Drainpipe including any incidentals, as shown on the plans and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Linear Foot price bid for Item 16 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing 12-Inch DIA. Solid HDPE Drain Pipe, inclusive of all excavation, pipe bedding stone, solid pipe, fittings of all types and appurtenances, backfilling and compaction, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.19 BID ITEM 17 – TIDE GATE FOR HDPE DRAINPIPE

A. Measurement

1. Measurement for payment under Item 17 on the Bid Form shall be on a per Each basis for furnishing and installing Tide Gate for HDPE Drainpipe including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Each price bid for Item 17 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Tide Gate For HDPE Drain Pipe inclusive of tide gate, pipe fittings and pipe appurtenances, hardware, and gaskets, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.20 BID ITEM 18 – HDPE FLARED END

A. Measurement

1. Measurement for payment under Item 18 on the Bid Form shall be on a per Each basis for furnishing and installing all HDPE Flared End including any incidentals, as shown on

the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Each price bid for Item 18 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all HDPE Flared End, inclusive of excavation, all pipe bedding, flared ends, fittings, hardware, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.21 BID ITEM 19 – 8"-DIA. DUCTILE IRON DRAINPIPE

A. Measurement

1. Measurement for payment under Item 19 on the Bid Form shall be on a Linear Foot basis for installing all 8" DIA. Ductile Iron Drainpipe including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Linear Foot price bid for Item 19 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all 8"-DIA. Ductile Iron Drain Pipe, inclusive of excavation, all pipe bedding, pipe, fittings, backfilling, compacting, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.22 BID ITEM 20 – SANITARY SEWER TIGHT TANK & VALVE PIT

A. Measurement

1. Measurement for payment under Item 20 on the Bid Form shall be on a Lump Sum basis for installing Sanitary Sewer Tight Tank & Valve Pit, including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Lump Sum price bid for Item 20 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing Sanitary Sewer Tight Tank & Valve Pit, including forming, placing of reinforcing bars, dowels and related embedded items, pouring and finishing concrete, precast concrete septic tank with floor bed pitched to drain, pipe slide rail system for future pumps, concrete tank access covers, concrete and metal risers, access doors and hardware, all PVC pipe and fittings from the tank stubbed out a minimum of 2'-0", all HDPE pipe and fittings from tank to precast concrete valve pit, metal access doors, all related mortar, sealants, gaskets, waterproofing and related fasteners and hardware, excavation, backfilling, compacting, as shown on the plans and as specified herein, and

any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

2. Payment shall include conduit, wiring, fittings, connectors, grounding, junction boxes, panels, sensors, as well as all switches, alarm system and all appurtenances to provide power and communications to the sensors, to provide a fully functional alarm system; the installation of which shall be fully coordinated with work performed under Phase 2.

1.23 BID ITEM 21 – DRAINAGE OUTLET CONTROL STRUCTURE

A. Measurement

1. Measurement for payment under Item 21 on the Bid Form shall be on a per Each basis for furnishing and installing Drainage Outlet Control Structures including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Each price bid for Item 21 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Drainage Outlet Control Structures including forming, placing of reinforcing bars, dowels and related embedded items, pipe bond outs, pouring and finishing concrete, furnishing and installing frame and grate, as well as all excavation, backfilling, compacting, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.24 BID ITEM 22 – STORM WATER INFILTRATION SYSTEM NO.1

A. Measurement

1. Measurement for payment under Item 22 on the Bid Form shall be on a Lump Sum basis for furnishing and installing Stormwater Infiltration System No. 1 including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Lump Sum price bid for Item 22 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Storm Water Infiltration System No. 1, including excavation, sand borrow, crushed stone aggregate backfill, aggregate stone base, infiltration chambers, chamber fittings, pipe fittings, inspection manhole structures, frames and covers, geo-grid reinforcing, perimeter geotextile fabric for soil separation, geotextile filer fabric for drain pipe isolator rows, hardware, gaskets, as well as backfilling and compacting, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

2. Crushed Stone Aggregate utilized as backfill for Infiltration System No. 1 shall be considered as part of this Item and not measured and paid for separately.

1.25 BID ITEM 23 - STORM WATER INFILTRATION SYSTEM NO. 2

A. Measurement

1. Measurement for payment under Item 23 on the Bid Form shall be on a Lump Sum basis for furnishing and installing Stormwater Infiltration System No. 2 including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Lump Sum price bid for Item 23 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Storm Water Infiltration System No. 2, including excavation, sand borrow, crushed stone aggregate backfill, aggregate stone base, infiltration chambers, chamber fittings, pipe fittings, inspection manhole structures, frames and covers, geo-grid reinforcing, perimeter geotextile fabric for soil separation, geotextile filer fabric for drain pipe isolator rows, hardware, gaskets, as well as backfilling and compacting, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

2. Crushed Stone Aggregate utilized as backfill for Infiltration System No. 2 shall be considered as part of this Item and shall not measured and paid for separately.

3. Gravel Borrow placed above Infiltration System No. 2 shall be measured and paid for separately under the respective Bid Item.

1.26 BID ITEM 24 – 2 -INCH WATER SUPPLY LINE

A. Measurement

1. Measurement for payment under Item 24 on the Bid Form shall be on a Linear Foot basis for furnishing and installing all 2-Inch Water Supply Line including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Linear Foot price bid for Item 24 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all 2-Inch Water Supply Line, inclusive of all excavation, pipe bedding, water corporation stop, water supply pipe, pipe fittings, water shutoffs, valves, and related appurtenances, backfilling and compaction, as shown on the plans and as specified herein, and any and all incidentals, including all required testing and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.27 BID ITEM 25 – 3/4 INCH HDPE WATER LINE

A. Measurement

1. Measurement for payment under Item 25 on the Bid Form shall be on a Linear Foot basis for furnishing and installing all 3/4 Inch HDPE Water Line including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Linear Foot price bid for Item 25 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all 3/4-inch HDPE Water Line, inclusive of all excavation, pipe bedding, pipe, pipe fittings, valves, and, appurtenances, backfilling and compaction, as shown on the plans and as specified herein, and any and all incidentals, including all required testing and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.28 BID ITEM 26 – TWO INCH HDPE WATER LINE

A. Measurement

1. Measurement for payment under Item 26 on the Bid Form shall be on a Linear Foot basis for furnishing and installing all Two-Inch HDPE Water Line including any incidentals, as shown on the plans and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Linear Foot price bid for Item 26 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all 2 inch HDPE Water Line, inclusive of all excavation, pipe bedding, pipe, pipe fittings and appurtenances, backfilling and compaction, as shown on the plans and as specified herein, and any and all incidentals, including all required testing and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.29 BID ITEM 27 – 6 INCH DUCTILE IRON WATER PIPE

A. Measurement

1. Measurement for payment under Item 27 on the Bid Form shall be on a Linear Foot basis for furnishing and installing all 6 (Six) Inch Ductile Iron Water Line including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Linear Foot price bid for Item 27 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all 6-inch Ductile Iron Water Pipe, inclusive of all excavation, pipe bedding, pipe, pipe fittings, valves, thrust blocks, and appurtenances, backfilling and compaction as shown on the plans and as specified herein, and any and all incidentals, including all

required testing and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.30 BID ITEM 28 – 8 INCH DUCTILE IRON WATER PIPE

A. Measurement

1. Measurement for payment under Item 28 on the Bid Form shall be on a Linear Foot basis for furnishing and installing all 8 (Eight) Inch Ductile Iron Water Line including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Linear Foot price bid for Item 28 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all 8-inch Ductile Iron Water Pipe, inclusive of all excavation, pipe bedding, pipe, pipe fittings, valves, thrust blocks, and appurtenances, backfilling and compaction as shown on the plans and as specified herein, and any and all incidentals, including all required testing, and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.31 BID ITEM 29 – 6 INCH GATE VALVE & BOX

A. Measurement

1. Measurement for payment under Item 29 on the Bid Form shall be on a per Each basis for installing 6 Inch Gate Valve & Box including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Each price bid for Item 29 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all 6-inch Gate Valve & Box, inclusive of all excavation, bedding, valve box, valve assembly, all castings, fittings, covers, fasteners, hardware and appurtenances, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.32 BID ITEM 30 – 8 INCH GATE VALVE & BOX

A. Measurement

1. Measurement for payment under Item 30 on the Bid Form shall be on a per Each basis for installing 8 Inch Gate Valve & Box including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Each price bid for Item 30 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all 8 Inch Gate Valve & Box, inclusive of all excavation, bedding, valve box, valve assembly, all castings, fittings, covers, fasteners, hardware and appurtenances, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.33 BID ITEM 31 – WATER VALVE BOX ASSEMBLY

A. Measurement

1. Measurement for payment under Item 31 on the Bid Form shall be on a per Each basis for furnishing and installing all Water Valve Box Assemblies including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Each price bid for Item 31 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Water Valve Boxes, inclusive of all excavation, bedding, valve box, valve assembly, seasonal drain assembly, castings, fittings, covers, fasteners, hardware and appurtenances, including backfilling and compaction, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.34 BID ITEM 32 – YARD HYDRANT

A. Measurement

1. Measurement for payment under Item 32 on the Bid Form shall be on a per Each basis for furnishing and installing all Yard Hydrants including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Each price bid for Item 32 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Yard Hydrants, inclusive of all excavation, bedding, valve box, valve assembly, all castings, fittings, covers, fasteners, hardware and appurtenances, forming and placing reinforcing, pouring and finishing concrete collar, backfilling and compaction, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.35 BID ITEM 33 -- FLUSH MOUNT YARD HYDRANT

A. Measurement

1. Measurement for payment under Item 33 on the Bid Form shall be on a per Each basis for furnishing and installing all Flush Mount Yard Hydrants including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Each price bid for Item 33 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Flush Mount Yard Hydrants, inclusive of all excavation, bedding, valve box, valve box assembly, all castings, fittings, covers, fasteners, hardware and appurtenances, as well as forming and placing, reinforcing, pouring and finishing concrete collar, backfilling and compaction, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.36 BID ITEM 34 – FIRE HYDRANT

A. Measurement

1. Measurement for payment under Item 34 on the Bid Form shall be on a per Each basis for furnishing and installing all Fire Hydrant including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Each price bid for Item 34 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Fire Hydrant, inclusive of all excavation, pipe bedding, all castings, taps, tees, riser pipe, hydrant, valve assemblies, fittings, fasteners, hardware, thrust blocks, and appurtenances, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.37 BID ITEM 35 – HMA / SUPERPAVE SURFACE COURSE

A. Measurement

1. Measurement for payment under Item 35 on the Bid Form shall be on a per Ton basis for furnishing and installing all HMA/Superpave Surface Course including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Ton price bid for Item 35 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing HMA / Superpave Surface Course, compacted to the line and grades, as shown on the plans, and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

2. Excavation required for pavement shall be included for payment under Item 3 – Earthwork.

3. Fine grading and compacting subgrade shall be included for payment under Item 3 – Earthwork.

4. Gravel borrow for base course shall be measured and paid for under Item 5 – Gravel Borrow.

1.38 BID ITEM 36 – HMA / SUPERPAVE INTERMEDIATE COURSE

A. Measurement

1. Measurement for payment under Item 36 on the Bid Form shall be on a per Ton basis for furnishing and installing all HMA/Superpave Intermediate Course including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Ton price bid for Item 36 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing HMA / Superpave Intermediate Course, compacted to the line and grades, as shown on the plans, and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

2. Excavation required for pavement shall be included for payment under Item 3 – Earthwork.

3. Fine grading and compacting subgrade shall be included for payment under Item 3 – Earthwork.

4. Gravel borrow for base course shall be measured and paid for under Item 5 – Gravel Borrow.

1.39 BID ITEM 37 – HOT MIX ASPHALT PAVEMENT – POROUS PAVEMENT

A. Measurement

1. Measurement for payment under Item 37 on the Bid Form shall be on a per Ton basis for furnishing and installing Hot Mix Asphalt Pavement – Porous Pavement including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Ton price bid for Item 37 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing Hot Mix Asphalt - Porous Pavement, compacted to the line and grades, as shown on the plans, and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

2. Excavation required for Hot Mix Asphalt Pavement – Porous Pavement shall be included for payment under Item 3 – Earthwork.

3. Fine grading subgrade shall be included for payment under Item 3 - Earthwork

4. Gravel Borrow shall be measured and paid for under Item 5 - Gravel Borrow.

5. Crushed Stone shall be measured and paid for under Item 7 – Crushed Stone – All Types.

6. Geotextile Fabric shall be measured and paid for under Item 8 – Geotextile Fabric for Subsurface Drainage.

1.40 BID ITEM 38 – HOT MIX ASPHALT BERM

A. Measurement

1. Measurement for payment under Item 38 on the Bid Form shall be on a Linear Foot basis for furnishing and installing Hot Mix Asphalt Berm including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

2. Hot Mix Asphalt Berm shall be measured by the front arris-line of the berm, except where the curb is set on a curve having a radius of 10 feet or less, where it shall be measured along the face of the curb at the lowest level after completion off the installation of binder course pavement.

B. Payment

1. Payment of the Linear Foot price bid for Item 38 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing Hot Mix Asphalt Berm, including placing, shaping, and compacting asphalt berm, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.41 BID ITEM 39 – GRANITE CURB – TYPE 1

1.42 BID ITEM 40 - GRANITE CURB – TYPE 2

A. Measurement

1. Measurement for payment under Items 39 and 40 on the Bid Form shall be on a Linear Foot basis for installing Granite Curb – Type 1 and Type 2 including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

2. Curb shall be measured by the front arris-line of the curb, except where the curb is set on a curve having a radius of 10 feet or less, where it shall be measured along the face of the curb at the lowest level after completion of the installation of binder course of pavement.

3. Work shall be inclusive of installing all granite curb, excavation, setting, fitting, cutting curb, concrete curb lock, backfilling, compacting, and all labor, equipment, and incidentals required for furnishing and installing all types of Granite Curb.

B. Payment

1. Payment of the Linear Foot price bid for Item 39 and 40 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all vertical and transition granite curb, excavation, setting, fitting, cutting curb, placing concrete curb lock, backfilling, compacting, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.43 BID ITEM 41 – STABILIZED AGGREGATE

A. Measurement

1. Measurement for payment under Item 41 on the Bid Form shall be on a per Ton basis for furnishing and installing Stabilized Aggregate including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Ton price bid for Item 41 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Stabilized Aggregate, including, all aggregates, binders, mixing, batching, placing, shaping, compacting, and finishing, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

2. Crushed Stone Base shall be measured and paid for separately under the respective Bid Item.

1.44 BID ITEM 42 – COBBLESTONE PAVERS

A. Measurement

1. Measurement for payment under Item 42 on the Bid Form shall be on a Square Foot basis for furnishing and installing Cobblestone Pavers including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Square Foot price bid for Item 42 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Cobblestone Pavers, inclusive of forming, placing reinforcement, placing concrete setting bed, mortar setting bed, fitting, cutting, and installing cobblestones and joints, fully mortared, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.45 BID ITEM 43 INSTALL STONE SLABS FROM STOCKPILE

A. Measurement

1. Measurement for payment under Item 43 on the Bid Form shall be on a Linear Foot basis for installing Stone Slabs from Stockpile including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Linear Foot price bid for Item 43 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Stone Slabs From Stockpile, located on site, including all coordination, inventory, sorting, selection, hauling, loading and unloading, chiseling, cutting, fitting and setting to the line and grade, including backfilling, compacting, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.46 BID ITEM 44 – LANDSCAPE BOULDER GROUPING

A. Measurement

1. Measurement for payment under Item 44 on the Bid Form shall be on a Linear Foot basis for installing Landscape Boulder Groupings including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Linear Foot price bid for Item 44 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Landscape Boulder Groupings, utilizing boulders sourced from on site, including all coordination, inventory, sorting, selection, hauling, loading and unloading, fitting and setting to the line and grade, including backfilling, compacting, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.
2. Excavation, Geotextile Fabric and Stone Base shall be measured and paid for separately under the respective Bid Items.

1.47 BID ITEM 45 – CONCRETE PAVEMENT – TYPE A (EXPOSED AGGREGATE)

A. Measurement

1. Measurement for payment under Item 45 on the Bid Form shall be on a Square Yard basis for furnishing and installing all Concrete Pavement Type A including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Square Yard price bid for Item 45 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing Concrete Pavement – Type A (Exposed Aggregate), inclusive of layout, forming, placing reinforcing, pouring, placing, finishing and sealing concrete, and jointing, concrete pads for all site furnishings, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.48 BID ITEM 46– CEMENT CONCRETE PAD FOR ARTIST SHANTY/KAYAK KIOSK

A. Measurement

1. Measurement for payment under Item 46 on the Bid Form shall be on a Square Yard basis for installing all Cement Concrete Pad for Artist Shanty/Kayak Kiosk including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Square Yard price bid for Item 46 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Cement Concrete Pad for Artist Shanty / Kayak Kiosk, inclusive of layout, forming, placing reinforcing, pouring, and finishing and sealing concrete, jointing, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.49 BID ITEM 47 – CEMENT CONCRETE UTILITY PAD

A. Measurement

1. Measurement for payment under Item 47 on the Bid Form shall be on a Cubic Yard basis for installing all Cement Concrete Utility Pads including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Cubic Yard price bid for Item 47 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Cement Concrete for Utility Pads, inclusive of layout, forming, placing reinforcing, pouring, placing, and finishing and sealing concrete, with all edge finishing and jointing, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.50 BID ITEM 48 – CEMENT CONCRETE TRANSFORMER SLAB & OIL CONTAINMENT CURB

A. Measurement

1. Measurement for payment under Item 48 on the Bid Form shall be on a Lump Sum basis for installing Cement Concrete Transformer Slab & Oil Containment Curb, including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Lump Sum price bid for Item 48 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing Cement Concrete Transformer Slab & Oil Containment Curb, inclusive of layout, forming, placing reinforcement, pouring, placing, and finishing concrete, coordination with utilities, placing curb, to the lines and grades, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.51 BID ITEM 49 – CEMENT CONCRETE PEDESTRIAN CURB RAMP 1 & 2 WITH DETECTABLE WARNING PANELS

A. Measurement

1. Measurement for payment under Item 49 on the Bid Form shall be on a Square Yard basis for installing all Cement Concrete Pedestrian Curb Ramp 1 & 2 with Detectable Warning Panels including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Square Yard price bid for Item 49 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Cement Concrete Pedestrian Curb Ramp 1 & 2 with detectable warning panels, inclusive of layout, formwork, placing reinforcing, embedded items, placing concrete, installing Detectable Warning Panels, finishing and sealing concrete, and all edge finishing and jointing, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.52 BID ITEM 50 – DETECTABLE WARNING PANELS

A. Measurement

1. Measurement for payment under Item 50 on the Bid Form shall be on a Square Foot basis for installing Detectable Warning Panels including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Square Foot price bid for Item 50 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Detectable Warning Panels, inclusive of layout, placing, installing Detectable Warning Panels, as shown on the plans, and as specified herein, and any and all

incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.53 BID ITEM 51 – END BENT ASSEMBLY AT BOARDWALK LOOP

A. Measurement

1. Measurement for payment under Item 51 on the Bid Form shall be on an Each basis for installing End Bent Assembly including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Each price bid for Item 51 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all End Bent Assembly, inclusive of all pile layout, helical anchors, grout materials, grouting, metal plates and saddles, timber bent cap, backing timber, blocking, granite curb, brackets, joist hangers, nuts, washers, bolts, screws, hardware, waterproofing barrier, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.54 BID ITEM 52 – HELICAL PILES AT BOARDWALK LOOP

A. Measurement

1. Measurement for payment under Item 51 on the Bid Form shall be on a per Each basis for installing all Helical Piles at Boardwalk Loop including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Each price bid for Item 52 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Helical Piles at Boardwalk Loop, inclusive of all pile layout, daily placement and removal of protective marsh mats, transport and removal of all materials and work-by-products generated off the marsh, all helical pile shafts, pile helices, pile leads, grout materials, grouting, metal plates and saddles, timber bent cap, brackets, nuts, washers, bolts, screws, hardware, waterproofing barriers and sealants, all drilling, cutting and fitting, assembled in place, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

2. Helical Piles at Pedestrian Bridge shall be measured and paid for separately under the respective Item.

1.55 BID ITEM 53 – HELICAL PILES AT PEDESTRIAN BRIDGE

A. Measurement

1. Measurement for payment under Item 53 on the Bid Form shall be on a per Each basis for installing all Helical Piles at Pedestrian Bridge including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Each price bid for Item 53 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Helical Piles at Pedestrian Bridge, inclusive of all pile layout, daily placement and removal of protective marsh mats, transport and removal of all materials and work-by-products generated off the marsh, all helical pile shafts, pile helices, pile leads, grout and grouting materials, plates, saddles, timber bent cap, brackets, nuts, washers, bolts, screws, hardware, waterproofing barriers and sealants, all drilling, cutting and fitting, assembled in place, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.
2. Helical Piles at Boardwalk Loop shall be measured and paid for under Bid Item 52.

1.56 BID ITEM 54 – HELICAL PILE TEST

A. Measurement

1. Measurement for payment under Item 54 on the Bid Form shall be on a per Each basis for installing all Helical Piles for Load testing including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

Payment of the per Each price bid for Item 54 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Helical Piles for Load Testing, inclusive of metal piles of the sizes specified, hydraulic jacks, and related installation and testing equipment for all coordination, layout, test set-up, measurement procedures, recording and monitoring equipment, sun/wind/rain protection of monitoring equipment, and all resultant test results, readings, measurement, calculations and reports, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.57 BID ITEM 55 – BOARDWALK LOOP

A. Measurement

1. Measurement for payment under Item 55 on the Bid Form shall be on a Square Foot basis for installing all Boardwalk Loop including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Square Foot price bid for Item 55 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Boardwalk Loop, inclusive of all wood framing, blocking, plates, hanger, bolts, nuts, washers, and related hardware assemblies, all water proofing barriers, sealants, wood decking, surface treatments, all necessary cutting, drilling, sanding, fitting and finishing of wood components, as well as furnishing and installing handrails, including layout, cutting, fitting, welding and finishing metal railings, for a complete boardwalk loop system, including all types of bolts, screws, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.
2. Coordination, handling, and installation of Engraved Boardwalk Planks, as shown on the plans and as specified herein, shall be considered incidental to this Item, and shall not be measured and paid for separately.
3. Furnishing the specified seventy-five (75) "Attic-Stock" 2X6 hard wood decking planks, pre-drilled, cut to length and finished, to the Owner, shall be considered incidental to this Item and shall not be measured or paid for separately.

1.58 BID ITEM 56 – BOARDWALK PLANK ENGRAVING

A. Measurement

1. Measurement for payment under Item 56 on the Bid Form shall be on a per Each basis for furnishing Engraved Boardwalk Planks including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Each price bid for Item 56 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for furnishing to the Project Site Engraved Boardwalk Planks including, all Owner content coordination, loading and unloading at on and off-site locations, transport, set-up, layout, templating, engraving and finishing wood 2x6x6 foot-long wood boardwalk decking planks, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.
2. Installation of Engraved Boardwalk planks shall be measured and paid for under Bid Item 55.

1.59 BID ITEM 57 – BOARDWALK BENCH

A. Measurement

1. Measurement for payment under Item 57 on the Bid Form shall be on an Each basis for installing Boardwalk Benches including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Each price bid for Item 57 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing Boardwalk Benches, including all fasteners, bolts, washers, blocking, installation of bench, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.60 BID ITEM 58 – PEDESTRIAN BRIDGE

A. Measurement

1. Measurement for payment under Item 58 on the Bid Form shall be on a Lump Sum basis for installing Pedestrian Bridge including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Lump Sum price bid for Item 58 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing the Pedestrian Bridge, inclusive of Glue-Laminated beams, wood blocking, timber posts, bridge wood decking, tension ties, metal plates, angles, bolts, hardware and related assemblies, as well as wood railing system, inclusive of pickets, top and bottom rails, inclusive of all cutting, drilling, sanding, fitting and finishing, as well as lag bolts, screws, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.61 BID ITEM 59 – BOARDWALK RAILING TYPE W (WOOD)

A. Measurement

1. Measurement for payment under Item 59 on the Bid Form shall be on a Linear Foot basis for installing Boardwalk Railing Type W (Wood) including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

2. Boardwalk Railing Type W shall be measured at the bottom of railing or top of decking.

B. Payment

1. Payment of the Linear Foot price bid for Item 59 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Boardwalk Railing Type W (wood), inclusive of all timber posts, wood bottom and top railings, wood pickets, bolts, nuts, washers, and related hardware assemblies, inclusive of all necessary cutting, drilling, sanding, fitting and finishing, as well as lag bolts, screws, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.62 BID ITEM 60 - BOARDWALK RAILING TYPE C (CABLE)

A. Measurement

1. Measurement for payment under Item 60 on the Bid Form shall be on a Linear Foot basis for installing Boardwalk Railing Type C (Cable) including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

2. Boardwalk Railing Type C shall be measured at the bottom of railing or top of decking.

B. Payment

1. Payment of the Linear Foot price bid for Item 60 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Boardwalk Railing Type C (cable), inclusive of all timber posts, wood bottom and top railings, cables, tensioners, fasteners, stays spacer struts, bolts, nuts, washers, and related hardware assemblies, inclusive of all necessary cutting, drilling, fitting and finishing, as well as lag bolts, screws, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.63 BID ITEM 61 – REINFORCED TURFGRASS SYSTEM

A. Measurement

1. Measurement for payment under Item 61 on the Bid Form shall be on a Square Yard basis for installing Reinforced Turfgrass System including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Square Yard price bid for Item 61 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Reinforced Turfgrass System, inclusive of furnishing, layout, placing, geo-grid rings, edging, cutting and fitting and connecting geo-grid rings to the correct line and grade, concrete sand, backfilling and compacting, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.64 BID ITEM 62 – LANDSCAPE STAIR LS-1 THRU LS-6

A. Measurement

1. Measurement for payment under Item 62 on the Bid Form shall be on a Square Foot basis for installing Landscape Stair LS-1 thru LS-6 including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Square Foot price bid for Item 62 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Landscape Stair LA-1 Thru LS-6, inclusive of layout, cutting and fitting and setting to the correct line and grade, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.
2. Excavation shall be paid for separately under Item 3 – Earthwork.
3. Crushed Stone Base shall be measured and paid for separately under Item 3 – Crushed Stone – All Types.

1.65 BID ITEM 63 – REGULATORY & PARK SIGNAGE – ALL TYPES

A. Measurement

1. Measurement for payment under Item 63 on the Bid Form shall be on a Square Foot basis for installing Regulatory & Park Signage including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Square Foot price bid for Item 63 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing Regulatory & Park Signage, assembled on sign posts, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.66 BID ITEM 64 - REGULATORY & PARK SIGN POST 2-1/2" STEEL

A. Measurement

1. Measurement for payment under Item 64 on the Bid Form shall be on a per Each basis for installing all Regulatory & Park Sign Posts including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Each price bid for Item 64 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Regulatory & Park Sign Posts, as shown on the plans, and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.67 BID ITEM 65 – PARK ENTRANCE SIGN

A. Measurement

1. Measurement for payment under Item 65 on the Bid Form shall be on a per Each basis for installing Park Entrance Sign including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Each price bid for Item 65 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing Park Entrance Sign, inclusive of excavation, backfilling, compacting, furnishing and installing wood piles, rope wrap, sign frame, interior panel/face panels, all fasteners, brackets, channels, screws, bolts, hardware, per the approved Shop Drawings, and as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.68 BID ITEM 66 - INTERPRETIVE GRAPHIC PANEL – TYPE GP-BW

A. Measurement

1. Measurement for payment under Item 66 on the Bid Form shall be on a per Each basis for Installing all Interpretive Graphic Panels – Type GP-BW including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Each price bid for Item 66 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing Interpretive Graphic Panel – Type GP-BW, inclusive of finishing, fastening galvanized plate, fasteners, screws, bolts, blocking, brackets, plates, welding, graphic panel installed to the lines and grades, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.69 BID ITEM 67 – INTERPRETIVE GRAPHIC PANEL – TYPE GP-S

A. Measurement

1. Measurement for payment under Item 67 on the Bid Form shall be on a per Each basis for installing all Interpretive Graphic Panel – Type GP-S including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Each price bid for Item 67 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing Interpretive Graphic Panel – Type GP-S, inclusive of excavating, placing gravel borrow, forming, pouring and finishing concrete footing, placing steel posts and support bar level, installing graphic panel face to the lines and grades, backfilling, compacting, as shown on the plans and as specified herein, and any and all incidentals and

miscellaneous work not specifically included for payment but necessary to complete the Work.

1.70 BID ITEM 68 – PAVEMENT MARKINGS – YELLOW AND WHITE EPOXY RESIN

A. Measurement

1. Measurement for payment under Item 68 on the Bid Form shall be on a Linear Foot basis for installing all Pavement Markings – Yellow and White Epoxy Resin including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Linear Foot price bid for Item 68 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Pavement Markings, lines, accessible logo marker, arrows, in Yellow and White Epoxy Resin, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.71 BID ITEM 69 – PAVEMENT MARKINGS – CROSSWALK – ALL TYPES – EPOXY RESIN

A. Measurement

1. Measurement for payment under Item 69 on the Bid Form shall be on a Linear Foot basis for required installing all Pavement Markings – Crosswalk – All Types – Epoxy Resin including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Linear Foot price bid for Item 69 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Pavement Markings – Crosswalks – All Types, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.72 BID ITEM 70 – WOOD SPLIT RAIL FENCE

A. Measurement

1. Measurement for payment under Item 82 on the Bid Form shall be on a Linear Foot basis for installing the Wood Split Rail Fence including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Linear Foot price bid for Item 82 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for install the Wood Split Rail Fence system including all fence layout, excavation, forming,

placing and pouring concrete as well as setting of posts, all backfilling, cutting, drilling assembly and installation of related hardware, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.73 BID ITEM 71 – WOOD RUSTIC POST FENCE

A. Measurement

1. Measurement for payment under Item 83 on the Bid Form shall be on a Linear Foot basis for installing all Wood Rustic Post Fence, including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Linear Foot price bid for Item 83 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for install the Wood Rustic Post Fence system including all fence layout, excavation, forming, placing and pouring concrete as well as setting of posts, all backfilling, cutting, drilling, and shaping of posts, all boring, cutting of all types of materials, metal pipe rails, all assembly and tying of rope, installation of related hardware, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.74 BID ITEM 72 – BOLLARD – TYPE 1 (WOOD)

A. Measurement

1. Measurement for payment under Item 72 on the Bid Form shall be on a per Each basis for installing Bollard – Type 1 (Wood) including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Each price bid for Item 72 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Bollard – Type 1 (Wood) in all locations and configurations shown, including all excavation, layout, wood bollards, cutting, fitting, sealing, finishing and setting to the line and grade indicated, including backfilling, compacting, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

2. Layout, drilling, furnishing, and installing hardware and chain assembly, where shown on the plans and as specified herein, shall be considered incidental to the cost of this Bid Item.

1.75 BID ITEM 73 – BOLLARD – TYPE 2 (REMOVABLE)

A. Measurement

1. Measurement for payment under Item 73 on the Bid Form shall be on a per Each basis for Installing Bollard – Type 2 (Removable) including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Each price bid for Item 73 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Bollard – Type 2 assemblies, in all locations and configurations shown, including layout, all excavation, forming, placing reinforcing, pouring, placing and finishing concrete, all embedded items, bollard receiver and steel bollards, resulting in a complete assembly, set to the line and grade indicated, including backfilling, compacting, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.76 BID ITEM 74– CCTV SITE CAMERA POLE & FOUNDATION

A. Measurement

1. Measurement for payment under Item 74 on the Bid Form shall be on a per Each basis for installing all CCTV Site Camera Poles including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Each price bid for Item 74 in the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing CCTV Site Camera Pole & Foundation including all concrete formwork, placement of reinforcing, grounding wire, rod and related components, conduits, CCTV Site Camera pole anchor bolts, placement of concrete, finishing of exposed concrete surfaces, setting and backfilling of CCTV pole foundations, Site Camera pole, assembling the CCTV Site Camera pole and various components including securing the CCTV Site Camera pole on the foundations, sealed from the weather, coordinated for future connections, as indicated on the plans and as specified herein inclusive of any and all incidentals and miscellaneous work not specifically included for payment but necessary to compete the Work.

1.77 BID ITEM 75 – SITE LIGHT, TYPE S1 – POLE, LUMINAIRE & FOUNDATION

A. Measurement

1. Measurement for payment under Item 75 on the Bid Form shall be on a per Each basis for installing all Site Light Type S1 including any incidentals, as shown on the plans, and

as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Each price bid for Item 75 in the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing Site Light S1 including all concrete formwork, placement of reinforcing, grounding wire, rod and related components, conduits, light pole anchor bolts, placement of concrete, finishing of exposed concrete surfaces, setting and backfilling of light pole foundations, light pole, assembling the site light pole and various components including GFCI receptacles, brackets, arms and banner arms and luminaires with the required lamps and ballasts, setting and securing the light pole on the foundations, as indicated on the plans and as specified herein inclusive of any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

2. Internal wiring to connect luminaire and GFCI receptacles, connectors, testing and other electrical work required to provide a fully functional assembly shall be measured and paid for separately under Bid Item E.

1.78 BID ITEM 76 – SITE LIGHT, TYPE S2 – BOLLARD, LIGHT & FOUNDATION

A. Measurement

1. Measurement for payment under Item 76 on the Bid Form shall be on a per Each basis for installing all Site Light Type S2 including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Each price bid for Item 76 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing Site Light S2 including coordination of the various components that comprise Site Light S2; furnish and install all concrete formwork, placement of grounding components, furnish and install wood bollard post, assembly of components including all drilling and cutting and installation of conduits and junction boxes, and placement of concrete, backfilling of the S2 foundations, installing related raceways, luminaire, assembling the S2 sconce site light on the bollard coordinated with a connection to the power pedestal and related components including receptacles of all types and sizes, and the required S2 lamps and light fixtures, setting and securing the light on the bollard, and installing the entire S2 assembly, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

2. Internal wiring to connect luminaire and GFCI receptacles, connectors, testing and other electrical work required to provide a fully functional assembly shall be measured and paid for separately under Bid Item E.

3. The power pedestal and all associated wiring shall be measured and paid for under the Bid Item E.

1.79 BID ITEM 77 – SITE LIGHT, TYPE S3 – POLE, LIGHT & FOUNDATION

A. Measurement

1. Measurement for payment under Item 77 on the Bid Form shall be on a per Each basis for installing all Site Light – Type S3 – Pole, Light & Foundation including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Each price bid for Item 77 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing Site Light S3 including all concrete formwork, placement of reinforcing, grounding components, wiring, connections, conduits and light pole anchor bolts, placement of concrete, finishing of exposed concrete surfaces all, setting and backfilling of light pole foundations, light poles, assembling the site light pole and various components including GFCI receptacles, brackets, arms and luminaires with the required lamps and ballasts, setting and securing the light pole on the foundations, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

2. Internal wiring to connect luminaire and GFCI receptacles, connectors, testing and other electrical work required to provide a fully functional assembly shall be paid for separately under Bid Item E.

1.80 BID ITEM 78 – BIKE RACK TYPE 1

1.81 BID ITEM 79 - BIKE RACK TYPE 2

1.82 BID ITEM 80 - BIKE RACK TYPE 3

A. Measurement

1. Measurement for payment under Items 78, 79 & 80 on the Bid Form shall be on an Each basis for installing Bike Racks Type 1, 2 and 3 including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Each price bid for Item 78, 79 & 80 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing Bike Racks of each type as shown on the plans, including layout, assembly, placement, drilling and setting of anchor bolts, and installation of bike racks on concrete pavement, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.83 BID ITEM 81 - ACCESSIBLE PICNIC TABLES

A. Measurement

1. Measurement for payment under Item 81 on the Bid Form shall be on a per Each basis for furnishing and installing the Accessible Picnic Tables, inclusive of all labor, materials, equipment, and incidentals required to complete all work as shown on the plans and specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Each bid price bid for this item shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installation of the Accessible Picnic Tables, inclusive of the following:

2. Assembly and installation of the picnic tables, drilling and bolting in place and otherwise securing the picnic tables as indicated on the plans and as specified herein, noting that the concrete base on which to install the picnic table is furnished and paid for separately under the Bid Item for Cement Concrete Sidewalk – Type A.

3. Work shall be inclusive of any and all incidentals and miscellaneous work not specifically included for payment but necessary to deliver the item complete in place.

1.84 BID ITEM 82 – PARK BENCH

A. Measurement

1. Measurement for payment under Item 82 on the Bid Form shall be on a per Each for furnishing and installing Park Benches, inclusive of all labor, materials, equipment, and incidentals required to complete all work as shown on the plans and specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Each bid price bid for this item shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installation of the Park Benches, inclusive of the following:

2. Assembly and installation of the benches, drilling and bolting in place and otherwise securing the benches as indicated on the plans and as specified herein, noting that the concrete base on which to install the bench is furnished and paid for separately under the Bid Item for Cement Concrete Sidewalk – Type A.

3. Work shall be inclusive of any and all incidentals and miscellaneous work not specifically included for payment but necessary to deliver complete in place.

1.85 BID ITEM 83 – BARRIER GATE

A. Measurement

1. Measurement for payment under Item 83 on the Bid Form shall be on an Each basis for installing all Barrier Gates including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Each price bid for Item 83 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Barrier Gates, including metal posts and gate frames, locking hardware, gate layout, excavation, forming, placing, pouring and finishing concrete footing as well as setting of posts, any field welding, cutting, drilling necessary for assembly, installation of related hardware, and all backfilling and compacting, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.86 BID ITEM 84 – NATURE BASED PLAY AREA

A. Measurement

Measurement for payment under Item 84 on the Bid Form shall be on a Lump Sum basis for install all components of the Nature Based Play Area including any incidentals, as shown on the plans and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Lump Sum price bid for Item 84 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for preparation of subgrade, furnishing, installing, placing, shaping, and compacting aggregate base materials,
2. Furnish and install Play equipment inclusive of layout, excavating, constructing formwork, and placing reinforcing and anchor bolts and hardware, placing concrete for play equipment foundations to the required line and grade, backfilling, compacting, furnishing, and installing Nature Based Play equipment on foundations per approved shop drawings and submittals.
3. Furnishing and installing poured-in-place rubber surfacing and engineered fiber wood mulch,
4. Work as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.87 BID ITEM 85 – LOAM FOR SEEDED AREAS – 6” DEEP

A. Measurement

1. Measurement for payment under Item 85 on the Bid Form shall be on a Square Yard basis, installed, complete and in place to the full satisfaction of the Engineer.
2. Measurement for payment under Item 85 on the Bid Form shall be on a Square Yard basis for installing Loam for Seed Areas including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Square Yard price bid for Item 85 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing Loam for Seeded Areas inclusive of scarifying sub-grade, hauling, placing, as shown on the plans, and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.88 BID ITEM 86 – LOAM FOR PLANTING

A. Measurement

1. Measurement for payment under Item 86 on the Bid Form shall be on a Cubic Yard basis for installing all Loam for Planting, including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Cubic Yard price bid for Item 86 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing Loam surrounding plant root balls for plants including all trees, shrubs, perennials and grasses, mixing soil amendments, backfilling and compacting in a coordinated manner with the installation of the specified plant materials, edging beds, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.89 BID ITEM 87 – MODIFIED LOAM FOR EVENT SPACE

A. Measurement

1. Measurement for payment under Item 87 on the Bid Form shall be on a Cubic Yard basis for installing all Modified Loam for Event Space including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Cubic Yard price bid for Item 87 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Modified Loam for Event Space, inclusive of blending, mixing, placing modified loam, as shown on the plans, and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.90 BID ITEM 88 – DECIDUOUS TREE – 3 – 3 ½" CAL.

1.91 BID ITEM 89 - DECIDUOUS TREE – 10'-12' HEIGHT.

1.92 BID ITEM 90 - DECIDUOUS TREE – 12'-14' HEIGHT.

1.93 BID ITEM 91 - DECIDUOUS TREE – #2 CONT.

1.94 BID ITEM 92 - EVERGREEN TREE – 5'-6' HEIGHT.

1.95 BID ITEM 93 - EVERGREEN TREE – 7'-8' HEIGHT.

1.96 BID ITEM 94 - EVERGREEN TREE – #15 CONT.

A. Measurement

1. Measurement for payment under Item 88, 89, 90, 91, 92, 93 & 94 on the Bid Form shall be on a per Each basis for installing all Deciduous and Evergreen Trees, all sizes, including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Each price bid for Item 88, 89, 90, 91, 92, 93 & 94 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Deciduous and Evergreen Trees, all sizes, inclusive of tagging, placing, field layout and coordination, hand and machine excavation required for plant installation, backfilling and compacting, soil amendments, herbicides, fertilizers, staking, watering, placing pine bark mulch, establishment and maintenance measures, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.97 BID ITEM 95 – SHRUB - #1 CONT.

1.98 BID ITEM 96 - SHRUB – #2 CONT.

1.99 BID ITEM 97 - SHRUB – #3 CONT.

1.100 BID ITEM 98 - SHRUB – 18-24" HEIGHT.

1.101 BID ITEM 99 - SHRUB – 24-30" HEIGHT.

1.102 BID ITEM 100 - SHRUB – 3' HEIGHT.

1.103 BID ITEM 101 - SHRUB – 5'-7' HEIGHT.

A. Measurement

1. Measurement for payment under Item 95, 96, 97, 98, 99, 100 & 101 on the Bid Form shall be on a per Each basis for installing all Deciduous and Evergreen Shrubs, all sizes, including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Each price bid for Item 95, 96, 97, 98, 99, 100 & 101 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Deciduous and Evergreen Shrubs, all sizes, inclusive of tagging, placing, field layout and coordination, hand and machine excavation required for plant installation, backfilling and compacting, soil amendments, herbicides, fertilizers, staking, watering, placing pine bark mulch, establishment and maintenance measures, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.104 BID ITEM 102 – PERENNIALS/GRASSES – 4" CONT.

1.105 BID ITEM 103 - PERENNIALS / GRASSES – #1" CONT.

A. Measurement

1. Measurement for payment under Item 102 and 103 Bid Form shall be on a per Each basis for installing all perennials and grasses, all sizes, including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the per Each price bid for Item 102 and 103 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all Perennials/Grasses, all sizes, inclusive of tagging, placing, field layout and coordination, hand and machine excavation required for plant installation, backfilling and compacting, soil amendments, herbicides, fertilizers, staking, watering, placing pine bark mulch, establishment and maintenance measures, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.106 BID ITEM 104 – SEED MIX TYPE A

1.107 BID ITEM 105 – SEED MIX TYPE B

1.108 BID ITEM 106 – SEED MIX TYPE C

1.109 BID ITEM 107 – SEED MIX TYPE D

1.110 BID ITEM 108 – SEED MIX TYPE E

A. Measurement

1. Measurement for payment under Item 104, 105, 106, 107 & 108 on the Bid Form shall be on a Square Yard basis for installing each Seed Mix Type including any incidentals, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Square Yard price bid for Item 104, 105, 106, 107 & 108 on the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing each Seed Mix type in the locations shown on the plans and as specified herein, inclusive of watering, establishment and maintenance measures, as shown on the plans and as specified herein, and any and all incidentals and miscellaneous work not specifically included for payment but necessary to complete the Work.

1.111 BID ITEM 109 - PARK ELECTRICAL SYSTEM

A. Measurement

1. Measurement for payment under Bid Item 109 Park Electrical System on the Bid Form shall be on a Lump Sum basis per the approved Schedule of Values, inclusive of furnishing all labor, materials, equipment, and incidentals required for installing all Electrical work as shown on the plans and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Lump Sum price for Bid Item 109 Park Electrical System shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing all electrical system components for a fully functional electrical system including but not limited to the following:

2. Coordinating the sequencing of the installation of all park electrical system components shown within Phase 1 with future construction of Phase 2 of construction as well as,

3. Coordination for all work being performed by Eversource with work to be performed under this contract for both off-site and on-site electrical improvements, as well as,

4. Furnishing and installing all conduits and fittings, concrete encasement where indicated, utility hand holes, and manholes associated with the primary electric service connection from Rte. 28 to the proposed transformer location, including wiring connections for the primary electric service, as well as furnishing and installing all associated wiring, grounding and terminations at the transformer, as well as the electric service conduit and conductor wiring from the transformer to the Phase 2 disconnect panel (by others) as well as,

5. Furnishing and installing all electrical systems shown on the plans and as specified herein, including conduit and fittings and all wiring of all types and sizes, all switches, disconnects, electrical/utility enclosures, panel boards, electrical cables, connectors, grounding wires, grounding rods, and equipment, all controls for all site electrical circuits as well as,

6. Furnish and install power pedestals where indicated onto wood bollards as shown on the plans and as specified herein, and also, furnish and install all components and related consumables such as primers, solvents, solder, screws, bolts, cutting and grinding wheels, adhesives, calking etc. as necessary to complete the Work, as well as,

7. Providing all coordination and installation of all circuitries and wiring for the necessary connections for all site lighting. Work shall include furnishing and installing all lighting power and control systems as necessary to deliver a complete and functional lighting system that operate site light types S1, S2 and S3 as well as,

8. Furnishing and installing septic tank conduit, fittings, wiring, connectors, and alarm panel affixed on the exterior of future restroom building, work to be coordinated with Phase 2 improvements, as well as,

9. Furnishing and installing all electrical work complete and inclusive of any and all incidentals and miscellaneous work not specifically included for payment but necessary to deliver a complete a functional lighting and electrical system for the Owner to operate a fully functional Park and Event Space facility, as well as,

10. Furnishing and Installing new temporary power connections and maintaining continuous and uninterrupted power at the shellfish upweller facility and any Contractor and Engineer facilities until determined by the Engineer to be no longer required.

C. Payments for Bid Item – 109 Park Electrical System shall be made based on a Schedule of Values for this Item submitted by the Contractor and as agreed to by the Owner.

D. Related Work paid for by the Owner includes the following:

Per Eversource Work Order WO12408266: Eversource will install riser pole conduits, fuses, Rte. 28 underground crossing consisting of conduits and fittings, concrete encasement, as well as provide and pull electrical conductor wiring and will make all wiring connections for the primary electric service, with work to include furnishing and installing the three phase transformer and all associated primary service wiring, connections, grounding and terminations at transformer, as well as furnish new electric service meter, installation to be coordinated with Phase 2.

E. Related Items measured and paid for elsewhere include the following.

1. Bid Item 47 – Concrete Utility Pad
2. Bid Item 48 – Concrete Transformer Slab & Oil Containment Curb,
3. Bid Item 74 - CCTV Site Camera Pole and Foundation
4. Bid Item 75 – Site Light Type S1 Pole, Light & Foundation
5. Bid Item 76 – Site Light Type S2 Bollard, Light & Foundation
6. Bid Item 77 – Site Light S3 Pole, Light & Foundation

1.112 ADDITIVE ALTERNATE NO. 1 KAYAK LAUNCH FACILITY

A. Measurement

1. Measurement for payment under Additive Alternate No. 1 on the Bid Form shall be on a Lump Sum basis for furnishing all labor, materials, equipment, and incidentals required for installing all Kayak Launch Facility per the approved Schedule of Values, as shown on the plans, and as specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Lump Sum price bid for Additive Alternate No 1 in the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing Kayak Launch Facilities, inclusive of the following:
2. Coordinating the various aspects of the work and inter-related components including float and gangway design and preparation of any related calculations, preparation of all shop drawings and submittals on products and techniques proposed for use, with plans sealed by a professional engineer license in the state of Massachusetts,
3. Furnishing, installing, maintaining, and removing construction access pad, floating silt fence and associated erosion controls.
4. Furnishing and installing helical anchors, bents, end bents and elevated wood boardwalk with wood railings,
5. Furnishing and installing river bottom mooring system for the kayak launch float, including helical anchors or similar, elastomeric mooring stays, chains, and all associated hardware,
6. Furnishing and installing wood piles and wooden landing with railings, as indicated on the plans,
7. Furnishing and installing both fixed and hinged aluminum gangways, including all necessary aluminum and stainless-steel hardware, transition plates, mounting hardware, stiff arm struts or similar braces, plates, angles, and associated components,
8. Furnishing and installing the kayak launch float complete and inclusive of any and all incidentals and miscellaneous work not specifically included for payment but obviously necessary to deliver a complete, safe and functional Kayak Launch Facility.
9. Payment to be made based on a Schedule of Values for Additive Alternate 1 submitted by the Contractor and agreed to by the Owner.

1.113 ADDITIVE ALTERNATE NO. 2 SHADE STRUCTURE & BENCHES

A. Measurement

1. Measurement for payment under Additive Alternate No. 2 on the Bid Form shall be on a Lump Sum basis for required for furnishing and installing the Shade Structure and Park Benches inclusive of all labor, materials, equipment, and incidentals required to

complete all work as shown on the plans and specified herein, complete and accepted in place, to the full satisfaction of the Engineer.

B. Payment

1. Payment of the Lump Sum price bid for Additive Alternate No 2. in the Bid Form shall be full compensation for furnishing all labor, materials, equipment, and incidentals required for installing the Shade Structure& Benches, inclusive of the following:
2. Coordinating the various aspects of the work and inter-related components including any related shade structure design calculations and the preparation of all shop drawings and submittals with plans designed and sealed by a professional engineer licensed in the state of Massachusetts.
3. Furnishing and installing the shade structure complete and in place including layout, excavation, forming, of footings, rebar and rebar placement, placement, and installation of anchor bolts, pouring concrete, backfilling, and compacting of soils,
4. Furnishing and installing shade structure steel support posts on foundations installed,
5. Furnishing and installing fabric shade sails on steel posts installed, inclusive of all required tensioners, hardware, bolts, assemblies etc.
6. Coordinating the various aspects of the work and inter-related components including any related shop drawings and submittals for the park benches and picnic tables.
7. Furnishing and drilling and bolting in place and otherwise installing Park Benches as indicated on the plans and as specified herein, noting that the concrete base on which to install the bench is furnished and paid for separately under the Bid Item for Cement Concrete Sidewalk – Type A.
8. Work for this Additive Alternate shall be inclusive of any and all incidentals and miscellaneous work not specifically included for payment but necessary to deliver complete, safe and functional shade sail, park benches and picnic tables.

END OF SECTION

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SECTION 01 29 73

SCHEDULE OF VALUES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. Requirements for breakdown of Lump Sum bid.

B. Related Sections

1. Section 01 33 00, SUBMITTAL PROCEDURES

1.2 BREAKDOWN OF LUMP SUM BID

A. Within 20 business days of the date of the executed Contract, a list detailing the breakdown of theLump Sums bid by the appropriate Divisions of these Specifications or as otherwise directed by the Engineer, shall be submitted for review and concurrence by the Engineer. This list will be used by the Engineer as a guide in preparing estimates for payment. The list shall be an accurate representation of costs required to complete the Work in accordance with the Contract Documents.

B. A schedule of the monthly value of work done based on the Progress Schedule submitted under Section 01 33 00 - SUBMITTAL PROCEDURES shall be submitted within 20 business days of the date of the executed Contract. The schedule shall show the total sum of work done for each month of the projected construction period and shall be updated monthly to reflect the actual amount requisitioned for payment.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

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SECTION 01 32 00

CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Requirements for computer generated Critical Path Method (CPM) construction scheduling and Narrative progress report.

B. No portion of this specification shall take precedent over SECTION 00 50 00, CONTRACT AGREEMENT.

1.2 SUBMITTALS

A. Submit in accordance with Section 01 33 00, SUBMITTALS

1. Quality Assurance/Control Submittal

a. Name and version of CPM software proposed for use.

b. List of construction projects completed on which progress of work was controlled with CPM software.

2. Schedule

a. Within 14 days following the receipt of the Notice to Proceed, the Contractor shall submit two color copies of a computer-generated schedule and a list of activities to the Engineer. Following review by the Engineer and Owner the Contractor shall meet with the Engineer and Owner to discuss the review. The Contractor shall incorporate the Engineer's comments into the schedule and submit eight color copies of the revised schedule within 14 days following receipt of the Engineer's comments.

PART 2 - PRODUCTS

2.1 SOFTWARE

A. Computer based scheduling software used by the Contractor shall be the product of a recognized commercial computer software producer and shall be capable of meeting the requirements specified herein.

PART 3 - EXECUTION

3.1 PREPARATION

A. General

1. The Contractor shall prepare his proposed CPM schedule based on a breakdown of work tasks that he has developed.

2. The construction schedule and updates shall be prepared by the Contractor or the Contractor's qualified consultant.

B. Schedule

1. Each schedule shall be prefaced with the following summary data:
    a. Contract name and number
    b. Contractor's Name
    c. Contract duration
    d. The effective or starting date of the schedule
    e. Revision date of the latest schedule.
2. The CPM schedule shall be sequenced by early start date and shall include the following minimum items:
    a. Activity Name
    b. Estimated duration
    c. Activity description
    d. Early start date (calendar date)
    e. Early finish date (calendar date)
    f. Latest allowable start date (calendar date)
    g. Latest allowable finish date (calendar date)
    h. Status (whether critical)
    i. Estimated cost of the activity
    j. Float (total and free)
    k. Major milestones
3. Separate milestones shall be included for Notice-to-Proceed and Project Completion Date.
4. Activities shall include major components of the work including submittals that might impact the critical path, subcontractor work, major and critical equipment design, fabrication, testing, delivery and installation times, system/subsystem/component testing, process and facility startup, training, demobilization, project cleanup and closeout. Critical portions of process instrumentation and control system work, shall be defined in detail in a sub schedule.
5. The sum of the costs assigned to the activities shall be equal to the Contract price. Activity costs shall not be assigned to submittals or submittal reviews. Comply with SECTION 01 29 73, SCHEDULE OF VALUES. Provide a table showing the anticipated monthly percentage of completion, based on the total contract price.
6. Critical activities, predecessors, free float, and total float shall be clearly displayed on the schedule in graphical form. Schedules that contain activities showing negative float or that extend beyond the contract completion date will not be approved.

7. Each schedule submittal shall also include a list of activities in the order in which the activities will be performed, along with activity durations, activity predecessors, type of predecessor (finish-start, finish-finish, start-start, lead/lag), and any dependency or required date.
8. The schedule shall be based on a standard 5-day work week with allowance for holidays and adverse weather.
9. Engineer's approval of the CPM schedule is advisory only and shall not relieve the Contractor of responsibility for accomplishing the work prior to the contract completion date. Omissions and errors in the approved CPM schedule shall not excuse performance less than that required by the Contract. Approval by the Engineer in no way makes the Engineer an insurer of the CPM schedule's success or liable for time or cost overruns flowing from its shortcomings. The Owner hereby disclaims any obligation or liability by reason of approval by its agent, the Engineer, of the CPM schedule.

C. Narrative Progress Report

1. Include as a minimum:
   a. Summary of work completed during the previous period (since submission of last narrative progress report).
   b. Explanation for variations between actual work completed in previous period and planned work as reported in last period.
   c. Summary of work planned during the next period.
   d. Current and anticipated delaying factors and their estimated impacts on other activities and milestones, both critical and non-critical.
   e. Corrective actions taken or proposed.
2. A Narrative Progress Report shall be submitted monthly to the Engineer, at least 5 working days prior to the progress meeting.
3. At the discretion of the Engineer, the Contractor may be required to submit a revised CPM schedule showing completion to date and any changes to the previous schedule.

3.2 MONITORING SCHEDULE

A. The CPM approved construction schedule shall be used by the Contractor throughout the duration of the project for planning, organizing, and directing the Work, and for reporting progress of the Work.

B. The Contractor is solely responsible for monitoring schedule compliance. When a delay to the critical path occurs, the Contractor shall immediately notify the Engineer in writing. Within one week of the notification, the Contractor shall submit for the Engineer's approval, a description of proposed actions to return the project to schedule.

3.3 MODIFYING SCHEDULE

A. If the Contractor desires to make changes in his method of operating which affect the approved CPM schedule, he shall notify the Engineer in writing stating what changes are proposed and the

reason for the change. If the Engineer approves these changes, the Contractor shall revise and submit for approval, without additional cost to the Owner, all of the affected portions of the CPM schedule.

B. It may be necessary for the contract schedule or completion time to be adjusted by the Owner to reflect the effects of job conditions, weather, technical difficulties, strikes, unavoidable delays on the part of the Owner or its representatives and other unforeseeable conditions which may indicate schedule adjustments or completion time extensions. Under such conditions, the Engineer will direct the Contractor to reschedule the work or contract completion time to reflect the changed conditions and the Contractor shall revise his schedule accordingly.

C. Float time is a project resource available to both the Contractor and the Owner to meet contract milestones and completion dates. Use of float suppression techniques such as preferential sequencing or logic, special lead/lag logic restraints, and extended activity times are prohibited, and use of float time disclosed or implied by use of alternate float suppression techniques shall be shared to proportionate benefit of OWNER and CONTRACTOR.

D. If the Contractor provides an accepted schedule with an early completion date, the Owner reserves the right to reduce the Time of Completion to match the early completion date by issuing a deductive Change Order at no change in Contract Price.

END OF SECTION

SECTION 01 32 33

PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Requirements for providing photographs for existing conditions and the work proposed under this Contract.

1.2 REQUIREMENTS

A. The Contractor shall employ at his own expense a fully competent and qualified commercial photographer demonstrating at least three (3) years professional experience in the field of commercial photography. The purpose of this employment shall be to take preconstruction and construction photographs at locations and times designated by the Engineer.

1.3 SUBMITTALS

A. Submit to the Engineer all requested qualifications, experience records, and examples of the photographer's work, for review. Only after the review of the photographer's qualifications and approval thereof by the Engineer shall the Contractor finalize such employment.

1.4 SCHEDULING

A. Prior to commencement of any work or at any time during the construction, directed by the Engineer, the Contractor and photographer shall consult with the Engineer for instructions concerning views required at each specific work site. The photographs shall show the existing conditions prior to and during construction as require by the Engineer and shall be taken from locations or views designated by the Engineer to adequately illustrate the state of the project and/or conditions of construction. The Contractor shall also arrange with the photographer adequate photographic coverage throughout the duration of this Contract, at the times requested by the Engineer, having said photographer on 24-hour call when services are required.

PART 2 - PRODUCTS

2.1 PHOTOGRAPHS

A. The Owner shall be allowed a minimum of two (2) photographed views and shall furnish to the Engineer two (2) prints of each view designated. All photographs shall be a factual presentation of the views designated and shall be taken using correct exposure and focusing techniques insuring high resolution and sharpness, maximum depth-of-field, and minimum distortion. All photograph negatives shall remain the property of the photographer. All prints shall be color, 8 inch by 10 inch size, smooth surface with glossy finish, and paper weight being single. Identification of each print is required giving the following information:

1. Name of Project.
2. Description of view.
3. Time and date of exposure.
4. Climatic conditions (temperature and weather conditions).
5. Name and address of photographer.
6. Photographer's numbered identification of exposure.

B. The Contractor shall insure delivery of all prints on a monthly basis, or as otherwise requested, to the Owner through the Engineer. These deliveries must be made prior to the payment of monthly progress estimates. The Contractor shall pay all costs associated with employing said photographer and furnishing all construction photographs, tapes, and prints, complete as specified, including all incidentals necessary at no additional expense to the Owner.

C. The photographer hereby agrees to properly file and maintain all photograph negatives associated with this Contract for a period of two (2) years from the date of final completion of the project as shown on the final estimate. The photographer must also agree to furnish promptly upon request, additional prints during this specified time period, to the Owner and his Engineer at the commercial rates applicable at the time of the request.

PART 3 - EXECUTION - NOT USED

END OF SECTION

SECTION 01 33 00

SUBMITTALS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

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 Section.

1.2 DESCRIPTION OF WORK

A. Requirements for submission of submittal procedures, construction schedule, shop drawings, product data, samples, manufacturer's instructions and certificates, construction photographs, and record drawings.

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 1, Section 01 40 00, QUALITY CONTROL
2. Division 1, Section 01 77 00, CONTRACT CLOSEOUT

PART 2 - SUBMITTALS - NOT USED

2.1 PROGRESS SCHEDULE

A. Refer to Section 01 32 00, CONSTRUCTION PROGRESS SCHEDULE for Critical Path Method (CPM) construction scheduling requirements.

B. Within fourteen (14) calendar days after execution of the Contract Documents, the Contractor shall submit to the Engineer for review a construction progress schedule conforming to requirements specified. This schedule should show the proposed dates of commencement and completion of each of the various subdivisions of work required under this Contract and the anticipated monthly percentage of completion based on the total contract price. The Contractor shall be responsible for updating and/or revising this schedule whenever directed by the Engineer throughout the duration of the Contract.

C. Special attention is directed to the requirement that the Contractor shall start the Work, as specified under this Contract, no later than thirty (30) calendar days after the execution of the Contract Documents, unless otherwise directed by the Owner. The Contractor shall comply with all pre-construction requirements as specified. The Owner reserves the right to delay the commencement of the Work or any part thereof if the specified requirements as determined by

the Engineer have not been satisfied. The Owner further reserves the right to limit or, delay construction, or certain activities thereof, in certain areas of the Contract should the Owner deem it to be in the public's best interest and/or safety to do so.

D. The Contractor shall contact the Owner concerning any public or semi-public events that may occur during the construction period that may affect construction. The Contractor alone shall be responsible for arranging his construction sequence to conform to any restrictions these events may impose. No claims for extras will be allowed because of any delay, extra materials handling, extra excavation, etc. caused by the imposed restrictions. However, additional time may be granted for completion of the work to compensate for delays caused by said restrictions.

2.2 SHOP DRAWINGS

A. Submit six (6) copies of all shop and working drawings of concrete reinforcement, structural details, piping layout, wiring, materials fabricated especially for the Contract, and materials and equipment for which such drawings are specifically requested.

B. A maximum of two (2) submittals of each shop drawing will be reviewed by the Engineer. If more submittals are required due to the Contractor’s neglect or failure to fulfill the requirements of the Contract plans and specifications, or to make corrections or modifications required by the Engineer in the review of the first two submittals, the Engineer will review the submittal and the Contractor will be responsible for the cost of the review, as determined by the Owner based on the Engineer’s documentation of time and rates for additional services established in the Engineering Agreement between the Owner and the Engineer.

C. If resubmittals on shop and working drawings are required, the Engineer will retain three (3) copies and three (3) copies will be returned to the Contractor. When resubmittals are returned to the Engineer, six copies of the complete submittal shall again be required.

D. Such drawings shall show the principal dimensions, weight, structural and operating features, space required, clearances, type and/or brand of finish or shop coat, grease fittings, etc., depending on the subject of the drawing. When the dimensions are of particular importance, or when specified, the drawings shall be certified by the manufacturer or fabricator as correct for the Contract.

E. When so specified or if considered by the Engineer to be acceptable, manufacturer's specifications, catalog data, descriptive matter, illustrations, etc., may be submitted in place of shop and working drawings.

F. The Contractor shall be responsible for the prompt and timely submittal of all shop and working drawings to eliminate delay to the Work due to the absence of such drawings. All shop and working drawings must be submitted to the Engineer within thirty (30) calendar days prior to incorporation into the Work, unless otherwise permitted by the Engineer. Prior to the submittal of any shop drawings, the Contractor shall submit a schedule of proposed shop drawing transmittals. The schedule shall identify the subject matter of each transmittal, the corresponding specification section number and the proposed date of submission. Prior to and during the progress of the Work the schedule shall be revised and resubmitted as requested by the Engineer.

G. No material or equipment shall be purchased or fabricated for the Contract until the required shop and working drawings have been submitted as hereinabove provided and reviewed for

conformance to the Contract requirements. All such materials and equipment and the work involved in their installation or incorporation into the Work shall then be as shown in and represented by said drawings.

H. Until the necessary review has been made, the Contractor shall not proceed with any portion of the Work (such as the construction of foundations) for which review is required.

I. All shop and working drawings shall be submitted to the Engineer by and/or through the Contractor, who shall be responsible for obtaining shop and working drawings from his subcontractors and returning reviewed drawings to them. All shop and working drawings shall be prepared on standard size, 24 inch by 36 inch sheets, except those which are made by changing existing standard shop and working drawings. All drawings shall be clearly marked with the names of the Owner, Contractor, and building, equipment, or structure to which the drawing applies, and shall be suitable numbered. Submitted shop drawings shall be accompanied by a letter of transmittal, completed by the Contractor as provided by the Engineer.

J. Only drawings which have been checked and corrected by the fabricator should be submitted to the Contractor by his subcontractors and vendors. Prior to submitting drawings to the Engineer, the Contractor shall check thoroughly all such drawings to satisfy himself that the subject matter thereof conforms to the Drawings and Specifications in all respects. All drawings which are correct shall be marked with the date, checker's name, and indication of the Contractor's approval, and then shall be submitted to the Engineer; other drawings shall be returned for correction.

K. If a shop drawing shows any deviation from the Contract requirements, the Contractor shall make specific mention of the deviations in his letter of transmittal.

L. The review of shop and working drawings by the Engineer will be general only, and nothing contained in this Section shall relieve, diminish or alter in any respect the responsibilities of the Contractor under the Contract Documents and in particular, the specific responsibility of the Contractor for details of design and dimensions necessary for proper fitting and construction of the work as required by the Contract and for achieving the result and performance as specified. The Contractor shall be responsible for errors and omissions in shop drawings.

M. Should the Contractor submit equipment that requires modifications to the structures, piping, electrical conduit, wires, appurtenances, or layouts etc., either existing or as detailed on the Drawings, he shall also submit details of the proposed modifications. If such equipment and modifications are accepted, the Contractor, at no additional cost to the Owner, shall do the work necessary to make such modifications.

N. The Contractor shall furnish additional copies of shop drawings or catalog cuts when so requested.

2.3 SCHEDULING OF WORK

A. Before starting work or within ten (10) calendar days of Notice to Proceed, whichever comes first, the Contractor shall submit the following:

1. A construction schedule which shall include dates and time period descriptions for the items listed below. The schedule shall indicate lead time impact of material availability on the overall construction timetable.

    a. Start of construction date

b. Beginning and end dates for each major phase of work

c. Schedule for submittal of all required Shop Drawings and Samples

d. Substantial Completion date

e. Final Completion date

2. Site organization plans and work schedule shall be subject to Owner's Representative's approval and shall be updated as necessary during the course of construction.

2.4 WORK PROGRESS REPORT

A. Contractor shall prepare daily reports of his operations and forward them to the Owner's Representative on a biweekly basis. The weekly report shall contain at least the following information.

1. Weather conditions.
2. Manpower on the job in each trade.
3. Major items of equipment on the job.
4. A brief summary of work accomplished that week.
5. Materials and equipment items arriving or leaving site.
6. Significant events.
7. Any tests made and their result if known.
8. Any oral instructions received.
9. Visitors to the job.

B. Contractor shall maintain a file of copies of weekly reports on the site and make it available to the Owner upon request.

2.5 SCHEDULE OF VALUES

A. Prior to the first request for payment, the General Contractor shall submit to the Owner's Representative a Schedule of Values of the various portions of the work including quantities when requested, aggregating the total contract sum, and divided so as to facilitate payments for work under each Section. The schedule shall be prepared in such form as specified or as the Owner's Representative may approve. The list shall be an accurate representation of costs required to complete the Work in accordance with the Contract Documents. This schedule requires the approval of the Owner's Representative and shall be used only as a basis for the Contractor's requests for payment.

2.6 PRUDUCT DESCRIPTION, ACCEPTABILITY AND SUBSTITUTIONS

A. Products are specified by ASTM or other reference standards, and/or by manufacturer's name and model number, or by trade name. When specified only by reference standard(s), the Contractor may select products meeting this standard by any manufacturer. When several products or manufacturers are specified as being equally acceptable, the Contractor has the

option of using any product or manufacturer listed. When one product or manufacturer is specified, and an "or equal" clause allows substitution, the Contractor must demonstrate through full testing, and certifications, etc., that the equivalent product being submitted is equal to or exceeds all technical, performance, and visual criteria of the original, specified item. When only one product or manufacturer is specified, and no "or equal" clause allows substitution, the Contractor must use that product or manufacturer. The Owner has the final indisputable word on accepting substitutions.

B. After the Contract has been executed, the Owner's Representative will consider a formal, written request for the substitution of products in place of those specified under the following conditions:

1. The request is accompanied by complete technical data and product installation instructions on the proposed substitution, substantiating compliance with the Contract Documents, including product identification, performance and test data, references, and samples where applicable, and an itemized comparison of the proposed substitution with the product specified, with data relating to Contract time schedule, design and visual appearance where applicable.

2. The request is accompanied by detailed cost data on the proposed substitution in comparison with the product specified, whether or not the modification of the Contract Sum is to be a consideration.

3. It is understood by the Contractor that the request for substitution:

a. Represents that the Contractor has personally investigated the proposed product and has determined that it is equal to or superior in all respects to the product specified.

b. Represents that the Contractor will provide the same guarantee for the substitution that he would for the product specified, whether the manufacturer's standard guarantee is the same period or not.

c. Represents that the Contractor certifies that the cost data presented is complete and includes all related costs under this Contract, and that the Contractor waives all claims for additional costs related to the substitution which subsequently become apparent.

d. Represents that the Contractor will coordinate the installation of the accepted substitute, making such changes as may be required for the work to be completed in all respects, at no additional cost to the Owner.

e. Represents that the Contractor waives all claims for extensions of time related to the substitution, including allowance for evaluation of the proposed substitution by the Owner's Representative.

C. Requests for substitutions will not be considered if:

1. They are indicated or implied on shop drawing submissions without prior formal, written request as required above, and their implementation requires revision of the Contract Documents in order to accommodate their use.

2.7 SHOP DRAWINGS, SUBMITTALS, AND SAMPLES

A. The Contractor shall provide the following submittals designated below, subject to additional requirements of individual Technical Sections of the Specifications:

1. Submittals shall be made electronically, including manufacturer's literature and shop drawings. Submittals must include the requirements below, including verification that the General Contractor has reviewed and approved submittals from any subcontractors (if applicable) and suppliers prior to submitting for approval.
2. Returned submittals shall also be made electronically. Electronic file labeling shall be reviewed at the pre-construction meeting for consistency.
3. On-site mock-ups: Minimum of one, or as required by technical specification sections.

B. Submittals shall be delivered to the Owner's Representative via email to:

PM / LA
ENGINEER / LA
EMAIL

C. Covering letters of transmittal which accompany Shop Drawings or other submittals shall contain the following information:

1. Contractor's name, address and telephone number.
2. Supplier's name, address and telephone number.
3. Project title and Specification Section reference
4. Reference to any prior actions on related submittals.

D. Shop Drawings and all other submittals shall have the Contractor's approval on each drawing signed and dated, as evidence of the Contractor's verification and coordination of items submitted. Items not so marked will be returned to the Contractor without comment. Catalog cuts and brochures shall have items proposed for the project installation readily identified for review by the Owner's Representative. Submittals not so marked will be returned by the Owner's Representative for resubmission by the Contractor.

E. The initial submission for each specification item, trade, class, or category of work shall be a complete and integrated submission, including all required Shop Drawings, product data, samples, and all other information necessary to permit a thorough and detailed review. Partial or incomplete submissions will be returned for completion without review. If, in the opinion of the Owner's Representative, a submission cannot be completely evaluated without reference to the submission for a related item or work not yet submitted, the submission of the related item may be required prior to review of the primary submission.

F. Reproductions of Contract Drawings are acceptable as Shop Drawings if specifically authorized in writing by the Owner's Representative.

G. Normal return time for submissions after review shall be three (3) business days following Owner's Representative's receipt of submission and transmittal letter.

1. Review of submittals involving substitutions or variations from the Contract Documents may exceed the normal review time.
2. Disapproved submittals shall be resubmitted within fourteen consecutive calendar days after receipt by Contractor of transmittal letter.

3. Disapproved submittals and final approval of Shop Drawings, materials, etc., will not be acceptable as a cause for delay under the contract completion time clause.

H. If a shop drawing shows any deviation from the Contract requirements, the Contractor shall make specific mention of the deviations in the letter of transmittal.

I. No material or equipment shall be purchased or fabricated for the Contract until the required shop and working drawings have been submitted as hereinabove provided and reviewed for conformance to the Contract requirements. All such materials and equipment and the work involved in their installation or incorporation into the Work shall then be as shown in and represented by said drawings.

J. Until the necessary review has been made, the Contractor shall not proceed with any portion of the Work for which the review is required.

K. Approval of Shop Drawings shall not relieve the Contractor from responsibility for any errors or omissions in such drawings nor from responsibility for complying with the requirements of this contract.

PART 3 - PRODUCTS - NOT USED

PART 4 - EXECUTION - NOT USED

END OF SECTION

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SECTION 01 40 00

QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

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 Section.

1.2 DESCRIPTION OF WORK

A. Work of this Section includes quality assurance and control of installation, references, field samples and mockups, inspection and testing laboratory services, and manufacturer's field services and reports, and workmanship.

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 1, Section 01 33 00, SUBMITTALS
2. Division 1, Section 01 77 00, CONTRACT CLOSEOUT

1.4 SUBMITTALS - NOT USED

1.5 QUALITY CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

B. Comply fully with manufacturers' instructions, including each step, in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, notify the Engineer.

D. Perform work by persons qualified to produce workmanship of specified quality.

E. Comply with specified standards as a minimum quality for the work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

G. Supervise performance of work in such manner and by such means to ensure that work, whether completed or in progress, will not be subjected to harmful, dangerous, damaging, or otherwise deleterious exposure during construction period.

1.6 REFERENCES

A. Conform to reference standard by date of issue current on date of Contract Documents.

B. Obtain copies of standards when required by Contract Documents

1.7 FIELD SAMPLES

A. Install field samples at the site as required by individual specification sections for review.

B. Acceptable samples represent a quality level for the work.

C. Where field samples are specified in individual sections to be removed, clear area after field sample has been accepted by and the Landscape Architect/Project Manager.

1.8 FIELD MOCKUPS

A. Tests will be performed under provisions identified in this Section.

B. Assemble and erect specified items, with specified attachment and anchorage devices, flashings, seals, and finishes.

C. Where mock-up is specified in individual Sections to be removed, clear area after mock-up has been accepted by the Landscape Architect/Project Manager.

1.9 CERTIFIED WELDERS

A. Structural welds shall be made only by operators who have been qualified by tests, as prescribed in the "Standard Qualification Procedure" of the American Welders Society, to perform the type of work required.

B. Pipe welds shall be made only by operators who have been qualified by the National Certified Pipe Welding Bureau and each operator's qualification record shall be submitted to the Engineer before any work is performed.

C. Shop welding shall be in accordance with the "Code for Welding in Building Construction".

1.10 INSPECTION AND TESTING LABORATORY SERVICES

A. An independent Testing Lab will carry out tests and inspections for concrete and paving to assure compliance with ASTM and other criteria as listed in each of the sections.

1.11 MANUFACTURER'S FIELD SERVICES AND REPORTS

A. Submit qualifications of observer to Engineer 30 days in advance of required observations. Observer subject to approval of the Engineer.

B. When specified in individual specifications sections, required materials or Contractor Product suppliers of manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance of equipment as applicable, and to initiate instructions when necessary.

C. Individuals shall report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

D. Submit report in duplicate within 30 days of observations to the Engineer for review.

1.12 COORDINATION

A. The General Contractor shall be responsible for the proper fitting of all work and the coordination of the operations of all trades, materials and equipment engaged in the Work. Contractor shall do or cause the installers to do all the cutting, fitting, adjusting, and patching necessary to make the several parts of the work come together properly and to fit the work to receive or be received by that of other contractors.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

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SECTION 01 41 00

TESTING REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. Qualification, duties, and responsibilities of testing laboratories.
2. Coordination and scheduling responsibilities of the Contractor.

B. Related Sections

1. Section 01 60 00, MATERIALS & EQUIPMENT

1.2 PAYMENT PROCEDURES

A. Initial Testing

1. The Owner will pay for initial testing services required by the Engineer, unless noted otherwise.

B. Retesting

1. When initial tests indicate noncompliance with the Contract Documents, subsequent retesting occasioned by the noncompliance shall be performed by the same testing agency, and costs thereof will be deducted by the Owner from the Contract Sum.

C. Contractor Convenience Testing

1. Inspecting and testing performed exclusively for the Contractor's convenience and self verification of compliance shall be the sole responsibility of the Contractor.

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. E329, Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection

1.4 REQUIREMENTS

A. Work included:

1. Coordinate and communicate scheduled work processes and cooperate with the Owner's selected testing agency, Engineer, and all others responsible or testing and inspecting the Work.
2. Provide other testing and inspecting as specified to be furnished by the Contractor in this Section and/or elsewhere in the Contract Documents.

3. Where no testing requirements are described, but the Owner directs testing, the Contractor shall provide testing under the requirements of this Specification.

B. Work not included:

1. Selection of testing laboratory: The Owner will select a qualified independent testing laboratory.

1.5 QUALITY ASSURANCE

A. Qualifications

1. The testing laboratory will be qualified to the Owner's approval in accordance with ASTM E329.

B. Regulatory requirements

1. Testing, when required, will be in accordance with all pertinent codes and regulations and with selected standards of the American Society for Testing and Materials.

2. Regulatory Requirements Inspections and tests required by codes or ordinances, or by a plan approved authority, and which are made by a legally constituted authority, shall be the responsibility of and shall be paid for by the Contractor, unless otherwise provided in the Contract Documents.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Comply with pertinent provisions of Section 01 60 00, MATERIALS AND EQUIPMENT.

B. Promptly process and distribute, to the Engineer, required copies of test reports and instructions to assure necessary retesting and replacement of materials with the least possible delay in progress of the Work.

1.7 SCHEDULING

A. Establishing schedule

1. By advance discussion with the testing laboratory selected by the Owner, determine the time required for the laboratory to perform its tests and to issue each of its findings.

2. Provide all required time within the construction schedule.

3. Coordinate testing activity with the appropriate testing laboratory.

B. Revising schedule

1. When changes of construction schedule are necessary during construction, coordinate all such changes with the testing laboratory as required.

C. Adherence to schedule

1. When the testing laboratory is ready to test according to the established schedule but is prevented from testing or taking specimens due to incompleteness of the Work, all extra charges for testing attributable to the delay may be back-charged to the Contractor and shall not be borne by the Owner.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

A. Site Tests

1. Representatives of the testing laboratory shall have access to the Work at all times and at all locations where the Work is in progress. Provide facilities for such access to enable the laboratory to perform its functions properly.
2. All specimens and samples for testing, unless otherwise provided in the Contract Documents, shall be taken by the testing personnel. All sampling equipment and personnel will be provided by the testing laboratory. All deliveries of specimens and samples to the testing laboratory will be performed by the testing laboratory.

END OF SECTION

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SECTION 01 42 00

REFERENCES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Reference material, abbreviations, and terms used in the Construction Documents and establishes edition dates and complete titles for standards referenced elsewhere in the Specifications.

1.2 QUALITY ASSURANCE

A. For products or workmanship specified by association, trade, or Federal Standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Obtain copies of standards when required by Contract Documents.

C. Maintain copy at jobsite during submittals, planning, and progress of the specific work, until Substantial Completion.

D. Should specified reference standards conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.

E. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.3 SCHEDULE OF REFERENCES

AA Aluminum Association
1400 Crystal Dr. Suite 430
Arlington, VA 22202

AASHTO American Association of State Highway and Transportation Officials
444 North Capitol Street, N.W.
Washington, DC 20001

ACI American Concrete Institute
38800 Country Club Dr.
Farmington Hills, MI 48331-3439

AFBMA Anti-Friction Bearing Manufacturers Association
2025 M. Street, NW
Washington, DC 20036-3309

AGC Associated General Contractors of America
2300 Wilson Blvd.

Arlington, VA 22201

AGM American Gear Manufacturers Association
1001 N. Fairfax Street
Alexandria, VA 22314-1587

AI Asphalt Institute
2696 Research Park Drive
Lexington, KY 40511-8480

AISC American Institute of Steel Construction
One East Wacker Drive
Chicago, IL 60601-1802

AISI American Iron and Steel Institute
25 Massachusetts Drive
Washington, DC 20001

AMCA Air Movement and Control Association
30 West University Drive
Arlington Heights, IL 60004

ANS American National Standard

ANSI American National Standards Institute
1899 L Street, NW, 11th Floor
Washington, DC 20036

API American Petroleum Institute
1220 L Street, NW
Washington, DC 20005

ARI Air-Conditioning and Refrigeration Institute
2111 Wilson Boulevard
Arlington, VA 22201

ASCE American Society of Civil Engineers
1801 Alexander Bell Drive
Reston, VA 20191

ASHRAE American Society of Heating, Refrigerating and
Air Conditioning Engineers
1791 Tullie Circle, N.E.
Atlanta, GA 30329

ASME American Society of Mechanical Engineers
Two Park Avenue

New York, NY 10016-5990

ASPA American Sod Producers Association
1855 A Hicks Road
Rolling Meadows. IL 60008

ASTM American Society for Testing and Materials
100 Bar Harbor Drive
PO Box C700
West Conshohocken, PA 19428-2959

AWG American or Brown and Sharpe Wire Gage

AWPA American Wood-Preservers' Association
100 Chase Park South
Birmingham, AL 35244-1851

AWS American Welding Society

AWWA American Water Works Association
6666 West Quincy Avenue
Denver, CO 80235

BIA Brick Institute of America
1850 Centennial Park Drive
Reston, VA 20191

CS Commercial Standard

EJCDC Engineers' Joint Contract Document Committee
American Consulting Engineers Council
1015 15th Street, N.W.
Washington, DC 20005

FM Factory Mutual System
1151 Boston-Providence Turnpike
PO Box 688
Norwood, Massachusetts 02062

Fed Spec. Federal Specification
General Services Administration
Specification and Consumer Information Distribution Section (WFSIS)
Washington Navy Yard, Bldg. 197
Washington, DC 20407

HMA Hot Mix Asphalt

IBR Institute of Boiler and Radiator Manufacturers

ICBO International Conference of Building Officials
900 Montclair Road
Birmingham, AL 35213-2298

IPS Iron Pipe Size

JIC Joint Industry Conference Standards

MIL Military Specification
Naval Publications and Forms Center
5801 Tabor Avenue
Philadelphia, PA 19120

NASSCO National Association of Sewer Service Companies
2470 Longstone Lane
Marriottsville, MD 21104

NBS National Bureau of Standards

NCMA National Concrete Masonry Association
13750 Sunrise Valley Drive
Herndon, VA 20171

NCPWB National Certified Pipe Welding Bureau

NEMA National Electrical Manufacturers' Association
1300 North 17th Street
Arlington, VA 22209

NFPA National Fire Protection Association
Battery March Park
Quincy, MA 02269

NPT National Pipe Thread

OS&Y Outside screw and yoke

PCA Portland Cement Association
5420 Old Orchard Road
Skokie, IL 60077

SMACNA Sheet Metal and Air Conditioning Contractors' National Assoc.
4201 Lafayette Center Drive

Chantilly, VA 20151-1219

Stl. WG U.S. Steel Wire Washburn and Moen, American Steel and Wire
or Roebling Gage

UL Underwriters' Laboratories, Inc.
333 Pfingston Road
Northbrook, IL 60062

USS Gage United States Standard Gage

125-lb. ANS American National Standard for Cast-Iron Pipe Flanges and Flange
250-lb. ANS Fittings, Designation B16.1-1975, for the appropriate class

1.4 EDITION DATES

A. Reference to publications and reference material shall be understood to mean the latest edition, unless stated otherwise.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

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SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

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 Section.

1.2 DESCRIPTION OF WORK

A. Work of this Section includes all temporary utilities and facilities, maintenance of access, dust control, noise control, erosion and sediment control, pollution control, surface water control, barriers and enclosures, parking, security, cleaning during construction, and removal of temporary utilities, facilities, and controls.

B. Requirements for Contractor's and Engineer's field offices.

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 1, Section 01 33 00, SUBMITTALS
2. Division 1, Section 01 77 00, CONTRACT CLOSEOUT

1.4 SUBMITTALS - NOT USED

1.5 CLEANING DURING CONSTRUCTION

A. Unless otherwise specified under the various trade Sections of the Specifications, the General Contractor shall perform clean-up operations during construction as herein specified.

1. Maintain construction entrance tracking pad. Tracked mud, soil or other debris off site is prohibited. Clean entrance to the site regularly, using power brooms, water etc. as required and as directed by the Engineer.
2. Control accumulation of waste materials and rubbish; periodically dispose of waste at an off-site location. Contractor shall bear all costs, including fees resulting from the management and disposal for refuse and debris generated by Phase 1 construction activities.
3. The Contractor responsible for Phase 2 shall furnish dumpsters for that phase of work and shall be responsible for management and removal of rubbish generated from that phase.
4. Clean interior areas of the site prior to starting finish work and maintain areas free of dust and other contaminants during finishing operations.

5. Maintain project in accordance with all local, State and Federal Regulatory Requirements.
6. Store volatile wastes in covered metal containers and remove from premises.
7. Prevent accumulation of wastes that create hazardous conditions.
8. Provide adequate ventilation during use of volatile or noxious substances.

1.6 DUST CONTROL

A. Provide adequate means for the purpose of preventing dust caused by construction operations throughout the period of the construction contract.

B. Regularly assess weather conditions. Provide dust control as necessary to eliminate airborne dust based on wind and exposed soil conditions.

C. Provide dust control when so directed by the engineer. Dust control methods are subject to approval of the Engineer.

1.7 EROSION AND SEDIMENT CONTROL

A. Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.

B. Minimize amount of bare soil exposed at one time.

C. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.

D. Construct fill and waste areas by selective placement to avoid erosive surface silts for clays.

E. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

F. Construct sediment control devices for discharge from dewatering trenches.

G. Construct all sedimentation control devices shown on the plans and as specified herein or as required by permits issued for the project.

1.8 NOISE CONTROL

A. Develop and maintain a noise-abatement program and enforce strict discipline over all personnel to keep noise to a minimum.

B. Execute construction work by methods and by use of equipment which will reduce excess noise.

1. Equip air compressors with silencers, and power equipment with mufflers.
2. Manage vehicular traffic and scheduling to reduce noise.
3. No heavy equipment may be started or idled prior to 7:00 a.m. or after 6:00 p.m.

1.9 POLLUTION CONTROL

A. Adhere to all Permit requirements. Special care shall be taken to prevent contamination or muddying up or interfering in any way with the stream flows, if any along the line of work. No

waste matter of any kind will be allowed to discharge into the stream flows or impounded water of any pools, designated resource areas, or other bodies of water.

1.10 SURFACE WATER CONTROL

A. Adhere to all permit requirements. Take all precautions to prevent damage to the work or equipment by high waters or by storms. The Engineer with the approval of the Owner may prohibit the carrying out of any work at any time when in his judgment, high water or storm conditions are unfavorable or not suitable, or at any time, regardless of the weather, when proper precautions are not being taken to safeguard previously constructed work or work in progress.

B. In case of damage caused by the failure of the Contractor to take adequate precautions, the Contractor shall repair or replace equipment damaged and shall make such repairs or rebuild such parts of the damaged work, as the Engineer may require, at no additional expense to the Owner.

1.11 BARRIERS AND ENCLOSURES

A. Fences and Barricades

1. Provide and maintain temporary fences, barriers, lights, guardrails, and barricades as indicated in the drawings or as specified herein, or as necessary to secure the Work and adjacent property and protect persons and property.

2. Obtain necessary approvals and permits and provide temporary expedients as necessary to accommodate tasks requiring items mentioned herein.

B. Protection of Trees

1. The Contractor shall take care not to harm trees along the sides of roads or within the existing facility in which the construction work is to be done or trees on adjacent lands except as indicated on the drawings or with the written permission of the Owner and any other owner of the trees involved. Care shall be taken not to cut tree roots so as to harm the growth of trees to remain.

2. If, in the opinion of the Engineer, any trees damaged during construction can be repaired, the Contractor shall satisfactorily repair at no further cost to the Owner.

3. If, in the opinion of the Engineer, any tree damaged during construction cannot be repaired and should be removed, the Contractor shall satisfactorily remove and replace, in kind, same at no further cost to the Owner.

1.12 TEMPORARY CONSTRUCTION FENCE

A. Construction fences shall be as specified in Section 31 10 00, SITE CLEARING and shall be installed at the discretion of the Contractor so as to protect ongoing work and to provide adequate public safety.

B. The locations of the fence and gates shall be approved by the Engineer to minimize interference with the work.

C. The Contractor shall move the fence as required during the work should its location interfere with construction operations at no extra cost.

D. Fencing shall be removed at such time before final completion as the Representative directs. Restore site to acceptable condition after removing fence.

1.13 PARKING

A. Contractor shall arrange for parking of all workers at an appropriate location. Contractor's employees shall not park in public or private parking areas except as approved by the Engineer. Onsite parking may be permitted at the discretion of the contractor and approved by Engineer. Coordinate with the Engineer and conform to their requirements. Site access and parking shall be coordinated and provided for Phase 2 Contractors.

1.14 CONTRACTOR FIELD OFFICE

A. Prior to starting work at the site, Contractor shall furnish, equip and maintain a temporary Field Office on-site for his own use during the period of construction at which readily accessible copies of all Contract Documents and Field Drawings shall be kept. Location of the Contractor Field Office shall be determined by the Contractor in a location where it will not interfere with the progress of the Work. The Contractor Superintendent shall oversee the Field Office.

B. Provide electricity and high-speed internet.

1.15 ENGINEERS FIELD OFFICE

A. Prior to starting work at the site, Contractor shall furnish and equip a temporary Field Office on-site for the exclusive use of the Engineer. This office shall be a separate building located adjacent to the Contractor Field Office in a location that will not interfere with the progress of the Work. The Field Office shall be furnished to the satisfaction of the Engineer. The Field Office shall be weather tight, walls and roof shall be insulated with at least ½ in. insulating board and suitably ventilated. The floor shall be tight and of double-thick construction. The office shall have at least three screened windows which can be both opened and locked shut and the door shall have a cylinder lock with two keys.

B. Engineers Field Office shall be furnished with but not limited to the following furniture, equipment, supplies, and services: a 3' X 5' table, four chairs, shelves, lights, and outlets, two desks, carbon dioxide fire extinguisher of at least 4 lb capacity.

C. Provide electricity and high-speed internet.

1.16 FUTURE PHASE FIELD OFFICE

A. The Contractor shall provide a suitable location and point of connection for electric utilities serving Phase 2 Contractor's Field Office.

B. The Phase 2 Field Office shall be furnished and installed by others.

C. Provisions for vehicular access and contractor parking at the Phase 2 field office shall be provided.

1.17 REMOVAL OF OFFICES

A. The Contractor shall remove the Phase 1 Contractor and Engineer's Field Office and all other temporary facilities from the site after the date of completion of the Work as stated in the

Contract, unless otherwise directed by the Engineer. The Field Office and temporary facilities shall become the Contractor's property and the premises shall be left in a condition acceptable to the Engineer.

B. The Phase 2 Contractor shall be responsible for the removal of any Field Office utilized for that phase of work.

1.18 SECURITY

A. Provide security and facilities to protect the Work and existing facilities from unauthorized entry, vandalism, or theft.

1. Coordinate with Owner's security program, if any.

1.19 TEMPORARY ELECTRICITY

A. Provide and pay for separately metered power service required from local utility company.

B. Provide power outlets for construction operations, with branch wiring and distribution boxes, located as required. Provide flexible power cords as required.

C. Provide main service disconnect and overcurrent protection at a convenient and easily accessible location.

D. Permanent convenience receptacles may not be utilized during construction.

E. Electrical work shall be done in accordance with all applicable codes.

F. Obtain necessary permits from the municipality; pay all costs of permit and electricity used during term of Contract.

G. Contractor shall maintain uninterrupted electrical service to the Existing Upweller Facility throughout the entirety of Construction.

1.20 TEMPORARY LIGHTING

A. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.

1. Maintain lighting and provide routine repairs, as necessary.

1.21 TEMPORARY WATER SERVICE

A. Connect to existing water source for construction operations. Provide a temporary water meter at each connection.

B. Extend branch piping with outlets located so water is available by hoses with threaded connections. Provide temporary pipe insulation to prevent freezing.

C. Obtain necessary permits from the municipality; pay all costs of permit unless waived by the municipality. The Contractor shall pay for water used during term of Contract.

D. Contractor shall maintain uninterrupted water service to the Existing Upweller Facility throughout the entirety of Construction.

1.22 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Existing facilities shall not be used.

1.23 REMOVAL OF TEMPORARY UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary above grade or buried utilities, equipment, facilities, materials, fencing and controls, prior to Final Application for Payment inspection.

B. Remove underground installations to a minimum depth of two (2) feet. Grade site as indicated or as directed by Representative.

C. The Phase 2 Contractor shall be responsible for the removal of any Phase 2 Field offices.

D. Clean and repair damage caused by installation or use of temporary work or facilities.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

SECTION 01 58 00

PROJECT IDENTIFICATION AND TEMPORARY SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes, without limitation providing:

1. The work to be performed under this section consists of coordination with the Engineer and Owner to compile content and finalize text and graphic content for the project sign.
2. Requirements for fabricating and erecting Project Identification Sign.

B. Submittals

1. Submit per Section 01 33 00 SUBMITTALS.

C. Related Specifications without Limitation

1. Division 01
2. Division 03
3. Division 06

1.2 SEQUENCING

A. Graphic logo and layout files will be made available for Contractor use by the Engineer.

B. Contractor shall develop all final materials for the production of the project sign.

C. Contractor to develop draft Project Sign and submit for review and approval.

D. Final signage shall be in place prior to construction.

PART 2 - PRODUCTS

2.1 FABRICATION

A. Construct 4’-0” x 8’-0” sign consisting of ¾ MDO Plywood with 2”x4” backer bracing and 6”x6” wood post supports per approved shop drawings.

B. Lettering, Images Logos on surface consisting of UV Stable ink, vinyl graphic wrap, etc. suitable for exterior use.

C. Project Sign Content Area A

1. Town of Yarmouth, Massachusetts
    a. Town Administrator
    b. Assistant Town Administrator
    c. Selectboard Members

D. Project Sign Content Area B

1. Commonwealth of Massachusetts
    a. Healy-Driscoll Administration
        1) Governor
        2) Lt. Governor
        3) Supporting Departments

2. US Land and Water Conservation Fund
    a. Grant Administrator: Executive Office of Energy & Environmental Affairs
        1) Division of Conservation Services
        2) Melissa Cryan

            Executive Office of Energy and Environmental Affairs
            100 Cambridge Street – Suite 900
            Boston, MA 02114

3. Parkland Acquisitions & Renovations for Communities (PARC) Grant program.
    a. Executive Office of Energy & Environmental Affairs
        1) Division of Conservation Services
        2) Melissa Cryan

            Executive Office of Energy and Environmental Affairs
            100 Cambridge Street – Suite 900
            Boston, MA 02114

4. Seaport Economic Council Program
    a. Executive Office of Economic Development
        1) Ellen Cebula, Director

E. Content Area C

1. BETA Group Inc., Project Engineers
2. SAR Engineering
3. GEI Consulting Engineers
4. General Contractor

2.2 PROJECT IDENTIFICATION SIGN GRAPHIC LAYOUT

RIVERWALK PARK

Boardwalk Loop & Event Space Phase 1

MAURA HEALEY
GOVERNOR

SIGN CONTENT AREA B

TOWN OF YARMOUTH
ROBERT WITHINGTON
TOWN ADMINISTRATOR
WILLIAM SCOTT
ASSISTANT TOWN ADMINISTRATOR

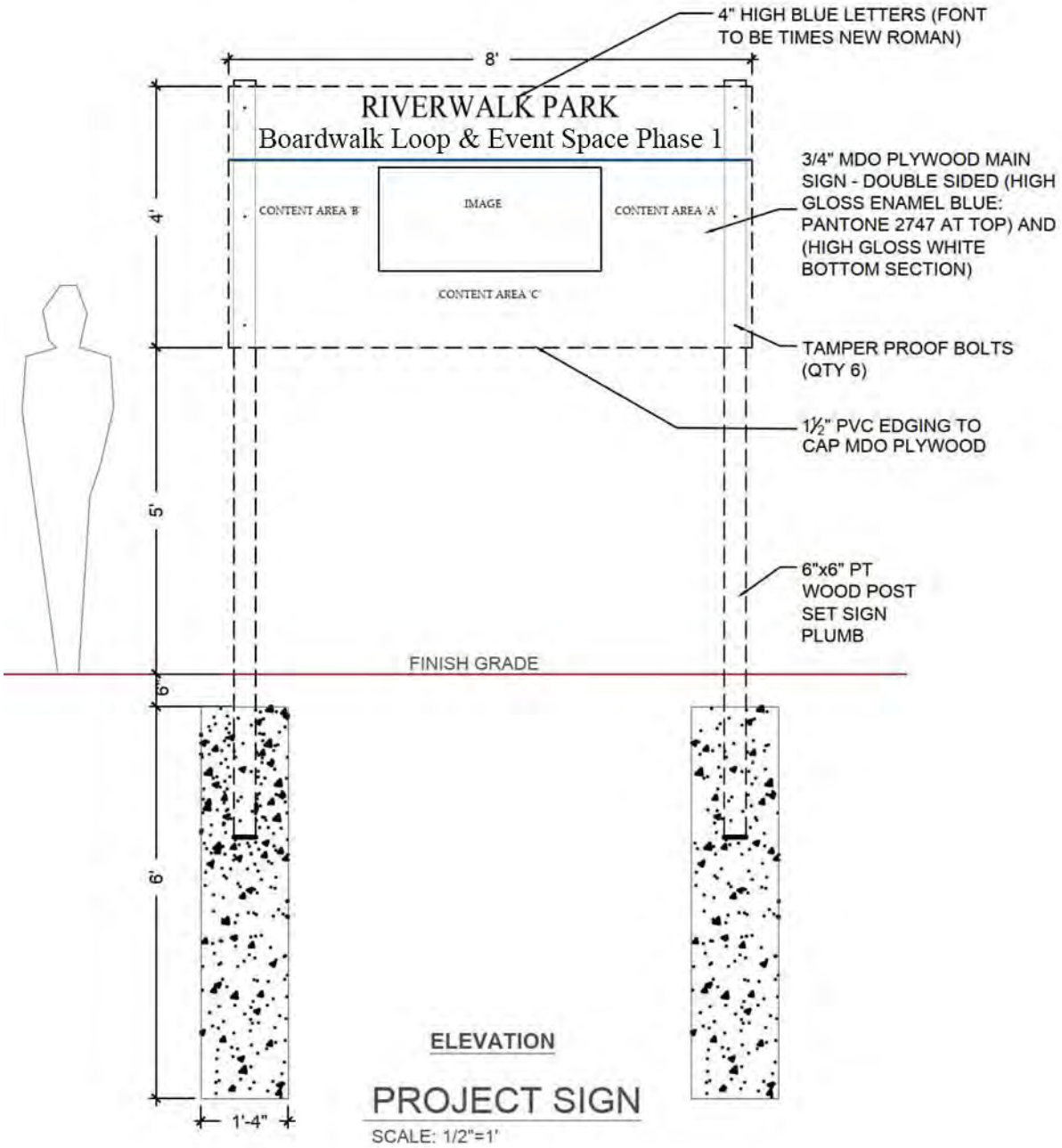
SIGN CONTENT AREA A

CONTRACTOR:

SIGN CONTENT AREA

DESIGNER / ENGINEER:

BETA
IMPROVING COMMUNITIES TOGETHER
WWW.BETA-INC.COM


4" HIGH BLUE LETTERS (FONT TO BE TIMES NEW ROMAN)
8'
RIVERWALK PARK
Boardwalk Loop & Event Space Phase 1
CONTENT AREA 'B'
IMAGE
CONTENT AREA 'A'
CONTENT AREA 'C'
3/4" MDO PLYWOOD MAIN SIGN - DOUBLE SIDED (HIGH GLOSS ENAMEL BLUE: PANTONE 2747 AT TOP) AND (HIGH GLOSS WHITE BOTTOM SECTION)
TAMPER PROOF BOLTS (QTY 6)
1½" PVC EDGING TO CAP MDO PLYWOOD
6"x6" PT WOOD POST SET SIGN PLUMB
4'
5'
6"
6'
FINISH GRADE
1'-4"
ELEVATION
PROJECT SIGN
SCALE: 1/2"=1'

EXECUTION

3.1 INSTALLATION

A. Install sign at the location designated by the Owner.

B. Assemble components.

C. Erect sign in accordance with the details in the Specifications.

D. Maintain sign plumb, with neat, clean appearance.

A.

END OF SECTION

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SECTION 01 60 00

MATERIALS AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. Requirements for delivery, storage, handling and installation of systems, materials, manufactured units, equipment, components, and accessories used in the work.

B. Related Sections

1. Section 01 33 00, SUBMITTALS

1.2 DELIVERY

A. Refer to Specifications' Sections for requirements pertaining to delivery and handling of materials and equipment.

B. Transport products by methods to avoid product damage; deliver in undamaged condition in manufacturers' unopened containers or packaging, dry.

C. Provide equipment and personnel to handle products by methods to prevent soiling or damage.

D. Promptly inspect shipments to assure that products comply with requirements, that quantities are correct, and products are undamaged.

1.3 STORAGE AND PROTECTION

A. The site is within the coastal flood plain. The Contractor shall use care when receiving and storing and securing materials and products on site. Avoid storage of materials at low elevations, or within the Riverfront Area.

B. The Contractor shall monitor the weather and take any necessary measures to relocate, stockpile, cover or otherwise secure all stored materials during severe weather events.

C. Refer to Specifications' Sections for requirements pertaining to storage and protection of materials and equipment.

D. Store products in accordance with manufacturers' instruction, with seals and labels intact and legible. Store sensitive products in weather tight enclosures; maintain within temperature and humidity ranges required by manufacturers' instructions.

E. For exterior storage of fabricated products, place on sloped supports above ground. Cover products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.

F. Store loose granular materials on solid surfaces in a well-drained area; prevent mixing with foreign matter.

G. Arrange storage to provide access for inspection. Periodically inspect to assure that products are undamaged and are maintained under required conditions.

1.4 INSTALLATION STANDARDS

A. Comply with Specifications and referenced standards as minimum requirements.

B. Components required to be supplied in quantity within a Specification Section shall be the same and shall be interchangeable.

C. Do not use materials and equipment removed from existing structures, except as specifically required, or allowed, by the Contract Documents.

D. Perform work by persons qualified to produce workmanship of specified quality.

E. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.

F. When work is specified to comply with manufacturers' instructions, submit copies as specified in Section 01 33 00 - SUBMITTALS, distribute copies to persons involved, and maintain one set in field office.

G. Perform work in accordance with details of instructions and specified requirements.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

SECTION 01 77 00

CONTRACT CLOSEOUT

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Requirements for specific administrative procedures, record keeping, close-out submittals, and forms used at substantial and final completion of the Work.

B. Contractor shall satisfy all administrative requirements within the Contract Documents and the Requirements listed in this section prior to release of final payment.

1.2 FINAL CLEANING

A. On or before the completion of the work, the Contractor shall, unless otherwise especially directed or permitted in writing, tear down and remove all temporary buildings and structures built by him; shall remove all temporary works, tools, and machinery or other construction equipment furnished by him; shall remove all rubbish from any grounds which he has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by his operations in a neat and satisfactory condition.

B. The Contractor shall restore or replace, when and as directed, any public or private property damage by his work, equipment, or employees, to a condition at least equal to that existing immediately prior to the beginning of operations. To this end, the Contractor shall do as required, all necessary highway or driveway, walk and landscaping work. Suitable materials, equipment, and methods shall be used for such restoration. The restoration of existing property or structures shall be done as promptly as practicable as work progresses and shall not be left until the end of the contract period.

C. Unless otherwise specified under the various Sections of the Specifications, the Contract or shall perform final cleaning operations as herein specified prior to final inspection.

D. At completion of work, remove waste materials, rubbish tools, equipment, machinery and surplus materials, and clean all sight-exposed surfaces; leave project clean and ready for occupancy.

E. Cleaning shall include all surfaces, interior and exterior in which the Contractor and all Subcontractors have had access whether existing or new.

F. Refer to Sections of the Specifications for cleaning of specific products or work.

G. Use only those materials which will not create hazards to health or property and which will not damage surfaces.

H. Use only those cleaning materials and methods that are recommended by the manufacturer of surfaces material to be cleaned.

I. Employ experienced workmen, or professional cleaners, for final cleaning operations.

1.3 PROJECT RECORD DOCUMENTS

A. Project Record Documents shall include approved project submittals as well as Record Drawings or As-Built Drawings, which shall consist of all the contract drawings annotated to reflect the built project and field survey work showing the constructed improvements.

B. The Contractor and all Subcontractors shall be required to maintain one set of Record Drawings, as the work relates to their Sections of the Specifications, at the site.

C. Record Drawings shall be stored and maintained in the General Contractor's field office apart from other documents used for construction. The Record Drawings shall be maintained in a clean, dry, and legible condition and shall not be used for construction purposes.

D. Record Drawings shall be available at all times for inspection by the Engineer. All deficiencies noted shall be promptly corrected.

E. Comply with Project Grant Requirements in regard to As-Built documentation. Make documents available to the engineer as per milestones identified.

F. The following information shall be indicated on the Record Drawings for construction:

1. Record locations of all utilities installed.
2. Record all changes, including change orders, in the location, size, number, and type both horizontally and vertically of all elements of the projects which deviate from those indicated on all the contract drawings.
3. The tolerance for the actual location of utilities and appurtenances within the building to be marked on the Record Drawings shall be plus or minus two (2) inches.
4. The location of all underground utilities and appurtenances referenced to permanent surface improvements, both horizontally and vertically at ten (10) ft. intervals and at all changes of direction.
5. The location of all internal utilities and appurtenances, concealed by finish materials, including but not limited to valves, coils, dampers, vents, clean outs, strainers, pipes, junction boxes, turning vanes, variable and constant volume boxes, ducts, traps and maintenance devices. The location of these internal utilities, appurtenances and devices shall be shown by offsets to the column grid lines on the drawings.
6. Each of the utilities and appurtenances shall be referenced by showing a tag number, area served and function on the Record Drawings.
7. Prior to the installation of all finish materials, a review of the Record Drawings shall be made to confirm that all changes have been recorded. All costs to investigate such conditions shall be borne by the applicable party as demonstrated by the Engineer.

G. The following information shall be indicated on the Record Drawings for sewer construction:

1. Location of manholes with 3 swing ties.
2. Linear distance of sewer from manhole to manhole, including size and type of pipe.
3. Manhole rim elevation and invert elevations of all pipes within manholes, including drops.
4. Recalculated pipe slopes based on record elevations.

5. Location in feet from downstream manhole of wyes and chimneys and vertical height of chimneys.
6. Length of service connections.
7. Location of service connection terminus (at property line) with 3 swing ties and depth from existing surface grade.
8. Tight Tank and valve pit/pumping station information as detailed in 1.03, E.

H. The following information shall be indicated on the Record Drawings for water main construction:

1. Linear distance along watermain from appurtenance (i.e. vault to tee, tee to bends, bends to valves, blow offs and service corporations, including size and type of pipe.
2. Depths of pipe and fittings.
3. Location of vaults, valves, hydrants, bends, blow offs and service curb boxes with 3 swing ties.
4. Rim elevation on vaults (meter, air release etc.).

I. The following information shall be indicated on the Record Drawings for storm drain construction:

1. Rim elevations on inlets, catch basins, manholes and other structures.
2. Invert elevations of all pipes within inlets, catch basins, manholes, end sections, headwalls, culverts, and other structures.
3. Linear distance along drain from structure to structure, and branch connections, including size and type of pipe.
4. Recalculated pipe slopes based on record elevations.
5. Location of manholes, inlets, catch basins, outlets, headwalls, other structures, and service line connections with 3 swing ties.

J. At the end of each month and before payment for materials installed, the Contractor, and his Subcontractors, shall review Record Drawings for purpose of payment. If the changes in location of all installed elements are not shown on the Record Drawings and verified in the field, then the material shall not be considered as installed and payment will be withheld.

K. At the completion of the contract, each Subcontractor shall submit to the Contractor a complete set of his respective Record Drawings indicating all changes. After checking the above drawings, the Contractor shall certify in writing on the title sheet of the drawings that they are complete and correct and shall submit the Record Drawings to the Engineer.

1.4 EQUIPMENT AND SYSTEM CHECKOUT, CERTIFICATIONS AND TESTING

A. Comply with requirements for certifications and testing of all systems, including but not limited to Water, Sewer, Stormwater, Electric, Lighting.

B. Furnish supporting documentation.

1.5 WARRANTIES

A. Provide Manufacturer's warranties for the manufactured products installed unless specified otherwise.

1.6 FINAL INSPECTION

A. The Contractor shall submit written certification to the Engineer that:

1. Project has been inspected for compliance with Contract Documents.
2. Equipment and systems have been tested in the presence of the manufacturer's representative and are operational and satisfactory.
3. The project punch list has been completed or otherwise resolved to the full satisfaction of the Engineer.
4. The Project is completed, and ready for final inspection.
5. At the completion of the project the Contractor shall submit a final set of Record Drawings for the entire project. The Contractor shall be responsible for including all work performed by Subcontractors and checking the information provided in regard to accuracy and direct any required adjustments to the documents. The Contractor shall certify in writing on the cover sheet of the Record Drawing set that the documents are complete and correct.
6. Submission of these documents to the Engineer is required prior to release of final payment.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

SECTION 01 78 19

MAINTENANCE CONTRACTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Procedures for maintaining work completed under this Contract.

1.2 MAINTENANCE PERIOD

A. The general maintenance period for all construction or materials under this Contract shall be one (1) year subsequent to the date of the acceptance of the work by the Owner, or as provided by other sections of this Specification.

B. If the Owner puts any structure or equipment to use prior to acceptance of all work under the Contract, the maintenance period for such structures or equipment shall be calculated from the time use begins.

C. Contractor agrees to replace the material which does not conform to the Contract requirements, and to repair any damage of material or work without cost to the Owner, to satisfaction of Engineer, in conformance with Contract Documents provided orders for replacement and/or repairs are received in writing by the Contractor within the one year period.

D. This Section shall in no way limit the duration of the Contractor's responsibility for the correction of any defect due to workmanship or materials provided by the Contractor which are not in compliance with the Contract Documents.

1.3 ABUSE OF WORK

A. Contractor is not obligated to perform work of replacement or repair that he may prove is required because of abuse by parties other than the Contractor, after the date the Owner puts to continuous use the work requiring replacements or repair, or after date the Owner has approved the Certificate of Completion.

1.4 EMERGENCY REPAIRS

A. If the Owner deems necessary, the Owner shall order replacement or repairs be undertaken within 24 hours.

B. If the Contractor delays or fails to make the ordered replacement or repairs within the time specified, the Owner shall have the right to make such replacements or repairs and the expense shall be deducted from moneys due the Contractor, or moneys of the Contractor retained by the Owner.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

SECTION 03 20 01

CONCRETE REINFORCEMENT

PART 1 - PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Requirements for reinforcing steel bars, wire fabric and accessories as shown on the drawings, specified herein, and as needed for a complete and proper installation.

B. Related Sections

1. Section 03 30 00 - CAST-IN-PLACE CONCRETE.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM).

1. A82, Specification for Steel Wire, Plain for Concrete Reinforcement.
2. A185, Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
3. A497, Specification for Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement.
4. A615, Specification for Deformed and Plain Billet Steel Bars for Concrete Reinforcement.
5. A706, Specification for Low-Alloy Steel Deformed Bars for Concrete Reinforcement.
6. A775, Specification for Epoxy-Coated Reinforcing Steel Bars.

B. American Concrete Institute (ACI).

1. ACI 318, Building Code Requirements for Structural Concrete.

1.3 SUBMITTALS

A. In accordance with Section 01 33 00, SUBMITTALS cutting and bending drawings and schedules for all reinforcement to be furnished.

B. Shop Drawings:

1. Prepare in accordance with Concrete Reinforcing Steel Institute (CRSI) Manual of Standard Practice and ACI SP-66 Detailing Manual:
    a. Bending lists.
    b. Placing drawings.
    c. Welded splice, Cad weld splice, and mechanical threaded splice.

C. Quality Control Submittals:

1. Lab test reports for reinforcing steel showing stress-strain curves and ultimate strengths.

2. Mechanical Threaded Connections:
    a. Current International Conference of Building Officials (ICBO) Research Report or equivalent code agency report listing findings to include acceptance, special inspection requirements, and restrictions.
    b. Manufacturer's instructions.
    c. Verification that device threads have been checked and meet all requirements for thread quality, in accordance with manufacturer's published methods.
3. Epoxy-Coated Reinforcing Bars: Written certification in accordance with paragraph 4.2.1 of ASTM A775.
4. Welding Qualification: Prior to welding, submit welder qualifications and radiographic nondestructive testing procedures.

1.4 QUALITY ASSURANCE

A. The steel shall be newly rolled stock substantially free from mill scale, rust, dirt, oil, grease, or other foreign matter. Bars shall be of billet steel and, unless otherwise indicated, shall be Grade 60 bars.

B. Billet steel bars shall conform to ASTM A 615.

C. All bars shall be rolled by an acceptable mill. The Contractor shall submit at his own expense certified copies of tests of the bars furnished. The tests shall be as specified in the appropriate ASTM Specification referred to above and shall be made by an acceptable laboratory.

D. Welder Qualifications: Certified in accordance with AWS D1.4-79.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Unload, store, and handlebars in accordance with CRSI publication "Placing Reinforcing Bars."

B. Coated Bars:
1. Protect epoxy-coated bars contact areas from handling equipment.
2. Lift bundles of coated bars at multiple pickup points to minimize bar-to-bar abrasion from sags in bundles.
3. Do not drop or drag coated bars or bundles of coated bars.
4. Store coated bars on protective cribbing.
5. Color fading of coating is not cause for rejection of epoxy-coated reinforcing bars.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Deformed Billet-Steel Reinforcing Bars:

1. Includes stirrups, ties, and spirals.
2. ASTM A615, Grade 60, including Supplemental Requirements S1 where welding is not required.
3. ASTMA706, Grade 60, including Supplemental Requirements for reinforcing to be welded.

B. Splices and Mechanical Connections:

1. Metal Sleeve: Furnish with cast filler metal, capable of developing, in tension or compression, 125 percent of minimum tensile strength of the bar.
2. Mechanical Threaded Connections: Furnish metal coupling sleeve for splicing reinforcing in secondary members or in areas of low stress with internal threads engaging threaded ends of bars developing in tension or compression 125 percent of yield strength of bar.
    a. Manufacturers and Products:
        1) Erico Products, Inc., Cleveland, OH; Lenton Reinforcing Steel Couplers.
        2) Richmond Screw Anchor Co., Inc. Fort Worth, TX; Richmond DB-SAE Dowel Bar Splicers.
        3) Or approved equal.

C. Epoxy-Coated Reinforcing Bars: ASTM A775, deformed bars, with bond strength not less than 80 percent of uncoated bars.

D. Welded Wire Fabric:

1. ASTM A185, or A497, and ACI 318/318R, using ASTM A82, wire of 75 ksi minimum tensile strength.
2. Furnish flat sheets only, rolled sheets not permitted.

E. Reinforcement shall be accurately formed to the dimensions indicated on the drawings. Stirrups and tie bars shall be bent around a pin having a diameter not less than two times the minimum thickness of the bar. Bends for other bars shall be made around a pin having a diameter not less than six times the minimum thickness except for bars larger than 1 in., in which case the bends shall be made around a pin of eight bar diameters. All bars shall be bent cold.

F. Bars shall be shipped to the work with bars of the same size and shape fastened in bundles with securely wired-on metal identification tags giving size and mark.

G. Deformations on bars for concrete reinforcement shall conform to the requirements of the above-mentioned ASTM Specifications.

2.2 ACCESSORY MATERIALS

A. Tie Wire:

1. Black, soft-annealed 16-gauge wire.
2. Nylon-, epoxy-, or plastic-coated wire.

B. Bar Supports and Spacers:

1. Precast concrete bar supports, cementitious fiber-reinforced bar supports, or all-plastic bar supports and side form spacers meeting the requirements of CRSI Manual of Standard Practice. Do not use other types of supports or spacers.
2. In Beams, Columns, Walls, and Slabs Exposed to View After Stripping: Small rectangular concrete blocks made up of same color and strength as concrete being placed around them or all-plastic bar supports and side form spacers.
3. Use supports made of dielectric material for epoxy-coated reinforcing bars supported from formwork.
4. If epoxy-coated reinforcing is used, furnish epoxy-coated reinforcing bars for spreader bars.
5. Precast concrete supports of same strength as concrete for reinforcing in concrete place don grade.

C. Welded steel wire fabric shall conform to the ASTM A 185. The gage and spacing of wires shall be as indicated on the drawings.

D. Soffit Clips: Made of galvanized steel wire not lighter than No. 12 Stl. W.C. They shall be shared so that the greater portion of the wire is held about 1 in. from the flange of the steel beam and shall be spaced not less than 9 in. on centers, the spacing being maintained by suitable longitudinal wires.

2.3 FABRICATION

A. Follow CRSI Manual of Standard Practice.

B. Bend all bars cold.

PART 3 - EXECUTION

3.1 PREPARATION

A. Notify Engineer when reinforcing is ready for inspection and allow sufficient time for inspection prior to placing concrete.

B. Repair epoxy coating damaged due to handling, shipment, and placing. Repair with patching material in accordance with ASTM A775, and manufacturer's recommendations.

C. Clean metal reinforcement of loose mill scale, oil, earth, and other contaminants.

D. Coat wire projecting from precast concrete bar supports with dielectric material, epoxy, or plastic.

E. Before being placed in position, reinforcement shall be thoroughly cleaned of loose mill and rust scale, dirt, and other coatings, including ice, that tend to interfere with development of proper bond. Where there is delay in depositing concrete after reinforcement is in place, bars shall be reinspected and cleaned when necessary.

F. Reinforcement which is to be exposed for a considerable length of time after having been placed shall be painted with a heavy coat of cement grout, if required by the Engineer.

3.2 REINFORCING BAR INSTALLATION

A. Bundle or space bars, instead of bending where construction access through reinforcing is necessary.

B. Spacing and Positioning: Conform to ACI 318/318R.

C. Location Tolerances: In accordance with CRSI publication, “Placing Reinforcing Bars”.

D. Splicing:

1. Follow ACI 318/318R.
2. Use lap splices unless otherwise shown or permitted in writing by the Engineer.
3. Welded Splices: Accomplish by full penetration groove welds and develop at least 125 percent of yield strength of bar.
4. Stagger splices in adjacent bars.
5. Metal sleeves may be used.

E. Mechanical Splices and Connections:

1. Use only in areas specifically approved in writing by the Engineer.
2. Install as required by manufacturer with threads tightened and in accordance with ICBO Research Report.
3. Maintain minimum edge distance and concrete cover.

F. Tying Deformed Reinforcing Bars:

1. Tie every other intersection on mats made up of Nos. 3, 4, 5, and 6 bars to hold them firmly at required spacing.
2. Bend all noncoated tie write to prevent tie wire from being closer than 1 inch from the surface of concrete.
3. Epoxy-Coated Bars:
    a. Use epoxy-coated or nonmetallic clips.
    b. Repair coating damage at clipped or welded intersection.

G. Reinforcement Around Openings: Place an equivalent area of steel bars or fabric around pipe or opening and extend as shown, on each side sufficiently to develop bond with each bar. See drawing details.

H. Welding Reinforcement:

1. Only A706/A706M bars may be welded.
2. Do not perform welding until welder qualifications are approved.
3. Provide suitable ventilation when welding epoxy-coated reinforcing bars.
4. After completion of welding on epoxy-coated reinforcing bars, repair coating damage, welds, and steel splice members with same material as used for repair of coating damage.

I. Straightening and Re-bending: Field bending of reinforcing steel bars is not permitted.

J. Unless permitted by Engineer, do not cut reinforcing bars in the field. When epoxy-coated reinforcing bars are cut in the field, coat ends of bars with same material used for repair of coating damage.

K. Reinforcement shall be accurately positioned as indicated on the drawings and secured against displacement by using annealed iron wire ties or suitable clips at intersections. Concrete blocks having a minimum bearing area of 2 in. by 2 in., and equal in quality to that specified for the slab, shall be used for supporting reinforcing bars for slabs on grade. Where the underside of slabs will be exposed to view in the finished work, stainless-steel supports shall be used.

L. Furnish and place all concrete reinforcement as indicated on the drawings and as herein specified. Concrete reinforcement in sizes No. 3 (3/8 in.) and larger shall be deformed steel bars of the shapes and sizes indicated on the drawings.

3.3 WELDED WIRE FABRIC INSTALLATION

A. Extend fabric to within 2 inches of edges of slab, and lap splices at least 1-1/2 courses of fabric or minimum 8 inches.

B. Tie laps and splices securely at ends and at least every 24 inches with tie wire.

C. Place welded wire fabric on concrete blocks at correct distance as shown, above bottom of slab and rigidly support equal to that provide for reinforced bars. Do not use broken concrete, brick, or stone.

D. Follow ACI 318/318R and current Manual of Standard Practice, Welded Wire Fabric.

E. Do not use fabric that has been rolled. Install flat sheets only.

3.4 TESTS AND INSPECTION

A. Test 10 percent of all welds using radiographic, nondestructive testing procedures referenced in AWS D1.4-79.

B. Inspect each splice and verify each component is in accordance with manufacturer's instructions and ICBO Research Report.

END OF SECTION

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Requirements for furnishing and installing forms, reinforcing steel, furnishing and finishing concrete, and expansion and construction joints.

1.2 REFERENCES

A. 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. C31, Practice for Making and Curing Concrete Test Cylinders in the Field.
4. C33, Specification for Concrete Aggregates.
5. C39, Test Method for Compressive Strength of Cylindrical Concrete Specimens.
6. C42, Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
7. C94, Specification for ready Mixed Concrete.
8. C143, Test Method for Slump of Hydraulic Cement Concrete.
9. C150, Specification for Portland Cement.
10. C172, Practice for Sampling Freshly Mixed Concrete.
11. C231, Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
12. C260, Test Method for Air-Entraining Admixtures for Concrete.
13. C494, Specification for Chemical Admixtures for Concrete.
14. C920, Specification for Elastomeric Joint sealants.
15. D994, Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type)
16. D1056, Specification for Flexible Cellular Materials-Sponge or Expanded Rubber.
17. D1751, Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).

B. American Concrete Institute (ACI):

1. ACI 301, Specification for Structural Concrete for Buildings.
2. ACI 304, Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete.
3. ACI 305, Recommended Practice for Hot Weather Concreting.

4. ACI 306, Recommended Practice for Cold Weather Concreting.
5. ACI 315, Building Code Requirements for Reinforced Concrete.
6. ACI 347, Guide to Formwork for Concrete.

C. Concrete Reinforcing Steel Institute (CRSI):

1. Manual of Standard Practice.

1.3 SUBMITTALS

A. Submit Shop Drawings in accordance with Section 01 33 00, SUBMITTALS for the following:

1. Reinforcing Steel
   a. Furnish in detail and completeness that all fabrication and placement at the site can be accomplished without the use of contract drawings for reference.
   b. Include number of pieces, sizes, and grade of reinforcing steel, accessories, and any other information required for fabrication and placement.
   c. Show joint layout and design.
   d. Check structural and site drawings for anchor bolts, anchors, inserts, conduits, sleeves, and any other items which are required to be embedded in concrete, and make necessary provisions as required so that reinforcing steel will not interfere with the placement of such embedded items.
2. Concrete mix designs.
3. Grout manufacturer / design mix.
4. Manufacturer's data for ancillary materials such as joint fillers and sealants, epoxy bonding compound.
5. Batch slips certifying concrete mix, air content, slump, and time of loading.
6. Shop Drawings of all control and expansion joint layouts. All layouts shall include conformance to requirements as shown on the Drawings and as specified herein.
7. Mockups: Cast mockup panel in 6' x 6' square of Concrete Type A and Concrete Type B. Mockups shall demonstrate typical joints, surface finish, texture, color, slip resistance, and standard of workmanship.
   a. Obtain Engineer's approval of mockups prior to pavement construction.
   b. Maintain approved mockups during construction in an undisturbed condition as a standard for judging the completed pavements. Approved mockups may not be part of the completed work unless approved by the Owner. Contractor shall demolish and remove mockups after final acceptance of work.
   c. Mockup panels shall be constructed until approval is obtained.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed exposed aggregate pavement work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Selection of testing laboratory in accordance with Section 01 41 00, TESTING REQUIREMENTS.

C. Sample and Test Concrete as follows:

1. Test Specimens: Make, cure and have tested, a minimum of one set of four test specimens from the concrete of each day's pour and for each fifty cubic yards of concrete cast in accordance with ASTM C172, C31 and C39. One cylinder shall be broken after seven days and three cylinders after twenty-eight days.

2. Slump: A slump test shall be made for each truckload of concrete in accordance with ASTM C143. Slumps greater than design mix limit will be grounds for rejection of the concrete.

3. Air Content: An air content test shall be made from each day's pour of concrete by the pressure method in accordance with ASTM C231. Air contents above or below the limits specified will be grounds for rejection of the concrete.

4. In the event the compressive strength of the cylinders, when tested, is below the specified minimum, the Engineer may require test cores of the hardened structure to be taken by the Testing Laboratory in accordance with ASTM C42. If such test indicates that the core specimen is below the required strength, the concrete in question shall be removed and replaced without cost to the Owner. Any other work damaged as a result of this concrete removal shall be replaced with new materials to the satisfaction of the Engineer at no additional cost to the Owner. The cost of coring will be deducted from the contract amount. Where the Testing Laboratory has taken core cylinders and the concrete proves to be satisfactory, core holes shall be filled in a manner satisfactory to the Engineer at no additional cost to the Owner.

5. The Contractor shall coordinate the date and location of tests with the Engineer before any concrete work is started.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Reinforcing steel

1. Transport to the site, store, and cover in a manner which will ensure that no damage shall occur to it from moisture, dirt, grease, or any other cause that might impair bond to concrete or chip protective epoxy coating.

2. Store on the site at all times, a supply of approved reinforcing steel to ensure that there will be no delay of the work.

3. Identification of steel shall be maintained after bundles are broken.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Portland Cement.
   1. In accordance with ASTM C150, Type II of U.S. manufacture.
   2. Only one brand of cement shall be used on the project.

B. Aggregates.
   1. Fine aggregate, in accordance with ASTM C33, clean and graded from 1/4 inch to fines.
   2. Coarse aggregate, in accordance with ASTM C33, clean and graded from 1/4 inch to maximum sizes hereinafter specified.

C. Air Entraining Agent.
   1. In accordance with ASTM C260.

D. Water Reducing Agent.
   1. In accordance with ASTM C494 Type A.

E. Microsilica Admixture.
   1. Packaged in easily dispersing form.

F. Water.
   1. Clean and potable,
   2. Free of impurities detrimental to concrete.

G. Reinforcing Bars.
   1. New, deformed billet steel bars, in accordance with ASTM A615, Grade 60.

H. Welded Wire Fabric
   1. In accordance with ASTM A185.

I. Accessories.
   1. Reinforcement accessories, consisting of spacers, chairs, ties, and similar items shall be provided as required for spacing, assembling, and supporting reinforcement in place.
   2. All accessories shall be dielectric coated steel or approved plastic accessories, conforming to the applicable requirements of the CRSI Standards.

J. Tie wire.
   1. 16 gauge or heavier black annealed wire.

K. Form Ties and Spreaders.
   1. Standard metal form clamp assemble and plastic cone, of type acting as spreaders and leaving no metal within 1 inch of concrete face.
   2. Provide form tie with water stop for all walls to be in contact with earth or liquid.

3. Inner tie rod shall be left in concrete when forms are removed.
4. No wire ties or wood spreaders will be permitted. Use ½" x 1" C.T. plastic cones for sinkages.

L. Form Coatings.

1. Non-grain raising and non-staining type that will not leave residual matter on surface of concrete or adversely affect proper bonding of subsequent application of other material applied to concrete surface.
2. "Nox-Crete Form Coating" as manufactured by Nox-Crete Company or approved equal.
3. Coatings containing mineral oils, or the non-drying ingredients will not be permitted.

M. Grout.

1. See Section 03 60 10, CEMENTITIOUS GROUT

2.2 CONCRETE STRENGTHS AND PROPORTIONS

A. Cast-in-place concrete shall have the minimum compressive strength at 28 days as indicated below or as described on the Drawings.

1. Sidewalks / Walkways – 4,000 PSI
2. Concrete Pads / Footings – 4,000 PSI
3. Trench Drain / Curb Inlet – 4,000 PSI
4. Other uses – 4,000 PSI

B. The exact proportions for the mix, including amounts admixture (if any), and water, shall be determined by the concrete supplier.

C. The proportions of aggregate to cement for any concrete shall be such as to produce a mixture which will work readily into the corners and angles of the forms and around reinforcement with the method of placing employed not, he work, but without permitting the materials to segregate or excess free water to collect on the surface.

D. Air-Entrainment: The air content in all concrete shall be maintained at 5 to 7 percent.

2.3 PREMOLDED JOINT FILLER

A. Bituminous Type.

1. In accordance with ASTM D994 or D1751.

B. Sponge Rubber Type.

1. Neoprene, closed cell, expanded in accordance with ASTM D1056, Type 2C5, with a compression deflection, 25 percent deflection (limits), 17 to 24 psi (119 to 168 kPa) minimum.

2.4 POURABLE JOINT FILLERS

A. Filler for Non-potable Water Structures

1. Specific Gravity: Greater than 1.0 for cured, in-place filler.

2. Vertical and Sloped Joints: Furnish gun grade material that will remain as placed in joints and will not run down slope.
3. Suitable for continuous immersion and exposure to liquid being contained in the structure.

2.5 JOINT SEALANTS

A. In slabs.
   1. In accordance with ASTM C920 for poured 2-component polyurethane sealant.
   2. Sikaflex-2c, as manufactured by Sika Corporation or approved equivalent.

B. In walls.
   1. Type II, Class A, compound conforming to Interim Federal Specification TT-S-00227E (3) (COM-NBS) for Sealing Compound; Elastomeric Type, Multi-Component (for Caulking, Sealing, and Glazing in Buildings and Other Structures).
   2. Sikaflex-1a, as manufactured by Sika Corporation or approved equivalent.

2.6 EPOXY BONDING COMPOUND

A. The epoxy bonding compound shall be a three-component, solvent-free, moisture-tolerant, epoxy modified, cementitious product specifically formulated as a bonding agent and anti-corrosion coating. The product shall have suitable contact time, fluidity, and application temperature for this type of application.

2.7 RETARDER

A. Retarder to be utilized for Concrete Pavement Type A shall be:
   1. True Etch Surface Retarder by The Burke Company or approved equal.

2.8 SEALANT

A. Sealant shall be:
   1. Sikagard 740W by Sika Corp or approved equal.

PART 3 - EXECUTION

3.1 FORMWORK

A. Falsework for Forms
   1. Build and maintain necessary false work for the forms.

B. Construction of Forms

1. General

a. Construct in accordance with ACI 347.

b. Construct of sound material, to the correct shape and dimensions, mortar tight, of sufficient strength, and so braced and tied together that the movement of men, equipment, materials, or placing and vibrating the concrete will not throw them out of line or position.

2. Embedded Items

a. Make provisions for pipes, sleeves, anchors, inserts, reglets, anchor slots, nailers, water stops, and other features.

b. Do not embed wood, other than necessary nailing blocks, in concrete.

c. Extended complete cooperation to suppliers of embedded items in their installation.

d. Secure information for embedded items from other trades as required.

e. Securely anchored embedded items in correct location and alignment prior to placing concrete.

3. Openings for Items Passing Through Concrete

a. Establish exact locations, sizes, and other conditions required for openings and attachment of work specified under other sections.

b. Coordination work of this nature in order that there will be no unnecessary cutting and patching of concrete.

c. Cutting and repairing of concrete as a result of failure to provide for such openings shall be paid for by the Contractor at no additional expense to the Owner.

C. Removing Forms and False work

1. Forms shall not be removed for at least 72 hours after concrete has been placed.

2. Forms shall not be removed until the concrete has attained sufficient strength to insure stability.

3.2 REINFORCING STEEL

A. General

1. Place reinforcing steel in accordance with the drawings and approved shop drawings and the applicable requirements of the CRSI, Manual of Practice.

2. Install reinforcement accurately and secure against movement, particularly under the weight of workmen and the placement of concrete.

B. Reinforcing Steel Supports

1. Support bars on approved plastic or dielectric-coated metal chairs or spacers, accurately placed and securely fastened to forms or steel reinforcement in place.

2. Supply additional bars, whether specifically shown on the drawings or not, where necessary to securely fasten reinforcement in place.
3. Support legs of accessories in forms without embedding in form surface.
4. Spacing of chairs and accessories shall conform to CRSI, Manual of Standard Practice. Accurately space hoops and stirrups and wire to the reinforcement.
5. Permit no lose wood inside forms.
6. Lifting of welded wire fabric into proper position while concrete is being poured rather than supporting fabric on chairs will not be permitted.

C. Placing and Tying

1. Set in place, space, and rigidly and securely tie or wire with tie wire at all splices and at all crossing points and intersections in the positions shown, or as directed.
2. Re-bending of bars on the job to accommodate the job to accommodate existing conditions will not be permitted without the written approval of the Engineer.
3. Points ends of wire ties away from forms.

D. Spacing

1. Minimum center to center distance between parallel bars shall be in accordance with the details on the drawings, or, where not shown, the clear spacing shall be 2 times the bar diameter but in no case less than 1½ inches or less than 1½ times the maximum size aggregate.

E. Splices

1. Maximum 50% of steel spliced occurring within lap length.
2. Top bars shall be 1.3 times values given in 3.01.D.5.c.
3. Splice lengths.
   a. #6 bars and smaller: 50-bar diameter
   b. #7 bars and larger: 60-bar diameter

F. Concrete Covering

1. In accordance with ACI 315, except where shown otherwise on drawings.

3.3 CONCRETE

A. Mixing of Concrete

1. All concrete shall be ready-mixed concrete and shall be mixed and delivered in accordance with ASTM C 94. The batch plant of the concrete producer shall be certified for compliance with the standards established by the National Ready-Mixed Concrete Association.
2. In the event concrete is mixed at a central batching plant, the delivery shall be arranged so that intervals between batches are kept to a minimum, and in any event not more than thirty

(30) minutes. Trucks shall be in first class condition and kept in constant rotation during delivery.

3. Concrete shall be placed within 90 minutes after cement has been mixed with aggregate or 45 minutes after addition of water and admixtures.
4. No admixtures, except those mentioned in paragraph 2.1 shall be used. Calcium chloride will not be permitted.
5. Truck delivery slips of all concrete delivered to the job shall indicate the quantity and quality of concrete, additives, date and time of batching and delivery, and the location of placement. Delivery slips shall be forwarded to the Engineer at the end of each pour.

B. Cold Weather Concreting.

1. In accordance with ACI 306.
2. Concrete shall not be mixed or placed when the temperature is below 40 degrees F, or when conditions indicate that the temperature will fall below 40 degrees F within 72 hours from the time of placement unless precautions are taken to protect the concrete. Such precautions must be approved by the Engineer.
3. Concrete temperature shall be maintained, when deposited, at not less than 60 degrees F. Reinforcement, forms, and ground which concrete will contact must be completely free of frost.
4. Concrete and formwork must be kept at a temperature of not less than 50 degrees F. for not less than 96 hours after placing.
5. Calcium chloride shall not be used.

C. Hot Weather Concreting.

1. In accordance with ACI 305.
2. The maximum temperature of the concrete, when deposited, shall be 85 degrees F. If the weather causes the placing temperature to exceed 85 degrees F., the mix shall be cooled by methods approved by the Engineer.
3. No concrete shall be deposited when the air temperature is greater than 90 degrees F.

D. Conveying and Placing Concrete.

1. In accordance with ACI 304.
2. Notification: Before placing concrete, forms shall be thoroughly inspected. All chips, dirt, etc., shall be removed, all temporary bracing and cleats taken out, all openings for pipes, etc., properly boxed, all forms properly secured in their correct position and made tight, all reinforcement, anchors, and embedded items secured in their proper places. Concrete which maybe on the forms or reinforcement, and which is set and dry, shall be cleaned off, and the forms and steel washed off before proceeding. Remove all foreign matter from forms and excavations.
3. Water shall be removed from place of deposit before concrete is placed unless otherwise permitted by the Engineer. Any flow of water into an excavation shall be diverted through

proper side drains into a sump or shall be removed by other approved methods which will avoid washing away the freshly deposited concrete.

4. Soil on which concrete will be poured shall be thoroughly wetted (except in freezing weather).
5. Anchors and Embedded Items: Anchors, bolts, sleeves, inserts, wood blocking, and any other items to be embedded in concrete shall be accurately secured in position before the concrete is placed. Aluminum shall not be embedded in concrete.
6. Handling and Depositing
    a. Before any concrete is placed, notify all whose work is in any way connected with or influenced by the concrete work, and give them reasonable time to complete all portions of their work that must be completed before concrete is deposited.
    b. Immediately before concrete is placed, inspect all forms to ensure that they are in proper position, sufficiently rigid, thoroughly clean, properly oiled, and free from foreign materials, and that all reinforcement is in proper position.
    c. Concreting, once started, shall be carried on as a continuous operation until the section of approved size and shape is completed.
    d. Concrete shall be conveyed as rapidly as practicable from the mixer to the place of final deposit by methods that prevent the separation or loss of ingredients. It shall be deposited, as nearly as practicable, in its final position to avoid rehandling or flowing.
    e. Concrete shall not be dropped freely where reinforcement will cause segregation, nor shall it be dropped freely more than six (6) feet. Concrete shall be deposited to maintain a plastic surface approximately horizontal.
    f. Concrete that has partially hardened shall not be deposited in the work.
7. Pumping
    a. Concrete may be placed by pumping if first approved in writing by the Engineer for the location proposed.
    b. Equipment for pumping shall be of such size and design as to ensure a practically continuous flow of concrete at the delivery end without separation of materials.
    c. The concrete mix shall be designed to the same requirements as herein before specified and may be richer in lubricating components in order to allow proper pumping.
    d. Concrete shall not be pumped through aluminum pipes.
8. Vibrating and Compacting
    a. All concrete shall be thoroughly consolidated and compacted by suitable means during the operation of placing, and shall be thoroughly worked around reinforcement, embedded items, and into the corners of the forms. All concrete against forms shall be thoroughly spaded. Internal vibrators shall be used under experienced supervision and shall be kept out of contact with reinforcement and wood forms. Vibrators shall not be used in a manner that forces mortar between individual form members.

b. Vibrators shall be flexible electric type or approved compressed air type, adequately powered and capable of transmitting to the concrete not less than seven thousand (7,000) impulses per minute. Vibration shall be sufficiently intense to cause the concrete to flow or settle readily into place without separation of the ingredients. A sufficient number of vibrators shall be employed so that complete compaction is secured throughout the entire volume of each layer of concrete. At least one (1) vibrator shall be kept in readiness as a spare for emergency use. Vibrators shall be such that the concrete becomes uniformly plastic with their use.

c. Vibration shall be close to the forms but shall not be continued at one spot to the extent that large areas of grout are formed, or the heavier aggregates are caused to settle. Care shall be taken to not disturb concrete that has its initial set.

d. Where conditions make compacting difficult, or where the reinforcement is congested, batches of mortar containing the same proportions of cement to sand as used in the concrete shall first be deposited in the forms, to a depth of at least on inch.

e. The responsibility for providing fully filled out, smooth, clean, and properly aligned surfaces free from objectionable pockets shall rest entirely with the Contractor.

3.4 FINISHING

A. Cement Concrete Pavement – Type A

1. Cement Concrete Pavement – Type A shall be an exposed aggregate finish concrete.

a. The method employed to achieve the desired results shall be in applying a chemical concrete set retarder admixture to the surface of the concrete in accordance with the manufacturer's directions.

b. The amount of retardant applied will be sufficient to expose 1/8 inch of the coarse aggregate by utilizing a water spray and provide an overall surface with a rough texture.

c. Use care to monitor the initial power-washing and 'release' process and then repeat the process for subsequent areas.

B. Cement Concrete Pavement – Type B

1. Cement Concrete Pavement – Type B shall be a non-slip broom finish.

C. Walkway Contraction Joints

1. Shall be tooled into the concrete surface to a depth of one-fourth the thickness of the concrete.

2. The spacing of contraction joints shall be per the plans or at maximum intervals of 12 times the thickness of the concrete.

D. Walkway Expansion Joints

1. Expansion Joints shall be placed a maximum spacing of 30 feet.

2. Provide expansion joint material against all walls, light posts, manhole structures, and other objects that could restrain the movement of the concrete.

E. Construction Joints

1. Construction joints shall be located a maximum of 40 feet apart. If, for any reason, the contractor feels a change is necessary, he shall prepare a placing plan and submit it to the Engineer for approval.
2. Where a joint is to be made, the surface of the concrete shall be sandblasted or thoroughly picked, thoroughly cleaned, and all laitance removed. In addition to the foregoing, joints shall be thoroughly wetted, but not saturated, and slushed with a coat of grout immediately before the placing of new concrete.
3. Approved keys shall be used at all joints, unless detailed otherwise.
4. Forms shall be retightened before placing of concrete is continued. There shall be an interval of at least 48 hours between adjacent pours.
5. Bonding Concrete at Construction Joints
    a. To new concrete construction joints:
        1) Thoroughly clean and saturate joint with water.
        2) Cover horizontal wall surfaces as specified in this Section, and immediately place concrete.
        3) Limit concrete lift placed immediately on top of bonding compound to 12 inches thick.
        4) Thoroughly vibrate to mix and consolidate bonding compound and concrete together.

F. Bonding new concrete to old concrete:

1. Mechanically roughen existing concrete surfaces to a clean, rough surface using appropriate mechanical means to remove the existing concrete surface and provide a minimum roughness profile of ¼-inch.
2. Saturate surface with water for 24 hours, cover with epoxy bonding compound and place concrete as specified for new concrete.

G. Expansion Joints

1. Expansion joints shall be located as shown on contract drawings.
2. The joint shall include a joint filler, a bond breaker and joint sealant and installed as indicated on contract drawings.

H. Joint Sealants.

1. Prepare surface in accordance with manufacturer's directions.
2. Apply primer as recommended by sealant manufacturer.
3. Install sealant with the proper tools and methods as directed by the sealant manufacturer.

I. Patching

1. Immediately after stripping forms, patch minor defects, form-tie holes, honeycombed areas, etc., before concrete is thoroughly dry.

2. Repair gravel pockets by cutting out to solid surface, form key, and thoroughly wet before placing patching mortar consisting of 1 part cement to 2 parts fine sand; compact into place and neatly finish. Honeycombed areas or gravel pockets which, in the Engineer's opinion are too large and unsatisfactory for mortar patching as described above, shall be cut out to solid surface, keyed, and packed solids with matching concrete to produce firm bond and surface.
3. The Contractor shall do all the cutting as required by himself or other trades. All such work shall be of the minimum size required. No excessive cutting will be permitted, or shall any structural members or reinforcement be cut.
4. The Contractor shall do all patching after work by other trades has been installed, where required, using Portland Cement Mortar 1:2 mix.

J. Protection and Curing

1. Protect concrete from injurious action of the elements and defacement of any nature during construction operations.
2. Keep concrete in a thoroughly moist condition from the time it is placed until it has cured, for at least (7) days.
3. Carefully protect exposed concrete corners from damage.
4. Allow no slabs to become dry at any time until curing operations are complete. In general, slabs shall be cured with non-staining curing paper, hosing or fog spray; vertical surfaces shall be curing with Burlene or fog spray or an approved curing compound.
5. Protect fresh concrete from drying winds, rain, damage, or spoiling. Curing paper shall be lapped 4 inches minimum at joints and sealed with waterproof tape.

K. Concrete Finishes

1. Unexposed Surfaces: All unexposed surfaces shall have any form finish, at the Contractor's option.
2. Wearing Surface Finish: Float the surface by hand using a wooden or magnesium float. Finish with a flexible bristle broom. Permit surface to harden sufficiently to retain the scoring or ridges. Broom transverse to traffic or at right angles to the slope of the slab.
3. Addition of Material: The addition of cement, sand, water, or mortar to slab surfaces while finishing concrete is strictly prohibited.

L. Defective Work

1. The following concrete work shall be considered defective and may be ordered by the Engineer to be removed and replaced at Contractor's expense:
    a. Incorrectly formed.
    b. Not plumb or level.
    c. Not specified strength.
    d. Containing rock pockets, voids, honeycomb, or cold joints.
    e. Containing wood or foreign matter.
    f. Otherwise not in accordance with the intent of the Drawings and Specifications.

END OF SECTION

SECTION 03 41 00

STRUCTURAL PRECAST CONCRETE - PLANT CAST

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. Requirements for structural precast concrete units, plant cast, including the following:
    a. Light Pole Foundations

B. Related Section:

1. Section 03 30 00 - CAST-IN-PLACE CONCRETE.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. A36, Standard Specification for Carbon Structural Steel.
2. A47, Standard Specification for Ferritic Malleable Iron Castings.
3. A82, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
4. A123, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
5. A153, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
6. A185, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
7. A307, Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
8. A325, Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
9. A497, Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete.
10. A615, Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
11. A666, Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
12. A706, Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement.
13. C33, Standard Specification for Concrete Aggregates.
14. C42, Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
15. C94, Standard Specification for Ready-Mixed Concrete.

16. C150, Standard Specification for Ready-Mixed Concrete.
17. C260, Standard Specification for Air-Entraining Admixtures for Concrete.
18. C309, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
19. C330, Standard Specification for Lightweight Aggregates for Structural Concrete.
20. C618, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
21. C404, Standard Specification for Aggregates for Masonry Grout.
22. C494, Standard Specification for Chemical Admixtures for Concrete.
23. C567, Standard Test Method for Determining Density of Structural Lightweight Concrete.
24. C881, Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.
25. C1077, Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.
26. C1107, Standard Specification for Packaged Dry, Hydraulic-Cement Grout.
27. E119, Standard Test Methods for Fire Tests of Building Construction and Materials.
28. E329, Standard Specification for Agencies Engaged in Construction Inspection and/or Testing.

B. American Association of State Highway and Transportation Officials (AASHTO)
   1. Standard Specification for Roads and Bridges, 17th Edition, Section 5.

C. American Concrete Institute (ACI)
   1. 211-1, Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.
   2. 211-2, Standard Practice for Selecting Proportions for Structural Lightweight Concrete.
   3. 301, Specification for Structural Concrete for Buildings.
   4. 304R, Guide for Measuring, Mixing, Transporting, and Placing Concrete.
   5. 305R, Hot Weather Concreting.
   6. 306R, Cold Weather Concreting.
   7. 309R, Guide for Consolidation of Concrete.
   8. 318, Building Code Requirements for Reinforced Concrete.

D. American Welding Society (AWS)
   1. D1.1, Structural Welding Code-Steel.
   2. D1.4, Structural Welding Code-Reinforcing Steel.

E. Concrete Reinforcing Steel Institute (CRSI)
   1. Manual of Standard Practice.

F. Precast Prestressed Concrete Institute (PCI)

1. MNL-116, Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products.
2. MNL-120, Design Handbook.
3. MNL-124, Design for Fire Resistance of Precast Prestressed Concrete.
4. MNL-127, Recommended Practice for Erection of Precast Concrete.

G. Society for Protective Coatings (formally Steel Structures Painting Council) (SSPC)

1. SP-3, Power Tool Cleaning.
2. PA-1, Shop, Field, and Maintenance Painting of Steel.
3. Paint 20, Zinc-Rich Coating, Type I-Organic and Type II-Inorganic.

H. Military Specification

1. DOD-P-21035A, Paint High Zinc Dust Content, Galvanizing Repair.

I. Federal Specification

1. FS-TT-P-664, Primer Coating, Alkyd, Corrosion Inhibiting, Lead and Chromate Free, VOC-Compliant.

1.3 PERFORMANCE REQUIREMENTS

A. Structural Performance: Engineer, fabricate, and install structural precast concrete Light Pole Foundations to withstand design loadings indicated within limits and under conditions required.

1. Structure shall be designed to resist the dead, live, ice, wind, and any additional loads required.
2. The foundations are to be designed per the AASHTO LRFD Specifications for Highway Signs, Luminaires, and Traffic Signs.

B. Engineering Responsibility: Engage a fabricator who assumes undivided responsibility for engineering structural precast concrete structures by employing a qualified professional engineer to prepare design calculations, fire-resistance calculations, shop drawings, and other structural data.

1.4 SUBMITTALS

A. Submit in accordance with Section 01 33 00.

1. Product data and instructions for manufactured materials and products.
    a. Certification by paint and curing compound manufacturers that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).
2. Shop drawings prepared by or under the supervision of a qualified professional engineer detailing fabrication and installation of precast concrete units. Indicate member dimensions and cross-sections; locations, sizes, and types of reinforcement, including special reinforcement; and lifting devices necessary for handling and erection.

a. Indicate layout and dimensions, and identify each precast concrete unit corresponding to sequence and procedure of installation. Indicate welded connections by AWS standard symbols. Detail loose, cast-in, and field hardware, inserts, connections, and joints, including accessories and construction at openings in precast units.

b. Indicate locations and details of anchorage devices that are to be embedded in other construction. Furnish templates, if required, for accurate placement.

c. For precast concrete Light Pole Foundations indicated to comply with design loadings, include structural analysis data sealed and signed by the qualified professional engineer responsible for their preparation.

3. Welder certificates signed by Contractor certifying that welders comply with requirements specified under the "Quality Assurance" Article.

4. Design mixes for each concrete mix. Submit revised mix proportions when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.

5. Material test reports from a qualified independent testing agency evidencing compliance with requirements of the following based on comprehensive testing of current materials:

a. Concrete materials.

b. Reinforcing materials.

c. Admixtures.

6. Material certificates in lieu of agency test reports, when permitted by Engineer, signed by fabricator certifying that each material item complies with requirements.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced Installer who has completed structural precast concrete work similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

B. Fabricator Qualifications: Firm experienced in producing structural precast concrete units 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 without delaying the Work.

1. Fabricator must participate in the PCI Plant Certification Program and be designated a PCI Certified Plant for the following product group and category:

2. Product Group and Category: Group C, Category C1.

C. Professional Engineer Qualifications: A professional engineer legally authorized to practice in the jurisdiction where Project is located and experienced in providing engineering services of the kind indicated that have resulted in the installation and successful in-service performance of precast concrete units similar to this Project in material, design, and extent.

D. Design and install the structures to withstand hydrostatic uplift caused by a groundwater elevation at grade level or equal to the top of the structure, whichever produces the most severe condition. Use only the weight of the empty structure (no fill) and submerged soil directly over

any base perimeter to resist hydrostatic uplift with a minimum safety factor of 1.10. The weight of submerged soil may be 60 pounds per cubic foot maximum. Do not include side friction of soil on walls.

E. Testing Agency Qualifications: To qualify for acceptance, an independent testing agency must demonstrate to Engineer's satisfaction, based on evaluation of agency-submitted criteria conforming to ASTM C1077 and ASTM E329, that it has the experience and capability to satisfactorily conduct the testing indicated without delaying the Work.

F. PCI Design Standard: Comply with recommendations of PCI MNL-120 applicable to types of structural precast concrete units indicated.

G. PCI Quality-Control Standard: Comply with requirements of PCI MNL-116 including manufacturing and testing procedures, quality-control recommendations, and camber and dimensional tolerances for types of units required.

H. ACI Publications: Comply with the following ACI publications applicable to types of structural precast concrete units indicated:

1. ACI 301 "Specifications for Structural Concrete for Buildings."
2. ACI 318 (ACI 318M) "Building Code Requirements for Reinforced Concrete."

I. Welding Standards: Comply with applicable provisions of AWS D1.1 and AWS D1.4.

1. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

J. Calculated Fire-Test-Response Characteristics: When fire-resistance-rated assemblies are indicated, provide structural precast concrete units whose calculated fire resistance has been determined according to ASTM E119 and PCI MNL-124 and is acceptable to authorities having jurisdiction.

K. Fire-Test-Response Characteristics: Provide structural precast concrete units that comply with the following requirements:

1. Fire-response tests are performed by a qualified testing and inspecting agency. A qualified testing and inspecting agency includes UL or another agency that is acceptable to authorities having jurisdiction and performs testing and follow-up services.
2. Fire-resistance-rated assemblies indicated are identical in materials and construction to those tested for fire resistance per ASTM E119.
3. Fire-resistance-rated assemblies are indicated by design designations listed in the UL "Fire Resistance Directory" or in the listings of another qualified testing and inspecting agency.
4. Products are identified with appropriate markings of applicable testing and inspecting agency.

L. Product Options: The drawings indicate size, profiles, and inside dimensional requirements of precast concrete Light Pole Foundations.

M. Preinstallation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section 01 01 90 COORDINATION OF MEETINGS.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver precast concrete Light Pole Foundations to the Project site in such a manner and time to ensure continuity of installation. Store structures at the Precaster yard to prevent cracking, distorting, warping, staining, or other physical damage, and so that markings are visible.

B. Lift and support unit only at designated lifting or supporting points as shown on final shop drawings.

C. Deliver anchorage items that are to be embedded in other construction before starting such work. Provide setting diagrams, templates, instructions, and directions, as required, for installation.

PART 2 - PRODUCTS

2.1 PRECAST CONCRETE FABRICATORS

A. Fabricators: Subject to compliance with requirements, suggested fabricators offering products that may be incorporated in the Work include, but are not limited to, the following:

1. CSI Concrete Systems, Hudson, N.H.
2. Chase Precast, N. Brookfileld, MA.
3. Oldcastle Precast, Avon, CT, Rehoboth, MA

2.2 FORMWORK

A. Forms: Provide forms and, where required, form facing materials of metal, plastic, wood, or another acceptable material that is nonreactive with concrete and will produce required finish surfaces.

2.3 MATERIALS AND COMPONENTS

A. Reinforcing

1. Reinforcing Bars: ASTM A615, Grade 60 (ASTM A615M, Grade 400), deformed.
2. Low-Alloy-Steel Reinforcing Bars: ASTM A706, Grade 60 (ASTM A706M, Grade 400).
3. Steel Wire: ASTM A82, plain, cold drawn.
4. Steel-Welded Wire Fabric: ASTM A185, plain, cold drawn.
5. Deformed-Steel-Welded Wire Fabric: ASTM A497, cold drawn.
6. Supports for Reinforcement: Provide supports for reinforcement, including bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing, complying with CRSI recommendations.
    a. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs that are protected with plastic (CRSI, Class 1) or stainless steel (CRSI, Class 2).

B. Concrete

1. Portland cement: ASTM C150, Type I or Type III.
    a. Use only one brand and type of cement throughout Project, unless otherwise acceptable to Architect.
2. Fly Ash: ASTM C618, Class C or F.
3. Normal-Weight Aggregates: ASTM C33, Class 5S. Provide aggregates from a single source.
4. Lightweight Aggregates: ASTM C330.
5. Water: Potable.
6. Admixtures, General: Provide admixtures for concrete that contain not more than 0.1 percent chloride ions by mass of Portland cement or cementitious material.
7. Air-Entraining Admixture: ASTM C260, certified by manufacturer to be compatible with other required admixtures.
8. Water-Reducing Admixture: ASTM C494, Type A.
9. Water-Reducing and Accelerating Admixture: ASTM C494, Type E.
10. Water-Reducing and Retarding Admixture: ASTM C494, Type D.

C. Connections and Finishes

1. Steel Shapes and Plates: ASTM A36 (ASTM A 36M).
2. Malleable Iron Castings: ASTM A47 (ASTM A 47M).
3. Plate Stainless Steel: ASTM A666, Type 304, of grade suitable for application.
4. Bolts and Studs: ASTM A307, Grade A (ASTM F 568, Property Class 4.6); carbon-steel, hex-head bolts and studs; carbon-steel nuts; and flat, unhardened steel washers.
5. High-Strength Bolts and Nuts: ASTM A325 (ASTM A325M), Type 1, heavy hex steel structural bolts, heavy hex carbon-steel nuts, and hardened carbon-steel washers.
6. Welded Headed Studs: AWS D1.1, Type B headed studs, cold-finished carbon-steel bars.
7. Deformed-Steel Wire Bar Anchors: ASTM A497.
8. Welding Electrodes: Comply with AWS standards.
9. Accessories: Provide clips, hangers, shims, and other accessories required to install precast concrete units.
10. Hot-Dip Galvanized Finish: For exterior steel items and items indicated for galvanizing, apply zinc coating by the hot-dip process, complying with the following requirements:
    a. ASTM A123 for galvanizing rolled, pressed, and forged shapes, plates, bars, and strips.
    b. ASTM A153 for galvanizing iron and steel hardware.
11. Galvanizing Repair Paint: High-zinc-dust-content paint with dry film containing not less than 94 percent zinc dust by weight, and complying with DOD-P-21035A or SSPC-Paint 20.

12. Shop-Primed Finish: Prepare surfaces of interior steel items, except those with galvanized finish or those surfaces to be embedded in concrete, according to requirements of SSPC-SP 3 and shop-apply primer according to SSPC-PA 1.
    a. Primer: Fast-curing, lead and chromate-free, VOC-conforming, universal modified-alkyd primer with good resistance to normal atmospheric corrosion, complying with performance requirements of FS TT-P-664.

D. Grout
1. Cement Grout: Portland cement, ASTM C150, Type I, and clean, natural sand, ASTM C404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.
2. Nonmetallic, Nonshrink Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, plasticizing and water-reducing agents, complying with ASTM C1107, with fluid consistency and an extended working time.
3. Epoxy Grout: ASTM C881, 2-component epoxy resin, of type, grade, and class to suit requirements.

E. Curing Materials
1. Clear, Solvent-Borne, Liquid, Membrane-Forming Curing Compound: ASTM C309, Type I, Class A or B, wax free.
2. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C309, Type I, Class B.
    a. Provide material that has a maximum volatile organic compound (VOC) rating of 350 g/L.

2.4 CONCRETE MIXES

A. Prepare design mixes for each type of concrete required.
1. Limit use of fly ash to not exceed, in aggregate, 25 percent of the Portland cement by weight.

B. Design mixes may be prepared by a qualified independent testing agency or by qualified precast manufacturing plant personnel at precast fabricator's option.

C. Normal-Weight Concrete: Proportion mixes by either laboratory trial batch or field test data methods according to ACI 211.1 and ACI 301, using materials to be used on the Project, to provide normal-weight concrete with the following properties:
1. Compressive Strength (28-Day): 5000 psi (34.5 MPa).
2. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.40.

D. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows, with a tolerance of plus or minus 1-1/2 percent:
1. Severe exposure conditions where the concrete will be exposed to freezing.
    a. Air Content: 6 percent for 1-inch (25-mm) maximum aggregate.
    b. Air Content: 6 percent for 3/4-inch (19-mm) maximum aggregate.

c. Air Content: 7 percent for 1/2-inch (13-mm) maximum aggregate.

2. Mild exposure conditions where the concrete will NOT be exposed to freezing.

a. Air Content: 2.5 to 4.5 percent.

E. Lightweight Concrete: Proportion mixes by either laboratory trial batch or field test data methods according to ACI 211.2 and ACI 301, using materials to be used on the Project, to provide lightweight concrete with the following properties:

1. Compressive Strength (28-Day): 5000 psi (34.5 MPa).

2. Unit Weight: Calculated equilibrium unit weight of 115 lb/cu. ft. (1842 kg/cu. m), plus or minus 3 lb/cu. ft. (48 kg/cu. m), according to ASTM C567.

F. Add air-entraining admixture at manufacturer's prescribed rate to result in lightweight concrete at point of placement having an air content as follows:

1. Severe exposure conditions where the concrete will be exposed to freezing.

a. Air Content: 4 to 6 percent for 3/4-inch (19-mm) maximum aggregate.

b. Air Content: 4.5 to 7.5 percent for 3/8-inch (10-mm) maximum aggregate.

2. Mild exposure conditions where the concrete will NOT be exposed to freezing.

a. Air Content: 4 percent, minimum.

G. Other Admixtures: Use water-reducing, water-reducing and accelerating, or water-reducing and retarding admixtures according to manufacturer's directions.

H. Concrete-Mix Adjustments: Concrete-mix design adjustments may be proposed when characteristics of materials, project conditions, weather, test results, or other circumstances warrant.

2.5 FABRICATION

A. Formwork: Accurately construct forms, mortar tight, of sufficient strength to withstand pressures due to concrete placing operations, temperature changes, and for pretensioning and detensioning operations. Maintain formwork to provide completed precast concrete units of shapes, lines, and dimensions indicated, within fabrication tolerances specified in PCI MNL-116.

1. Coat surfaces of forms with bond-breaking compound before reinforcement is placed. Provide commercial-formula, form-coating compounds that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces requiring bond or adhesion. Apply in compliance with manufacturer's instructions.

2. Unless forms for precast, prestressed concrete units are stripped prior to detensioning, design forms so that stresses are not induced in precast units due to deformation of concrete under prestress or movement during detensioning.

B. Built-In Anchorages: Accurately position built-in anchorage devices and secure to formwork. Locate anchorages where they do not affect the position of the main reinforcement or placing of concrete. Do not relocate bearing plates in units, unless acceptable to Architect.

C. Cast-in openings larger than 8 inches (200 mm) in diameter or 8 inches (200 mm) square according to final shop drawings. Other smaller holes may be field cut by trades requiring them, as acceptable to Engineer.

D. Reinforcement: Comply with the recommendations of CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

1. Clean reinforcement of loose rust and mill scale, earth, and other materials that reduce or destroy the bond with concrete.

2. Accurately position, support, and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcement by metal chairs, runners, bolsters, spacers and hangers, as required.

3. Place reinforcement to obtain at least the minimum coverages for concrete protection. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position while placing concrete. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

4. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

E. Concrete Mixing: Comply with requirements and with ASTM C94. Following concrete batching, no additional water may be added.

F. Concrete Placement: Place concrete in a continuous operation to prevent seams or planes of weakness from forming in precast units. Comply with requirements of ACI 304R for measuring, mixing, transporting, and placing concrete.

1. Thoroughly consolidate placed concrete by internal and external vibration without dislocating or damaging reinforcement and built-in items. Use equipment and procedures complying with ACI 309R.

2. Comply with ACI 306R procedures for cold-weather concrete placement.

3. Comply with ACI 305R procedures for hot-weather concrete placement.

G. Identify pickup points of precast concrete units and orientation in structure with permanent markings, complying with markings indicated on final shop drawings. Imprint casting date on each precast unit on a surface that will not show in the finished structure.

H. Cure concrete according to the requirements of PCI MNL-116 by moisture retention without heat or by accelerated heat curing, using low-pressure live steam or radiant heat and moisture.

I. Finish formed surfaces of precast concrete as indicated for each type of unit, and as follows:

1. Standard Finish: Normal plant-run finish produced in forms that impart a smooth finish to concrete. Small surface holes caused by air bubbles, normal color variations, form joint marks, and minor chips and spalls will be tolerated. Major or unsightly imperfections, honeycombs, or structural defects are not permitted.

J. Finish unformed surfaces by trowel, unless otherwise indicated. Consolidate concrete, bring to proper level with straightedge, float, and trowel to a smooth, uniform finish.

2.6 EXTERIOR COATING

A. The material shall be:

1. TREMproof 260 Spray-Applied Waterproofing Membrane made by Tremco Incorporated, 3735 Green Road, Beachwood, Ohio 44122; or
2. TREMproof 201/60 Fluid-Applied Waterproofing Membrane made by Tremco Incorporated, 3735 Green Road, Beachwood, Ohio 44122; or
3. Or product deemed acceptable by the Engineer.

2.7 SOURCE QUALITY CONTROL

A. The Owner may employ an independent testing agency to evaluate precast fabricator's quality control and testing methods.

1. Allow Owner's testing agency access to material storage areas, concrete production equipment, concrete placement, and curing facilities. Cooperate with Owner's testing agency and provide samples of materials and concrete mixes as may be requested for additional testing and evaluation.

B. Quality-Control Testing: Test and inspect precast concrete according to PCI MNL-116 requirements.

C. Strength of precast concrete units will be considered potentially deficient when precast concrete units fail to comply with requirements, including the following:

1. Fail to meet compressive-strength test requirements.
2. Reinforcement does not conform to fabrication requirements.
3. Concrete curing and protection of precast units against extremes in temperature fail to meet requirements.
4. Precast units are damaged during handling and erecting.

D. Testing: When there is evidence that the strength of precast concrete units may be deficient or may not meet requirements, the Owner will employ an independent testing agency to obtain, prepare, and test cores drilled from hardened concrete to determine compressive strength according to ASTM C42.

1. A minimum of 3 representative cores will be taken from precast concrete units of suspect strength, from locations directed by Engineer.
2. Cores will be tested, following immersion in water, in a wet condition per ACI 301 when precast concrete units will be wet under service conditions.
3. Cores will be tested in an air-dry condition per ACI 301 when precast concrete units will be dry under service conditions.
4. Strength of concrete for each series of 3 cores will be considered satisfactory if the average compressive strength is at least 85 percent of the 28-day design compressive strength and no core compressive strength is less than 75 percent of the 28-day design compressive strength.

5. Test results will be made in writing on the same day that tests are made, with copies to Engineer, Contractor, and precast fabricator. Test reports will include the Project identification name and number, date, name of precast concrete fabricator, name of concrete testing agency; identification letter, name, and type of precast concrete unit or units represented by core tests; design compressive strength, compressive strength at break and type of break, corrected for length-diameter ratio, and direction of applied load to core with respect to horizontal plane of concrete as placed.

E. Patching: Where core test results are satisfactory and precast concrete units meet requirements, solidly fill core holes with patching mortar and finish to match adjacent concrete surfaces.

F. Dimensional Tolerances: Units having dimensions smaller or greater than required and not meeting tolerance limits may be subject to additional testing.

1. Precast units having dimensions greater than required will be rejected if the appearance or function of the structure is adversely affected or if larger dimensions interfere with other construction. Repair or remove and replace rejected units, as required, to meet construction conditions.

G. Defective Work: Precast concrete units that do not conform to requirements, including strength, manufacturing tolerances, and finishes, are unacceptable. Replace with precast concrete units that meet requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions for compliance with requirements, including installation tolerances, true and level bearing surfaces, and other conditions affecting performance of precast concrete units. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Welding: Perform welding in compliance with AWS D1.1 and AWS D1.4, with qualified welders.

1. Protect precast concrete units from damage by field welding or cutting operations and provide noncombustible shields as required.

2. Repair damaged metal surfaces by cleaning and applying a coat of galvanizing repair paint to galvanized surfaces.

3. Repair damaged metal surfaces by cleaning and repriming damaged painted surfaces.

B. Erection Tolerances: Install precast units level, plumb, square, and true, without exceeding the recommended erection tolerances of PCI MNL-127.

C. Shore and brace precast concrete units to maintain location, stability, and alignment until permanent connections are installed.

D. Grouting Connections and Joints: After precast concrete units have been placed and secured, grout open spaces at keyways, connections, and joints using suitable grout approved by the Engineer.

1. Provide forms or other acceptable method to retain grout in place until hard enough to support itself. Pack spaces with stiff grout material, tamping until voids are completely filled. Place grout to finish smooth, plumb, and level with adjacent concrete surfaces. Keep grouted joints damp for not less than 24 hours after initial set. Promptly remove grout material from exposed surfaces before it hardens.

3.3 CLEANING

A. Clean exposed surfaces of precast concrete units after erection to remove weld marks, other markings, dirt, and stains.

1. Wash and rinse according to precast concrete fabricator's recommendations. Protect other work from staining or damage due to cleaning operations.

2. Do not use cleaning materials or processes that could change the appearance of exposed concrete finishes.

3.4 ASSEMBLY

A. Assembly of this precast concrete Light Pole Foundations will include all the mechanical equipment installed and tested. The equipment will be installed at the yard of the precaster and shipped as a completed unit. The precaster will be required to cooperate with the equipment installer by supplying a safe work area, sufficient electrical power, and water. Sanitary facilities will be the responsibility of the equipment installer.

END OF SECTION

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SECTION 03 60 10

CEMENTITIOUS GROUT

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Requirements for non-shrink cementitious grout for leveling base plates, filling helical piles, setting of railing posts, and miscellaneous patching as approved by the Engineer.

1.2 SUBMITTALS

A. Submit in accordance with the provisions of SECTION, 01 33 00 SUBMITTALS.

1. Product Data: Submit manufacturer's technical data sheets for the Grout.

1.3 QUALITY ASSURANCE

A. The grout manufacturer shall be ISO 9001 certified and have at least five (5) years experience manufacturing of precision cement-based grouts.

PART 2 - PRODUCTS

2.1 GROUT

A. The Grout shall be a non-shrink cementitious, pre-proportioned, prepackaged, precision grout requiring only the addition of potable water. The grout shall not contain metallic aggregate, expansive cement, or gas generating additives such as aluminum powder. The grout shall be formulated for exposure to a salt/chemical environment. The grout shall meet the following minimum requirements:

1.	Early Height Change,	ASTM C827	0.0 to 4.0%
2.	Hardened Height Change,	ASTM C1090	0.0 to 0.3%
3.	Effective Bearing Area		95%
4.	Minimum Compressive Strength,	ASTM C109 5	500 psi (7 days)
5.	Minimum Bond Strength,	ASTM C882	2,000 psi (28 days)
6.	Meets	ASTM C1107 Performance Grade	Grade C

B. Grout shall be Five Star Special Grout 120 as manufactured by Five Star Products, Inc. of Fairfield, CT or Engineer approved equal. For cold weather applications, Grout shall be Five Star Instant Grout as manufacture red by Five Star Products, Inc. of Fairfield, CT or Engineer approved equal.

PART 3 - EXECUTION

3.1 GENERAL

A. Mix and apply the grout in accordance with the manufacturer's instructions.

B. Work requiring Grout shall adhere strictly to manufacturer's current printed recommendations for air and substrate temperatures at the time of application. Temporary heat may be used to meet the specified requirements and shall be maintained for the minimum amount of time recommended by the manufacturer to ensure performance of the Grout. The method of providing and maintaining temporary heat shall be submitted to the Engineer for approval prior to construction.

C. Grout shall be new material, delivered in manufacturer's unopened containers. The Grout shall be stored to maintain the integrity of the product by protecting it from exposure to weather.

D. Grout shall be used within the shelf and pot life limitations set forth by the manufacturer. The shelf life shall be clearly marked on the containers.

3.2 PREPARATION OF SURFACES

A. Surfaces to receive Grout shall be clean and sound. Remove dust, laitance, grease, curing compounds, waxes, and other foreign particles by mechanical abrasion.

END OF SECTION

SECTION 04 40 00

GRANITE CUT STONE

PART 1 - GENERAL

1.1 SUMMARY

A. The work included in this Section includes the fabrication and furnishing of granite dimensional cut stone components and the installation of certain specified stone furnished under this specification.

B. This specification includes the fabrication of all of the following Cut Stones:

1. Granite Cut Stone CS-1
2. Granite Cut Stone CS-2
3. Granite Cut Stone CS-3

1.2 REFERENCES

A. For Cut Stone: ASTM Standards: C-97, C-99, C-170, C-241, C-615, C-880

B. National Building Granite Quarries Association, Inc. (NBGQA)

C. Specifications for Architectural Granite.

1.3 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, requirements, apply to this Section.

B. Related Sections: The following sections contain requirements that relate to this section.

1. Section 31 05 16, AGGREGATE FOR EARTHWORK,
2. Section 31 20 00, EARTH MOVING,

1.4 DEFINITIONS

A. The definition of trade terms used in these specifications shall be those published by the National Building Granite Quarries Association, Inc. (NBQGA).

1. Arris: Sharp edge or exterior corner formed by the intersection of two surfaces.
2. Face: The exposed major surface of a piece with its specified finish.
3. Joint: The end or side surface of a piece that which is covered when a piece is set in place. Also refers to the open space or filled space that
4. Extends the full width of the top surface then vertically or angled down ward between the adjacent pieces set in place.
5. Start: The beginning of a crack, caused by quarrying techniques, piece fabrication or handling.

6. Seam: Crack or Fissure.
7. Finishes: Refer to this specification Section 2.01

1.5 SUBMITTALS

A. The Contractor shall provide qualifications for the following:

1. Stone Quarry / Stone Fabrication Facility. Provide the Company Name, location, years in business (minimum of ten (10) years of related experience) with photographic samples or other proof of a minimum of five (5) projects featuring similar types of projects or related work with regard to scale, size, shape fit and finish. Provide a minimum of five (5) references, with full contact information. The Manufacturer must be certified according to the National Building Granite Quarries Association.
2. Mason/Stone Installer: Provide Company Name, location, years in business (minimum of 10 years of related experience) with photographic samples or other proof of projects featuring similar types of projects or related work with regard to scale, size, shape fit and finish. Provide a minimum of five (5) references, with full contact information.
3. Foreman: Provide the name and credentials of the person assigned to oversee the implementation process, including the on-site activities. The foreman shall be an experienced installer who has completed Stone Work, fabrication and installations similar in material, design, and extent to that indicated for this Project and whose work has resulted in constructions with a record of successful in-service performance. Provide a minimum of five (5) previous projects for which the Foreman was directly responsible.

B. Furnish a minimum of three (3) samples (Minimum of 6”x6”) of the proposed granite. Samples shall include stone type / name and manufacturer and shall be submitted to the Engineer to show the texture, finish, and anticipated range of color.

C. The granite supplier shall submit copies of all full shop drawings to the Engineer for approval where applicable. These drawings shall show all sizes, dimensions, layout, finishes, bedding, bonding, stone jointing and identifying names and numbers of each piece of granite in non-staining paint.

D. Submit Product Data Sheets and Material Test Reports on material proposed for use. Submit reports from a qualified testing agency indicating and interpreting test results for compliance based on comprehensive testing of materials.

1.6 QUALITY CONTROL

A. The General Contractor shall submit all Supplier, Fabricator, Mason or Installer, Foreman, and all Contractor qualifications required upon the presentation of the initial Schedule of Values for the Project. The General Contractor shall provide tests from a qualified independent testing entity and submit test reports for review and approval prior to the granite fabrication.

B. Granite shall conform to ASTM C-615, Architectural Grade Granite. All granite shall meet the following structural standards ASTM C97, ASTM C99, ASTM C170, ASTM C241, and ASTM C880.

C. All Granite shall be free from flaws, reeds, rifts, laminations, cracks, seams, starts or other such defects. Sample must be approved prior to proceeding with the work.

D. Exposed surfaces shall be free from spots, spalls, chips, stains, discoloration and other defects including variations that would affect the appearance outside the approved sample range.

E. The Owner reserves the right to perform independent testing by a qualified testing laboratory. Impact hammer, sonoscope, or other nondestructive device may be permitted but will not be used as sole basis for approval or rejection of Granite.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Packing and Loading

1. Finished granite shall be carefully packed and loaded for shipment by the fabricator using all reasonable and customary precautions against damage in transit. No material which may cause staining or discoloration shall be used for blocking or packing.

B. Delivery

1. Written Notice shall be provided to the Owner and Engineer 48 hours prior to intended delivery to the site. Upon arrival to the site all pieces shall be uncovered, inventoried, and inspected for shipping damage prior to preparing for off loading. No unloading shall occur if damage is found. All damaged Stone shall be immediately identified and reviewed with the Owner and Engineer.

2. All granite shall be handled with wide belt nylon straps. The use of chains is not permitted. All off loaded stone shall be stacked on timber cribbing or platforms beginning at a minimum of 6" above the ground, with 4" cribbing spaces between, and care shall be taken to prevent staining from soil, plastic, tarps, strapping, ropes or other incidentals during storage. If storage is to be for a prolonged period, polyethylene or other suitable plastic film may be placed over all stones if used with spaces and configured for even air circulation and as an overall protective covering. Holes in the stones shall be plugged during freezing weather to prevent the accumulation of water. Salt shall not be used for melting of ice in on or adjacent to granite.

C. Granite shall be carefully handled to prevent chipping, breakage soiling or other damage. Steel 'Pinch' or wrecking bars shall not be used without protecting the edges of the granite with wood or other rigid materials. All lifting shall be conducted with wide belt nylon slings. Use of chains in contact with the granite cut stones is prohibited. Lifting straps containing tar, grease or any other substances which might mar or cause staining to damage to the granite finishes shall not be used.

D. If material is damaged in the unloading process, immediately notify the Engineer for a determination on suitability for reuse or rejection. If rejected the Contractor shall take charge and replace the stone pieces identified at no charge. Back charges to the supplier shall be if made only with prior notification.

1.8 SOURCE OF SUPPLY

A. Supplier: All granite shall be obtained from quarries in the United States or Canada with adequate capacity and facilities to meet the specified requirements. Cutting and finishing shall be done by a firm equipped to process the material promptly on order and in strict accord with specifications. The supplier shall provide written, photographic of otherwise documented evidence to this effect to the Owner and Engineer.

B. Quarries shall show evidence by way of written or otherwise documented environmentally responsible practices and shall have a method for the diversion of stone scrap or cuttings from the waste stream thru recycling or re-purposing and shall have a system that minimizes the use of potable water in cutting through the recycling and reuse of water.

C. Suitable Suppliers and Fabricators Include:

Plymouth Quarries
410 Whiting Street
Hingham, MA 02043
781.335.3686
www.plymouthquarries.com

Swenson Granite
10 Main Street
Medway, MA 02053
508.533.2882
www.swensongranite.com

Granites of America
15 Branch Avenue
Smithfield RI 02917
401.232.2040
www.granitesofamerica.com

PART 2 - PART 2 - PRODUCT

2.1 GRANITE CUT STONE:

A. Granite Cut Stone Type 1 shall be “Woodbury Gray” or approved equal.

B. Proposed Granite Cut Stone elements shall be fabricated from new granite. All granite shall be of good quality as graded by the National Building Granite Quarries Association, Inc., free of cracks, seams, fissures or starts which may impair its structural integrity or function.

C. The Granite provided for all capstone shall architectural grade, naturally occurring, fine to medium grain textured, light to medium gray in color without pronounced or detracting veining flecking, quartz pockets, or discoloration.

D. The granite selected for use shall physically and visually match the existing granite monument pieces designated to be salvaged and re-set.

E. GRANITE FINISHES: Granite shall be finished as indicated in the drawings and as approved in the shop drawings.

1. The National Building Granite Quarries Association, Inc shall define Finishes used in bold in the schedule below. Finishes are defined as follows:

a. Polished: Mirror gloss, with sharp reflections.

b. Honed: Dull sheen, without reflections.

c. Fine rubbed: Smooth and free from scratches; no sheen.

d. Rubbed: Plane surface with occasional slight "trails" or scratches.

e. Shot ground: Plane surface with pronounced circular markings or trails having no regular pattern.

f. Thermal: Finish produced by application of high temperature flame to the surface. Large surfaces may have shadow lines caused by overlapping of the torch.

2.2 FABRICATION

A. Granite shall be of the sizes and dimensions indicated in the final approved shop drawings.

B. Face variation from a true plane shall be as follows:

1. Honed: 3/64 inch.

2. Thermaled: 3/16 inch.

C. Back variation: ¼ inch on any piece under 12” thick, ½” above 12” thick.

D. Back sides may be roughly dressed when not exposed to view.

E. Arris lines shall be cut sharp and square or to the angle specified, shown and approved in the shop drawings. Where exposed, all corners shall be eased.

2.3 FLATNESS TOLERANCES

A. A 4’ dimension in any direction on the surface shall determine variation from true plane, or flat surfaces. Such variations on polish, honed, and fine rubbed surfaces shall not exceed tolerances listed below or 1/3 of the specified joint width, whichever is greater. On surfaces having other finishes, the maximum variation from true plane shall not exceed the tolerance listed below or 1/2 of the specified joint width, whichever is greater.

1. Polished, honed or fine rubbed finishes 3/64 inch

2. Sawn, 4-cut, 6-cut, and 8-cut finishes 1/8 inch

3. Thermal and coarse stippled finishes 3/16 inch

4. Split face, Rock Face or other rough-cut finishes 1 inch

PART 3 - EXECUTION

3.1 INSTALLATION: GENERAL

A. Layout all stone pieces that intersect or connect to other elements, either in the shop or in the field, for review of fitment and composition. Maintain all desired relationships as shown on the Drawings.

3.2 INSTALLATION: SPECIFIC

A. Granite Placement. Before placing granite, the Contractor shall verify that all conditions are ready for placement of granite. Verify that all lay-out and grade information is accurate and complete.

B. All setting shall be performed by competent granite setters under qualified supervision and in accordance with the approved shop drawings.

C. Set stones level unless otherwise noted or to prevent ponding. Shim as necessary. Set granite pieces to obtain the reveals and angles and orientations shown in the Drawings.

D. Stones with chips, cracks, stains or defects that will be visible shall not be installed. Granite to be set shall be clean and dry. Granite shall be set to the line and grade shown on the Drawings. Joints shall be at the specified thickness and as Indicated on the Drawings. Direct contact bearing between granite pieces shall be prohibited.

E. Set granite stones as shown on drawings and as specified herein.

F. All work involving epoxy, cement base coating and protective coating to adhere strictly to the manufacturer's current printed recommendations as to temperatures at time of application. No use of epoxy materials allowed when either the temperature of the Granite stone or the ambient temperature is below 50 degrees F, 24 hours before, during, or for a period of 48 hours after the completion of the installation. Temporary heat may be used to meet the specified requirements. All epoxy, shall be new and used within the shelf life limitations set forth by the manufacturer.

G. Surfaces shall be clean and sound. Surfaces may be dry, damp or wet, but free of standing water. Remove dust, laitance, grease, curing compounds, impregnations, waxes, foreign particles and disintegrated materials by abrasion methods such as sandblasting.

H. Relieve all exterior corners and ease edges of permanently exposed Granite.

3.3 PROTECTION OF THE WORK

A. All installed granite cut-stone work shall be properly installed and adequately protected under the responsibility of the Contractor until Final Acceptance of the Project by the Owner.

END OF SECTION

SECTION 05 50 00

METAL FABRICATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. Requirements to fabricate, furnish, erect, set, fasten and install miscellaneous metalwork as indicated on the Drawings and as specified.

B. Related Sections

1. Section 03 30 00 CAST IN PLACE CONCRETE,
2. Section 03 60 10 CEMENTITIOUS GROUT,
3. Section 06 10 00 ROUGH CARPENTRY,
4. Section 06 15 00 WOOD DECKING LUMBER & TIMBERS,
5. Section 10 14 00 SIGNAGE,
6. Section 35 00 00 WATERWAY AND MARINE CONSTRUCTION,

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. A36, Specification for Carbon Structural Steel.
2. A48, Specification for Gray Iron Castings.
3. A53, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc Coated, Welded Seamless.
4. A123, Specification for Zinc (Hot-Dipped Galvanized) Coatings on Iron and Steel Products.
5. A153, Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
6. A167, Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
7. A276, Specification for Stainless Steel Bars and Shapes.
8. A307, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
9. A325, Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
10. A489, Specification for Carbon Steel Lifting Eyes.
11. A500, Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
12. A501, Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.

13. B209, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
14. B221, Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
15. B308, Specification for Aluminum-Alloy 6061-T6 Standard Structural Profiles.
16. B429, Specification for Aluminum-Alloy Extruded Structural Pipe and Tube.
17. B632, Specification for Aluminum-Alloy Rolled Tread Plate.
18. B660, Standard Practices for Packaging/Packing of Aluminum and Magnesium Products.
19. F436, Specification for Hardened Steel Washers.
20. F468, Specification for Nonferrous Bolts, Hex Cap Screws, Studs for General Use.
21. F593, Specification for Stainless Steel Bolts, Hex Cap Screws and Studs.
22. F594, Specification for Stainless Steel Nuts.
23. F844, Specification for Washers, Steel, Plain (Flat), Unhardened for General Use.

1.3 SUBMITTALS

A. In accordance with Section 01 33 00, SUBMITTALS, submit the following:

1. Manufacturer's technical data sheets for the following:
    a. All proposed hardware
    b. All proposed finishes
    c. Bitumastic coating
    d. Grout
    e. Chemical Anchors
2. Shop Drawings:
    a. Details of the fabrication and erection of each metal fabrication indicated on the Drawings.
    b. Plans, elevations, sections, and details of metal fabrications and their connections.
    c. Anchorage and accessory items.
    d. The shop drawings shall furnish the required information in sufficient detail and completeness that the work may be accomplished without the use of the Contract Drawings as a reference.
3. Welding Certificates: Copies of certificates for welding procedures and personnel.
4. Qualification Data: Firms and persons specified in the "Quality Assurance" Article shall demonstrate their capabilities and experience. Firms shall include a list of at least three (3) recently completed projects with project names and addresses. The name, address, and phone number of a contact (architect, engineer, or owner) shall be provided for each project in the list, as well as any other required information hereinafter or hereinbefore specified.

1.4 QUALITY ASSURANCE

A. Fabricator Qualifications:

1. Fabrication Company to be experienced in the production of metal fabrications similar to those indicated for this Project, with a record of successful in-service performance.
2. Fabrication Company to possess sufficient production capacity to produce the work required and complete the work within the duration of the contract.

B. Welding:

1. Procedures and personnel shall be qualified according to the latest revisions of the following American Welding Society designation:
    a. AWS D1.1, Structural Welding Code - Steel.
    b. AWS D1.2, Structural Welding Code - Aluminum.
    c. AWS D1.6, Structural Welding Code - Stainless Steel.
    d. Certification shall be provided stating that each welder has passed the AWS qualification tests for the welding processes involved and has maintained that certification as required by AWS.

1.5 DELIVERY STORAGE AND HANDLING

A. Aluminum to be delivered to the fabricator in accordance with ASTM B 660, complying with the commercial packing and preservation requirements.

B. Epoxy Adhesive

1. Store epoxy cartridges on pallets or shelving in a covered storage area.
2. Control temperature above 60 degrees F and dispose of cartridges if shelf life has expired.

C. Vinyl Ester Products

1. Store components on pallets or shelving in a covered storage area with locking door.
2. Control temperature within 41 to 77 degrees F and dispose of product if shelf life has expired.

1.6 PROJECT CONDITIONS

A. Field Measurements: Where metal fabrications are indicated on the plans. Work to to fit within wood boardwalk and gangway structures and other construction. All dimensions shall be verified by field measurements before fabrication. The fabrication schedule shall be coordinated with the Construction Progress Schedule to avoid delaying the Work.

1. Established Dimensions: Where field measurements cannot be made without delaying the Work, proceed with fabricating metal fabrications upon receipt of Engineer reviewed and approved shop drawings, without field measurements. Allowance shall be made for trimming and fitting.

1.7 SCHEDULING

A. Installation of anchorages for metal fabrications shall be coordinated with the Contractor. Setting drawings, templates, and instructions for installing anchorages, including sleeves, concrete inserts, thru-bolts, anchor bolts, items with integral anchors, and any items that are required to affix boardwalk elements or set materials in embedded in concrete shall be provided to the Contractor. Any Items to be embedded in concrete shall be delivered to Project site sufficiently in advance to allow time for installation, as determined by the Contractor.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Steel, in accordance with the following ASTM Designations unless otherwise indicated:
   1. Steel plates and structural shapes ASTM A36.
   2. Steel Pipe: A501 or A53, Type E or S, Grade B
   3. Structural Steel Tubing: A500, Grade B
   4. Steel Bolts and Nuts:
      a. Carbon Steel: A307 or A36
      b. High-Strength: A325, Type 3
      c. Galvanized Steel Bolts and Nuts A307 or A36, with A153 Zinc Coating, and ANSI B1.1
      d. Eyebolts: A489
      e. Threaded Rods: A36
      f. Flat Washers (Unhardened): F844; use A153 for Zinc Coating
      g. Flat Washers (Hardened): F436

B. Stainless Steel, Type 316 and in accordance with the following ASTM designations unless otherwise indicated:
   1. Bars and Shapes: A276, AISI Type 316
   2. Plate, Sheet, and Strip: A167, AISI Type 316
   3. Bolts and Threaded Rods: F593, AISI Type 316,
   4. Nuts: F594, AISI Type 316,
   5. Welding Rods and Bare Electrodes: Compatible with the material to be welded per the AWS D1.6 specifications.

C. Aluminum, in accordance with the following ASTM designations and alloy and temper designations of The Aluminum Association:
   1. Structural shapes: B 308, 6061-T6 mill finish.
   2. Extruded shapes: B 221, 6061-T6 mil finish

3. Structural Plates: B 209, 6061-T6 mil finish
4. Sheets: Alclad 3003-H14 and 3003
5. Bolts and nuts: F468, 2024-T4
6. Aluminum Tread Plate:
    a. In accordance with ASTM B 632, 6061-T6.
    b. Provide a clear, Class II, anodized finish in accordance with Aluminum Association Designation AA-A31, 0.4 mils thick minimum.
7. Structural Aluminum Tubes: ASTM B 429, 6063-T52, mill finish.
8. Welding Rods and Bare Electrodes:
    a. Compatible with the material to be welded per the AWS D1.2 specifications.
    b. Aluminum items to be anodized shall not be welded using 4043 weld rod.

D. Cast Iron
1. In accordance with ASTM A48, Class 35.

2.2 GROUT

A. In accordance with SECTION 03 60 10, CEMENTITIOUS GROUT.

2.3 FASTENERS

A. Provide Stainless steel fasteners for all connections unless indicated otherwise

B. Bolts:
1. Stainless steel in accordance with ASTM F 593, Alloy Group 2, Type 316,
2. CW with hexagonal heads shall be provided for connections.

C. Nuts:
1. Stainless steel in accordance with ASTM F 594, Alloy Group 2, Type 316,
2. CW with hexagonal heads, and thread designation to match stainless steel bolts shall be provided for connections.

D. Washers:
1. In accordance with ASTM F 436, except that the material shall be Type 316 stainless steel in accordance with ASTM A 276.

E. Stainless steel fasteners for framing connections
1. Provide bolts, nuts, and washers of the size and quantity as indicated on the Drawings. One nut shall be provided per each bolt unless otherwise indicated on the Drawings. A washer shall be provided at the contact surface between framing members or clips and the heads of bolts and nuts, minimum two (2) washers per bolt.

F. Machine Screws:

1. Stainless steel in accordance with ASME B18.6.3, Type 316.

2.4 ALUMINUM COVERS/PLATES

A. Composed of aluminum tread plate, thickness as specified on the Drawings.

2.5 ABRASIVE NOSINGS

A. Aluminum.
   1. In accordance with ASTM B221 for extrusions.
   2. Class 30 for cast aluminum tread plate.
B. Abrasive, Two (2) part Epoxy combined with aluminum oxide grit.
C. Two component OR Single component as detailed on the Drawings.
D. Manufactured by Balco Inc, Wichita, KS or equal.

2.6 ANCHOR BOLTS

A. To be Stainless Steel.
B. Configuration and specific type as specified, as listed in the associated equipment specifications and as detailed on the Contract Drawings.
C. Provide Antiseizing Lubricant for all stainless steel threads.
D. Anchor Bolt Sleeves
   1. High Density Polyethylene Plastic:
      a. Single unit construction with deformed sidewalks such that the concrete and grout lock in place.
      b. The top of the sleeve shall be self-threading to provide adjustment of the threaded anchor bolt projection.
      c. Material requirements:
         1) Plastic: High density polyethylene.
         2) Density: ASTM D 1505
      d. Manufacturer:
         1) Sinco West, Simi Valley, CA
         2) Or equal
   2. Fabricated Steel Sleeve
      a. A 36 steel.

2.7 CHEMICAL ANCHORING SYSTEMS

A. Epoxy Anchors

1. Anchor Rod: Stainless steel threaded rod free of grease, oil or other deleterious material with a 45-degree chisel point.
2. Epoxy Adhesive:
    a. ASTM C 881, Type 1, Grade 3, Class A, B, or C.
    b. Two-component, 100 percent solids, nonsag, paste, insensitive to moisture, designed to be used in adverse freeze/thaw environments and gray in color.
    c. Cure Temperature, Pot Life, and Workability: Compatible for intended use and environmental conditions.
3. Mixed Epoxy Adhesive: Nonsag paste consistency, with ability to remain in a 1-inch diameter overhead drilled hole without runout, having the following properties:
    a. Slant Shear Strength, ASTM C 881, No Failure In Bond Line, Dry/Moist Conditions: 5,000 psi.
    b. Compressive Strength, ASTM D 695; 14,000 psi, minimum.
    c. Tensile Strength, ASTM D 695: 4,500 psi.
    d. Heat Deflection Temperature, ASTM D 648 E2: 135 degrees F, minimum.
4. Epoxy Adhesive Packaging:
    a. Disposable, self-contained cartridge system capable of dispensing both epoxy components in the proper mixing ratio, and fit into a manually or pneumatically operated caulking gun.
    b. Cartridge Markings: Include manufacturer's name, batch number, mix ratio by volume, product expiration data, ANSI hazard classification, and appropriate ANSI handling precautions.
5. Manufacturer's and Products:
    a. Adhesives Technology Corp.; Anchor-It Fastening Systems, HS 200 Epoxy Resin.
    b. ITW Ramse/Red Head; Epcon Ceramic 6 Epoxy Anchor System.
    c. Covert Operations; CIA Epoxy Anchors with viscosity to suit application.
    d. Rawplug Co., Inc.; Rawl/Sika Foil Fast Epoxy Injection Gel System.

B. Adhesive Anchors

1. Two-component vinyl ester adhesive, insensitive to moisture, designed to be installed in adverse freeze/thaw environments.

2.8 BOARDWALK HANDRAIL

A. Handrail shall be fabricated from Steel conforming to ASTM A53 schedule 40, hot dipped galvanized after fabrication and as shown on the Drawings and indicated herein.

2.9 GUARD CHAINS

A. Provide guard chains removable with security screws at the gap between the gangways and approach railings.

B. Chain to be proof coil steel chain made from open hearth 316 stainless steel, and contain twelve ¼ inch welded links per foot.

C. Provide 316 stainless steel eyes for securing the chain at openings.

D. Provide 316 stainless steel quick release hooks at chain ends.

2.10 LIFTING HOOKS

A. Supported from concrete:

1. Fabricated of 3/4-inch diameter steel rod bent in U shape and threaded at ends to receive nuts.
2. Fasten hook to 1/2-inch by 4-inch by 11-inch steel anchor plate.
3. Provide hooks hot-dip galvanized after fabrication.

B. Supported from steel:

1. Fabricated of 3/4-inch diameter steel rod bent in U-shape and threaded at both ends to receive nuts.
2. Provide hooks hot-dip galvanized after fabrication.

2.11 CURB INLET DRAIN FRAME & COVER ASSEMBLY

A. Gray cast iron trench drain solid covers, frames, and inlets where indicated on the Drawings in accordance with ASTM A48, class 35 heavy duty use. Provide castings of uniform quality, free from blow holes, shrinkage defects, swells, cracks or other defects. Casting to be free of fins, burrs and slag.

1. Covers: Cover shall be T-12A Tsunami, 12” Wide Cast Iron Grate, Tsunami Style w/ Penta-Lock Angle Frame as manufactured by Evergrate, 101 Ironwood Road, Middlesboro, Kentucky 40965. 800-245-5521. www.evergrate.com.
   a. Finish shall be natural.
   b. Or approved equal.
2. Curb Opening shall be C-1246T 12” Cast Iron Curb Opening as manufactured by Evergrate, 101 Ironwood Road, Middlesboro, Kentucky 40965. 800-245-5521. www.evergrate.com.
   a. Finish shall be natural.
   b. Or approved equal.
3. Bolt trench drain covers to frames with stainless steel cap screws.
4. Trench drain frame and cover assembly to support AASHTO H20 rated load.

2.12 MISCELLANEOUS ITEMS

A. Provide hangers, supports, brackets, anchors, bolts and other miscellaneous metalwork not previously specified, of the shape, size, material and detail indicated on the Drawings for the purpose intended.

2.13 FABRICATION

A. General

1. Metals shall be sheared and punched cleanly and accurately. Burrs shall be removed.
2. Exposed edges shall be rounded to a radius of approximately 1/32 inch, unless otherwise indicated. Bent-metal corners shall be formed to the smallest radius possible without causing grain separation or otherwise impairing the work.
3. Corners and seams shall be welded continuously to comply with the following:
    a. Materials and methods shall be used that minimize distortion and develop strength and corrosion resistance of the base metals.
    b. Fusion shall be obtained without undercut or overlap.
    c. Welding flux shall be removed immediately.
    d. At exposed connections, exposed welds and surfaces shall be finished smooth and blended so that no roughness is apparent and the contour of the welded surface matches that of the adjacent surface.
4. Joints that will be exposed to weather shall be fabricated in a manner to exclude water. Drain holes shall be provided where water may accumulate.
5. Fabrications exposed to view in the completed Work, shall be provided with smooth, flat surfaces without blemishes.
6. Fabrications with exposed pitting, seam marks, roller marks, rolled trade names, or roughness shall not be used.

B. Shop Assembly:

1. Items shall be preassembled in shop to greatest extent possible to minimize field splicing and assembly.
2. Units shall be disassembled only as necessary for shipping and handling limitations.
3. Connections shall maintain the structural value of joined pieces through the use of properly sized holes, proper spacing and gage distances, tolerances, and other requirements as determined in the applicable codes listed elsewhere in this specification.
4. Units shall be clearly marked for reassembly and coordinated installation.

2.14 FINISHES

A. Fabrications shall be finished after shop assembly.

B. Anodized aluminum finishes to be in accordance with the Aluminum Association's standards for Anodized Architectural Aluminum as published by the American Architectural Manufacturer's Association (AAMA).

C. Anodized finishes damaged in the field during installation or transit shall be repaired using brush anodizing to restore the coating to its specified Class and thickness.

D. Galvanizing

1. Items of miscellaneous ironwork and steel work indicated on the Drawings or specified to be galvanized shall be zinc-coated by the hot-dip process in accordance with ASTM Standard Specification for Zinc (Hot-Galvanized) Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars, and Strip, Designation A123; or ASTM Standard Specifications for Zinc Coating (Hot-Dip) on Iron and Steel Hardware, Designation A153, as appropriate.

E. Aluminum Surfaces in Contact with Concrete

1. Paint-on coating suitable for embedment in, or surface mounting to, concrete to prevent adverse reaction between aluminum and concrete surfaces.

2. Apply one coat of the following;

a. Coal Tar 46-465 H. B. Tnemecol, Tnemec Company, North Kansas City, MO.

b. Bitumastic Super Service Black, KOP-COAT, Inc., Pittsburgh, PA.

c. Tarmastic 100 Porter Coatings Division, Porter Paint Co., Louisville, KY.

d. Or equal.

F. Stainless steel

1. All stainless steel shall be cleaned, descaled, and passivated in strict accordance with ASTM A380 and A967.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Field Assembly:

1. Metal fabrications shall be cut, reinforced, drilled, and tapped cleanly and accurately to receive finish hardware, screws, and similar items.

2. Exposed work shall be formed true to line and level, with accurate angles and surfaces, and straight rounded edges.

3. Sharp or rough areas shall be removed on exposed traffic surfaces.

4. Exposed connections shall be formed with hairline joints, flush and smooth, using concealed fasteners where possible.

5. Exposed fasteners of type indicated on the Drawings shall be used; when not indicated, Phillips flat-head (countersunk) screws or bolts shall be used. Joints shall be located where least conspicuous.

B. Erection Tolerances

1. Maximum Variation from Plumb: 1/4 inch per story, noncumulative.
2. Maximum Offset from True Alignment: 1/4 inch.

C. Anchorage:

1. Coordinated type of anchorage with supporting structure.
2. Anchoring devices shall be fabricated and spaced to secure metal fabrications in place and to support indicated loads.

D. Fastening to In-Place Construction:

1. Anchorage devices and fasteners shall be provided where necessary for securing metal fabrications to in-place construction.

E. Cutting, Fitting, and Placement:

1. Cutting, drilling, and fitting for the installation of metal fabrications shall be performed as required.
2. Metal fabrications shall be set accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

F. Temporary bracing or anchors shall be provided in formwork for items that are to be built into concrete.

G. Exposed connections shall fit together to form hairline joints. Welded connections that can not be made in the shop due to shipping limitations shall be made in the field. Do not weld, cut, or abrade surfaces of exterior units that have been anodized after fabrication and are for bolted or screwed field connections.

H. Field Welding: Comply with the following requirements:

1. Materials and methods shall be used that minimize distortion and develop strength and corrosion resistance of base metals.
2. Fusion shall be obtained without undercut or overlap.
3. Welding flux shall be removed immediately.
4. At exposed connections, welds and surfaces shall be finished smooth and blended so that no roughness shows after finishing and the contour of the welded surface matches that of adjacent surface.

3.2 ANCHOR BOLTS (CAST IN PLACE)

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. Minimum bolt size: 1/2-inch diameter by 12 inches long, unless otherwise shown.

C. All anchors and anchor bolts shall be properly located and shall be built into the connecting work when the work is built. Expansion bolts shall be inserted into drilled holes.

3.3 ANCHORING SYSTEMS (CURED CONCRETE)

A. Begin installation only after concrete or masonry receiving anchors have attained design strength.

B. Do not install an anchor closer than six times its diameter to either an edge of concrete or masonry, or to another anchor, unless specifically shown otherwise.

C. Install in accordance with manufacturer's specific quality control submittal instructions. Hole diameters are critical to installation, use only drills recommended by anchor manufacturer. Follow manufacturer's safe handling instructions.

D. Epoxy or Adhesive Anchors: Do not install when temperature of concrete is below 40 degrees F or above 100 degrees F, unless stated otherwise in manufacturer's written instructions.

E. Follow specific manufacturer safe handling practices when handling and installing concrete anchors.

3.4 FASTENER SCHEDULE:

Service Use and Location	Product	Remarks
Anchor Bolts Cast Into Concrete for Equipment Bases:		
Dry Areas	Stainless steel bolts, unless otherwise specified with equipment	
Submerged or Wet Areas	Stainless steel bolts with fusion bond coating unless otherwise specified with equipment	See Section 09900, Painting and Protection Coating
Anchor Bolts Cast Into Concrete for Metal Fabrications and Structural Components.		
Dry or Protected Areas Exterior, Wet, Washdown, and Chemical Handling Areas	Stainless steel bolts with fusion bond coating	See Section 09900, Painting
Anchors for Metal Components to Concrete: e.g. Electrical Panels and Equipment:		
Dry Areas	Stainless steel wedge or expansion anchors	
Wet and Damp Areas	Epoxy or adhesive stainless steel anchors	
Submerged or Buried in Earth	Epoxy or adhesive stainless steel anchors	
Connections for Structural Steel Components:		

Exterior and Interior	High-strength zinc-coated steel bolts	See Section 05120, Structural Steel
Connections for Steel Fabrications:		
Exterior and Interior	Zinc-coated steel bolts	See Section 05120, Structural Steel
Connections for Aluminum Components:		
Exterior and Interior	Stainless steel bolts	
All Others:		
Exterior and Interior	Stainless steel fasteners	

A. Do not use epoxy anchors to support fire-resistive construction or where ambient temperature will exceed 120 degrees F.

3.5 BOARDWALK HANDRAILS

A. Anchor to structure in accordance with the plans and per the manufacturers instructions and in alignment the boardwalk posts, and matching the boardwalk ramp grades.

B. The height of the handrails shall be in accordance with all governing codes.

C. Galvanize in accordance with ASTM A123.

3.6 ACCESS COVERS AND HATCHES

A. Accurately position access covers and hatches prior to placing concrete, such that covers and hatches are flush with concrete surface.

B. Protect from damage resulting from concrete placement. Thoroughly clean exposed surfaces of concrete spillage to obtain a clean, uniform appearance.

3.7 ANGLE PROTECTION

A. Provide galvanized structural steel angles and strap anchors, as indicated and specified.

3.8 MISCELLANEOUS ITEMS

A. Metal Fabrication Subcontractor shall furnish items to be embedded in the Work to the Contractor for installation.

3.9 ALUMINUM WORK PROTECTION

A. Areas where the coating has been damaged by abrasion or other cause shall be cleaned and repainted as directed so that the aluminum will have a complete protective film when brought into contact with the material against which it is being protected. Before application of coating, the surface shall be cleaned of all dirt, heavy deposits of grease or oil, and other foreign substances, and shall be immersed in or swabbed with an acceptable solvent. Next, the surfaces shall be rinsed with clear water and thoroughly dried.

B. Protect against electrolysis where aluminum is to be used in conjunction with dissimilar metals.

C. Where a shop coating of methacrylate lacquer has been specified on aluminum work to protect the surface from stain, the protective coating of lacquer worn off due to handling or erection shall be replaced in the field by a new coating of lacquer of the same type.

D. During construction, care shall be taken to prevent damage to the aluminum work from splashing or by the accumulation of paint, concrete, mortar, or other similar materials.

3.10 CLEANING AND TOUCHUP

A. Painted Surfaces: Clean and touchup paint field welds, bolted connections, and abraded areas of shop paint as specified and approved by the Engineer.

B. Anodized Surfaces: Clean field welds, bolted connections, and abraded areas and repair anodizing to match the quality of the coating provided by the shop.

C. After aluminum has been erected, it shall be cleaned with mild soap and water, followed by a clear water rinse.

END OF SECTION

SECTION 06 10 00

ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Requirements to provide rough carpentry necessary for the proper completion of all work shown on the Drawings or specified herein which generally shall consist of the following:

1. Furnish, erect, and install boardwalk timber bents, timber framing, timber railings, and decking.
2. Install all wood blocking, brackets, angles, wood nailers, and hardware in all areas requiring attachment of work of other sections of this Specification.
3. All miscellaneous carpentry work not specifically shown on the Drawings or specified herein, but customarily done under this Section and necessary to proper completion of the work.

1.2 RELATED REQUIREMENTS

A. Fabricated Metal handrails, chains, plates, and bench supports: Section 05 50 00, METAL FABRICATIONS.

B. Lumber: Section 06 15 00, WOOD DECKING, LUMBER AND TIMBERS.

1.3 SUBMITTALS

A. Submit in accordance with Section SECTION 01 33 00, SUBMITTALS.

B. Shop Drawings showing framing connection details, fasteners, connections and dimensions.

C. Manufacturer's Literature and Data:

1. Submit data for lumber, hardware and adhesives.
2. Submit data for wood-preservative treatment from chemical treatment manufacturer and certification from treating plants that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
3. For products receiving a waterborne treatment, submit statement that moisture content of treated materials was reduced to levels specified before shipment to project site.

D. Samples:

1. Hardwood Boardwalk Decking
    a. Submit quantity required to show full color, and texture, range.
2. Approved samples may be incorporated into work.

E. Certificates: Certify each product complies with specifications.

1. Moisture content of materials.

F. Qualifications: Substantiate qualifications comply with specifications.

1. Fabricator with project experience list.
2. Installer with project experience list.

1.4 QUALITY ASSURANCE

A. Fabricator Qualifications:

1. Regularly fabricates specified products.
2. Fabricated specified products with satisfactory service on five similar installations for minimum five years.
    a. Project Experience List: Provide contact names and addresses for completed projects.

B. Installer Qualifications:

1. Regularly installs specified products.
2. Installed specified products with satisfactory service on five similar installations for minimum five years.
    a. Project Experience List: Provide contact names and addresses for completed projects.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Protect lumber and other products from dampness both during and after delivery at site.

B. Pile lumber in stacks in such manner as to provide air circulation around surfaces of each piece or per manufacturers recommendations.

C. Locate stacks on well drained areas, supported at least 152 mm (6 inches) above grade and cover with well-ventilated sheds having firmly constructed over hanging roof with sufficient end wall to protect lumber from driving rain.

D. Protect from contact with materials which would cause staining or discoloration.

E. Protect products from damage during handling and construction operations.

F. Before installation, return or dispose of products within distorted, damaged, or opened packaging.

1.6 GRADING AND MARKINGS

A. Any unmarked lumber for its grade and species will not be allowed on the construction site for lumber and material not normally grade marked, provide manufacturer's certificates (approved by an American Lumber Standards approved agency) attesting that lumber and material meet the specified the specified requirements.

1.7 FIELD CONDITIONS

A. Field Measurements: Verify field conditions affecting fabrication and installation. Show field measurements on Submittal Drawings.

1. Coordinate field measurement and fabrication schedule to avoid delay.

PART 2 - PRODUCTS

2.1 MATERIALS

A. All lumber shall be of sound stock delivered dry and shall be fully protected at all times from injury and dampness. Split, broken or otherwise damaged pieces will not be allowed in the work.

B. Softwood members for framing and railing shall be pressure treated. Pressure treatment shall use a waterborne preservative, alkaline copper quat (ACQ), and shall conform to the requirements of AWPA Standard U1 for ACQ treatment. Minimum retention of preservative shall be in accordance with AWPA Standard U1 to the requirements of use category UC4C. Net final retention of oil shall be not less than 0.60 lb per cu ft. Lumber shall be dried to a moisture content of no more than 19% after treatment. Lumber and treatment shall conform to GENERAL REQUIREMENTS FOR TREATED LUMBER hereinafter.

1. Lumber shall be of the form, structural grade and dressing as shown, specified or required.
2. Lumber shall be fastened with approved nails, spikes, bolts, rods, plates and all other hardware as indicated or required sizes and lengths.
3. Lumber shall be dressed, pre-cut, bored and framed as required prior to treatment.
4. Wood for blocking, and nailers shall be Construction Grade, Southern Yellow Pine.
5. Nails, spikes, etc., where sizes are not indicated or specified, shall be of suitable size and number to securely fasten and hold members in place. All fasteners for exterior workmanship of furring shall be hot-dip galvanized.

C. Hardwood decking and railing components shall be per Section 06 15 00, WOOD DECKING, LUMBER AND TIMBERS.

2.2 GENERAL REQUIREMENTS FOR TREATED LUMBER

A. All pressure treatments shall conform to the latest appropriate standard specifications of the American Wood-Preservers' Association.

B. Lumber shall be conditioned for treatment by air-seasoning, by kiln drying, by steaming, by heating in the preservative either at atmospheric pressure or under vacuum, or by a combination of them, in such a manner as will not cause damage to the timber for the use intended. Conditioning of lumber for pressure treatment shall conform to the requirements of AWPA Spec. U1 "Standard for Preservative Treatment by Pressure Processes -- All Timber Products".

C. Pressure treatments shall comply with all applicable portions of AWPA Standards C2, C9, and C28.

D. Tests of pressure treated material shall conform to Paragraph 3, "Results of Treatment" of AWPA Spec. Cl.

E. Treated timber shall be handled, bored, framed and field treated in complete conformance with AWPA Spec. M4 "Standard Instructions for the Care of Pressure Treated Wood After Treatment", where permitted by the Engineer. Treated lumber or timber injured so as to impair its structural

capabilities or its preservative qualities will be rejected, and such material shall be removed from the job.

F. When pressure treated materials have been cut into, or bored after treatment, where permitted, all cuts, chamfers, holes and damaged portions of lumber shall be carefully field treated with hot preservative solution and over-coated with a hot coal tar pitch coating. All holes bored after treatment shall be treated with equipment to apply preservative under pressure, using the Greenlee Bolt Treater or equal. Counterbored holes shall be coated with hot preservative followed by filling with an approved pitch or asphalt mastic.

G. The Contractor shall furnish a certificate by the preservative treating plant warranting the grade of lumber, the quality of preservative used and the net final retention of preservative in pounds per cubic foot.

PART 3 - EXECUTION

3.1 ROUGH CARPENTRY

A. Framing shall be well nailed, spiked, screwed, or bolted together, erected plumb and true in accurate planes, and set accurately to support finished work.

B. Wood anchored to concrete or masonry shall be rigidly fastened with 5/8-in. bolts countersunk flush, or as shown on the Drawings.

C. Provide and set all grounds for finish.

D. Do all necessary blocking of sizes and shapes as shown for all finish; use merchantable wood well secured in place.

3.2 INSTALLATION

A. Fabricated products shall be installed in strict accordance with manufacturer's instruction, and/or as shown on the drawings.

B. Work shall be done in neat, workmanlike manner by carpenters experienced in work of the type required herein.

C. All hardwood lumber shall be predrilled and secured with screws as specified on the plans.

3.3 PROTECTION

A. Protect finished carpentry from construction operations.

B. Cover finished decking exposed to construction activity with reinforced kraft paper, and plywood or hardboard.

C. Remove protective materials immediately before acceptance.

D. Repair damage.

END OF SECTION

SECTION 06 15 00

WOOD DECKING, LUMBER AND TIMBERS

PART 1 - GENERAL

1.1 SUMMARY

A. Provide labor, materials, and equipment necessary to complete the work of this Section, including the following:

1. Wood decking, lumber, stringers, beams, and timbers for the following applications:

a. Bridges

b. Boardwalks

c. Site furnishings

d. Marine Constructions

e. Other exterior and marine constructions

B. Related Work: The following items are not included in this Section and will be performed under the designated Sections.

1. Section 06 10 00, ROUGH CARPENTRY for other rough carpentry work.

C. Reference Standards: Comply with applicable requirements of the following:

1. General:

a. Allowable Design Values by Grade

b. ANSI A137.1 sec 9.6 – Standard Test Method for Determining the Static and Dynamic Coefficient of Friction of Ceramic Tile and Other Like Surfaces.

c. ASTM D143 – Standard Test Methods for Small Clear Specimens of Timber.

d. ASTM D 4761-13, Section 8.5.3.1 – Standard Test Methods for Mechanical Properties of Lumber and Wood-Based Structural Materials.

e. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.

f. U.S. Lacey Act.

g. U.S. Buy American Act.

h. U.S. Foreign Corrupt Practices Act

i. U.S. Forced Labor Laws

2. Ipe:

a. Tropical Forest Products™ Grading Rules

1.2 SUBMITTALS

A. Submittals: Submit under provisions of Division 01.

B. Submit paper, or rubber of similar non-elastic template 'Mock-Up' of boardwalk decking 'Dedication Planks' for initial review of type face, text size character height, word spacing and letter kerning.

C. Submit up to three (3) full scale samples of engraved 'Dedication Planks', furnished on the decking lumber approved for use:

1. Proposed 'Dedication Plank' fully lettered and finished with twenty-four (24) characters depicting accurately type face, character height, spacing between words and letter kerning.

2. Proposed 'Dedication Plank' engraved with each of five (5) proposed standard symbols Note final selection of symbols to be approved by the Owner. For example, Heart, Dog Paw, Fish, Sunflower, Four-Leaf Clover)

3. Upon Review and selection, submit a final 'Dedication Plank' with Owner preferred lettering type face and symbols for final review and approval. Sample shall have the maximum number of characters (24, including spaces) for example with @ as symbol and * as space between words:

@*@*TOWN*OF*YARMOUTH*@*@

D. Literature: Manufacturer's product literature describing all components.

E. Verification Samples: For each type of decking, lumber, and timbers.

F. Certificates of Compliance Technical: Submit documentation of the following.

1. Certificate of Compliance "Inspection": A vendor certificate confirming product compliance with grade and quality requirements.

2. Certificate of Compliance "Technical": A vendor certificate confirming product compliance with minimum specified Physical, Mechanical and Technical performance requirements as defined by the specification.

3. Certificate of Compliance Allowable Design Values.

4. MSDS (Material Safety Data Sheet) – Submit a Material Safety and Data Sheet for the wood products supplied on the project.

5. Grading Rules – Written Grading Rules and Definitions".

6. Best Practices: 'Best Practice Guide' or other relevant installation guides.

G. Certificates of Compliance Environmental: Submit documentation of the following.

1. Black Locust:

a. Forest Stewardship Council (FSC) Certificate showing source of lumber of from a certified operation.

2. Ipe:

   a. Certificate of Compliance, LEGAL LUMBER™: Controlled Wood, Chain of Custody, Life Cycle Impact and Due Care Policies and Procedures. Submit Vendor documented, comprehensive and verifiable Standards, Policies and Procedures outlining step by step a process of verification and accountability related to 'Due Care' Environmental Compliance Submittals.

   b. Certificate of Compliance, LEGAL LUMBER™: Submit a certificate confirming compliance with LEGAL LUMBER™ 'Due Care' Standards, Policies and Procedures, Life Cycle Impact, CITES, U.S. Buy American Act, U.S Foreign Corrupt Practices Act, U.S. Forced Labor Laws, U.S. Lacey Act, Third Party Controlled Wood, Chain of Custody, Verification of Legal Origin, and Legal Compliance.

   c. Verification of Legal origin: Submit report from third party environmental NGO such as Unifloresta™, Living Forest or Approved Equal confirming audit of legal chain of custody and compliance from harvest source to importer.

   d. Forest Stewardship Council (FSC) Certificate showing source of lumber of from a certified operation.

1.3 QUALITY ASSURANCE

A. Manufacturer/Vendor Qualifications: Products covered under this Section shall be supplied by a single manufacturer/vendor unless otherwise specified with a minimum of fifteen years proven production or supply experience.

B. Installer Qualifications: Installer shall have a minimum of three years proven construction experience and be capable of estimating and building from drawings and details, determining elevations, in addition to proper material handling.

C. Pre-installation Conference: Conduct conference by phone or on site to comply with requirements in Division 01.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Protect materials during shipment, storage, and construction against damage. If material is air dried, stickers of a minimum of 10mm shall be placed between each layer of boards when packed. If material is kiln dried, material shall be dense packed and wrapped.

B. All units shall be individually strapped to wood pallets or blocking of a minimum thickness to allow the egress of lift forks using high strength strapping with a minimum of 4 straps per crate.

C. Store a minimum of 6 inches off the ground in a dry location and cover with well-ventilated sheds having firmly constructed over hanging roof with sufficient end wall to protect lumber from driving rain.

D. Protect from contact with materials which would cause staining or discoloration.

E. Lumber shall not be placed or stored in direct sunlight while stored to prevent warping, buckling, and checking.

F. Protect products from damage during handling and construction operations.

G. Before installation, return or dispose of products with distortion, warping, checking, damaged, or opened packaging.

1.5 HARDWOOD DECKING ENGRAVING

A. The Owner requires engraving of boardwalk decking as 'Dedication Planks', work consisting of lettering cut into the upper surface of the decking as indicated in the plans and details. The Owner will provide the Contractor with a sequentially number list of names and text to be engraved, organized in quantities of not less than 50 entries. Total quantity shall be as specified in the Bid Form. The Contractor shall create 'cut-files' and visual representation of the images and letter to be engraved. The Contractor will provide submittals depicting the finished product for review and approval. The Contractor shall coordinate this process to the complete satisfaction of the Engineer.

B. Two company that produce work that may meet these project requirements are:

Plymouth Sign Company Inc.
63 Old Main Street
PO Box 134
South Yarmouth MA. 02664
508.398.2721
Plymouthsign@comcast.net

Cape& Island Signs
103 Enterprise Road
Hyannis, MA 02601
508.815.3431
info@capesigns.com

PART 2 - PRODUCTS

2.1 HARDWOOD LUMBER

A. Parameters

1. Moisture Content:

a. Air Dried, moisture content of 18 to 25 percent; all dimensions when net thickness is over 1 inch.

2. Surface Options:

a. At level locations: S4SE4E (surfaced four sides, eased four edges). Surfaces shall be planed smooth; Edges shall be eased to a radius of 1/8 inch.

b. At Ramp locations: surfaced bottom and sides, eased four edges. Top surface shall be finished to provide traction at the ramp locations. Options for traction include bandsaw finish, grooves, etc. Planed surfaces shall be smooth, Edges shall be eased to a radius of 1/8 inch.

3. Finish:

a. Natural lumber finish with no oils or stains.

4. Length Options:

a. Boardwalk decking lumber shall be supplied precision trimmed to specified lengths as shown on the plans.

b. Overlook and bench bump-out regions shall be supplied over specified length for final fit in the field.

5. Dimensions on Drawings: Nominal and Actual Size shall be listed.
6. Dimensional Tolerance: Plus, or minus 0.125 inch in width and 0.0625 in thickness, measured at 25 percent moisture content.
7. End Coating: Supply lumber with ends sealed with "Anchor seal", "Paraffin "or "Equal" wax end sealer. Lumber shall be resealed after any field cutting to reduce end splits.
8. All lumber shall be acclimated to the final installation location for a minimum of three days prior to any construction.

B. Wood Species

1. BLACK LOCUST HARDWOOD
    a. Mechanical Properties: Meet or exceed the following Maximum Mechanical Properties when tested in accordance with ASTM D143:
        1) Bending Strength: 19,400 psi.
        2) Modulus of Elasticity: 2,050,000 psi.
        3) Compression Parallel to Grain: 10,180 psi.
        4) Compression Perpendicular to Grain: 1,830 psi.
        5) Shear Parallel to Grain: 2480 psi.
        6) Average Air-Dry Density: 48 pcf.
        7) Basic Specific Gravity: Ranges from 0.65-0.77.
    b. Grade Option:
        1) Grade: 1 or Premium
        2) Inspected for serviceable appearance 2 Face 2 Edges (Grading Face).
        3) Include: Appearance characteristics.
        4) Include: Unlimited Tight Reverse Grain
        5) Include: Physical characteristics which can be removed using normal installation methods, tools, or sanding.
        6) Include: Sound defects, Sound included knots less than 3"
        7) Grading Face: Clear All Heart: Exclude unsound defects and milling defects.
        8) Back Face and Edges: Clear All Heart: Exclude unsound defects and milling defects.
        9) Exclude: Knots bigger than ¾" at narrow face or edges, Knots bigger than 3" at wide face, Maximum Permitted Slope of Grain 1" in 8", Length of End Split and Surface Split shall be as per ASTM D245 (5.4.3)
2. IPE HARDWOOD
    a. Mechanical Properties: Meet or exceed the following Maximum Mechanical Properties when tested in accordance with ASTM D143:

1) Bending Strength: 25,400 psi

2) Modulus of Elasticity: 3,140,000 psi.

3) Compression Parallel to Grain: 13,010 psi.

4) Shear Parallel to Grain: 2,060 psi.

5) Average Air-Dry Density: Ranges from 56.7 to 59.3pcf.

6) Basic Specific Gravity: Ranges from 0.85-0.97.

b. Grade Option:

1) FEQ: (First European Quality) #1 Grade Clear Mixed Grain, Inspected for serviceable appearance 2 Face 2 Edges (Grading Face).

a) Include: Appearance characteristics.

b) Include: Unlimited Tight Reverse Grain

c) Include: Physical characteristics which can be removed using normal installation methods, tools, or sanding.

d) Include: Sound defects.

e) Grading Face: Clear All Heart: Exclude unsound defects and milling defects.

f) Back Face and Edges: Clear All Heart: Exclude unsound defects and milling defects.

g) Exclude Knots bigger than ¾" at narrow face or edges, Centerline Knots bigger than 1-3/4" at wide face, Edge Knots bigger than ¾ at wide face, Maximum Permitted Slope of Grain 1" in 8", Length of End Split and Surface Split shall be as per ASTM D245 (5.4.3)

C. Coefficient of Friction: Meet or exceed the minimum Static and Dynamic Coefficient of Friction as required by International Building Code in accordance with ANSI A137.1 sec 9.6 standard testing method:

1. Static Minimum: Wet .60 FP.

2. Dynamic Minimum: Wet .42 FP.

D. Decay Resistance: Meet or exceed International Building Code/International Residential Code requirements for "Naturally Durable Wood" being durability rated by the U.S Forest Products Laboratory or the Forest Research Laboratory Oregon State University as Class 2 or better. Ipe (Tabebuia spp, Lapacho Group) – Class 1.

E. Screw Pull Out: Meet or exceed a minimum average screw pull out of 1102 pounds at maximum load.

F. Fire Rating, Combustion and Toxicity Requirements: Meet or exceed the following.

1. Lumber supplied shall be naturally fire resistant without the use of any fire-resistant treatments to meet NFPA Class A / Limited Combustible Materials, UBC Class 1 accordance with ASTM E-84 standard test methods.

G. Lumber Supplied shall meet International Building Code / International Residential Code minimum requirements for "Limited Combustible Wood".

H. Environmental Compliance:

1. Lumber that has not been milled from repurposed timber and is sourced from naturally occurring, renewable and sustainable forests.

2. Ipe:

a. LEGAL LUMBER™ Compliance: All lumber shall meet minimum environmental requirements as defined under LEGAL LUMBER™ Controlled Wood, Chain of Custody, Life Cycle Impact and Due Care – Environmental Compliance Standards, Policies and Procedures confirming that:

1) All wood products supplied have been verified of legal origin and compliance as being, legally harvested, transported, exported, imported and documented in compliance with all country of origin, international and domestic laws, rules, regulations and treaties pertaining to the fair and legal trade of forest products including but not limited to the U.S. Department of Agriculture Lacey Act, ITTA (International Tropical Timber Trade Agreement), CITES (Convention On The International Trade of Endangered Species), U.S. Buy American Act, U.S Foreign Corrupt Practices Act, U.S. Forced Labor Laws.

2) All wood products supplied shall be derived from forests which are naturally occurring, renewable and sustainable and shall not be harvested from forests or forest plantations where traditional or civil rights have been violated, forests having high conservation values which are threatened, forests that have been genetically modified or forests which have been converted to non-forest use. All Woods and their packaging materials shall have been fumigated and free from live and or invasive insect, plant, or animal species.

3) All wood products are 100 percent organic and grown without the use of chemical fertilization and are regenerated naturally or by seeding and replanting. The natural service life of wood products in the intended application, exceed their natural growth cycle, trap and store carbon and are able to be reclaimed, reused or recycled. The wood products supplied do not require for service any petroleum based or inorganic chemical treatments adhesives or coatings. The Wood products supplied do not require for service any specialized handling storage or disposal procedures and generate zero post-industrial or post-consumer non-biodegradable waste. The wood products supplied are also safe for human and animal contact, meet Low VOC emission standards and meet International Building Code and International Residential Code requirements for naturally durable wood.

2.2 SOURCES OF SUPPLY

A. Companies that provide wood products that may meet the project requirements of this project include but are not limited to:

Black Locust Lumber
77 Pine Ridge Drive
Port Royal PA 17082
888.501.0678
www.blacklocustlumber.com

Robi Decking
1005 Rundell Street,
Salem St.
Winston Salem, N.C. 27105
333.365.2850
www.Robidecking.com

LSweet Lumber Co. Inc.
709 Harris Avenue
Providence, Rhode Island 02909
401.521.3800
www.LsweetLumber.com

Liberty Cedar
325 Liberty Lane
West Kingston, RI 02892
401.789.6626
www.libertycedar.com

2.3 BOARDWALK DECKING RESERVE

A. The Contractor shall carry seventy-five (75) boardwalk decking planks in reserve. This 'Attic Stock' decking material shall be furnished to the Owner, and not installed. These planks shall be cut to length, end grain sealed and finished and fully prepared for installation, including coordinated pilot holes for fasteners.
B. Boardwalk Decking Reserve planks shall be delivered to the Town of Yarmouth Department of Public Works, 74 Town Brook Road, West Yarmouth, MA 02673.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to starting work inspect the framing system and all substrate surfaces to ensure that they have been properly prepared to accept materials specified in this Section. Commencement of work shall imply acceptance of surfaces and or conditions.

1. Review drawings to determine if materials specified are appropriate for the specified applications.
2. Confirm weatherproofing of framing members, joinery, and connections.
3. If preparation is the responsibility of another installer, notify the Engineer in writing of deviations from manufacturer's recommended installation tolerances and conditions.
4. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions and approved project submittals including the following:
   1. Manufacturers Best Practices.
   2. Install materials plumb, true to line, cut and fitted.
   3. Apply end-grain wax to all cut edges.
   4. Scribe and cope as required for accurate fit to adjacent construction.
   5. Use manufacturer's recommended fasteners.
   6. Fasten tight to supports. Provide shims if there are variations in framing.
   7. Establish uniform spacing between decking planks.
   8. Joints between adjoining deck boards shall not exceed 1/16-inch width.

3.3 BOARDWALK DECKING ENGRAVING

A. Coordinate decking installation with the Owner's 'Dedication Plank' engraving program. Create an installation sequence for decking that allows for placement and installation of the engraved decking as part of the workflow operations.

B. Engraved decking shall be located as directed by the Owner within the Boardwalk Loop.

C. The Owner may request additional engraved decking. Additional engraving work shall be addressed thru a notice of change of work and paid for separately. Installation of additional engraved decking beyond the quantity identified in the bid form shall be at no additional cost to the Owner.

3.4 CLEANING AND PROTECTION

A. Protect from damage during construction operations. Promptly repair any damaged surfaces. Remove and replace work which cannot be satisfactorily repaired.

B. Clean using materials recommended by the manufacturer to remove stains, dirt, and debris prior to final acceptance.

END OF SECTION

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SECTION 06 18 00

GLUED-LAMINATED CONSTRUCTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes framing using structural glued-laminated timber.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:

C. "Product Certificates" Subparagraph below applies to LEED 2009, Materials and Resources Credit 5, "Regional Materials."

1. Verification of Recycled Content.
    a. Not required for Timber Connectors.
2. Volatile Organic Compound (VOC) documentation for all adhesives and sealants.
3. No-Added Urea Formaldehyde Content documentation for plywood, engineered wood products (including OSB), and laminating adhesives.
4. California Air Resources Board (CARB) formaldehyde content documentation for plywood, and engineered wood products including purchase invoices indicating required products were purchased for the project.
5. Purchase Invoices for all wood and wood-based products, regardless of whether the wood is required to be properly Chain of Custody or not.
6. Certified Chain-of-Custody certification certificates from one of the following standards.
    a. Forest Stewardship Council (FSC): via FSC CoC certificate.
    b. Sustainable Forestry Initiative (SFI): via SFI CoC certificate.
    c. American Tree Farm System (ATFS): via SFI CoC certificate.
    d. Canadian Standards Association (CSA): via SFI CoC certificate.
    e. Programme for the Endorsement of Forest Certification (PEFC): via PEFC CoC certificate.
    f. Other certificates are not acceptable, These include, but are not limited to: (i) SFI Fiber Sourcing certificate, (ii) PEFC Due Diligence System, and (iii) FSC Controlled Wood certificate
7. For all wood products designated as “Certified,” provide evidence of compliance with Chain of Custody standards as follows:
    a. Demonstrate that products are Chain of Custody certified by providing vendor invoices. Invoices will contain the vendor’s Chain of Custody number and will identify each FSC, SFI,

or PEFC Chain of Custody certified product on a line-item basis. A “vendor” is defined as the company that furnishes wood products to project contractors or subcontractors for on-site installation.

b. Wood products for which acceptable documentation is not submitted shall be rejected and their removal required.

D. Shop Drawings:

1. Show layout of structural glued-laminated timber system and full dimensions of each member.

2. Indicate species and laminating combination, adhesive type, and other variables in required work.

1.3 INFORMATIONAL SUBMITTALS

A. Certificates of Conformance: Issued by a qualified testing and inspecting agency indicating that structural glued-laminated timber complies with requirements in ANSI A190.1.

1.4 QUALITY ASSURANCE

A. Certified Wood Certification Requirement: Wood and wood-based products must be obtained from vendor sources certified by an FSC-accredited certification body complaint with STD-01-001, "FSC Principles and Criteria for Forest Stewardship.” Or SFI accredited or PEFC-accredited certification body complaint with ASTM D7612-10 (2015)," Categorizing Wood and Wood-Based Products According to Their Fiber Sources.”

1. Chain of Custody Certification Required: All wood products, including but not limited to: hardwood, softwood, and composite and engineered woods including, but not limited to; solid lumber, engineered lumber, plywood, door cores, particleboard, medium density fiberboard, and hardboard.

2. Purchase Invoices: Must be provided for all wood and wood-based purchased products, whether Chain of Custody Certified, Not-Chain of Custody Certified, or Exempt form Chain of Custody. Invoices must contain the vendor’s Chain-of-Custody (COC) number and identify each Chain of Custody certified product on a line item basis.

3. Vendor: Defined as the company that furnishes wood products to project contractors and/or subcontractors for on-site installation. This includes subcontractors who substantially modify a purchased product, for example, a cabinet maker who cuts sheet products into small pieces to make an assembly, such as a drawer.

B. Composite wood products: Products must comply with the California Green Building Standards Code 2013 (CalGreen), Section 5.504.4.5. Hardwood plywood, particleboard and medium density fiberboard composite wood products used on the interior or exterior of the buildings shall meet the requirements for formaldehyde as specified in CARB's Air Toxics Control Measure for (ATCM) Composite Wood (17 CCR 93120 et seq.). Those materials not exempted under the ATCM must meet the specified emission limits, as shown in CalGreen Table 5.504.4.5.

1.5 DELIVERY, STORAGE, AND HANDLING

A. General: Comply with provisions in AITC 111.

B. Individually wrap members using plastic-coated paper covering with water-resistant seams.

1.6 PRODUCTS

A. See Editing Instruction No. 1 in the Evaluations for cautions about named manufacturers and products. For an explanation of options and Contractor's product selection procedures, see Division 01 Section 01 60 00, MATERIALS AND EQUIPMENT.

1.7 STRUCTURAL GLUED-LAMINATED TIMBER

A. General: Provide structural glued-laminated timber that complies with ANSI A190.1 and ANSI 117 or research/evaluation reports acceptable to authorities having jurisdiction.

1. Factory mark each piece of structural glued-laminated timber with AITC Quality Mark or APA-EWS trademark. Place mark on surfaces that are not exposed in the completed Work.
2. Provide structural glued-laminated timber made with wet-use adhesive complying with ANSI A190.1.

B. Provide Chain of Custody certified wood products.

C. Provide composite wood, including plywood and engineered lumber, compliant with the following requirements:

1. Contains no added urea-formaldehyde content.
2. Meets California Air Resources Board (CARB), Air Toxics Control Measure for (ATCM) Composite Wood (17 CCR 93120 et seq.).
3. Binding Adhesives: Adhesives used to fabricate any composite wood product must not contain any urea-formaldehyde content.

D. Species and Grades for Beams:

1. Species: Southern Pine
2. Lay-up:
    a. Unbalanced at simple-span beams.

E. Appearance Grade: Architectural, complying with AITC 110.

1.8 TIMBER CONNECTORS

A. Materials: Unless otherwise indicated, fabricate from the following materials:

1. Structural-steel shapes, plates, and flat bars complying with ASTM A 36/A 36M.
2. Round steel bars complying with ASTM A 575, Grade M 1020.
3. Hot-rolled steel sheet complying with ASTM A 1011/A 1011M, Structural Steel, Type SS, Grade 316.

B. Hot-dip galvanize steel assemblies and fasteners after fabrication to comply with ASTM A 123/A 123M or ASTM A 153/A 153M.

1.9 MISCELLANEOUS MATERIALS

A. End Sealer: Manufacturer's standard, transparent, colorless wood sealer that is effective in retarding the transmission of moisture at cross-grain cuts and is compatible with indicated finish.

B. Penetrating Sealer: Manufacturer's standard, transparent, penetrating wood sealer that is compatible with indicated finish.

C. Adhesives and Sealants.

1. Products must not exceed the Volatile Organic Compound (VOC) limits noted on project drawings A0.02 and A0.03, 2013 California Green Building Standards Code (CalGreen), Pages 1 (A0.02) and 2 (A0.03). Refer to CalGreen Section 5.504.4.1 Adhesives, Sealants and Caulks.

1.10 FABRICATION

A. It is often advisable to allow Contractor to order glulam beams slightly long, cut them to length, and machine them for connections at Project site to ensure a proper fit.

B. Shop fabricate for connections to greatest extent possible, including cutting to length and drilling bolt holes.

C. Camber: Fabricate horizontal and inclined members of less than 1:1 slope with either circular or parabolic camber equal to 1/500 of span.

D. End-Cut Sealing: Immediately after end cutting each member to final length, apply a saturation coat of end sealer to ends and other cross-cut surfaces, keeping surfaces flood coated for not less than 10 minutes.

E. Seal Coat: After fabricating, sanding, and end-coat sealing, apply a heavy saturation coat of penetrating sealer on surfaces of each unit.

PART 2 - EXECUTION

2.1 INSTALLATION

A. General: Erect structural glued-laminated timber true and plumb and with uniform, close-fitting joints. Provide temporary bracing to maintain lines and levels until permanent supporting members are in place.

1. Handle and temporarily support glued-laminated timber to prevent surface damage, compression, and other effects that might interfere with indicated finish.

B. Cutting: Avoid extra cutting after fabrication. Where field fitting is unavoidable, comply with requirements for shop fabrication.

C. Fit structural glued-laminated timber by cutting and restoring exposed surfaces to match specified surfacing.

1. Predrill for fasteners using timber connectors as templates.

2. Finish exposed surfaces to remove planing or surfacing marks.
3. Coat cross cuts with end sealer.

2.2 ADJUSTING

A. Repair damaged surfaces after completing erection. Replace damaged structural glued-laminated timber if repairs are not approved by Architect.

2.3 PROTECTION

A. Do not remove wrappings on individually wrapped members until they no longer serve a useful purpose, including protection from weather, sunlight, soiling, and damage from work of other trades.
   1. Slit underside of wrapping to prevent accumulation of moisture inside the wrapping.

END OF SECTION

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SECTION 10 14 00

SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. Park Entrance Sign.
2. Interpretive Graphic Panels (Boardwalk and Site).
3. Regulatory signs and sign supports (posts).
4. Park signs and sign supports (posts).
5. Project Sign.
6. Removing existing signs and sign supports.

1.2 RELATED SECTIONS

A. Section 03 30 00 CAST-IN-PLACE CONCRETE.

1.3 REFERENCES

1. Materials and construction methods shall conform, insofar as applicable, to:
2. The requirements of the Commonwealth of Massachusetts, Massachusetts Highway Department, Standard Specifications for Highway and Bridges, dated 1988, as amended (hereinafter referred to as the MassDOT Standard Specifications);
3. The latest edition of the Manual of Uniform Traffic Devices (hereinafter referred to as the MUTCD);
4. All applicable requirements of the Americans with Disabilities Act (hereinafter referred to as the ADA);
5. All errata, addenda, additional revisions, and supplemental specifications applicable to each.

1.4 SUBMITTALS

A. Submit Shop Drawing for Park Entrance Sign in accordance with Section 01 33 00 SUBMITTALS.

1. Shop Drawings shall include plans, elevations, sections, and details. Shop Drawings shall show all sign and post connections. Shop Drawings shall show layout of sign text and graphics. Owner reserves the right to modify text and graphics during the Shop Drawing review process, prior to final approval
2. Submit Manufacturer's Certificates for all materials including wood posts, rope, steel channel, fiberglass panel, corten steel face panel and all sign and post connections.

B. Submit Shop Drawing for Interpretive Graphic Panels in accordance with Section 01 33 00 SUBMITTALS.

1. Coordinate with Owner to obtain the graphic and narrative text for the Graphic Panels. Owner will provide graphic files and text documents for the Contractor to utilize in the development of the shop drawings.

2. Shop Drawings shall show layout of sign text and graphics. Owner reserves the right to modify text and graphics during the Shop Drawing review process, prior to final approval.

3. Provide full size paper proofs of each of the panels, with right-reading images, printed in the actual color to be used in production, for approval by the Owner and Engineer.

4. The Owner may request two revisions and two paper drafts prior to final approval.

5. Submit one or two 10" x 10" minimum lab sample/s of high-resolution digital graphics embedded into the fiberglass Graphic Panel. Sample/s shall include a section of text, background, black and white and color image/s. Color image/s shall convey color ranges in the images.

6. Submit catalog cuts and detailed description of all materials, components, and fabrication processes. Any components that do not meet the requirements of this section will be rejected.

7. Submit Manufacturer's Certificates for materials proposed for use.

8. Submit Sign Schedule and Manufacturer's Literature for Regulatory Signs in accordance with Section 01 33 00 SUBMITTALS.

C. Coordinate with Owner for Park Signage text. Prepare and Submit Shop Drawings and Manufacturer's data for Park Sign materials in accordance with Section 01 33 00 SUBMITTALS.

1.5 DELIVERY, STORAGE AND HANDLING

A. All items shall be delivered individually wrapped and boxed and shall not be removed from packaging prior to installation.

B. Store delivered signage in a dry and safe environment, as required by the manufacturer.

C. Signage which becomes rusted or damaged due to improper storage or handling shall be rejected and shall be replaced without additional cost to the Owner.

D. Take all necessary precautions to protect all items from moisture, chipping, cracking, or other damage, during the transportation of these materials to the project, unloading and storage on the site. After delivery take all necessary precautions to prevent all items from chipping, cracking, construction dust and debris, or damage of any kind. Damaged units will not be allowed to be installed and should any damaged units be found in constructed work, such units shall be removed immediately and replaced with new units, and the Contractor shall assume all expenses incurred.

E. Stored materials shall be adequately protected against moisture by (1) stacking in such a manner as to allow a complete circulation of air under each stack, and (2) covering each stack, top and sides with a waterproof paper or membrane. Coverings shall remain in place at all times, when not working from the particular stack.

PART 2 - PRODUCTS

2.1 PARK ENTRANCE SIGN

A. Park Entrance Sign shall be furnished and installed as per the approved shop drawings.

B. Park Entrance Sign shall be two sided. Park Entrance Sign shall be as shown on plans, with a steel-powder coated steel frame, encasing a colored interior panel, faced on both sides with a corten steel face panel with cut lettering on both sides, allowing the interior color to show through the letter openings. The corten steel panel lettering shall be water jet from steel face. Letters shall be free of burrs and sharp edges.

C. Sign interior panels shall be 2 inch thick, fiberglass core, high-pressure laminate boards, completely sealed to the weather. The face layer shall be uniform color, non-glare matte finish, as selected by the Owner. All layers to be permanently bonded to the core and shall not delaminate when subjected to weather and vandalism.

D. Vandal resistance: neither the coated steel frame, the interior panel or the corten steel face shall be defaced by spraying with aerosol paint or brushing and splashing paint and shall be readily wiped clean with paint remover or solvent without affecting the appearance or legibility of the graphics.

E. All products shall be exterior grade, 100% UV stable.

F. All fasteners shall be stainless steel and related hardware exposed to view shall be tamperproof.

G. Posts shall be green heart piles with angled tops, as shown on the drawings.

H. Rope shall be 1.5 inch diameter CWC Manila 3 Strand Rope, 16650 breaking strength or approved equal.

I. Corten steel panel shall be offset from the interior panel a minimum of ½" utilizing tamper-proof spacers.

J. Corten steel panel shall be treated with a Corten Weathering Steel Accelerator such as "XL-08" as manufactured by Bromoco International or approved equal. The look and level of patina of the corten steel shall be coordinated with the Owner as part of the Shop Drawing process. Accelerator shall be applied in accordance with the manufacturer's specification.

K. Once corten steel has sufficiently weathered, panel shall be completely sealed to the weather using a water-based Corten Steel Sealer such as "CT-7571-W" as manufactured by Bromoco International or approved equal. Sealer shall be applied in accordance with the manufacturer's specifications.

2.2 REGULATORY SIGNS

A. Materials for traffic and regulatory signs shall conform to the requirements of Section M8 of the MassDOT Standard Specifications.

B. For Sign Panels refer to: M8.19.1 Aluminum Sign Panels.

1. Regulatory Signs shall consist of:

a. Sign R1-1 Standard 30" STOP. Sign face layout and content shall be per the MUTCD Standards.

b. Sign R3-7L shall be Standard 24" W x 24" H Left Lane Must Turn Left. Sign face layout and content shall be per the MUTCD Standards.

c. Sign R3-7R shall be Standard 24" W x 24" H Right Lane Must Turn Right. Sign face layout and content shall be per the MUTCD Standards.

d. Sign R8-3 shall be Standard 12" W x 18" H No Parking Any Time. Sign face layout and content shall be per the MUTCD Standards.

e. Sign R7-8 shall be Standard 12" W x 18" H ADA-compliant parking space sign. Sign face layout and content shall be in accordance with the MUTCD and ADA Standards.

2.3 PARK SIGNS

A. Park Signs shall be 12" W x 18" H. Park sign face shall be green with white lettering. Park Signs shall be identified as follows:

1. Park Sign PS-1
2. Park Sign PS-2
3. Park Sign PS-3
4. Park Sign PS-4
5. Park Sign PS-5

B. Park Sign Layout shall be as shown in the Drawings. Final content, graphic, and locations shall be provided by Engineer. Owner reserves the right to modify Park Sign text during the Shop Drawing process. Park Sign quantities shall be per the Drawings.

2.4 INTERPRETIVE GRAPHIC PANEL

A. Interpretive Graphic Panel – Site

1. Interpretive Graphic Panel shall be fabricated and installed as shown in the Drawings and as specified herein.
2. Panels shall be ¾ inch thick, high-pressure laminate boards, completely sealed to the weather. The face layer to be transparent with non-glare matte finish. All layers to be permanently bonded to the core and shall not delaminate when subjected to weather and vandalism.
3. Vandal resistance: Panel face shall not be defaced by spraying with aerosol paint or brushing and splashing paint and shall be readily wiped clean with paint remover or solvent without affecting the appearance or legibility of the graphics.
4. Graphic reproduction methods shall be high resolution digital printing.
5. All products shall be UV stable.
6. Utilize Manufacturer's standard support frame and integrated hardware. All hardware provided shall be tamperproof.
7. Final graphic size, types, layout and content shall be provided by the Owner.

8. Interpretive signs listed below:
    a. GP-S-1 – “Site Map” – 24” x 36”
    b. GP-S-2 – “History” – 24” x 36”
    c. GP-S-3 – “Water” – 24” x 36”
9. Three companies are listed below that manufacture products that may be acceptable for use on this project:
    a. Fossil Industries, Inc. 44 Jefryn Boulevard, Deer Park, NY 11729, 1-800-244-9809, www.fossilgraphics.com
    b. iZone Imaging, 2526 Charter Oak Drive, Suite 100, Temple TX, 76502, 1-888-778-0722, www.izoneimaging.com
    c. HDC International, 1719 Newport Gap Pike, Wilmington, DE 19808-6119, +44 (0) 7831-776361.

B. Interpretive Graphic Panel – Boardwalk

1. Interpretive Graphic Panel shall be fabricated and installed as shown in the Drawings and as specified herein.
2. Panels shall be 1/2” thick high-pressure laminate boards, completely sealed to the weather. The face layer to be transparent with non-glare matte finish. All layers to be permanently bonded to the core and shall not delaminate when subjected to weather and vandalism.
3. Vandal resistance: Panel face shall not be defaced by spraying with aerosol paint or brushing and splashing paint and shall be readily wiped clean with paint remover or solvent without affecting the appearance or legibility of the graphics.
4. Graphic reproduction methods shall be high resolution digital printing.
5. All products shall be UV stable.
6. All hardware provided shall be tamperproof.
7. Final graphic size, types, layout and content shall be provided by Engineer.
8. Interpretive signs listed below:
    a. GP-BW-1 – “Ecology Salt Marsh” – 53” x 14”
    b. GP-BW-2 – “Above The Salt Marsh” – 53” x 14”
    c. GP-BW-3 – “In The Salt Marsh” – 53” x 14”
9. Three companies are listed below that manufacture products that may be acceptable for use on this project:
    a. Fossil Industries, Inc. 44 Jefryn Boulevard, Deer Park, NY 11729, 1-800-244-9809, www.fossilgraphics.com
    b. iZone Imaging, 2526 Charter Oak Drive, Suite 100, Temple TX, 76502, 1-888-778-0722, www.izoneimaging.com

c. HDC International, 1719 Newport Gap Pike, Wilmington, DE 19808-6119, +44 (0) 7831-776361.

C. Metal Frame and Support shall conform to National Park Service standards for cantilever style, 30-degree angle, dual post, with in-ground mount. and as shown on the drawings.

2.5 PROJECT SIGN

A. Temporary project sign shall be maintained through the duration of construction. Refer to Section 01 58 00 - PROJECT IDENTIFICATION AND SIGNS.

2.6 SIGN SUPPORTS

A. Materials for park and regulatory sign supports shall conform to the requirements of Section M4 and M8 of the MassDOT Standard Specifications.

B. Fabricate all brackets, plates and support required for Graphic Panels.

2.7 SIGN POSTS

A. Sign posts shall be affixed to a cast iron pedestal base designed to be compatible with the sign post, with necessary tamper-proof and four (4) 4 inch anchor bolt hardware.

1. A Manufacturer that produces surface mount sign bases is: TSP -Traffic Safety Products.
2. Model PBS 200 SQ-G. 1.800.285.3056, Traffic safety products.net
3. Or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Installation of signs and sign supports shall conform to the requirements of Section 828 and 840 of the MassDOT Standard Specifications.

B. Bolt sign bases to concrete walk or base with 4” anchor bolts minimum, as shown on the Plans. Shim sign bases, if necessary, to ensure sign post is set plumb. Post shall be within ¼” or vertical when measure at the top.

C. Removing and resetting of Street Signs and Traffic Signs, including the sign supports (post), shall include the dismantling, removal, transporting and resetting of signs and sign supports (post) at the location indicated on the plans.

D. Removing and resetting of traffic signs on new posts shall include the dismantling, removal, transporting and resetting of existing signs at the location indicated on the plans.

E. Signs and sign supports (posts) noted to be removed and not reset shall be carefully removed and transported to the Town of Yarmouth DPW at 74 Town Brook Road, West Yarmouth or to other location within town limits, as directed by the Engineer.

F. The Contractor will be held responsible for any damage during removal and resetting of signs and sign supports (posts) and shall replace or repair the damaged item as directed by the Engineer at no additional cost to the Owner.

G. Locations of signs shall be in accordance with the MUTCD and the applicable requirements of the ADA.

3.2 TOLERANCES

A. Shall be in accordance with the MassDOT Standard Specifications.

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SECTION 11 68 13

PLAYGROUND EQUIPMENT

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, equipment, and transportation required to install/assemble the play equipment as located, described, and set forth in the contract plans, specifications, and details and in accordance with manufacturer's requirements and recommendations, and as specified herein.

1.2 REFERENCES

A. Playground equipment design, layout, and installation shall comply with the following standards and guidelines, as applicable:

1. CPSC - Consumer Product Safety Commission Guidelines for Playground Safety, latest edition.
2. ASTM - American Society for Testing and Materials, Designation: F 1487, Standard Consumer Safety Performance Specification for Playground Equipment for Public Use, latest edition.
3. ANSI - American National Standards Institute.
4. AASHTO - American Association of State Highway and Transportation Officials (tests of specifications).
5. MassDOT. - Latest edition of the Standard Specifications for Highways, Bridges and Waterways,
6. MAAB - Massachusetts Architectural Access Board

B. Requirements not specifically set forth herein but required by the agencies listed above shall be understood to be a requirement of this contract since these standards of quality and safety are established as the industry standard(s). Any conflicts between the agency standards and the contract documents shall be brought to the attention of the Owner’s Representative, and unless otherwise directed in writing, the agency standards shall be the minimum requirement to be followed.

1.3 SUBMITTALS

A. Shop Drawings, submit in accordance with Section 01 30 00 – SUBMITTALS.

1. Include catalog cut sheets for all manufactured playground equipment
2. Submit shop drawings of the Tunnel.
3. Submit drawings of play equipment layout and foundations including plans, elevations, sections, and attachment details. Where applicable, shop drawings shall show adjacent surfaces and transitions.

4. Include detailed information, specifications, sizes and dimensions for all materials, accessories, and finishes.

1.4 QUALITY ASSURANCE

A. Contractor shall have provided min. one (1) current Certified Playground Safety Inspector on site during installation of playground equipment.

B. Contractor shall provide documented experience of at least three (3) playgrounds installed with equipment valued at over $100,000.

C. Installer shall have a minimum of five (5) years' experience installing playgrounds of similar size. References will be required.

1.5 RELATED DOCUMENTS

A. Reference the manufacturer's plans, details, specifications, and related product information contained in the Appendix.

PART 2 - PRODUCTS

2.1 PLAYGROUND EQUIPMENT

A. Playground equipment includes,

1. Embankment Slide

   a. Embankment Slide No. 1 and No. 2 shall be "COR 711001-1230 – Embankment Slide, wide" as manufactured by Kompan, , www.kompan.com, 605 West Howard Lane, Suite 101, Austin TX, 78753, 1-800-426-9788 or approved equal.

   b. Slide material shall be stainless steel. Posts shall be hot dipped color galvanized steel. Primary color shall be GREEN. Secondary color shall be YELLOW. Color options shall be submitted and confirmed as part of the Shop Drawings.

2. Embankment Log Ladder

   a. Embankment Log Ladder shall be "Timbercraft 1673-EMB Embankment Log ladder", as manufactured by Columbia Cascade Company, columbia-cascade.com, 1300 SW 6th Ave Ste 310, Portland, OR 97201, (503) 223-1157

   b. Or approved equal.

3. Playground Ship

   a. Playground Ship shall be "NRO543-1021 – Explorer Ship, Medium" as manufactured by Kompan, www.kompan.com, 605 West Howard Lane, Suite 101, Austin TX, 78753, 1-800-426-9788.

   b. Or approved equal.

4. Swing

   a. Free-Standing Swing shall be "NRO911-1101 – Birds Nest Swing" as manufactured by Kompan, www.kompan.com, 605 West Howard Lane, Suite 101, Austin TX, 78753, 1-800-426-9788.

   b. Or approved equal.

5. Music Play Panel

   a. Music Play Panel shall be "NRO612-1001" as manufactured by Kompan, www.kompan.com, 605 West Howard Lane, Suite 101, Austin TX, 78753, 1-800-426-9788.

   b. Or approved equal.

2.2 TUNNEL

1. Tunnel shall be furnished and installed as shown and detailed on the Drawings and as specified herein.
2. Tunnel shall 30" I.D. diameter N-12 St IB pipe (per ASTM F2648) and shall have a smooth interior and angular exterior corrugations. Tunnel shall be manufactured by Advanced Drainage Systems, 1-800-821-6710, 234 Copeland St, Quincy, MA 02169 or approved equal.

2.3 POLYURETHANE SAFETY SURFACING

A. Polyurethane safety surface shall be installed as shown on the Drawings and meet the requirements as specified in Section 32 12 45 of the Specifications.

2.4 WOOD FIBER MULCH

A. Wood fiber mulch shall be installed as shown on the Drawings and meet the requirements as specified in Section 32 12 47 of the Specifications.

2.5 CAST IN PLACE CONCRETE

A. Concrete footings for play equipment shall be installed as shown on the plans will be cast in place cement concrete as specified in Section 03 30 00 of the Specifications and per the manufacturer's requirements.

B. Top of concrete footings shall be twelve (12) inches minimum below finished grade or as per the manufacturer's requirements.

2.6 MAINTENANCE KIT

A. The Contractor shall supply the Town with all equipment maintenance kits and spare hardware that came with the equipment.

PART 3 - EXECUTION

A. The Contractor shall assemble the specified equipment under the supervision of an approved Supervisor according to the manufacturer's instructions, the contract drawings, and these Specifications.

B. The Contractor shall locate the structures to the lines and grades specified in the drawings in these Specifications and according to the specifications of the manufacturer of the equipment. Adjust all equipment to suit site gradients; no sloping platforms, tracks, or members intended to be horizontal shall be accepted.

C. The equipment shall be located and brought to the heights as shown in the drawings and as recommended by the manufacturer with vertical and horizontal members set plumb and then braced to be held in place.

D. The concrete shall be poured around the supporting pieces of the equipment to the grades detailed. The concrete shall be poured and cured according to Section 03 30 00 of these Specifications. Slope tops of footings to drain; set bottom of vertical members into gravel base to ensure drainage. Contractor shall consult manufacturer to confirm that concrete footings meet the requirements of the manufacturer.

E. After the specified cure period of the concrete has passed the bracing may be removed.

F. The fills and surfaces shall then be placed and brought to the grades shown in the Contract Drawings. The Contractor shall refer to appendixes of these specifications for additional information on the play equipment.

END OF SECTION

SECTION 260001

ELECTRICAL

PART 1 – GENERAL

1.1 DEFINITIONS

A. As used in this Section, "provide" means "furnish and install" and "POS" means "Provided Under Other Sections".

B. As used in the drawings and specifications for electrical work, certain non-technical words shall be understood to have specific meanings as follows regardless of indications to the contrary in the general conditions or other documents governing the electrical work.

C. "Furnish" means: Purchase and deliver to the project site complete with every necessary appurtenance and support, all as part of the electrical work. Purchasing shall include payment of all sales taxes and other surcharges as may be required to assure that purchased items are free of liens, claims, or encumbrances.

D. "Install" means: Unload at the delivery point at the site and perform every operation necessary to establish secure mounting and correct operation at the proper location in the project, all as part of the electrical work.

E. "Provide" means: "Furnish" and "Install".

F. "New" means: Manufactured within the past two years and never before used.

G. Except where modified by a specific notation to the contrary, it shall be understood that the indication and/or description of any electrical item in the drawings or specifications for electrical work carries with it the instruction to furnish, install and connect the item as part of the electrical work, regardless of whether or not this instruction is explicitly stated.

H. It shall be understood that the specifications and drawings for electrical work are complimentary and are to be taken together for a complete interpretation of the electrical work except that indications on the drawings, which refer to an individual element of work, take precedence over the specifications where they conflict with same.

I. Engineer means individual named or otherwise identified as such in the Agreement.

1.2 SCOPE

A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:

1. Primary electric service and coordination of service work with Eversource.

2. Secondary electric service including underground conduit bank and secondary service entrance feeders from the utility company pad mounted transformer and the building grounding electrode system.

3. Secondary distribution systems including all panelboards, electrical enclosures, overcurrent and switching devices, raceways, hand holes, cables, wiring, junction and pull boxes, wireways, and all other components required for complete electrical distribution system.

4. Site lighting, wiring, raceways, and controls.

5. Grounding and bonding of all electrical systems and equipment.

6. Wiring devices (switches and receptacles) complete with associated device plates.

7. Company Switches

8. Power pedestals.

9. Tele/Data communication system service empty conduit system.

10. Testing of all electrical and lighting systems.

11. Coordination between electrical work, site improvements, and other trades during both Phase 1 and Phase 2.

12. All other systems hereinafter specified or indicated on the Contract Drawings, complete, leaving ready an electrical system in perfect operating condition.

13. Coordination drawings and record drawings and similar requirements.

14. All required staging and scaffolding of any height.

15. Temporary electrical service for Phase 1 and Phase 2 Job-Site Trailers.

B. Examine all other Sections of the Specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this Section. Where paragraphs of this section conflict with similar paragraphs of Division 1, requirements of this section shall prevail.

C. Coordinate work with that of all other trades affecting, or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

D. The Contractor shall be responsible for filing all documents, payment of all fees, and securing of all inspections and approvals necessary for the electrical work.

E. Service and Metering

1. The power company serving this project is Eversource, Work Order # 12408266.

2. The existing 120/240 Volt, 100 Amp, 1-phase service on the property will be removed and completely replaced with a new service that will be obtained at 120/208 Volt, 3-phase, 4-wire from a new pad mounted transformer provided by the utility company.

3. The existing service can be utilized for a temporary service for construction power but will need to be separated from the owner's metering equipment. Coordinate with Eversource for increasing the service capacity and the installation of the additional temporary service equipment and metering.

4. Furnish and install the primary service conduit.

5. Furnish and install the hand holes, pre-cast transformer mounting pad, and oil containment curb.

6. Furnish and install the secondary service conduit, wire and connectors.

7. All Work and material for the electrical service shall be in accordance with the requirements of Eversource.

8. Make all arrangements with Eversource for obtaining the new service and furnish all labor and material for the services.

9. Make all arrangements with Eversource including the service removal request for removing the existing service and furnish all labor and material for the services.

10. Eversource shall invoice the Town of Yarmouth directly.

1.3 RELATED WORK UNDER OTHER SECTIONS

A. The following items are not included in this Section and will be performed under the designated Sections.

1. TEMPORARY FACILITIES AND CONTROLS Section 015000

2. EARTH MOVING: Refer to Section 312000

a. Excavation and backfill.

3. CAST IN PLACE CONCRETE: Refer to Section 033000

a. Utility hand holes including frames and covers. (Can be Pre-cast)

b. Utility transformer pad. (Can be Pre-cast)

c. Light pole bases. (Can be Pre-cast)

d. Equipment foundations.

e. Concrete encasement for conduit banks.

f. Rebar for items listed above.

1.4 REGULATORY REQUIREMENTS

A. Comply with all applicable federal and state laws, and all local codes, by-laws and ordinances.

B. Where provisions of the Contract Documents conflict with any codes, rules or regulations, the latter shall govern. Where the contract requirements are in excess of applicable codes, rules or regulations, the contract provisions shall govern unless the Engineer rules otherwise.

C. Request inspections from authorities having jurisdiction, obtain all permits and pay for all fees and inspection certificates as applicable and/or required. All permits and certificates shall be turned over to the Owners at the completion of the work. Copies of permits shall be given to the resident engineer prior to the start of work.

D. Materials and workmanship and equipment performance shall conform with the latest edition of the following standards, codes, specifications, requirements and regulations:

1. State Building Code

2. State Electrical Code

3. National Fire Protection Association (NFPA)

4. Local Town Regulations and By-laws

5. Underwriter's Laboratories, Inc. (UL)

6. National Electrical Manufacturer's Association (NEMA)

7. American National Standards Institute (ANSI)

E. All electrical work shall meet or exceed any other state and local codes and/or authorities having jurisdiction including all other standards indicated herein.

1.5 SUBMITTALS

A. This Paragraph supplements Division 1.

B. Definitions:

1. Shop Drawings are information prepared by the Contractor to illustrate portions of the work in more detail than shown in the Contract Documents.

C. Submittal Procedures and Format

1. Review submittal packages for compliance with Contract Documents and then submit to Engineer for review.

D. Acceptable Manufacturers

1. The electrical design for each product is based on the standard manufacturer products. Manufacturers equipment are acceptable if they:

a. Meet all performance criteria listed in the schedules and outlined in the specification.

b. Have identical operating characteristics to those called for in the specification.

c. Fit within the available space it was designed for, including space for maintenance and component removal, with no modification to either

the space or the product. Clearances to equipment will be at least equal to those shown on the design drawings. The fact that a manufacturers name appears as acceptable shall not be taken to mean that the Engineer has determined that the manufacturers products will fit within the available space - this determination is solely the responsibility of the contractor.

d. For equipment mounted in areas where structural matters are a consideration, the products must have a weight no greater than the product listed in the schedules or specifications.

e. Products must adhere to all Engineer considerations including but not limited to: being the same size and of the same physical appearance as scheduled or specified products.

2. See Section 016200 Materials and Equipment for general proprietary requirements.

E. Submittal Notations: Submittals will be returned from the Engineer marked as illustrated below:

- ☐ NO EXCEPTION TAKEN
- ☐ MAKE CORRECTIONS NOTED
- ☐ REJECTED
- ☐ REVISE AND RESUBMIT

Checking is only for general conformance with the design concept of the project and general compliance with the information given in the contract documents. Any action shown is subject to the requirements of the plans and specifications. Contractor is responsible for dimensions which shall be confirmed and correlated at the job site; fabrication process and techniques of construction; coordination of his work with that of all other trades; and the satisfactory performance of his work.

F. Schedule: Incorporate shop drawing review period into construction schedule so that Work is not delayed. Contractor shall assume full responsibility for delays caused by not incorporating the following shop drawing review time requirements into his project schedule: Allow at least 10 working days, exclusive of transmittal time, for review each time shop drawing is submitted or resubmitted with the exception that 22 working days, exclusive of transmittal time, are required for the following:

1. If more than five shop drawings of this trade are received in one calendar week.

G. List of Proposed Equipment and Materials

1. Within four weeks after Award of Contract and before ordering materials or equipment, submit complete list of proposed materials and equipment and indicate manufacturer's names and addresses. No consideration will be given to partial lists submitted out of sequence.

H. Responsibility

1. Intent of Submittal review is to check for capacity, rating, and certain construction features. Contractor shall ensure that work meets requirements of Contract Documents regarding information that pertains to fabrication processes or means, methods, techniques, sequences and procedures of construction; and for coordination of work of this and other Sections. Work shall comply with submittals marked "REVIEWED" to extent that they agree with Contract Documents. Submittal review shall not diminish responsibility under this Contract for dimensional coordination, quantities, installation, wiring, supports and access for service, nor the shop drawing errors or deviations from requirements of Contract Documents. The Engineer's noting of some errors while overlooking others will not excuse the contractor for proceeding in error. Contract Documents requirements are not limited, waived nor superseded in any way by review.

2. INFORM SUBCONTRACTORS, MANUFACTURERS, SUPPLIERS, ETC. OF SCOPE AND LIMITED NATURE OF REVIEW PROCESS AND ENFORCE COMPLIANCE WITH CONTRACT DOCUMENTS.

I. Material and equipment requiring Shop Drawing Submittals shall include but not be limited to:

1. Panelboards.

2. Overcurrent and switching devices.

3. Wiring devices and wallplates.

4. Company Switches

5. Electrical Enclosures

6. Power pedestals.

7. Light Fixtures.

8. Wiring and cables.

9. Conduit.

10. Boxes and fittings.

11. Non-Utilty hand holes.

1.6 SURVEYS AND MEASUREMENTS

A. Base all required measurements, both horizontal and vertical, on reference points established by the Contractor and be responsible for the correct laying out of the electrical work.

1.7 COORDINATION

A. Electrical Drawings are diagrammatic. They indicate general arrangements of the electrical systems and other work. They do not show all offsets required for coordination nor do they show the exact routings and locations needed to coordinate with structures and other trades and to meet Engineer requirements.

B. Work shall be performed in cooperation with other trades on the project and so scheduled as to allow speedy and efficient completion of the work.

C. Furnish to other trades advance information on locations and sizes of all frames, boxes, sleeves and openings needed for their work, and also furnish information and shop drawings necessary to permit trades affected by the work to install same properly and without delay.

D. Where the electrical work shall interfere with the work of other trades, assist in working out the space conditions to make satisfactory adjustments before installation. Without extra cost to the Owners, make reasonable modifications to the work as required by normal interferences.

E. If any electrical work has been installed before coordination with other trades so as to cause interference with the work of such trades, all necessary adjustments and corrections shall be made by the contractor without extra cost to the owners.

F. Where conflicts or potential conflicts exist and engineering guidance is desired, submit sketch of proposed resolution to Engineer for review and approval.

G. Protect all materials and work of other trades from damage which may be caused by the electrical work and repair all damages without extra cost to the owners.

1.8 COORDINATION BETWEEN CONTRUCTION PROJECT PHASES

A. This project site has two separate construction project phases, Phase 1 under this contract and Phase 2 under a separate contract.

B. Phase 1 electrical conduit and wire within the Phase 2 Bathroom Building footprint and Phase 2 site area shall be installed under this Phase 1 contract. Electrical work under Phase 1 shall be coordinated with the Phase 2 General Contractor and the Phase 2 Electrical Sub-Contractor.

1.9 INSTALLATION REQUIREMENTS

A. The arrangement of all electrical work shown on the drawings is diagrammatic only and indicates the minimum requirements of the work. Conditions at the building including actual measurements shall determine the details of the installation. All work shall be laid out and installed so as to require the least amount of cutting and patching.

B. Coordinate with the Phase 2 Contract and check building plans and specifications before ordering or installing any material and equipment. Any discrepancies shall be brought to the attention of the Engineer for his determination prior to proceeding with the work.

1.10 TYPICAL DETAILS

A. Typical details where shown on the drawings shall apply to each and every item of the project where such items are applicable. They are not repeated in full on the drawings, which in many cases are diagrammatic only, but with the intention that such details shall be incorporated in full. Any alternate method proposed for use by the Contractor shall have the prior approval of the Engineer.

1.11 SLEEVES, INSERTS

A. Furnish and install all sleeves, inserts, anchor bolts and similar items to be set into concrete, as required for electrical work. Internal diameter of sleeve shall be 2" larger than the outside diameter of the pipe or insulation covered line passing through it.

B. Seal all floor and foundation penetrations with conduit link seals.

1.12 ACCESSIBILITY

A. Install all work such that parts requiring periodic inspection, operation, maintenance and repair are readily accessible.

1.13 SUPPLEMENTARY SUPPORTING STEEL

A. Provide all supplementary steelwork required for mounting or supporting equipment and materials.

B. Steelwork shall be firmly connected to building construction as required.

C. Steelwork shall be of sufficient strength to allow only minimum deflection in conformity with manufacturer's published requirements.

D. All supplementary steelwork shall be installed in a neat and workmanlike manner; all turns shall be made at forty-five and ninety degrees, and/or as dictated by construction and installation conditions.

E. All manufactured steel parts and fittings for exterior work shall be aluminum or stainless steel.

1.14 TOOLS AND EQUIPMENT

A. Provide all tools and equipment required for the fabrication and installation of the mechanical and electrical equipment at the site.

1.15 PORTABLE AND DETACHABLE PARTS

A. Contractors shall retain in their possession all portable and/or detachable parts and portions of materials, devices, equipment etc. necessary for the proper operation and maintenance of the mechanical and electrical systems until final completion of the work, at which time they shall be handed over to the Owners.

1.16 RECORD DRAWINGS, PROJECT CLOSEOUT

A. As work progresses and for the duration of Contract, maintain a complete and separate set of prints of Contract Drawings at job site at all times. Record work completed and all changes from original Contract Drawings clearly and accurately including work installed as a modification or addition to the original design. Work shall be updated on a weekly basis and shall be made available for review by Engineer. Failure to perform this work shall be reason for withholding requisition payments. In addition, take photographs of all concealed equipment including underground duct banks and conduit. At completion of work, furnish copies of photographs with written label descriptions. These shall become part of Record Documents.

B. At completion of work prepare a complete set of record drawings on CD or thumb drive in Autocad Release 14 format showing all systems as actually installed, including all fire alarm and electrical circuitry. The design CADD drawings will be made available for the

electrical contractor's use to serve as backgrounds for the drawings. The quantity of drawings which are made available shall in no way be interpreted as setting a limit to the number of drawings necessary to show the required information. The Electrical Contractor's professional draftsperson shall transfer as installed mark ups to the CADD drawings and provide three sets of prints to Engineer for comments as to compliance with this section.

C. THE ENGINEER WILL NOT CERTIFY THE ACCURACY OF THE RECORD DRAWINGS - THIS IS THE SOLE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.

D. This trade shall submit the record set for approval by the fire and building departments in a form acceptable to the departments, when required by the jurisdiction.

E. Drawings shall show record condition of details, sections, riser diagrams, control changes and corrections to schedules. Schedules shall show actual manufacturer and make and model numbers of final equipment installation.

1.17 GUARANTEE/WARRANTY

A. Guarantee and 24 hour service

1. Guarantee Work of this Section in writing for not less than one year following the date of acceptance by the Owner. If the equipment is used for temporary power etc. prior to acceptance by the Owner, the bid price shall include an extended period of warranty covering the one year of occupancy, starting from the date of acceptance by the Owner. The guarantee shall repair or replace defective materials, equipment, workmanship and installation that develop within this period, promptly and to Engineer's satisfaction and correct damage caused in making necessary repairs and replacements under guarantee within Contract Price.

2. In addition to guarantee requirements of Division 1 and of Subparagraph A above, obtain written equipment and material warranties offered in manufacturer's published data without exclusion or limitation, in Owner's name.

3. Upon receipt of notice from the Owner of failure of any part of the systems or equipment during the warranty period, the affected part or parts shall be replaced by this Contractor without any reimbursement.

4. At nine (9) months into the one-year guarantee period, perform a 100% test of all installed equipment. Any device and/or part found to be defective shall be repaired and/or replaced at no cost to the Owner. The contractor shall notify the fire department one month in advance of the 100% test.

5. Replace material and equipment that require excessive service during guarantee period as defined and as directed by Engineer.

6. Provide 24 hour service beginning on the date the project is accepted by the Owner, whether or not fully occupied, and lasting until the termination of the guarantee period. Service shall be at no cost to the Owner. Service can be provided by this contractor or a separate service organization. Choice of service organization shall be subject to Engineer and Owner approval. Submit name and a phone number that will be answered on a 24-hour basis each day of the week, for the duration of the service.

7. Submit copies of equipment and material warranties to Engineer before final payment.

8. At end of guarantee period, transfer manufacturers' equipment and material warranties still in force to Owner.

9. This Paragraph shall not be interpreted to limit Owner's rights under applicable codes and laws and under this Contract.

10. Part 2 Paragraphs of this Specification may specify warranty requirements that exceed those of this Paragraph. Those paragraphs will govern.

11. Use of systems provided under this Section for temporary services and facilities shall not constitute Final Acceptance of work by Owner, and shall not initiate the guarantee period.

12. Non-durable items, such as electric lamps, shall be replaced up to the date of acceptance, such that they shall have had no more than 100 hours use prior to this date.

13. Provide manufacturer's engineering and technical staff at site to analyze and rectify problems that develop during guarantee period immediately. If problems cannot be rectified immediately to Owner's satisfaction, advise Engineer in writing, describe efforts to rectify situation, and provide analysis of cause of problem. Engineer and/or Engineer will direct course of action.

1.18 OPERATING, INSTRUCTION AND MAINTENANCE MANUALS

A. Refer to SECTION 01700 - CONTRACT CLOSEOUT for submittal procedures pertaining to operating and maintenance manuals.

B. Each copy of the approved operating and maintenance manual shall contain copies of approved shop drawings, equipment literature, cuts, bulletins, details, equipment and engineering data sheets and typewritten instructions relative to the care and maintenance for the operation of the equipment, all properly indexed. Each manual shall have the following minimum contents:

1. TABLE OF CONTENTS

2. Introduction

   a. Explanation of manual and its purpose and use.

   b. Description of the electrical systems.

   c. Safety precautions necessary for equipment.

   d. Illustrations, schematics and diagrams.

   e. Installation drawing.

3. Maintenance

   a. Maintenance and lubricating instructions.

   b. Replacement charts.

   c. Trouble shooting charts for equipment components.

   d. Testing instructions for each typical component.

   e. Two typed sets of instructions for ordering spare parts. Each set shall include name, price, telephone number and address of where they may be obtained.

4. Manufacturer's Literature

   a. The equipment for which shop drawings have been submitted and approved.

1.19 SERVICE CHARACTERISTICS

A. Primary Utility Voltage: 25 KV

B. Secondary Building Voltage: 120/208 V, 3-phase, 4-Wire

C. All equipment and wiring shall be suitable for the applied voltage.

1.20 QUALITY ASSURANCE

A. The requirements of the State Building Code and local regulations establish the minimum acceptable quality of workmanship and materials, and all work shall conform thereto unless more stringent requirements are indicated or specified herein.

B. All work shall comply with the latest editions of the codes as referenced herein.

C. Follow manufacturer's directions for articles furnished, in addition to directions shown on drawings or specified herein.

D. Protect all work, materials, and equipment from damage during process of work. Replace all damaged or defective work, materials and equipment without additional cost to Owner.

E. All equipment and materials for permanent installation shall be the products of recognized manufacturers and shall be new.

F. Equipment and materials shall:

1. Where normally subject to Underwriters Laboratory Inc. listing or labeling services, be so listed or labeled.

2. Be without blemish or defect.

3. Not be used for temporary light and power purposes.

4. Be in accordance with the latest applicable NEMA standards.

5. Be products which will meet with the acceptance of all authorities having jurisdiction over the work. Where such acceptance is contingent upon having the products examined, tested and certified by Underwriters or other recognized testing laboratory, the product shall be so examined, tested and certified.

G. Except for conduit, conduit fittings, outlet boxes, wire and cable, all items of equipment or material of one generic type shall be the product of one manufacturer throughout.

H. For items which are to be installed but not purchased as part of the electrical work, the electrical work shall include:

1. The coordination of their delivery.

2. Their unloading from delivery trucks driven into any point on the property line at grade level.

3. Their safe handling and field storage up to the time of permanent placement in the project.

4. The correction of any damage, defacement or corrosion to which they may have been subjected. Replacement if necessary shall be coordinated with Contractor who originally purchased the item.

5. Their field make-up and internal wiring as may be necessary for their proper operation.

6. Their mounting in place including the purchase and installation of all dunnage, supporting members, and fastenings necessary to adapt them to Engineer and structural conditions.

7. Their connection to building wiring including the purchase and installation of all termination junction boxes necessary to adapt and connect them to this wiring. Included also shall be the purchase and installation of any substitute lugs or other wiring terminations as may be necessary to adapt their terminals to the building wiring as called for and to the connection methods set forth in these specifications.

I. Items which are to be installed but not purchased as part of the electric work shall be carefully examined upon delivery to the project. Claims that any of these items have been received in such condition that their installation will require procedures beyond the reasonable scope of the electric work will be considered only if presented in writing within one week of the date of delivery to the project of the items in question. The electric work includes all procedures, regardless of how extensive, necessary to put into satisfactory operation, all items for which no claims have been submitted as outlined above.

1.21 DELIVERY, STORAGE AND HANDLING

A. All materials for the work of this section shall be delivered, stored and handled so as to preclude damage of any nature. Manufactured materials shall be delivered and stored in their original containers, plainly marked with the products' and manufacturer's name. Materials in broken containers or in packages showing watermarks or other evidence of damage, shall not be used and shall be removed from the site.

1.22 TEMPORARY POWER AND LIGHTING

A. Furnish and install shall furnish and install feeders of sufficient size from the Utility Company's power lines for the electric power requirements for the Phase 1 and Phase 2 job-site trailers and general construction power.

B. All necessary transformers, meters, cables, panelboards, switches, temporary lamp replacements and accessories required for the temporary light and power installation shall be provided by the Electrical Subcontractor.

C. Provide and maintain a feeder or feeders of sufficient capacity for the requirements of the entire project site and he shall provide a sufficient number of outlets, located at convenient points, so that extension cords of not over 50 ft. in length will reach all work requiring temporary light or power.

D. The Electrical Subcontractor shall install and maintain the wiring and accessories for the offices of the General Contractor as specified in the contract.

E. Furnish, install, and maintain a temporary service feeder to the Upweller Facility for the months of May thru November for a 24 hour 7-day week operation.

F. All temporary electrical work shall meet the requirements of the National Electrical Code Article 305 Temporary Wiring, the Local Utility Company, and all Federal Standards and Laws.

G. All temporary wiring and accessories thereto installed by the Electrical Subcontractor shall be removed after their purposes have been served.

H. The General Contractor will pay for the cost of electric energy consumed by himself and by all of his Subcontractors, unless otherwise indicated.

I. Provide all temporary lighting and power required above during the normal working hours of the project or a total of ten (10) hours per normal working day; Saturdays, Sundays and legal holidays are excluded. The ten hours per day shall include manning the temporary power and lighting 2 hour before and 2 hour after a normal eight (8) hour working day. In addition to the above, provide and maintain, to the satisfaction of the local authorities having jurisdiction, all temporary lighting and power that may be required for safety purposes. The Electrical Subcontractor will be compensated by the General Contractor for any additional standby time, materials or equipment required by the General Contractor or other Subcontractors beyond the normal working hours, as defined above.

1.23 STAGING AND SCAFFOLDING

A. Provide staging and scaffolding for all the work of this section complying with Division 1.

1.24 EXTRA MATERIALS

A. Furnish extra materials described in following product specification sections that match products installed, are packaged with protective covering for storage, and are identified with labels clearly describing contents.

PART 2 - PRODUCTS

2.1 GENERAL

A. Product specifications are written in such a manner so as to specify what materials may be used in a particular location or application and therefore do not indicate what is not acceptable or suitable for a particular location or application. As an example: non-metallic sheathed cable is not specified; therefore, it is not acceptable.

B. For purpose of establishing a standard of quality and not for purpose of limiting completion, the basis of this Specification is upon specified models and types of equipment and materials, as manufactured by specified manufacturers.

C. In all cases, standard cataloged materials and systems have been selected. Materials such as lighting fixtures specially manufactured for this particular project and not part of a manufacturers standard product line will not be acceptable. In the case of systems, the system components shall be from a single source regularly engaged in supplying such systems. A proposed system made up of a collection of various manufacturers products will be unacceptable.

D. Where Specifications list manufacturer's names and/or "as approved" or "Equal approved by Designer, other manufacturers equipment will be considered if equipment meets Specification requirements and has all features of the specified items as are considered essential by Engineer.

E. All materials shall be new and shall be UL listed.

2.2 RACEWAYS AND FITTINGS

A. Raceways - General:

1. Conduit shall be concealed.

2. No raceway shall be used smaller than 3/4" diameter. No conduit shall have more than three (3) 90^{o} bends in any one run, and where necessary, pull boxes shall be provided. Intermediate metal conduit is not allowed.

3. Rigid metal conduit conforming to, and installed in accordance with, Article 346 of NFPA 70 shall be heavy wall zinc coated steel conforming to American Standard Specifications C80-1 and shall be used for service risers and all exterior exposed work.

4. Thin wall conduit (EMT), conforming to, and installed in accordance with, Article 346 of NFPA 70 shall be zinc coated steel, conforming to industry standards, and shall be used for all interior work.

5. Flexible metal conduit shall be used for connections to recessed lighting fixtures and motors. Liquid tight flexible metal conduit shall be used for the above connections which are located in moist locations. All flexible connections shall include a grounding conductor.

6. Rigid non-metallic conduit shall be used for underground electric service and telephone service and shall be polyvinyl chloride (PVC) schedule 40, 90^{o}C.

7. Continuous flexible non-metallic conduit with no joints or seams shall be used for all underground non-service work and shall be HDPE schedule 40.

8. Fittings:

a. Provide insulated bushings on all raceways 1 inch diameter or larger.

b. Manufacturer's standard fittings shall be used for raceway supports.

c. Expansion Fittings: Expansion fittings shall be used where structural and concrete expansion joints occur and shall include a ground strap.

d. Couplings for rigid metal conduit shall be threaded type.

e. Threadless fittings for EMT shall be watertight compression type. Set-screw type fittings are not acceptable. All fittings shall be concrete tight. No diecast fittings allowed except for raceways larger than 1 inch diameter.

f. Cable supports in vertical raceways shall be of the split wedge type. Armored cable supports for vertical runs to be of wire mesh basket design.

g. Wall entrance seals shall be equal to O.Z. Gedney type "WSK".

h. Couplings, elbows and other fittings used with rigid nonmetallic raceways shall be of the solvent cemented type to secure a waterproof installation.

2.3 NON-UTILITY HAND HOLES

A. Hand holes are to be provided as indicated on drawing.

B. Although not required hand holes can be utilized to assist in the installation of exterior site lighting circuit wire pulling at the discretion of the electrical sub-contractor.

C. Hand hole are not allowed on paved surfaces.

D. Hand holes shall be UL listed, made of Polymer Concrete with Polymer Concrete Cover and open bottom.

E. The polymer concrete shall be molded of sand and aggregate, bound together with a polymer resin, and reinforced with steel or fiberglass or a combination of the two.

F. Impact resistant tested per ASTM D-2444.

G. Hand hole enclosure and covers shall meet or exceed the Tier 22 load requirements set forth in the American National Standards Institute’s ANSI/SCTE 77 2010

H. Hand holes shall be as indicated on drawings and at a minimum 11”x18”.

I. Covers shall be securely bolted to enclosure with stainless steel bolts and be on type and be embedded with “ELECTRICAL” logo for electrical power applications.

J. Provide 12" of compacted crushed stone under all hand holes

2.4 WIRING MATERIALS - 600V OR LESS SYSTEMS

A. Feeder conductors rated 100 Amps and greater shall be either copper or aluminum, 600V insulation type XHHW. Feeder conductors rated less than 100 Amps and all branch circuits shall be copper, 600V insulation type THWN for within the building and type XHHW for outside the building.

B. Copper conductors shall be of soft drawn 98% minimum conductivity properly refined copper, solid construction where No. 10 AWG and smaller, stranded construction where No. 8 AWG and larger.

C. Aluminum conductors shall be made of AA-8000 series electrical grade aluminum alloy stranded construction. Conductor and conduit sizing indicated on the contract drawings are based on copper conductor amperage ratings, provide the aluminum conductor equivalent size to maintain the same amperage rating, increase conduit sizes as needed to accommodate larger aluminum conductors.

D. Exterior of wires shall bear repetitive markings along their entire length indicating conductor size, insulation type and voltage rating.

E. Exterior of wires shall be color coded, so as to indicate a clear differentiation between each phase and between each phase and neutral. In all cases, grounded neutral wires and cables shall be identified by the colors white or gray. In sizes and insulation types where factory applied colors are not available, wires and cables shall be color coded by the application of approved colored plastic tapes in overlapping turns at all terminal points, and in all boxes in which splices are made. Colored tape shall be applied for a distance of 6 inches along the wires and cables, or along their entire extensions beyond raceway ends, whichever is less.

F. Final connections to motors shall be made with 18" of neoprene sheathed flexible metal conduit.

G. Minimum conductor size shall be No. 12 AWG installed in conduit. Motor control circuit wiring shall be minimum No. 14 AWG installed in conduit.

H. Other wires and cables required for the various systems described elsewhere in this section of the Specifications shall be as specified herein, as shown on the Contract Drawings, or as recommended by the manufacturer of the specific equipment for which they are used, all installed in conduit.

2.5 OUTLET, JUNCTION, PULL BOXES, AND WIRING TROUGHS FOR ALL SYSTEMS

A. Outlets:

1. Each outlet in wiring or raceway systems shall be provided with an outlet box to suit conditions encountered. Boxes installed in normally wet and exterior locations shall be of cast-metal type having hubs. Concealed boxes shall be

cadmium plated or zinc coated sheet metal type. Old work boxes with Madison clamps not allowed in new construction.

2. Each box shall have sufficient volume to accommodate number of conductors in accordance with requirements of NFPA 70. Boxes shall not be less than 1-1/2" deep unless shallower boxes are required by structural conditions and are specifically approved by Engineer.

3. Pedestal mounted outlet boxes shall be steel, rectangular shaped, 3.125” minimum width, 4.5” minimum depth capable of mounting (2) 20 Amp GFCI receptacles.

4. Acceptable manufacturers:

a. Appleton

b. Crouse Hinds

c. Steel City

d. RACO

B. Pull and Junction Boxes: Where necessary to terminate, tap off, or redirect multiple raceway runs or to facilitate conductor installation, furnish, and install appropriately designed boxes. Boxes shall be fabricated from code gauge steel assembled with corrosion resistant machine screws. Box size shall be as required by Code. Where intermediate cable supports are necessary because of box dimensions, provide insulated removable core brackets to support conductors. Junction boxes are to be equipped with barriers to separate circuits. Where splices are to be made, boxes shall be large enough to provide ample work space. All conductors in boxes are to be clearly tagged to indicate characteristics. Boxes shall be supported independently of raceways. Junction boxes in moist or wet areas shall be galvanized type. Boxes larger than 4 inches square shall have hinged covers. Boxes larger than 12 inches in one dimension will be allowed to have screw fastened covers, if a hinged cover would not be capable of being opened a full 90 degrees due to installation location.

2.6 WIRING DEVICES

A. Provide wiring device type plates for all devices. All device plates shall be stainless steel type.

B. Wiring devices standard for the project (i.e., with no specific type indicated) shall conform to the following:

1. Visible part colors of wiring devices shall be as directed by the Engineer for all public areas, offices, classrooms etc. Provide brown devices for the electrical and mechanical rooms.

2. Exclude compact or "despard" type devices.

3. Devices shall be specification grade.

C. Wiring device switches shall be toggle type, A.C., 20 amps on 120 volt circuits. Switches shall be mounted 48" to center line above finished floor unless noted otherwise.

1. Single pole switch shall be equal to No. HBL1221 and HBL1221L for locking type as manufactured by Hubbell or equal by Leviton, Legrand or approved equal.

D. Astronomical Time Clock Switches

1. Astronomical Time Clock Switches shall be programmable astronomically controlled switch front LCD time display and programmable buttons mounted in a standard back box.

2. The switch shall be 1-pole, 15 Amp rated and capable of 7-day week time scheduling, equal to Leviton VPT24-1PZ Vizia by Leviton or equal by Hubbell or Legrand.

3. Site lights shall be energized when the astronomical dusk “On” time of day is past time. The lights shall remain energized until either the astronomical dawn “Off” time of day or the user configured “Off” time day is past time.

E. Standard duplex convenience receptacles shall be 125 volt, 20 amps, three wire (two circuit wires plus ground), "U-bar" ground NEMA slot configuration 5-20R, specification grade with a one-piece ground assembly. Receptacles shall be mounted 18" to center line above finished floor unless noted otherwise.

1. Equal to No. HBL5362 as manufactured by Hubbell or equal by Leviton, Legrand or approved equal.

2. In exterior locations areas and where indicated on the drawings, provide receptacles with ground fault current interrupters, UL class A, 20A, 125V to be equal to No. GF5352 as manufactured by Hubbell or equal by Leviton, Legrand or approved equal.

F. Non-standard convenience receptacles and special purpose power supply receptacles shall be as listed on plans.

G. Devices and device plates for flush wall devices which are not integrally equipped with same, shall be as directed by the Engineer.

H. For unfinished spaces, plates for surface mounted wall devices which are not integrally equipped with same, shall be galvanized sheet steel, formed raised type which does not overlap box. Where for switches, such plates shall have toggle guards.

I. Where more than one wiring device is indicated in the same location, the devices shall be mounted in gangs under a common wall plate.

J. Mount duplex convenience and power receptacles vertically with grounding posts at top of device unless otherwise indicated. Locate grounding post to left when horizontal mounting is indicated.

K. Weatherproof and wet location cover plates shall comply with NEMA 250, type 3R weather-resistant die-cast aluminum with in use type lockable cover.

2.7 GROUNDING REQUIREMENTS

A. Ground all systems and equipment in accordance with best industry practice, the requirements of NFPA 70 and the following:

B. Install a ground rod electrode system consisting of (3) buried 3/4" diameter by 10'-0" long copperweld ground rods spaced 20'-0" apart, and provided in sufficient quantity so as to have measured resistance to ground of not more than 10 ohms. Provide independent certification confirming this. Establish a bonding connection from the electrode consisting of green insulated conductors run in conduit and sized as indicated hereinafter for main and supply side of service bonding jumpers.

C. Bond the following N.E.C. approved electrodes together to form a ground grid system:

1. Steel reinforcing rods

2. Grounding rods and plates

3. Buried bare copper conductors

4. Utility Transformer ground grid

D. Provide grounding bonds between all metallic conduits of the light and power system which enter and leave cable chambers or other non-metallic cable pulling and splicing boxes. Accomplish this by equipping the conduits with bushings of the grounding type individually cross connected.

E. Bond metallic conduits containing grounding electrode conductors and main bonding conductors to the ground bus service enclosure and/or grounding electrode at both ends of each run utilizing grounding bushings and jumpers.

F. Provide supplementary ground bonding where metallic conduits terminate at metal clad equipment (or at the metal pull box of equipment) for which a ground bus is specified. Accomplish this by equipping the conduits with bushings of the grounding type connected individually by means of jumpers to the ground bus. Exclude the jumpers where directed. This exclusion will be required where an isolated ground for electronic equipment is to be maintained.

G. Each grounding type bushing shall have the maximum ground wire accommodation available in standard manufacture for the particular conduit size. Connection to bushing shall be with wire of this maximum size.

H. Bonding conductors on the load side of the service device and equipment grounding conductors shall be sized in relation to the fuses or trip size of the overcurrent device supplying the circuit.

I. Each branch circuit and feeder shall have a dedicated equipment grounding conductor, minimum # 12 AWG. Shared or tapped equipment grounding conductor shall not be acceptable.

2.8 PHASING AND COLOR CODING

A. The insulation or covering of each wire or cable shall be color coded so as to provide for circuit identification as specified below.

	120/208 V Circuits	Phase
1.	Black	A
2.	Red	B
3.	Blue	C
4.	White	Neutral
5.	Green	Equipment Ground

B. Color coding shall be achieved by one of the following methods:

1. The insulation or covering shall be coded during manufacture by use of one of the following methods:

   a. Colored compounds.

   b. Colored coatings.

2. In sizes and insulation types where factory applied colors are not available, wires and cables shall be color coded by the application of colored plastic tapes in overlapping turns at all terminal points, and in all boxes in which splices are made.

C. The same colored cable shall be connected to the same phase throughout the project.

D. In general, building load centers and panelboards shall be phased "A", "B", "C", left to right. The neutral, although it may be in different locations for different equipment, shall be identified.

2.9 SURGE PROTECTION DEVICES (SPD)

A. Description: This section describes the materials and installation requirements for integrated surge protection devices (SPD) in distribution panelboards and panelboards.

B. Approved Vendors: Square D Company XTE/XHP/CX for service entrance, and XTE/XGA for distribution and/or motor control center applications.

C. Integral Surge Suppressor

1. SPD shall be Listed and Component Recognized in accordance with UL 1449 Second Edition to include Section 37.3 highest fault current category. SPD shall be UL 1283 listed.

2. SPD shall be installed by and shipped from the electrical distribution equipment manufacturer's factory.

3. SPD shall provide surge current diversion paths for all modes of protection; L-N, L-G, N-G in WYE systems, and L-L, L-G in DELTA systems.

4. SPD shall be modular in design. SPD for service entrance application shall provide two modules per phase for redundant protection. Each mode including N-G shall be fused with a 200kAIC UL recognized surge rated fuse and incorporate a thermal cutout device.

5. Audible diagnostic monitoring shall be by way of audible alarm. This alarm shall activate upon a fault condition. An alarm on/off switch shall be provided to silence the alarm. An alarm push to test switch shall be provided.

6. If a dedicated breaker for the SPD is not provided, the SPD shall include a UL recognized disconnect switch. A dedicated breaker shall serve as a means of disconnect for distribution SPD's

7. SPD shall meet or exceed the following criteria:

a. Minimum surge current capability (single pulse rated) per phase shall be:

1) Service entrance distribution panelboard: 240kA per phase
2) Panelboard locations: 160kA per phase

b. UL 1449 Suppression Voltage Ratings:

	VOLTAGE	LOCATION	L-N	L-G	N-G
2)	208Y/120V	Service Entrance:	330V	330V	330V
		Distribution:	330V	330V	330V

8. SPD shall have a minimum EMI/RFI filtering of -50dB at 100kHz with an insertion ration of 50:1 using MIL-STD-220A methodology.

9. SPD shall be provided with one set of NO/NC dry contacts.

10. SPD shall have a warranty for a period of five years, incorporating unlimited replacement of suppressor parts. Warranty shall be the responsibility of the electrical distribution equipment manufacturer and shall be supported by their respective field service division.

2.10 PANELBOARDS

A. Panelboards shall consist of factory completed deadfront assemblies of back pans, main busses, overcurrent and switching units, sheet metal cabinets and trims. They shall be so designed that switching and overcurrent devices can be replaced without disturbing adjacent units and without removing the main bus connectors, so that circuits may be changed without machining drilling or tapping.

B. Bus bars for their mains shall be of copper having current capacities as indicated and sized for such capacities in accordance with Underwriter Laboratory standards. Bus bar taps for panels with single pole branches shall be arranged for sequence phasing of the branch circuit devices. Bussing shall be braced throughout to conform to industry standard practice governing short circuit stresses in panelboards. Phase bussing shall be full height without reduction.

C. A ground bus shall be provided for each panel. Each ground bus shall be of the same material as the phase and neutral buses.

D. Cabinets shall be fabricated from industry standard gauge galvanized sheet steel with corners lapped and riveted, or fastened by approved methods.

E. The inside and outside of the trims shall be factory painted with one rustproofing primer coat and one finish coat. The finish paint shall be of a type to which field applied paint will bond. All trims shall be hinged.

F. Cabinets and trims shall be suitable for the required mounting. Trims shall be fastened to cabinets and shall be of a type that are self-supporting on cabinets. Trims for flush panels shall overlap cabinets by at least 3/4" all around. Where two section panels are required, cabinets shall be of equal height including those cases where there is one main for both sections.

G. Cabinets and trims for lighting and appliance panels shall accommodate and conform to the following limiting dimensions:

1. Minimum wiring gutter width on each side - 5-3/4".

2. Maximum overall width - 24".

3. Maximum overall depth - 6".

H. Where wires or cables are used within panelboards to make up internal connections (factory installed or otherwise) such wire or cable shall have copper conductors only.

I. Any cabinet for a power or distribution panel shall (regardless of the actual devices required to be in it) have a width, depth and bussing adequate for a three pole branch device equal in rating to the panel mains. In no case shall the cabinet be wider than 42 inches or deeper than 18 inches.

J. Hinged doors covering all switching device handles shall be included in all panel trims.

K. Doors in panelboard trims shall conform to the following:

1. In making switching device handles accessible, doors shall not uncover any live parts.

2. Doors shall have flush type paracentric cylinder locks and catches. Two keys shall be supplied for each lock and each key shall open all panelboards. Locks and keys shall conform to a "standard keying policy" as directed.

L. Where "spaces only" for overcurrent protection and switching devices are called for in a panel, its main bus, and backpan, as well as its cabinet and trim, shall be extended to accommodate these spaces and shall include all necessary hardware including bus connectors to add future devices.

M. Panelboards shall comply with the following industry standards:

1. UL Standards

a. Panelboards - UL67
b. Cabinet & Boxes - UL50

2. NEMA Standard - PB1

N. Panelboards shall be labeled with a UL short circuit rating adequate for the available short circuit and based on the lowest panel mounted circuit breaker available UL listed interrupting current rating, but in no case less than 65 ka for 480 volt and 22 ka for 240 volt panelboards.

O. When called for, supply SPD units in accordance with SPD specification section here within.

P. Where indicated on drawings provide an isolated grounding bus within the panelboard. Isolated ground bus shall be electrical isolated from equipment ground bus and panelboard cabinet.

2.11 ELECTRICAL EQUIPMENT ENCLOSURES

A. Construction shall be NEMA Class 4X stainless steel, fully enclosed with 12” mounting feet and dimension as indicated on the drawings.

B. Operating handles shall be front or side type to accommodate hand access space and flush or surface mounting requirements.

C. Each shall be equipped with padlock for locking operating handle in the open position.

D. For each enclosure provide an LED Lensed strip light and light switch complete with conduit/wiring back to panelboard within enclosure.

E. Provide receptacles and equipment as indicated on the drawings, complete with conduit/wiring back to panelboard within enclosure.

F. Conduit within enclosure shall be EMT with compression fittings. ½” conduit shall be allowed for single phase circuits.

2.12 MOLDED CASE CIRCUIT BREAKERS

A. Molded case type circuit breakers shall consist of manually operated quick-make quick-break mechanically trip free operating mechanisms for simultaneous operation of all poles, with contacts, arc interrupters and trip elements for each pole, all enclosed in molded phenolic plastic cases.

1. Their tripping units shall be of the "thermal magnetic" type having bimetallic elements for time delay overload protection and magnetic elements for short circuit protection.

2. Main and power distribution feeder breakers rated 400 Amps and larger shall have long time, short time, instantaneous, (LSI) trip functions.

3. They shall be manually operable by means of toggle type operating handles having "tripped" position midway between the "on-off" position.

4. They shall each be contained in an individual case enclosing only the number of poles required for the particular breaker.

5. All panels and individually mounted circuit breakers shall have short circuit ratings exceeding the available short circuit or the values indicated in the Power System Studies in this section by a factor of 1.2 with a minimum as follows:

a. 240V class panels/breakers

1) 10 kAIC where shown fed by a 150 kVA or less transformer
2) 22 kAIC where shown fed by a 300 kVA or less transformer

6. They shall be of the "bolted-in" type.

7. Where necessary, to accommodate other requirements, their frame sizes shall be increased to conform to such requirements, frame sizes being indicated only as a reference to the minimum acceptable interrupting ratings noted above.

8. Where single pole in trip sizes 20 amps or less, they shall be rated for switching duty.

9. They shall be equipped with 5 milliamp sensitivity ground fault interrupting features where so indicated.

B. They shall be manufactured by Square D, Cutler Hammer, or General Electric.

2.13 COMPANY SWITCHES

A. Switches must be UL Listed and labeled under the UL 891 standard.

B. Company switch enclosures shall be NEMA Type 3R, constructed of continuous seam-welded, powder coated 14-gauge steel. The main access shall be through an interlocked, hinged door that extends the full height of the enclosure. The enclosure shall have a provision for locking. Each phase shall have color-coded cam-style receptacles within the enclosure; the receptacles shall be factory-wired to a main circuit breaker. The circuit breaker shall be interlocked to the main access door. Access for portable cables with male cam-style plugs shall be via cable entry openings in the bottom of enclosure. The terminals for the feeder conductors shall be as required to accommodate conductor sizes as shown on the drawings. Enclosures shall be powder coated painted after fabrication.

C. Company switch safety-interlocking mechanism shall be integrated with the access door, preventing the cam-style receptacles from being energized unless the access door is closed. The access door interlock mechanism shall allow manual de-energizing but must also automatically de-energize the company switch if an attempt is made to partially or fully open the access door while the company switch is energized. The handle of the safety-interlock mechanism shall be recessed into the access door and shall not protrude at all beyond the face of the access door.

D. Pilot lights for each phase shall be located behind a clear window in the access door. Pilot lights shall illuminate only when voltage is present at each phase. Pilot lights shall be red colored LEDs. All Pilot lights shall be visible when the access door is closed.

E. Cam-style receptacles for each phase, neutral (if required), and ground shall be single-pole, color-coded separable connectors, UL Listed and rated 400 amps at 600VAC. Unless specified as isolated ground, the ground cam-style receptacle shall be bonded to the enclosure, and a ground lug shall be provided for connection of the facility ground conductor. The neutral cam-style receptacle shall be factory wired to a power

distribution block. None of the cam-style receptacles shall be accessible unless the main circuit breaker is in the “OFF” position and the main access door is open.

F. Mechanical lugs for portable cable direct wire connection shall be provided for each, phase, neutral (if required), and ground cables. Mechanical lugs shall accept wire sizes from #6AWG to 250MCM and shall be located in the portable cable connection area behind the company switch safety-interlocked door. None of the direct wire lugs shall be accessible unless the molded case circuit breaker is in the “OFF” position and the main access door is open. A non-conductive clamp shall be provided to secure direct wire portable cables in place and minimize mechanical tension at the connection points.

G. Molded case circuit breaker shall be UL Listed and the short circuit interrupt rating shall be a minimum of 65kAIC at 240VAC and 35kAIC at 480VAC. Trip rating of the molded case circuit breaker shall be as shown on the drawings. The molded case circuit breaker shall include a UL Listed door-mounted operating mechanism, preventing the opening of the main access door unless breaker is in the “OFF” position. The molded case circuit breaker shall be mounted behind a deadfront panel. The load-side of the molded case circuit breaker shall not be energizable unless the main access door is closed and the molded case circuit breaker is in the “ON” position.

H. Company switch shall be configured to allow for conduit entry at the top, back or upper sides of the enclosure.

I. Company switch shall include a UL Listed 1/4 DIN Volt-Amp meter with LED display showing 3 rows of 3 digits. Meter accuracy class shall be +/-.5% of full-scale value for voltage and +/- 2 digits for current. Meter shall be located behind a clear window in the access door, and shall be factory-programmed to display current in all (3) phases simultaneously by default.

2.14 POWER PEDESTAL

A. 5”X5”, 54” tall, direct burial stainless steel power pedestal with two 20 Amp receptacles mounted plate located within a hinged cover.

B. NEMA 3R, #14-guage 316 Stainless steel enclosure with bronze powered coated paint.

C. Pedestal to have factory installed stainless steel grounding hardware.

D. Pedestal to be buried a minimum 24”.

E. Provide and field mount two 20 Amp GFCI receptacles.

2.15 LIGHTING FIXTURES

A. Lighting fixtures shall be in accordance with identifications on the drawings and the following. The catalog numbers listed are given as a guide to the design and quality of fixture desired. Equivalent designs, materials, dimensions, coefficient of utilizations and

equal quality fixtures of other manufacturers will be acceptable. All light fixtures shall be either DLC (Design Lighting Consortium) or Energy Star listed.

B. Finishes shall be as selected by the Engineer or as indicated on the plans.

C. Any additional appurtenances required for installation and operation, where same are not covered by the identification used on the drawings, shall be included.

D. Fixtures for use outdoors or in areas designated as damp locations shall be suitably gasketed and U.L. listed for such applications.

E. Include the aiming and/or adjustments of all lighting fixtures requiring same in accordance with instructions issued by the Engineer in the field.

PART 3 - EXECUTION

3.1 BASIC REQUIREMENTS

A. Adhere to best industry practice and the following.

B. All work shall be concealed.

C. Route circuitry runs embedded in concrete to coordinate with structural requirements.

D. Equip each raceway intended for the future installation of wire or cable with a nylon pulling cord 3/16 inch in diameter and clearly identify both ends of the raceway.

E. Provide all outlet boxes, junction boxes, and pull boxes for proper wire pulling and device installation. Include those omitted from the drawings due to symbolic methods of notation.

F. Beyond the termination of raceways, fireproof the following:

1. All wires and cables within pad mounted transformer enclosure.

2. All service feeder cables ahead of main service overcurrent protection devices, and elsewhere where not in raceways.

3. Fireproofing of wires and cables shall be by means of a half-lapped layer of arcproof or by means of sleeving of a type specifically manufactured for the purpose. Ends of tape or sleeving shall be served with twine. Fireproofing shall be extended up into raceways. After conductors have been finally shaped into their permanent configuration, fireproofing tape or sleeving shall be coated with silicate of soda (water glass). Fireproofing shall be applied in an overall manner to raceway groupings of conductors.

G. Provide all sleeves through fireproof and waterproof slabs, walls, etc. required for electric work.

1. Provide waterproof sealing for the sleeves through waterproof slabs, walls, etc.

2. Provide fireproof sealing for the sleeves through fireproof walls, slabs, etc.

3. Provide fireproof sealing for the openings in fireproof walls, slabs, etc., resulting from removal of existing electrical sleeves, conduits, poke-thru's, etc.

H. Bundle wiring passing through pull boxes and panel boards in a neat and orderly manner with plastic cable ties. Cable ties shall by Ty-Raps as manufactured by Thomas & Betts, Holub Industries Inc., Quick Wrap, Bundy Unirap or equal.

I. Turn branch circuits and auxiliary system wiring out of wiring gutters at 90 degrees to circuit breakers and terminal lugs.

3.2 TESTING REQUIREMENTS AND INSTRUCTIONS

A. The Contractor shall provide supervision, labor, materials, tools, test instruments and all other equipment or services and expenses required to test, adjust, set, calibrate, and operationally check work and components of the electrical systems and circuitry throughout Division 26 work.

The Contractor shall pay for all tests specified in Division 26, including expenses incident to retests occasioned by defects and failures of equipment to meet specifications, at no additional cost to the owner. Any defects or deficiencies discovered in any of the electrical work shall be corrected.

The Contractor shall:

1. Replace wiring and equipment found defective (defined as failing to meet specified requirements) at no additional cost to the owner.

2. Submit three copies of test results to the engineer.

B. Do not void equipment warranties or guarantees by testing and checkout work. Checks and tests shall be supplemental to and compatible with the manufacturer's installation instructions. Where deviations are apparent, obtain the manufacturer's approved review of procedure prior to testing. Where any repairs, modifications, adjustments, tests or checks are to be made, the Contractor shall contact the engineer to determine if the work should be performed by or with the manufacturer's representative.

All checks and tests specified for proper operating and safety of equipment and personnel are to be performed concurrent with progression of the work, prior to Final Acceptance by the owner.

C. Test are to:

1. Provide initial equipment/system acceptance.

2. Provide recorded data for future routine maintenance and trouble shooting.

3. Provide assurance that each system component is installed satisfactorily and can be expected to perform, and continue to perform, its specified function with reasonable reliability throughout the life of the facility.

D. At any stage of construction and when observed, any electrical equipment or system determined to be damaged, or faulty, is to be reported to the engineer. Corrective action by the Contractor requires prior engineer approval, retesting, and inspection.

E. Prior to testing and start-up, equipment and wiring shall be properly and permanently identified with nameplates, and other identification as specified herein this specification. Check and tighten terminals and connection points, remove shipping blocks and thoroughly clean equipment, repair damaged or scratched finishes, inspect for broken and missing parts and review and collect manufacturer's drawings and instructions for delivery to the engineer. Make routine checks and tests as the job progresses to ensure that wiring and equipment is properly installed.

F. Testing and checkout work is to be performed with fully qualified personnel skilled in the particular tests being conducted. Personnel are to have at least five years of experience with tests of same type and size as specified:

G. Inspections and tests shall be in accordance with the following applicable codes and standards as amended to date, unless otherwise specified.

1. National Electrical Manufacturer's Association - NEMA.

2. American Society for Testing and Materials - ASTM.

3. Institute of Electrical and Electronic Engineers -IEEE.

4. National Electrical Testing Association - NETA.

5. American National Standards Institute - ANSI.

   a. C2: National Electrical Safety Code.

   b. Z244-1: American National Standard for Personnel Protection.

6. Insulated Cable Engineers Association - ICEA.

7. Association of Edison Illuminating Companies - AEIC.

8. Occupational Safety and health Administration.

   a. OSHA Part 1910; Subpart S, 1910.308.

b. OSHA Part 1926; Subpart V, 1926.950 through 1926.960.

9. National Fire Protection Association - NFPA.

a. 70B: Electrical Equipment Maintenance.

b. 70E: Electrical Safety Requirements for Employer Workplaces.

c. 70: National Electrical Code.

d. 101: Life Safety Code.

10. Inspections and tests shall utilize the following references:

a. Contract Drawings and Specifications.

b. Manufacturer's printed test procedures for respective equipment.

H. Test Equipment:

1. Test equipment used by the Contractor is to be inspected and calibrated.

2. Perform calibration and setting checks with calibrated test instruments of at least twice that of that of the accuracy of the equipment, device, relay or meter under test. Dated calibration labels shall be visible on test equipment. Calibrations over 6 months old are not acceptable on field test instruments. Inspect test instruments for proper operation prior to proceeding with the tests. Record serial and model numbers of the instruments used on the test forms.

I. Test Procedures:

1. The Contractor is responsible for the preparation of the procedures and schedules for the work specified herein. This work is to be coordinated and compatible with both the work and schedule of the other crafts. Sequence the tests and checks so that the equipment can be energized immediately after the completion of the application tests.

2. Submit proposed testing and check out forms. The procedures shall provide specific instructions for the checking and testing of each electrical component of each system. Schedule tests and inspections as the job progresses. Test procedures submitted shall include job safety rules.

J. After each electrical system installation is complete, perform the tests to determine that the entire system is in proper working order and in accordance with applicable codes, manufacturer's instructions, drawings, and specifications. Tests are in addition to shop tests of individual items at the manufacturer's plant. Perform insulation and ground resistance tests before operating tests.

K. Perform insulation tests on electrical equipment, apparatus, cables, motors, generators, transformers, circuit breakers and switches, switchgear, motor control centers, and similar electrical equipment, at the following times and conditions:

1. Prior to energization and/or placing into service.

2. When damage to the insulation is suspected or known to exist.

3. After repairs or modifications to the equipment affecting the insulation.

4. Where lightning or other surge conditions are known to have existed on the circuit.

L. Make openings in circuits for test instruments and place and connect instruments, equipment, and devices, required for the tests. Upon completion of tests, remove instruments and instrument connections and restore circuits to permanent condition.

M. List each circuit and measured resistance as test data. Maintain record of insulation resistance values. Identify conductor, or equipment, date that value was taken and resistance value. Arrange information in tabular form and submit to Engineer.

N. Report inspections, tests, and calibrations in writing on engineer-approved reports/forms. The recorded data form shall have the signatures of the persons conducting the tests, authorized witnesses, and the engineer. The forms shall serve as the test and inspection checklist.

O. When the electrical tests and inspections specified or required within Division 26 are completed and results reported, reviewed, and approved by the engineer, the Contractor may consider that portion of the electrical equipment system or installation electrically complete. The Contractor will then affix appropriate, approved, and dated completion or calibration labels to the tested equipment and notify the engineer of electrical completion. If the engineer finds completed work unacceptable, he will notify the Contractor in writing of the unfinished or deficient work, with the reason for his rejection, to be corrected by the Contractor. The Contractor will notify the engineer in writing when exceptions have been corrected. The Contractor will prepare a "Notification of Substantial Electrical Completion" for approval by the engineer following engineer's acceptance of electrical completion. If later in-service operation or further testing identifies problems attributable to the Contractor, these will be corrected by the Contractor, at no additional cost to the Authority.

P. Specific Tests:

1. Perform the following specific tests. De-energize and isolate equipment and cable prior to performing the tests.

2. Grounding Systems:

a. Test equipment grounds to remote earth, directly referenced to an extremely low resistance (approximately 1 ohm) reference ground bench mark. Perform a visual inspection of the systems, raceway and equipment grounds to determine the adequacy and integrity of the grounding. Ground testing results shall be recorded, witnessed, and submitted to the engineer.

b. Perform ground tests using a low resistance, Null balance type, ground testing ohmmeter, with test lead resistance compensated for. Use the type of test instrument which compensates for potential and current rod resistances.

c. Test each equipment grounding system for continuity of connections and for resistance. Ground resistance of conduits, equipment cases, and supporting frames, shall not vary from that of system as a whole and shall not exceed 5 ohms to ground. Submit all readings to the engineer.

d. Where ground test results identify the need for additional grounding conductors or rods that are not indicated or specified, design changes will be initiated to obtain the acceptable values. The Contractor is responsible for the proper installation of the grounding indicated and specified.

3. Wire and Cable: (All conductors originating from distribution panels).

a. Before energizing any cable or wire, megger the insulation resistance of every external circuit wire to each other and to ground. Tests shall be conducted at voltages of 500 volts or lower. Continuity test each wire and cable to verify the field applied tag per conductor. Minimum insulation resistance valves shall not be less than two megohms.

b. Take insulation resistance measurements for motor feeders. With motors disconnected, measure insulation resistance from load side of contactors or circuit breakers.

c. Check cables and wires for the proper identification numbering and/or color coding.

d. Inspect cables for physical damage and proper connection in accordance with single line diagram.

4. Power Distribution System:

a. Circuit Breakers - Molded Case

1) Circuit breaker shall be checked for proper mounting, conductor size and feeder designation.

2) Operate circuit breaker to ensure smooth operation.

3) Inspect case for cracks or other defects.

4) Check tightness of connections with calibrated torque wrench. Refer to manufacturer's instruction for proper torque levels.

5) Adjustable trip breakers shall have minimum pickup current determined by primary current injection where applicable.

6) Perform long time delay time-current characteristic tests by passing three hundred percent (300%) rated current through each pole separately. Determine trip time.

7) Verify trip unit reset characteristics.

b. Panelboards

1) Inspect for physical damage and proper grounding.

2) Compare nameplate information with schedules and report any discrepancies.

3) Inspect all panelboards for cleanliness, workmanship, etc.

5. Operating Instructions: Furnish operating instructions to owner's designated representative with respect to operations, functions and maintenance procedures for equipment and systems installed. Cost of such instruction up to a full five (5) days of Contractor's time shall be included in contract.

3.3 BRANCH CIRCUITRY

A. For all lighting and appliance branch circuitry, raceway sizes shall conform to industry standard maximum permissible occupancy requirements except where these are exceeded by other requirements specified elsewhere.

B. Circuits shall be balanced on phases at their supply as evenly as possible.

C. Feeder connections shall be in the phase rotation which establishes proper operation for all equipment supplied.

D. Reduced size conductors indicated for any feeders shall be taken as their grounding conductors.

E. Feeders consisting of multiple cables and raceways shall be arranged such that each raceway of the feeder contains one cable for each leg and one neutral cable, if any.

F. For circuitry indicated as being protected at 20 Amps or less, abide by the following:

1. Minimum conductor size shall be No. 12 A.W.G. copper.

2. Conductors operating at 120 volts extending in excess of 100 Ft., or at 277 volts extending in excess of 200 ft., or the last outlet or fixture tap shall be No. 10 A.W.G. copper throughout.

3. Lighting fixtures and receptacles shall not be connected to the same circuit.

4. Circuits shall be balanced on phases at their supply point as evenly as possible.

5. Each circuit shall have dedicated neutral conductor, sharing of single neutral conductor between multiple circuits shall not be allowed.

3.4 ELECTRICAL WORK IN DAMP OR WET LOCATIONS

A. Outlets and outlet size boxes shall be of galvanized cast ferrous metal only.

B. The finish of threaded steel conduit shall be galvanized only.

C. Wires for pulling into raceways for lighting and appliance branch circuitry shall be limited to "THWN".

D. Wires for pulling into raceways for feeders shall be limited to "THWN".

E. Plates for toggle switches and receptacles shall have gasketed snap shut covers suitable for wet locations while in use.

F. Final connections of flexible conduit shall be neoprene sheathed.

G. Apply one layer of half looped plastic electric insulating tape over wire nuts used for joining the conductors of wires.

H. Enclosures, junction boxes, pull boxes, cabinets, cabinet trims, wiring troughs and the like, shall be fabricated of galvanized sheet metal, shall conform to the following:

1. They shall be constructed with continuously welded joints and seams.

2. Their edges and weld spots shall be factory treated with cold galvanizing compound.

3. Their connection to circuitry shall be by means of watertight hub connectors with sealing rings.

I. Enclosures shall be NEMA Class 4X weatherproof construction.

J. The covers, doors and plates and trims used in conjunction with all enclosures, pull boxes, outlet boxes, junction boxes, cabinets and the like shall be equipped with gaskets.

K. Panels shall be equipped with doors without exception.

L. The following shall be interpreted as damp or wet locations within building confines:

1. Spaces where any designations indicating weatherproof (WP) or vaporproof appear on the drawings.

2. Below waterproofing in slabs applied directly on grade.

3. Spaces defined as wet or damp locations by article 100 of the National Electric Code.

3.5 UNDERGROUND CONDUIT BANKS

A. The electrical work required in conjunction with underground conduit banks shall include providing all conduits.

B. Conduits for underground banks shall be:

1. Trade diameter size as indicated but in no case less than one inch.

2. Service Conduit - PVC Schedule 40 (approved for encased burial).

3. Other Conduit – Continuous HDPE schedule 40.

4. Rigid steel conduit for vertical elbows and straight sections used to penetrate equipment pads and concrete slabs.

C. All conduits indicated as being incorporated into conduit banks unless specifically noted as rigid steel conduits shall be encased in a concrete envelope which accommodates the indicated configuration of conduits and which encompasses dimensions as follows:

1. Outside surfaces of conduits to outside surface of envelope where reinforcement of encasement is required - 6" minimum.

2. Outside surfaces of conduits to outside surface of envelope where no reinforcement of encasement is required - 3" minimum.

3. Spacing between centerlines of conduits assigned to different categories of use primary feeders, secondary feeders, communications and signaling - 10-1/2" minimum.

4. Spacing between centerlines of conduits assigned to the same category of use - 7-1/2" minimum.

D. Reinforcement of the concrete encasement for conduit banks where required shall consist of No. 4 longitudinal reinforcing bars located 3" in from the outside surface of the envelope and spaced 6" on centers all around. No. 8 wire reinforcing hoops set 8" apart shall be used to tie the longitudinal bars together.

E. Install conduit in such a manner as to provide a minimum cover of 30 inches after final grading except the cover may be reduced to a minimum of 18 inches to:

1. Tie into existing work.

2. Pass over other underground utilities.

3. Pass over underground obstructions.

4. Assist in the avoidance of low points.

F. Increase the minimum cover where required by field conditions.

G. Lay conduit to avoid low points during run. Pitch at a minimum of three inches per 100 feet away from building.

H. Provide reinforcement for the concrete encasement of a conduit bank where:

1. It passes under or over other underground utilities.

2. It passes under or over underground obstructions.

3. Its cover is reduced to less than 30 inches.

4. It runs through foundation walls and other building construction.

I. Concrete encasement reinforcing shall extend in each case five feet beyond the points at which the determining conditions terminate.

J. Bends in conduit shall have minimum radii as follows:

1. For primary feeder 15'-0" except where specifically indicated otherwise or where turning up at termination point.

2. For primary feeder turning up at termination point - 4'-0".

K. Install conduit so that adjacent joints are staggered at least six inches from one another.

L. Offsets to accommodate field conditions shall be accomplished with two bends of not more than ten degrees each.

M. Plug both ends of all conduit stubs.

N. Seal the end of each conduit run terminating inside a building utilizing a water and gas-tight sealant manufactured specifically for the purpose.

O. After conduit has been installed with concrete encasement completed, clear each conduit of all obstructions and foreign matter by pulling a flexible mandrel (12" minimum length and a diameter 1/4" less than that of the conduit) and brush through it. In the event that obstructions are encountered in any conduit which will not permit the mandrel to pass, remove and replace the blocked section. Include in the electric work all excavation, backfilling, repair of concrete encasement and restoration of surface at grade involved in the conduit replacement.

P. Provide a nylon cord for the pulling of cable in each conduit in which no cable is to be installed as part of the electric work.

Q. The Contractor shall provide all insulated racks as required for proper support of all cables and wires.

R. Provide a continuous nylon warning tape above each full length of duct bank 12 inches below grade.

3.6 IDENTIFICATION AND TAGGING

A. Identify individually:

1. Each panelboard.

2. Each switch and circuit breaker.

3. Each feeder, wire or cable of all systems.

4. Each end of nylon pullwire in empty conduit.

B. Each wire or cable in a feeder shall be identified at its terminal points of connection and in each pullbox, junction box and panel gutter through which it passes.

C. The nomenclature used to identify panelboards or load center shall designate the numbers assigned to them.

D. The nomenclature used to identify switches or circuit breakers shall:

1. Where they disconnect mains or services designate this fact.

2. Where they control feeders, designate the feeder number and the name of the load supplied.

3. Where they control lighting and appliance branch circuitry, designate the name of the space and the load supplied.

E. The nomenclature used to identify feeder wires and cables shall designate the feeder number.

F. Identification for distribution panelboards and panelboards shall be by means of engraved lamacoid nameplates showing 1/4" high white lettering on a black background fastened to the outside face of the front.

G. Identification for switches or circuit breakers shall be by means of the following:

1. Where individually enclosed -- engraved lamacoid nameplates showing 1/8" high white lettering on a black background fastened on the outside front face of the enclosure.

2. Where in panelboards or load centers without doors -- same as for individually enclosed.

3. Where in panelboards or load centers with doors -- typewritten directories mounted behind transparent plastic covers, in metal frames fastened on the inside face of the doors.

H. Identification for wires and cables shall be by means of wrap around "brady" type labels.

I. Device plates for local toggle switches, toggle switch type motor starters, pilot lights and the like, whose function is not readily apparent shall be engraved with 1/8" high letters suitably describing the equipment controlled or indicated.

J. Identify each outlet box, junction box, and cabinet used in conjunction with empty raceway for wires of a future system by means of indelible markings on the inside denoting the system.

K. Prior to installing identifying tags and nameplates, submit their nomenclature for approval. Conform to all revisions issued by the Engineer.

3.7 LIMITING NOISE PRODUCED BY ELECTRICAL INSTALLATION

A. Perform the following work to assure that minimal noise is produced by electrical installations due to equipment furnished as part of the electrical work.

B. Check and tighten the fastenings of sheet metal plates, covers, doors and trims used in the enclosures of electrical equipment.

3.8 SUPPORTS AND FASTENINGS

A. Support work in accordance with best industry standards, Mass. Electric Code and the following:

B. Include supporting frames or racks for equipment, intended for vertical surface mounting, which is required in a free standing position.

C. Supporting frames or racks shall be of standard angle, standard channel or specialty support system steel members. They shall be rigidly bolted or welded together and adequately braced to form a substantial structure. Racks shall be of ample size to assure a workmanlike arrangement of all equipment mounted on them.

D. No work intended for exposed installation shall be mounted directly on any building surface. In such locations, flat bar members or spacers shall be used to create a minimum of 1/4" air space between the building surfaces and the work. Provide 3/4" thick exterior grade plywood painted with two coats of fire-retardant grey paint for mounting of panelboards.

E. Nothing (including outlet, pull and junction boxes and fittings) shall depend on electric conduits, raceways or cables for support.

F. Support less than 2" trade size, vertically run, conduits at intervals no greater than 8 Ft. Support such conduits, 2-1/2" trade size or larger, at intervals no greater than the story height, or 15 Ft, whichever is smaller.

G. Where they are not embedded in concrete, support less than 1" trade size, horizontally run, conduits at intervals no greater than 7 ft.. Support such conduits, 1" trade size or larger, at intervals no greater than 10 ft.

H. Fasten electric work to building structure in accordance with the best industry practice.

I. Floor mounted equipment shall not be held in place solely by its own dead weight. Include floor anchor fastenings in all cases.

J. As a minimum procedure, where weight applied to the attachment points is 100 lbs. or less, fasten to concrete and solid masonry with bolts and expansion shields.

K. As a minimum procedure, where weight applied to building attachment points exceeds 100 lbs., but is 300 lbs. or less, conform to the following:

1. At field poured concrete slabs, utilize inserts with 20' minimum length slip-through steel rods, set transverse to reinforcing steel.

3.9 SPLICING AND TERMINATING WIRES AND CABLES

A. Maintain all splices and joints in removable cover boxes or cabinets where they may be easily inspected.

B. Locate each completed conductor splice or joint in the outlet box, junction box, or pull box containing it, so that it is accessible from the removal cover side of the box. Splices are not allowed below Electrical Datum elevation 9.5’.

C. Join solid conductors No. 8 AWG and smaller by securely twisting them together and soldering, or by using insulated coiled steel spring "wire nut" type connectors. Exclude "wire nuts" employing non-expandable springs. Terminate conductors No. 8 AWG and smaller by means of a neat and fast holding application of the conductors directly to the binding screws or terminals of the equipment or devices to be connected.

D. Join, tap and terminate stranded conductors No. 6 AWG and larger by means of solder sleeves, taps; and lugs with applied solder or by means of bolted saddle type or pressure indent type connectors, taps and lugs. Exclude connectors and lugs of the types which apply set screws directly to conductors. Where equipment or devices are equipped with set screw type terminals which are impossible to change, replace the factory supplied set screws with a type having a ball bearing tip. Apply pressure indent type connectors, taps and lugs utilizing tools manufactured specifically for the purpose and having features preventing their release until the full pressure has been exerted on the lug or connector.

E. Except where wire nuts are used, build up insulation over conductor joints to a value, equal both in thickness and dielectric strength, to that of the factory applied conductor insulation. Insulation of conductor taps and joints shall be by means of half-lapped layers of rubber tape, with an outer layer of friction tape; by means of half-lapped layers of approved plastic electric insulating tape; or by means of split insulating casings manufactured specifically to insulate the particular connector and conductor, and fastened with stainless steel or non-metallic snaps or clips.

F. Exclude splicing procedures for neutral conductors in lighting and appliance branch circuitry which utilize device terminals as the splicing points.

G. Exclude joints or terminations utilizing solder in any conductors used for grounding or bonding purposes.

H. Exclude all but solder or pressure indent type joints in conductors used for signaling or communications purposes.

I. Lugs for conductors used to make phase leg connections on the line side of the main service overcurrent and switching device shall be of the limiter type.

3.10 PULLING WIRES INTO CONDUITS AND RACEWAYS

A. Delay pulling wires or cables in until the project has progressed to a point when general construction procedures are not liable to injure wires and cables, and when moisture is excluded from raceways.

B. Utilize nylon snakes or metallic fish tapes with ball type heads to set up for pulling. In raceways 2" trade size and larger, utilize a pulling assembly ahead of wires consisting of a suitable brush followed by an 3-1/2" diameter ball mandrel.

C. Leave sufficient slack on all runs of wire and cable to permit the secure connection of devices and equipment.

D. Pulling lubricants shall be used. They shall be products manufactured specifically for the purpose.

E. Slack on wires and cables located in cabinets and pull boxes shall be formed and set in place in groupings corresponding to their occupancy of raceways. They shall also be arranged, with insulators and supports provided where necessary, such that cable shims or other such temporary expedients do not have to be left permanently in place to prevent the wires and cables from shifting when covers or trims are removed.

3.11 INSTALLATION OF JUNCTION BOXES, OUTLET BOXES AND PULL BOXES

A. Locate all boxes so that their removable covers are accessible without necessitating the removal of parts of permanent building structure, including piping, ductwork, and other permanent mechanical elements.

B. Apply junction and pull boxes in accordance with the following:

1. Include pull boxes in long straight runs of raceway to assure that cables are not damaged when they are pulled in.

2. Include junction and pull boxes to assure a neat and workmanlike installation of raceways.

3. Include junction and pull boxes to fulfill requirements pertaining to the limitations to the number of bends permitted in raceway between cable access points, the accessibility of cable joints and splices, and the application of cable supports.

4. Include all required junction and pull boxes regardless of indications on the drawings (which, due to symbolic methods of notation, may omit to show some of them).

C. Apply outlet boxes in accordance with the following:

1. Unless noted below or otherwise specifically indicated, include a separate outlet box for each individual wiring device. Outlet boxes supplied attached to lighting fixtures or poles shall not be used as replacements for the boxes specified herein.

2. Include all required outlet boxes regardless of indications on the drawings (which due to symbolic methods of notation, may omit to show some of them).

D. Install junction boxes, pull boxes and outlet boxes in accordance with the following:

1. Exclude surface mounted outlet boxes in conjunction with concealed circuitry.

2. Exclude unused circuitry openings in junction and pull boxes. In larger boxes each such opening shall be closed with a galvanized sheet steel plate fastened with a continuous weld all around. In small outlet type boxes, utilize plugs as specified for such boxes.

3. Close up all unused circuitry openings in outlet boxes. Unused openings in cast boxes shall be closed with approved cast metal threaded plugs. Unused openings in sheet metal boxes shall be closed with sheet metal knock-out plugs.

4. Outlet boxes for switches shall be located at the strike side of doors. Indicated door swings are subject to field change. Outlet boxes shall be located on the basis of final door swing arrangements.

5. Boxes and plaster covers for duplex receptacles shall be arranged for vertical mounting of the receptacle.

6. Equip outlet boxes used for devices which are connected to wires of systems supplied by more than one set of voltage characteristics with barriers to separate the different systems.

E. Barriers in junction and pull boxes of outlet size shall be of the same metal as the box.

F. Barriers in junction and pull boxes which are larger than outlet size shall be of the polyester resin fiberglass of adequate thickness for mechanical strength, but in no case less than 1/4" thick. Each barrier shall be mounted, without fastenings, between angle iron guides so that they may be readily removed.

3.12 LOCATING AND ROUTING OF CIRCUITRY

A. Circuitry and raceways shall not be run within the Phase 2 Bathroom Building slab

3.13 INSTALLING CIRCUITRY

A. The outside surface of circuitry which is to be embedded in cinder concrete shall be coated with asphaltum paint.

B. In runs of conduit or raceway including flexible limit the number of bends between cable access points to a total which does not exceed the maximum specified for the particular system. Where no such maximum is specified, limit the number to four right angle bends or the equivalent thereof.

C. In each conduit or raceway assigned for the future pulling in of wires, include a nylon drag cord. In raceways 2" trade size and larger, the cord shall be pulled in utilizing a suitable brush, followed by an 85% diameter ball mandrel ahead of the cord in the pulling assembly. In the event that obstructions are encountered, which will not permit the drag cord to be installed, the blocked section of raceway shall be replaced and any cutting and patching of the structure involved in such replacement shall be included as part of the electric work.

D. Circuitry shall be arranged such that conductors of one feeder or circuitry carrying "going" current are not separated from conductors of the same feeder or circuitry carrying "return" current by any ferrous or other metal. Where not within raceways, all "going" and "return" current conductors of one feeder or circuit shall be laces together so as to minimize induction heating of adjacent metal components.

E. Sleeves used where circuitry is to penetrate waterproof slabs, decks and walls, shall be of a type selected to suite the water condition encountered in the field.

END OF SECTION

SECTION 31 05 16

AGGREGATE FOR EARTHWORK

PART 1 - GENERAL

1.1 SUMMARY

A. Related documents:

1. American Association of State Highway and Transportation Officials (AASHTO).
    a. T11, Amount of Material Finer than 0.075 mm Sieve in Aggregate
    b. T27, Sieve Analysis of Fine and Coarse Aggregates.
2. American Society for Testing and Materials (ASTM).
    a. D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).
3. 2023 Commonwealth of Massachusetts Department of Transportation Standard Specifications for Highways and Bridges (Standard Specifications)

B. Section includes, without limitation, providing:

1. Requirements for furnishing and placing materials, which include Crushed Stone, Gravel Borrow, Dense Graded Crushed Stone and Selected Borrow.
2. Location of specified materials as detailed on the Drawings or as directed by the Engineer for roadway base, sidewalk base, structural fill, excavation below normal depth, utility support, replacement of unsuitable material or elsewhere, as ordered.

C. Extents: As shown.

D. Definitions

1. Gravel Borrow as per Section M1.03.0 of the Standard Specifications.
2. Crushed Stone as per Section M2.01.0 of the Standard Specifications, per gradation table,
3. Peastone (Filter Blanket) as per Section M2.01.6 of the Standard Specifications
4. Dense Graded Crushed Stone as per Section M2.01.7 of the Standard Specifications.
5. Sand Borrow as per Section M1.04.0 Sand Borrow of the Standard Specifications
6. Stone for Pipe Ends as per Section M2.02.3 of the Standard Specifications

E. Submittals

1. Shop Drawings
    a. Provide sieve analysis when gradation requirements are given in the Specification.

2. Samples

a. Furnish representative sample including location of source with Shop Drawing transmittal sheet.

F. Quality Assurance

1. Field Samples

a. All materials furnished by the Contractor to be incorporated into the Work shall be subject to the inspection of the Engineer. The Engineer shall be the sole judge as to the acceptability of proposed materials and said judgment shall be final, conclusive, and binding.

G. Delivery, Storage and Handling

1. Handling

a. Handle, haul, and distribute materials and all surplus materials on the different portions of the Work, required to complete the Work in accordance with the Contract Documents.

b. Provide suitable storage room for materials and equipment during the progress of the Work, and be responsible for the protection, loss of, or damage to materials and equipment furnished under this Contract, until the final completion and acceptance of the Work.

c. Pay all storage and demurrage charges by transportation companies and vendors.

2. Storage of Excavated Material

a. Place excavated materials and equipment to be incorporated in the Work so as not to injure any part of the Work or existing facilities and so that free access can be had at all times to all parts of the Work and to all public utility installations in the vicinity of the Work.

b. Materials shall be kept neatly piled and compactly stored in such locations as will cause a minimum of inconvenience to public travel and adjoining owners, tenants and occupants.

H. Related sections, without limitation, include:

1. Section 31 20 00, EARTH MOVING

2. Section 32 10 00, ASPHALT PAVING

PART 2 - PRODUCTS

2.1 MATERIALS

A. Crushed Stone

1. Gradation on accordance with Table M2.01.0-1 Tabulation of Stone Sizes – Percent by Weight Passing Through of the Standard Specifications.

2. For bedding and pipe zone material for pipe larger than 3 inches diameter. Well graded in size from 3/8 inches to 3/4 inches or such other sizes as may be approved.
3. For bedding and pipe zone material for plastic pipe 3 inches diameter and less, maximum particle size shall be 3/8 inches.
4. Clean, hard, and durable particles or fragments, free from dirt, vegetation, or other objectionable matter, and free from an excess of soft, thin elongated, laminated or disintegrated pieces.
5. Screened Stone of similar size and grading to this specification may be used instead of Crushed Stone.

B. Gravel Borrow

1. Granular material well graded from fine to coarse with a maximum size of 3 inches, obtained from approved natural deposits and unprocessed except for the removal of unacceptable material and stones larger than the maximum size permitted.
2. Gravel shall not contain vegetation, masses of roots, or individual roots more than 18 inches long or more than 1/2 inches in diameter.
3. Gravel shall be substantially free from loam and other organic matter, clay and other fine or harmful substances.
4. Gradation requirements for gravel shall be in accordance with Table M1.03.0-1 Gradation Requirements for Gravel Borrow of the Standard Specifications.

C. Peastone

1. Crushed Stone material of even gradation
2. Aggregate shall be 3/8” in size, and be in accordance with MassDOT standard M2.01.6
3. Peastone shall be comprised of hard durable particles of stone.

D. Dense Graded Crushed Stone

1. Sub-base material combining crusher-run coarse aggregates of crushed stone and fine aggregates uniformly premixed with a predetermined quantity of water.
2. Coarse aggregate shall consist of hard, durable particles of fragments of stone.
3. Materials that break up when alternately frozen and thawed or wetted and dried shall not be used.
4. Coarse aggregate shall have a percentage of wear, by the Los Angeles test, of not more than 45.
5. Fine aggregate shall consist of natural or crushed sand. The composite material shall be free from clay, loam or other plastic material.
6. Dense Graded Crushed shall meet the gradation requirements in Table M2.01.7-1 Gradation Requirements for Dense Graded Crushed Stone for Subbase of the Standard Specifications.

E. Sand Borrow

1. 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.
2. The allowable amount of material passing a No. 200 sieve as determined by AASHTO T 11 shall not exceed 10% by weight.
3. Maximum particle size shall be ¼ inch.
4. Sand Borrow shall meet the requirements of Section M1.04.0 Sand Borrow of the Standard Specifications, with the exception that processed glass aggregate shall not be used.

F. Stone for Pipe Ends

1. Shall be sound, durable rock which is angular in shape. Rounded stones, boulders, sandstone or similar stone or relatively thin slabs will not be acceptable.
2. Each stone shall weigh not less than 50 lb not more than 125 lb.
3. At least 75% of the volume shall consist of stones weighing not less than 75 lb each.

2.2 SOURCE QUALITY CONTROL

A. Test, Inspection

1. Engineer may elect to sample material supplied at the source.
2. Assist the Engineer and/or personnel from the designated testing laboratory in obtaining samples.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Crushed Stone

1. Spread in layers of uniform thickness not greater than 6 inches.
2. Compact thoroughly by means of a suitable vibrator or mechanical tamper.

B. Gravel Borrow

1. Spread in layers of uniform thickness not exceeding 8 inches before compaction and moistened or allowed to dry as directed.
2. Compact thoroughly by means of rollers, suitable power-driven tampers or other power-driven equipment.
3. Compaction shall conform to 95% of minimum dry density per ASTM D1557.
4. The percolation rate for the compacted bank-run gravel shall not exceed 5 minutes per inch.

C. Dense Graded Crushed Stone

1. Spread in uniform layers not exceeding 6 inches before compaction and moistened and allowed to dry.
2. Compact thoroughly by means of rollers, suitable power-driven tampers or other power-driven equipment unless otherwise directed by the Engineer.
3. Examine structure and conditions for compliance with requirements

D. Sand Borrow

1. Store so as to prevent contamination with organics, stone, roots or other deleterious materials.
2. Compact subgrade area to receive sand borrow in accordance with Section 3.2 below.
3. Spread uniformly throughout the excavated area to provide a level, stable surface.
4. Avoid contaminating sand with adjacent soils when backfilling and spreading.

E. Stone for Pipe Ends

1. Place stone to line and grade as shown on the plans or as directed on a prepared bed of embankment material or existing materials.
2. Each stone shall be carefully placed by hand, normal to the slope and firmly bedded thereon, unless otherwise methods of placement are approved by the Engineer.
3. Larger stones shall be placed directly at the drainage end to prevent erosion and displacement
4. Remainder of stones shall be so graded that when placed with the larger stones, the entire mass will be compact with a minimum percentage of voids and minimum thickness of 6 in.

3.2 BASE PREPARATION

A. Before placing of any fill, the base areas shall be cleared, and stripped of organic materials and shall be free from soft, spongy areas.

B. Frozen material shall not be placed for any base material under areas to receive embankment, structures, pavement or other areas of the work.

C. Any stone with a dimension greater than that permitted for the type of gravel specified shall be removed from the sub-base before the gravel is compacted.

D. For roadways, compaction shall continue until the surface is even and true to the proposed lines and grades within a tolerance of ⅜ in. above or below the required cross-sectional elevations and to a maximum irregularity not exceeding ⅜ in. under a 10-ft line longitudinally.

E. Any specific area of gravel sub-base which, after being rolled, does not form a satisfactory, solid, stable foundation shall be removed, replaced and recompacted by the contractor without extra compensation

3.3 FIELD QUALITY CONTROL

A. Material and compaction testing

1. In accordance with SECTION 01 41 00 TESTING REQUIREMENTS.
2. Proceed with installation only after unsatisfactory conditions have been corrected.

END OF SECTION

SECTION 31 05 19.13

GEOTEXTILES FOR EARTHWORK

PART 1 - GENERAL

1.1 SUMMARY

A. Related Documents

1. American Society for Testing and Materials (ASTM)

a. D3786, Test Method for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics: Diaphragm Bursting Strength Tester Method

b. D4355, Test Method for Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus)

c. D4491, Test Method for Water Permeability of Geotextiles by Permittivity

d. D4533, Test Method for Trapezoid Tearing Strength of Geotextiles

e. D4632, Test Method for Grab Breaking Load and Elongation of Geotextiles

f. D4751, Test Method for Determining Apparent Opening Size of a Geotextile

g. D4833, Test Method for Index Puncture Resistance of Geotextiles, Geomembranes and Related Products

h. D5261, Measuring Mass Per Unit Area of Geotextiles.

i. D6241, Standard Test Method for the Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe.

j. D4759-02, Standard Practice for Determining the Specification Conformance of Geosynthetics

k. D6637, Standard Test Method For Determining Tensile Properties of Geogrids by the Single or Multi-Rib Tensile Method

l. D7737-11, Standard Test Method for Individual Geogrid Junction Strength

m. D7748/D7748M-14, Standard Test Method for Flexural Rigidity of Geogrids, Geotextiles, and Related Products

n. D7864/D7864M-15, Standard Test Method for Determining the Aperture Stability Modulus of Geogrids

o. D4355-05, Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus

B. Section Includes, without limitation, providing:

1. Requirements for installation of geotextile filter fabric in trenches and under riprap.

2. Requirements for installation of Geogrid under pavements.

C. Related Sections

1. Section 31 05 16, AGGREGATES FOR EARTHWORK
2. Section 31 20 00, EARTH MOVING

1.2 QUALITY ASSURANCE

A. General

1. Producer of fabric and geogrid to maintain competent laboratory at point of manufacture to insure quality control in accordance with ASTM testing procedures.
2. Laboratory to maintain records of quality control results.

1.3 SUBMITTALS

A. Shop Drawings

1. Submit in accordance with requirements for submittals.
2. Include manufacturer's recommended method of joining of adjacent fabricand geogrid panels.

B. Certificate of Conformance

1. Upon each shipment/delivery of product to the work site, furnish mill certificate(s) from the company manufacturing the fabric or goegrid attesting that the product meets the chemical, physical, manufacturing and performance requirements specified. Product will be rejected if it is found to have defects, rips, flaws, deterioration, or other damage.

1.4 DELIVERY, STORAGE AND HANDLING

A. Provide product in rolls wrapped with a heavy-duty protective covering to protect from mud, dirt, dust, debris, and other deleterious sources until it is installed. Label each roll with number or symbol to identify production run.

B. Do not expose fabric to ultraviolet radiation (sunlight) for more than 20 days total in period of time following manufacture until fabric is installed and covered.

C. If Engineer determines material is damaged in any way or has excessive sunlight exposure, the Contractor shall immediately make all repairs and replacements as directed by the Engineer, at no additional cost to the Owner.

1.5 SCHEDULING

A. Schedule Work so that the covering of the fabric or geogrid with a layer of the cover material is accomplished immediately after inspection and approval of the placed fabric by the Engineer. Failure to comply with this requirement may require replacement of the fabric or geogrid.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER/MATERIAL – GEOTEXTILE FABRIC

A. The geotextile fabric shall be nonwoven polypropylene designated as MIRAFI 140N as manufactured by Nicolon Corporation/Mirafi Group, Norcross, Georgia; or acceptable equivalent and shall meet the following minimum requirements:

Property (Unit)	Unit	Test Method	Minimum Requirements
Weight	oz/sy	ASTM D5261	4.3
Grab Tensile Strength	lbs	ASTM D4632	120
Grab Tensile Elongation	%	ASTM D4632	50
Mullen Burst Strength	psi	ASTM D3786	240
Puncture Strength	lbs	ASTM D6241	310
Trapezoid Tear Strength	lbs	ASTM D4533	50
Apparent Opening Size (AOS)	US Std. Sieve (mm)	ASTM D4751	70 (0.21)
Permittivity	sec -1	ASTM D4491	1.5
Permeability	cm/sec	ASTM D4491	0.22
Flow Rate	gal/min/sf	ASTM D4491	120
Ultraviolet Resistance (strength retained at 500 hrs)	%	ASTM D4355	70

B. To keep the number of overlay joints to a minimum, fabric shall be provided in sections not less than 12.5 feet in width unless otherwise approved by the Engineer prior to delivery to the site.

2.2 ACCEPTABLE MANUFACTURER/MATERIAL – GEOGRID

A. Geogrid shall be geogrid designated as NX 750 as manufactured by Tensar Corporation, a division of CMC, Alpharetta, Georgia; or acceptable equivalent.

B. Geogrid shall be manufactured from a coextruded, composite polymer sheet, punched and oriented, and designed for base stabilization and subgrade improvement.

C. Geogrid shall satisfy the following general properties:

Aperture shapes	Hexagonal, Trapezoidal, & Triangular
Structure	Coextruded & Integrally Formed
Rib shape	Rectangular
Continuous parallel rib pitch(2), mm (in)	80 (3.2)
Rib aspect ratio(3)	> 1.0
Node thickness(2), mm (in)	3.5 (0.14)
Color identification	White / Black / White

PART 3 - EXECUTION

3.1 SUBGRADE PREPARATION

A. For Riprap

1. Prepared areas to receive geotextile in accordance with Section 31 20 00, EARTH MOVING.
2. Clear subgrade of all sharp objects, large stones, roots, debris, or any other foreign materials that may contribute to puncturing, shearing, rupturing, or tearing of the geotextile.
3. Grade area as smooth as possible and compact in accordance with Section 31 20 00, EARTH MOVING, with a vibratory roller or other method approved by the Engineer.
4. Inspect subgrade and repair all unstable areas or soft spots with the installation of gravel and recompact prior to the placement of geotextile.

3.2 FABRIC INSTALLATION

A. Fabric Installation in Trenches

1. In accordance with manufacturers recommendations
2. Place fabric in trench prior to placing crushed stone pipe bedding.
3. Overlap fabric 18-inches minimum for unsewn lap joints.
4. Do not permit equipment to travel directly on fabric.
5. Place fabric in smooth condition to prevent tearing or puncture.
6. Lay fabric loosely, without wrinkles or creases.
7. Leave slack in fabric to allow for adjustment.

3.3 GEOGRID INSTALLATION

A. Place at the locations shown on the Contract Drawings.

B. Install in accordance with manufacturer's recommendations.

C. Unroll directly onto the first layer of gravel subbase in a continuous manner. Join adjacent sections in accordance with manufacturer's recommendations.

D. Lay geogrid smooth, maximizing surface contact with the ground, free of tension, stress, folds, wrinkles, or creases.

E. Spread cover material in a manner that avoids creating undue tension, stress, sagging, buckling and/or other movement of the underlying fabric.

3.4 PROTECTION

A. Protect the work before, during and after installation, and protect the installed work covered by other Sections.

3.5 REPAIR

A. Geotextile fabric damaged during installation shall be repaired by a piece of geotextile material cut, placed, and adequately anchored over the damaged area, subject to a 3-foot minimum overlap requirement or as directed by the Engineer.

B. If detrimental movement of the geotextile fabric occurs during any step of the installation, as determined solely by the Engineer, the Contractor shall remove the cover material and/or sections of fabric to the limits deemed necessary and reinstall the fabric.

C. Any fabric damage during its installation or during placement of cover materials shall be replaced by the Contractor at no additional cost to the Owner.

END OF SECTION

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SECTION 31 10 00

SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section 01 11 00, SUMMARY OF WORK.

1.2 SUMMARY

A. This Section includes, without limitation, the following:

1. Protecting existing trees and vegetation to remain including installation of protective fencing, fencing, tree protection and any temporary safety barricade.
2. Removing trees, shrubs and other vegetation.
3. Clearing and grubbing.
4. Topsoil and subsoil stripping and stockpiling.
5. Removing above-grade site improvements for off-site disposal.
6. Salvage of above-grade site improvements for re-use on site.
7. Removal of designated pavements.

B. Related Sections include the following:

1. Division 01 Section 01 50 00, TEMPORARY FACILITIES AND CONTROLS,
2. Division 31 Section 31 20 00, EARTH MOVING,
3. Division 32 Section 32 01 93 CONTROL OF INVASIVE PLANT SPECIES,
4. Division 32 Section 32 92 19, SEEDING AND LAWN ESTABLISHMENT,

1.3 DEFINITIONS

A. Topsoil: Natural or cultivated surface-soil layer (typically the A horizon) containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; free of subsoil, clay lumps, gravel, and other objects more than [2 inches] in diameter; and free of weeds, roots, and other deleterious materials. Limited topsoil exists at this site. Refer to Geotechnical Report.

B. Subsoil: Naturally occurring weathered moraine material, typical 12”-24” depth located immediately under the topsoil and atop the residual moraine material.

C. Remnant Pavement: Friable bituminous asphalt, consisting of tar and sand layers, found in portions of previously developed areas of the site, typically 3”-8” below the surface. Refer to Geotechnical Report.

D. Standard Specifications or SSHB: "Standard Specifications for Highways and Bridges", Commonwealth of Massachusetts, Department of Transportation, 2023 edition, including all supplements.

E. Remove and Dispose: Separate, cut, excavate or otherwise detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

F. Remove and Salvage: Detach items from existing construction and deliver them to Owner.

G. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

H. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed, and salvaged, or removed and reinstalled.

1.4 MATERIALS OWNERSHIP

A. Except for materials indicated to be stockpiled or to remain Owner's property, all cleared and demolished materials shall become Contractor's property and shall be removed from the site.

1.5 SUBMITTALS

A. Qualified arborist, licensed in Massachusetts, with minimum of five (5) years of experience, to plan and manage the clearing and grubbing work.

B. Product data for fencing and related materials to protect existing vegetation.

C. Photographic documentation, sufficiently detailed, of existing vegetation or conditions of trees and plantings, adjoining construction, and site improvements that might be adversely impacted by site clearing.

D. Record drawings according to Division 1, Section 01 77 00, CONTRACT CLOSEOUT.

1. Identify and accurately locate capped utilities and other subsurface structural, electrical, and mechanical conditions..

1.6 QUALITY ASSURANCE

A. Preconstruction Conference: Conduct conference and site walk at to review limits of work at the Project site. Comply with requirements in Division 1, Section 01 01 90, COORDINATION AND MEETINGS. Coordinate meeting to include full review of project sediment and erosion control requirements.

B. All work shall comply with all codes, rules, regulations, laws, and ordinances for the Town of Yarmouth and the Commonwealth of Massachusetts, and all other authorities having jurisdiction.

1.7 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.

2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

B. Improvements on Adjoining Property: Authority for performing indicated removal and alteration work on property adjoining Owner's property will be obtained by Owner before award of Contract.

1. Peripheral areas outside the Contract limit line shall not be disturbed or used for storing materials.

C. Salvageable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.

D. Notify utility locator service for area where Project is located before site clearing.

E. Review and verify all limits or improvements to be removed prior to commencing demolition operations.

F. Inspection: Verify existing condition of all items scheduled for demolition or removal. The Owner assumes no responsibility for the actual condition of structures or utilities to be demolished. Do not proceed with any work that will result with unsafe conditions causing a continuing or permanent hazard. Ascertain that all work scheduled for demolition can be safely accomplished in a proper time period.

G. Benchmarks: Protect all survey monuments, benchmarks, and property boundary pins. Replace if destroyed by Contractor’s operations. Relocate designated monuments where and as directed by the Owner or Engineer. Coordinate and schedule work with Owner.

H. Permits/Fees: Coordinate with appropriate utility companies and pay any disconnect fees and obtain permits as necessary.

I. Provide 48 hour notice to the Engineer and Owner prior to conducting any site clearing, grubbing and demolition operation. Limits must be approved prior to start of work.

PART 2 - PRODUCTS

2.1 PROTECTIVE FENCING

A. Snow Fence: Wood slat snow fence comprised of 3/8” x 1.5” slats secured between a minimum of four strands of 14.ga. metal wire, minimum of 4’-0” in height.

B. Metal Fence Posts: Steel U-shaped, posts, with loops to secure fence, 6’-0” minimum.

2.2 PRUNING SEALER

A. Sealer designed to seal tree wounds, cuts to roots and branches. Product shall be designed to provide a flexible, watertight seal. Brush applicator.

1. TreeKote Tree Wound Dressing Wound Dressing as manufactured by Walter Clark and Son, 550 Grassy Hill Rd. Orange, CT, or approved equal.

PART 3 - EXECUTION

3.1 PREPARATION

A. Identify and/or establish on-site Benchmarks in locations convenient for construction operations. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Locate and clearly flag all limits of clearing, including trees and vegetation to remain or to be relocated. Place flagging every 25' oc. Review with Engineer, Landscape Architect, Town Planning & Conservation Staff, and Owner for acceptance.

C. Adjust path and trail alignments, edges of work limits if so directed to preserve specimen trees, shrubs, or other sensitive vegetation or habitats if so identified and directed.

D. Coordinate work with Invasive Plant Management operations. Adjust limits as necessary to accomplish invasive plant management work integrally to the clearing and grubbing operations.

E. Avoid distributing invasive plant roots, vegetation, bark, seeds, etc. during any removal work. Follow the protocols of the approved IPMS Plan.

F. Adjustments to clearing, grubbing, and pruning operations shall typically be made with off-set adjustments by shifting alignments to avoid trees and site features, modifying the footprint of work but not significantly altering the area of work, and as such shall be incidental to the project unless determined to have other significant differences from the work shown on the plans. Coordinate with the Engineer adjustments during staking operations.

G. .Protect existing any extant trees and site improvements shown to remain from damage during construction. Restore damaged improvements to their original condition, as acceptable to Owner.

H. Provide erosion control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways. Refer to Division 31, Section, 31 25 00 EROSION AND SEDIMENT CONTROL.

3.2 TREE PROTECTION

A. Erect and maintain protective fencing at the edge of all vegetation shown to remain that is adjacent to the Work and around drip line of individual trees or around perimeter drip line of groups of trees to remain. Remove fence when construction is complete. Post spacing shall be 6'-0" on center. Securely attach fencing to posts, including providing a top tension line, woven through top of fabric.

1. Do not store construction materials, debris, or excavated material within drip line of remaining trees.

2. Do not permit vehicles, equipment, or foot traffic within drip line of existing trees to remain.

B. Do not excavate within drip line of existing trees to remain, unless otherwise indicated.

C. Where excavation for new construction is required within drip line of trees, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and then cleanly cut roots as close to excavation as possible.

1. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.

2. Coat cut faces of roots more than 1-1/2 inches in diameter with tree pruning sealer formulated pruning cut and tree injuries. .

3. If so, directed by the Engineer, cover exposed roots with wet burlap to prevent roots from drying out. Backfill with soil as soon as possible.

D. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by the Engineer.

1. Replace trees that cannot be repaired and restored, as determined by the qualified arborist.

3.3 UTILITIES

A. Use care when working near existing utilities where shown to remain. The Contractor shall coordinate site clearing and grubbing work with overhead power lines on site. Arrange for disconnecting, removal and or sealing of utilities shown to be removed or abandoned.

3.4 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, grass, and other vegetation to permit installation of new construction. Removal includes digging out stumps and obstructions and grubbing roots. Selectively clear trees and prune branches with in 20’ of clearing limit line or property line. Pruning to conform to Class III Standards.

1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.

2. Selectively prune and cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.

3. Cut vegetation resulting in exposed stumps at the edges of the Limit of Work may be able to be ground down to 3” below grade. Review each location with the Engineer for acceptance of this approach.

4. Typically, where site improvements are shown, completely remove stumps, roots, obstructions, and debris y extending to a depth of 36 inches below finish grade.

5. Unless approved otherwise, use only hand methods for grubbing within drip line of remaining trees.

6. Along property lines, notify Engineer before beginning clearing operations. Coordinate clearing, grubbing and selective pruning with Engineer, to maintain as much existing vegetation as is practical.

B. Fill depressions caused by clearing and grubbing operations with satisfactory on-site material unless further excavation or earthwork is indicated.

1. Place fill material in horizontal layers not exceeding 8-inch loose depth and compact each layer to a density equal to adjacent original ground.

3.5 TOPSOIL STRIPPING

A. The site has limited topsoil and mixed soil horizons. Identify any material that can be salvaged and stockpiled for re-use.

B. When working in wooded areas, manage soil for re-use in proximity to where excavation operations generated the material. Avoid unnecessary movement of soils.

C. Strip topsoil materials to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.

1. Strip surface soil of unsuitable topsoil, including trash, debris, weeds, roots, and other waste materials.

2. Where trees are indicated to remain, hold stripping a sufficient distance away to prevent damage to the root system.

D. Stockpile materials away from edge of excavations without intermixing with other soil materials. Grade and shape stockpiles to drain surface water, in locations approved by the Owner and consistent with sediment and erosion control requirements.

1. Do not stockpile topsoil within drip line of trees shown to remain.

3.6 SITE IMPROVEMENTS

A. Remove existing above and below-grade improvements as indicated and as necessary to facilitate new construction.

B. Remove all slabs, foundations, paving, curbs, gutters, and all base/subbase material as indicated to full depths encountered, unless specifically noted otherwise.

1. Neatly saw-cut length of existing pavement to remain before removing existing pavement. Saw-cut faces vertically, perpendicular and or when appropriate, parallel to direction of traffic.

2. The Contractor shall remove existing surficial pavements from site unless an alternative approach such as crushing for on-site use is approved by the Engineer.

C. Remove existing site improvements, including pavements, fences of various types, and signage.

3.7 DISPOSAL

A. Disposal: Remove unsuitable soil material, debris, rubbish, concrete, asphalt cleared and grubbed material, obstructions, demolished materials, and waste materials, including trash and debris, and legally dispose of them off Owner's property. No burning or burying on site is permitted.

B. Accumulation of disposal/waste materials on-site is not permitted.

C. All pavement demolition material remains the property of the Contractor except as specifically noted to be retained or permitted to be re-used on-site.

3.8 MAINTENANCE

A. Maintain all fencing in good condition for the duration of the project. Replace damaged sections or posts as required as part of the Work.

B. The Contractor shall maintain all areas within the project limits, for the duration of the contract. This maintenance will include the line-trimming or mowing of excessive weed or grass growth, within project limits, as well as routine collection and removal of branches, rubbish, and any other similar debris generated or found on the job site.

END OF SECTION

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SECTION 31 20 00

EARTH MOVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes, without limitation, providing:

1. Requirements for; cutting, filling, shaping, excavating in earth for trenches and structures; backfilling excavations; furnishing necessary fill and aggregate materials compaction; constructing embankments and fills; miscellaneous earth excavations and miscellaneous grading.

B. Intent:

1. The project requires re-use of onsite soils to the maximum extent possible. Topsoil material where found on site may be stockpiled for possible re-use. Existing soils shall be cut, shaped, excavated, stockpiled and re-distributed for use as on-site fill (Type OS Fill) as indicated on the plans and as directed by the Engineer. Once on site materials have been fully utilized and placed, imported, ordinary fill may be utilized.

2. Existing, remnant bituminous asphalt pavements exist at or below the surface. Remnant pavement may not be visible on the surface. Refer to the Geotechnical Report. When remnant pavement is encountered it shall be excavated and crushed, broken up with tracked equipment or otherwise pulverized for re-use on site. The crushed material may be mixed with on-site soils and placed in areas identified to receive pavement, installed below the reservoir or gravel base. The material produced thru earthwork operations on site shall match the specifications shown for fill per Table 2 of the Geotechnical Report.

C. Extent:

1. Applicable to all excavation, grading, shaping, cutting, excavating utility trenches, compacting, backfilling and all associated civil site work.

2. Applicable to excavation, compacting and backfilling for structures and foundations.

3. Section shall not be applicable to landscaping elements and associated work. Earth moving requirements applicable to landscaping elements shall be found in the landscaping / planting specifications.

D. Related documents:

1. Commonwealth of Massachusetts Department of Transportation, 2023 Standard Specifications for Highways and Bridges, including all addenda, (referred to as the Standard Specification).

2. American Society for Testing and Materials (ASTM).

3. D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).

E. Quality Assurance

1. Field Samples

a. Provide samples of materials as requested by the Engineer, to the Quality Control Engineer hired by the Owner, prior to delivery of materials on site, in order to facilitate field testing of compaction operations and material properties.

2. Project/ Site Conditions

a. Existing Conditions

1) There may be pipes, drains, and other utilities in locations not indicated on drawings, no attempt has been made to show all services and completeness or accuracy of information given is not guaranteed.

3. Maintenance

a. Maintain sitework in accordance with SECTION 31 25 00 EROSION & SEDIMENT CONTROL.

b. Provide and maintain all necessary safety protections for excavations.

F. Related sections, without limitation, include:

1. Section 01 41 00, TESTING REQUIREMENTS

2. Section 03 30 00, CAST-IN-PLACE CONCRETE

3. Section 31 05 16, AGGREGATE FOR EARTHWORK

PART 2 - PRODUCTS

2.1 MATERIALS

A. Trench and Excavation Backfill

1. In general, and unless other material is indicated on drawings or specified, material used for backfilling trenches and excavations shall be suitable material which was removed in the course of making the construction excavations. If sufficient suitable material is not available from the excavations, the backfill material shall be crushed stone, or gravel borrow as directed by the Engineer, in according to respective Specification Sections.

B. Filling and Embankment Backfill

1. Suitable select on-site material (Type OS Fill) available from site grading, and excavations determined not required for backfill around pipes or against structures may be used for filling and building embankments, except if otherwise specified. Material needed in addition to that available from construction operations on site shall be obtained from suitable gravel banks or other suitable off-site sources.

2. Imported Ordinary Fill shall be used for embankments when suitable material from excavation is not available, and use of other aggregate materials are not specified or directed by the Engineer.

a. Ordinary Fill shall consist of an off-site material satisfactory to the Engineer and not specified as gravel borrow, sand borrow, or other particular kind of borrow.

b. The material shall have the physical characteristics of soils designated as group A-1, A-2-4 or A-3 under AASHTO M 145. It shall have properties such that it may be readily spread and compacted for the formation of embankments.

C. Additional materials

1. Crushed stone: In accordance with SECTION 31 05 16, AGGREGATES FOR EARTHWORK.

2. Gravel borrow: In accordance with SECTION 31 05 16, AGGREGATES FOR EARTHWORK.

2.2 EQUIPMENT

A. Well Points

1. Designed to drain soil and prevent saturated soil from flowing into excavation.

B. Pumping Units

1. Designed for use with the well points, capable of maintaining a high vacuum and handling large volumes of air and water at the same time.

C. Underdrain Pipe

1. Perforated HDPE pipe enclosed in crushed stone encased in filter fabric.

2.3 SOURCE QUALITY CONTROL

A. Provide Engineer with access to location of offsite sources of materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify all existing utilities and facilities prior to excavation.

3.2 PROTECTION

A. Utilities

1. Support and protect from damage existing pipes, poles, wires, fences, curbing, property line markers, and other structures, which the Engineer decides must be preserved in place without being temporarily or permanently relocated.

Restore items damaged during construction without compensation, to a condition at least equal prior to construction.

B. Trees

1. Enclose the trunks of trees adjacent to work with substantial wooden boxes of height necessary to protect trees from injury from piled material, equipment, operations or otherwise.

2. Employ excavating machinery and cranes of suitable type and size and operate with care to prevent injury to trees not to be cut and particularly to overhanging branches and limbs.

3. When trimming is required, make all cuts smooth and neat without splitting or crushing.

4. Cover cut areas with an application of grafting wax or tree healing paint.

5. Branches, limbs, and roots shall not be cut except by permission of the Engineer.

C. Plantings

1. Protect by suitable means or temporarily replant and maintain cultivated hedges, shrubs, and plants which may be injured by the Contractor's operations.

2. Replant in their original positions and care for until growth is re-established once the construction operations have been substantially completed.

3. If cultivated hedges, shrubs, and plants are injured to such a degree as to affect their growth or diminish their beauty or usefulness, they shall be replaced by items of kind and quality at least equal to which existed prior to the start of the Work.

D. Paved surfaces

1. Do not use or operate tractors, bulldozers, or other power-operated equipment with treads or wheels shaped as to cut or injure paved surfaces.

2. All surfaces which have been injured by the Contractor's operations shall be restored to a condition at least equal to which existed prior to start of the Work.

3. Suitable materials and methods shall be used for such restoration.

3.3 PREPARATION

A. Pavement Removal

1. Remove only existing pavement as necessary for the prosecution of the work.

2. Engineer may require that pavement be cut with pneumatic tools or saws without extra compensation to Contractor, where in the opinion of the Engineer it is necessary to prevent damage to the remaining road surface.

3. Dispose of large pieces of broken pavement before proceeding with excavation.

B. Topsoil Removal

1. From areas which excavations are to be made, loam and topsoil shall be carefully removed and separately stored to be used again as directed; or, if the Contractor prefers not to separate surface materials, he shall furnish, as directed, loam and topsoil at least equal in quantity and quality to that excavated.

C. Subgrade

1. Remove loam and topsoil, loose vegetable matter, stumps, large roots, etc., from areas where embankments will be built, or material will be placed for grading.

2. Shape as indicated on the drawings and prepare by forking, furrowing, or plowing to bond first layer of the new material placed.

3.4 RELOCATION AND REPLACEMENT OF EXISTING STRUCTURES

A. The structures to which the provisions of this article apply include pipes, wires, and other structures which meet all the following:

1. Are not indicated on the drawings or otherwise provided for.

2. Encroach upon or are encountered near and substantially parallel to the edge of the excavation.

3. In the opinion of the Engineer will impede progress to such an extent that satisfactory construction cannot proceed until they have been changed in location, removed (to be later restored), or replaced.

B. In removing existing pipes or other structures, the Contractor should use care to avoid damage to materials, and the Engineer shall include for payment only those new materials which, in his judgment, are necessary to replace those unavoidably damaged.

C. Whenever the Contractor encounters certain existing structures as described above and is so ordered in writing, he shall do the whole or such portions of the work as he may be directed to change the location of, remove and later restore, or replace such structures, or to assist the Owner thereof in so doing. For all such work, the Contractor shall be paid under such items of work as may be applicable, otherwise as Extra Work.

D. When fences interfere with the Contractor's operations, he shall remove and (unless otherwise specified) later restore them to a condition which existed prior to the start of the Work, all without additional compensation. The restoration of fences shall be done as promptly as possible and not left until the end of the construction period.

3.5 SHEETING AND BRACING

A. Furnish, put in place, and maintain such sheeting, bracing, etc., as necessary to support the sides of the excavation and to prevent any movement of earth which could in any way diminish the width of the excavation to less than that necessary for proper construction, or could otherwise injure or delay the work, or endanger adjacent structures.

B. Whenever possible, sheeting shall be driven ahead of the excavation to avoid loss of material from behind the sheeting. If it is necessary to excavate below the sheeting, care shall be taken to avoid trimming behind the face along which the sheeting will be driven. Care shall be taken to prevent voids outside of the sheeting, but, if voids occur, they shall be filled immediately with sand and compacted.

C. Leave in place to be embedded in the backfill, or concrete, all sheeting, bracing, etc., which is indicated on the drawings to be left in place. Leave in place any and all other sheeting, bracing,

etc., which the Engineer may direct to leave in place, at any time during the progress of the work, for the purpose of preventing injury to structures or property.

D. The Engineer may direct that sheeting and bracing to be left in place be cut off at any specified elevation.

E. All sheeting and bracing not to be left in place shall be carefully removed in such manner as not to endanger the construction or other structures. All voids left or caused by the withdrawal of sheeting shall be backfilled immediately using suitable materials and compaction methods.

3.6 DEWATERING

A. Ensure proper conditions at all times during construction, provide and maintain ample means and devices (including spare units kept ready for immediate use in case of breakdowns) to intercept and/or remove promptly and dispose properly all water entering trenches and other excavations. Keep excavations dry until the structures, pipes, and appurtenances to be built therein have been completed to such extent that they will not be floated or otherwise damaged.

B. Dispose of all water pumped or drained from the work in a suitable manner without undue interference with other work, damage to pavements, other surfaces, or property. Provide suitable temporary pipes, flumes, or channels for water that may flow along or across the site of the work.

C. Provide adequate sedimentation and/or erosion control methods at all times to ensure soil stabilization and protection of surrounding areas including any designated wetlands and/or waterways encountered.

D. Underdrains

1. Temporary underdrains, if used, shall be laid in trenches beneath the grade of the structure. Trenches shall be of suitable dimensions to provide room for the chosen size of underdrain and its surrounding gravel.

2. Underdrains, if used, shall be laid at a suitable distance below the bottom of the normal excavation and with open joints wrapped in cheesecloth or filter fabric approved by the Engineer, and surrounded by graded gravel, or crushed stone to prevent the admission of sand or other soil into the underdrains. The distance between the bottom of the pipe or structure and the top of the bell of the underdrain pipe shall be at least 3 in. unless otherwise permitted. The space between the underdrain and the pipe or structure shall be filled with graded gravel or crushed stone which shall be rammed if necessary and left with a surface suitable for laying the pipe or building the structure.

E. Drainage Well Point System.

1. If necessary, dewater the excavations by means of an efficient drainage wellpoint system which will drain the soil and prevent saturated soil from flowing into the excavation.

2. The installation of the wellpoints and pump shall be done under the supervision of a competent representative of the manufacturer. The Contractor shall do all special work such as surrounding the wellpoints with sand or gravel or other work which is necessary for the wellpoint system to operate for the successful dewatering of the excavations.

3.7 EXCAVATION

A. Execute operation of dewatering, sheeting, and bracing without undermining or disturbing foundations of existing structures or of work previously completed under this contract.

B. Excavate to widths that provide suitable room for:

1. Building structures or laying and jointing piping.

2. Placing all sheeting, bracing, and supports.

3. Cofferdamming, pumping and draining.

C. Render bottom of excavations firm, dry and acceptable in all respects.

D. Do not plow, scrape, or dig by machinery, earth at finished subgrade which results in disturbance of material below subgrade, unless indicated or specified, and remove with pick and shovel, last of material to be excavated, just before placing pipe, masonry, or other structure.

E. Make all excavations in open, except as otherwise specified or permitted.

F. Excavation Near Existing Facilities

1. As the excavation approaches pipes, conduits, or other underground structures, digging by machinery shall be discontinued and the excavation shall be done by means of hand tools. Such manual excavation when incidental to normal excavation shall be included in the work to be done under items involving normal excavation.

G. Unauthorized Excavation

1. If the bottom of any excavation is taken out beyond the limits indicated or prescribed, the resulting void shall be backfilled at the Contractor's expense with thoroughly compacted gravel borrow, if the excavation was for a pipeline, or with Class B concrete, if the excavation was for a masonry structure.

H. Unsuitable Material

1. If material unsuitable for foundation (in the opinion of the Engineer) is found at or below the grade to which excavation would normally be carried in accordance with the drawings and/or specifications, the Contractor shall remove such material to the required width and depth and replace it with thoroughly compacted, crushed stone, gravel borrow, fine aggregate or concrete as directed.

3.8 TRENCHING

A. Trench Excavation

1. Where pipe is to be laid in specified bedding material or concrete cradle, the trench may be excavated by machinery to, or to just below, the designated subgrade, provided that the material remaining at the bottom of the trench is no more than slightly disturbed, as approved by the Engineer.

2. Where pipe is to be laid directly on the trench bottom, the lower part of trenches in earth shall not be excavated to subgrade by machinery, but, just before the pipe is to be placed, the last of the material to be excavated shall be removed by means of hand tools to form

a flat or shaped bottom, true to grade, so that the pipe will have a uniform and continuous bearing and support on firm and undisturbed material between joints except for limited areas where the use of pipe slings may have disturbed the bottom.

B. Depth Of Trench

1. Excavate trench to depths permitting the pipe to be laid at the elevations, slopes, or depths of cover indicated on the drawings, and at uniform slopes between indicated elevations.

C. Width Of Trench

1. Excavate trench as narrow as practicable and do not widen by scraping or loosening materials from the sides. Every effort shall be made to keep the sides of the trenches firm and undisturbed until backfilling has been completed and consolidated.

2. Excavate trenches with approximately vertical sides between the elevation of the center of the pipe and an elevation 1 ft. above the top of the pipe.

D. Trench Excavation Infill

1. If pipe is to be laid in embankments or other recently filled material, the material shall first be placed to the top of the fill or to a height of at least 1 ft. above the top of the pipe, whichever is the lesser. Particular care shall be taken to ensure maximum consolidation of material under the pipe location. The pipe trench shall then be excavated as though in undisturbed material.

E. Length of trench open at any one time will be controlled by conditions, subject to any limits that may be prescribed by Engineer.

3.9 BACKFILLING

A. General

1. Frozen material shall not be placed in the backfill nor shall backfill be placed upon frozen material. Previously frozen material shall be removed or shall be otherwise treated as required, before new backfill is placed.

B. Fill And Backfill Under Structures

1. The fill and backfill materials shall be placed in layers not exceeding 6 in. in thickness. Unless otherwise indicated or specified, each layer shall be compacted to 95 percent in accordance with ASTM D1557.

C. Backfilling Around Structures

1. Do not place backfill against or on structures until they have attained sufficient strength to support the loads (including construction loads) to which they will be subjected, without distortion, cracking, or other damage. As soon as practicable after the structures are structurally adequate and other necessary work has been done, special leakage tests, if required, shall be made. Promptly after the completion of such tests, the backfilling shall be started and then shall proceed until its completion. The best of the excavated materials shall be used in backfilling within 2 ft. of the structure. Unequal soil pressures shall be avoided by depositing the material evenly around the structure.

2. The material shall be placed and compacted to 90 percent in accordance with ASTM D1557 unless otherwise indicated or specified.

D. Backfilling Pipe Trenches

1. As soon as practicable after the pipes have been laid and the joints have acquired a suitable degree of hardness, if applicable, or the structures have been built and are structurally adequate to support the loads, including construction loads to which they will be subjected, the backfilling shall be started and thereafter it shall proceed until its completion.

2. With the exception mentioned below in this paragraph, trenches shall not be backfilled at pipe joints until after that section of the pipeline has successfully passed any specified tests required. Should the Contractor wish to minimize the maintenance of lights and barricades and the obstruction of traffic, he may, at his own risk backfill the entire trench, omitting or including backfill at joints as soon as practicable after the joints have acquired a suitable degree of hardness, if applicable, and the related structures have acquired a suitable degree of strength. He shall, however, be responsible for removing and later replacing such backfill, at his own expense, should he be ordered to do so in order to locate and repair or replace leaking or defective joints or pipe.

3. No stone or rock fragment larger than 12 in. in greatest dimension shall be placed in the backfill nor shall large masses of backfill material be dropped into the trench in such a manner as to endanger the pipeline. If necessary, a timber grillage shall be used to break the fall of material dropped from a height of more than 5 ft. Pieces of bituminous pavement shall be excluded from the backfill unless their use is expressly permitted, in which case they shall be broken up as directed.

4. Zone Around Pipe

   a. Backfilled with the materials and to the limits indicated on the drawings.

   b. Material shall be compacted to 90 percent by tamping.

5. Remainder of Trench

   a. Compact by water-jetting, or tamping, in accordance with the nature of the material to 95 percent in accordance with ASTM D1557. Water-jetting may be used wherever the material does not contain so much clay or loam as to delay or prevent satisfactory drainage. However, tamping shall be used if water-jetting does not compact the material to the density required.

6. Excavated material which is acceptable to the Engineer for surfacing or pavement subbase shall be placed at the top of the backfill to such depths as may be specified elsewhere or as directed. The surface shall be brought to the required grade and stones raked out and removed.

E. Placing And Compacting Embankment Material

1. After the subgrade has been prepared as hereinbefore specified, the material shall be placed thereon and built up in successive layers until it has reached the required elevation.

2. Layers shall not exceed 12 in. thickness before compaction. In embankments at structures, the layers shall have a slight downward slope away from the structure; in other embankments the layers shall have a slight downward slope away from the center. In general, the finer and less pervious materials shall be placed against the structures or in the center, and the coarser and more pervious materials, upon the outer parts of embankments.

3. Each layer of material shall be compacted by the use of approved rollers or other approved means so as to secure a dense, stable, and thoroughly compacted mass. At such points as cannot be reached by mobile mechanical equipment, the materials shall be thoroughly compacted by the use of suitable power-driven tampers.

4. Previously placed or new materials shall be moistened by sprinkling, if required, to ensure proper bond and compaction. No compacting shall be done when the material is too wet, from either rain or too great an application of water, to compact it properly; at such times the work shall be suspended until the previously placed and new materials have dried out sufficiently to permit proper compaction, or such other precautions shall be taken as may be necessary to obtain proper compaction.

5. The portion of embankments constructed below proposed structures shall be compacted to 95 percent in accordance with ASTM D1557. The top 2 ft. of an embankment below a pavement base shall be compacted to 95 percent. All other embankments shall be compacted to 90 percent in accordance with ASTM D1557.

3.10 METHODS OF COMPACTION

A. Water-Jetting

1. Saturate backfill material throughout its full depth and at frequent intervals across and along the trench until all slumping ceases.

2. Furnish one or more jet pipes, each of sufficient length to reach the specified depth and of sufficient diameter (not less than 1-1/4 in.) to supply an adequate flow of water to compact the material.

3. Equip jet pipe with a quick-acting valve, supply water through a fire hose from a hydrant or a pump having adequate pressure and capacity to achieve the required results.

B. Tamping and Rolling

1. Deposit backfill material and spread in uniform, parallel layers not exceeding 8 in. thick before compaction. Before the next layer is placed, each layer shall be tamped to obtain a thoroughly compacted mass. Care shall be taken that the material close to the bank, as well as in all other portions of the trench, is thoroughly compacted. When the trench width and the depth to which backfill has been placed are sufficient to make it feasible, and it can be done effectively and without damage to the pipe, backfill may, on approval, be compacted by the use of suitable rollers, tractors, or similar power equipment instead of by tamping. For compaction by tamping (or rolling), the rate at which backfilling material is deposited in the trench shall not exceed that permitted by the facilities for its spreading, leveling, and compacting.

2. If necessary to ensure proper compaction by tamping (or rolling), the backfill material shall first be wet by sprinkling. However, no compaction by tamping (or rolling) shall be done when the material is too wet either from rain or too great an application of water to be compacted properly; at such times the work shall be suspended until the previously placed and new materials have dried out sufficiently to permit proper compacting, or such other precautions shall be taken as may be necessary to obtain proper compaction.

C. Miscellaneous Requirements.

1. Whatever method of compacting backfill is used, care shall be taken that stones and lumps shall not become nested and that all voids between stones shall be completely filled with fine material. Only suitable quantities of stones and rock fragments shall be used in the backfill; the Contractor shall, as part of the work done under the items involving earth excavation and rock excavation as appropriate, furnish and place all other necessary backfill material.

2. All voids left by the removal of sheeting shall be completely backfilled with suitable materials, and thoroughly compacted.

3.11 DISPOSAL OF SURPLUS EXCAVATED MATERIALS

A. No excavated materials shall be removed from the site of the work or disposed of by the Contractor except as directed or permitted by the Engineer.

B. Surplus excavated materials suitable for backfill shall be used to backfill normal excavations in rock or to replace other materials unacceptable for use as backfill; shall be neatly deposited and graded so as to make or widen fills, flatten side slopes, or fill depressions; or shall be neatly deposited for other purposes within a haul of 1 mile from the point of excavation; all as directed or permitted and without additional compensation.

C. Surplus excavated materials not needed as specified above shall be hauled away and dumped by the Contractor, at his expense, at appropriate locations, and in accordance with arrangements made by him.

3.12 DISPOSAL OF SPECIAL WASTES (IN MASSACHUSETTS)

A. The Contractor's attention is directed to the requirements set forth by the State of Massachusetts, Department of Environmental Protection, (Mass DEP) regarding "Special Hazardous Wastes" and the proper disposal thereof. All waste materials and debris, as designated by the Owner and/or Engineer, including but not limited to any sewers, storm drains, catch basins, and combined system pipelines and associated structures, or any portions thereof, including but not limited to sludge, grit, sediment, dirt, sand, rock, grease, roots and other liquid, solid or semi-solid materials contained therein, shall be considered Special Hazardous Waste" In addition, any excavated soils contaminated in any manner, as designated by the Owner and/or Engineer, shall also fall under this category and shall be handled the same. When so encountered, all such materials and debris shall be removed to the extent so ordered by the Engineer and properly disposed of in strict compliance with the requirements of the Mass DEP, Division of Waste Management, Rules, and Regulations for Hazardous Waste Management, amended 4/19/92. and other regulating authorities to an approved and certified waste disposal

site. It shall remain the sole responsibility of the Contractor to apply for and obtain all required permits, bonds and/or insurance relative to such disposal. The Contractor shall also pay all costs associated with the disposal, required permits, bonds and insurance with no additional expense to the Owner. All handling of such "Special Hazardous Waste" shall be done in strict compliance with the Mass DEP requirements and/or any other federal, state, or local agency having jurisdiction or authority over the same. Under no circumstances shall sewage, solids or other "Special Hazardous Wastes" removed from the sewer lines be dumped or spilled onto the streets or into ditches, catch basins or storm drains. The Contractor must use watertight and State approved vehicles in transporting any wastes as hereinbefore designated.

B. The Contractor shall indemnify and save harmless the Owner and Engineer and all persons acting for or on behalf of the Owner and Engineer from all claims and liability of any nature or kind, and all damages, costs and expenses, including attorney's fees and penalties, arising from the improper handling, transportation or disposal of "Special Hazardous Wastes" as determined by the RIDEM and/or any other federal, state or local agency having jurisdiction or authority over the same.

3.13 DUST CONTROL

A. During the progress of the Work, maintain the area of activities, by sweeping and sprinkling of streets to minimize the creation and dispersion of dust. If the Engineer decides that it is necessary to use calcium chloride for more effective dust control, the Contractor shall furnish and spread the material, as directed.

3.14 BRIDGING TRENCHES

A. Provide suitable and safe bridges and other crossings where required for the accommodation of travel, and to provide access to private property during construction. Remove once bridges and crossings are no longer needed.

3.15 FIELD QUALITY CONTROL

A. Site Tests - In accordance with SECTION 01 41 00 – TESTING SERVICES REQUIREMENTS.

3.16 CARE AND RESTORATION OF PROPERTY

A. Restoration of existing property or structures done as promptly as practicable and not left until the end of the construction period.

END OF SECTION

SECTION 31 23 29

DEWATERING

PART 1 - GENERAL

1.1 SUMMARY

A. Dewatering specified in this section is applicable to utilities and all other structure.

B. Section Includes

1. Requirements for designing, furnishing, installing, maintaining, operating and removal of temporary dewatering systems required to lower and control water levels and hydrostatic pressures during construction.

2. Requirements for disposing of pumped water.

1.2 DEFINITIONS

A. Dewatering: Lowering the zone of saturation and intercepting groundwater seepage which would otherwise emerge from the slopes or bottom of the excavations. The purposes of dewatering are to increase the stability of excavated slopes; prevent loss of material from beneath the slopes or bottom of the excavation; improve the excavating and hauling characteristics of on-site soil; prevent rupture or heaving of the bottom of an excavation; and dispose of pumped water. In addition, dewatering is required to place and compact structural fill.

1.3 DESIGN REQUIREMENTS

A. The Contractor is responsible for the adequacy of the dewatering system.

B. Design dewatering systems to:

1. Effectively reduce the hydrostatic pressure and lower the groundwater levels to a minimum of 2 feet below excavation in soil.

2. Develop a substantially dry and stable subgrade for the protection of subsequent operations.

3. Result in no damage to adjacent buildings, structures, utilities, and other work, included in this contract.

4. Depressurize stratified layers of sand that may be confined by silt layers so that a stable excavation bottom is maintained.

C. Methods may include sump pumping, single or multiple stage well point, or jet eductor well point systems, deep wells, or combinations thereof.

D. Locate dewatering facilities where they will not interfere with existing utilities, facilities and/or construction work to be done under this Contract.

E. Contractor is responsible to obtain all necessary permits from state and local authorities regarding the operation and discharge of the dewatering system, and to conduct all necessary sampling and testing that may be required by those authorities.

1.4 SUBMITTALS

A. Shop Drawings

1. In accordance with Section 01 33 00 SUBMITTALS, submit the following prior to dewatering system installation:

a. Proposed system components.

b. Operational plan to include locations and depth of components.

c. Method of disposal of pumped water, including method of ensuring proper sediment removal should upset in dewatering system occur.

B. Quality Assurance/Control Submittals

1. In accordance with Section 01 33 00 SUBMITTALS, submit the following:

a. Dewatering systems to be designed under the direct supervision of a professional Civil Engineer registered in the state which the work is to be done.

b. Complete Certificate of Design at the end of this section.

c. Provide documentation demonstrating ability and experience of installing contractor for the type of conditions under this contract.

d. Names, addresses and telephone numbers of supervisory personnel actively involved in at least five successful projects requiring dewatering.

1.5 PROJECT/SITE CONDITIONS

A. Environmental Requirements

1. Dispose of all pumped water in accordance with local agencies having jurisdiction.

B. Existing Conditions

1. Groundwater Measurements have been made previously and are noted, refer to Attachments.

2. Groundwater surface is subject to fluctuations during periods of heavy precipitation.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.1 SITE PREPARATION

A. Surface Drainage

1. Construct dikes, ditches, pipelines, sumps, or other means to intercept and divert precipitation and surface water away from excavations.

B. Drainage of Excavated Areas

1. Construct dikes, ditches, pipelines, sumps, or other means to collect surface and seepage water which may enter the excavation.
2. Discharge water through settling basins or method approved by Engineer when water is to be deposited into an existing watercourse.

3.2 INSTALLATION

A. Advise Engineer of changes made to Operation Plan as submitted under article 1.05 of this section, made to accommodate field conditions.

3.3 MONITORING

A. Observe and record daily the elevation of the groundwater during the length of the dewatering operation and provide data to Engineer on daily basis.

3.4 OPERATION

A. Operate dewatering systems to lower the groundwater level in excavations allowing all subsequent work to be done on a stable dry subgrade.

B. Modify dewatering procedures which cause, or threaten to cause, damage to new or existing facilities, to prevent further damage. Modifications made at no additional expense to the Owner.

C. Maintain the water level a minimum of two (2) feet below subgrade or at lower elevation to eliminate hydrostatic pressure on structures.

D. Prevent disturbance of foundation soils and loss of ground as water is removed.

E. Notify the Engineer of disturbance to the foundation soils caused by an interruption or inadequacy of the dewatering system.

F. Maintain on site, auxiliary equipment to operate the dewatering system continuously while excavations are opened below elevation of final grade.

3.5 DISPOSAL OF WATER

A. Discharge water in a manner that will not cause erosion, flooding, damage to existing facilities, completed Work or adjacent property, improved or otherwise.

3.6 REMOVAL

A. Remove all material and equipment from the site upon completion of dewatering operations.

B. Seal all dewatering wells upon completion of the dewatering by pressure injecting a grout capable of sealing the wells and preventing leakage.

CERTIFICATE OF DESIGN

Re: Contract Between

OWNER: _____
(Name)
and
CONTRACTOR: _____
(Name)
on
CONTRACT: _____
(Title)

_____ Dated:_____
(Number)

Contractor hereby certifies that _____
(Designer)

1. Is licensed or registered to perform professional engineering work in the state of

   _____
   (Location of Project)

2. Is qualified to design the_____
   (Item)
   specified in Section_____ of the subject contract;

3. Has designed_____before;

4. Has prepared the design in full compliance with the applications and requirements of Section_____ of subject contract including all applicable laws, regulations, rules and codes; and

5. The work has been signed and sealed pursuant to the applicable state law.

FOR: _____
(Contractor)

BY: _____
(Signature)

_____ Dated:_____

END OF SECTION

SECTION 31 25 00

EROSION AND SEDIMENTATION CONTROLS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

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 Section.

1.2 DESCRIPTION OF WORK

A. The work of this Section consists of furnishing and installing, maintaining, and removing various erosion and sedimentation controls including, but limited to, silt fence, compost filter tubes, jute mesh netting, and silt sacks.

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. Section 31 10 00, SITE CLEARING,
2. Section 31 20 00, EARTH MOVING,
3. Section 32 92 19, SEEDING AND GRASS ESTABLISHMENT,

1.4 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00 SUBMITTALS,

1. Product Information – submit manufacturer's product data and installation method for silt fence, compost filter tubes, compost, jute mesh netting, and silk sacks.

1.5 DELIVERY, STORAGE AND HANDLING

A. Provide fabric in rolls wrapped in original packaging or heavy-duty covering to protect fabric from mud, dirt, dust, debris, and other deleterious sources until it is installed.

1.6 SCHEDULING

A. Schedule work so that Erosion Control measures are installed prior to any site clearing or demolition. Erosion Control measures shall be installed immediately after planting and/or seeding operations are completed. For all sloped areas to be seeded, erosion control shall be installed prior to or at the same time as seeding takes place.

PART 2 - MATERIALS

2.1 EROSION CONTROL DEVICE – TYPE 1

A. Erosion Control Device – Type 1 shall be Silt Fence and Compost Filter Tube, as shown on the Plans and as specified herein.

2.2 EROSION CONTROL DEVICE – TYPE 2

A. Erosion Control Device – Type 2 shall be Compost Filter Tube, as shown on the Plans and as specified herein.

2.3 EROSION CONTROL DEVICE – TYPE 3

A. Erosion Control Device – Type 3 shall be Silt Fence, as shown on the Plans and as specified herein.

2.4 SILT FENCE

A. Silt fence shall consist of a woven fabric comprised of high-tenacity polypropylene yarns and a plastic net backing, square hardwood posts, and connection hardware or aluminum wire. Fabric shall be 3 feet wide.

B. Silt fence shall meet the following minimum requirements:

Fabric Property	Minimum Accepted Value	Test Method
Grab Tensile Strength (lb)	120	ASTM D 4632
Elongation at failure (%)	20% max.	ASTM D 5034 & D4632
Mullen Burst Strength (psi)	200	ASTM D 3786
Trap. Tear Strength (lb)	50	ASTM D 4533
Puncture Strength (lb)	40	ASTM D 6241 or D 4833
Equivalent Opening Size	30	US Std. Sieve CW-02215 ASTM D 6241 AOS-D 4751
Ultraviolet Radiation Stability (%)	80	ASTM ASTM D 4355
Life Span	6 months	-

C. Support stakes shall be 2” x 2” x 5’ min. hardwood.

2.5 COMPOST FILTER TUBES

A. Compost filter tubes shall be made of 100% biodegradable materials and shall be knitted mesh with openings that allow for sufficient water flow and effective sediment capture.

B. Compost filter tubes shall meet the following minimum requirements:

Fabric Property	Minimum Accepted Value
Material	HDPE, Cotton, Hemp, or Jute
Mesh Opening Size	approximately 3/8 inch
Diameter	12 inches
Tensile Strength	26 psi
Compost Media	Locally sourced
Life span	6 months

C. Support stakes shall be 2" x 2" x 3' min. hardwood.

D. Compost material shall be a well-decomposed humus material derived from the aerobic decomposition of biodegradable matter, free of viable weed seeds and other plant propagules (except airborne weed species), foreign debris such as glass, plastic, etc. and substances toxic to plants. Compost shall be suitable for use as a soil amendment and shall support the growth of ornamental nursery stock and turf establishment. Compost shall be in a shredded or granular form and free from hard lumps. Food and agriculture residues, animal manure, or other biosolids that meet the above requirements and are approved by the DEP are acceptable as source materials. The level of toxic elements and compounds in organic matter shall be below the DEP Type I standards for sludge and the EPA standards for Class A "Exceptional Quality Sludge", whichever is more stringent. Levels of pathogens shall be below both federal and state thresholds. Composted material with an unpleasant odor, such as that of ammonia or fecal material shall be rejected by the Engineer.

E. Compost shall not include peat, manure or biosolids, kiln dried wood, or construction debris. All material shall pass through a 2-inch sieve.

2.6 JUTE MESH NETTING

A. Jute mesh netting shall be undyed and unbleached 100% biodegradable material and contain no polypropylene.

B. Jute mesh netting shall meet the following minimum requirements:

Fabric Property	Minimum Accepted Value
Open Area	70-75%
Mesh Size	approximately 1/2 inch
Roll Weight	between 0.9 and 1.2 pounds per linear yard
Warp Ends	78 per linear yard
Weft Ends	41 per linear yard
Recommended flow	6 fps (1.8 m/s)
Life span	9-12 months

C. Anchoring devices shall be metal staples. Metal staples shall be a minimum of 0.09-inch diameter wire, or greater, with u-shaped legs at least 6 inches in length. Longer staples shall be used where loose and/or sandy soils are present or as required by the Engineer.

2.7 SILT SACKS

A. Silt sacks shall be manufactured woven polypropylene geotextile sewn by a double needle thread using high strength nylon thread. Silt sacks shall be specially designed to fit existing and proposed catch basin and inlet sizes and held in place with sleeved rebar.

PART 3 - EXECUTION

3.1 GENERAL

A. Prior to initial placement of barriers, the Contractor and the Engineer shall review locations specified on the plans and adjust placement to ensure that the placement will provide maximum effectiveness.

B. Sediment controls shall be installed prior to disturbing upslope soil.

C. Barriers shall be staked, trenched, and/or wedged as specified herein and according to the Manufacturer's instructions. Barriers shall be securely in contact with existing soil such that there is no flow beneath the barrier.

3.2 SILT FENCE INSTALLATION

A. Silt fence shall only be used if shown on the plans or when specified by Orders of Condition or other permit requirements.

B. Install fence posts no further than 8 ft apart along the line of the proposed fence. The top of the posts shall extend at least 2 ft above the normal water level. Posts shall be driven into the soil to a sufficient depth to form a stable support for the filter fabric. When used with compost filter tubes, the tube shall be placed on a minimum of 8 inches of folded fabric on the upslope side of the fence. Fabric does not need to be trenched.

C. Attach the fabric to the posts on the upstream side. Attachment of the fabric to the posts can be made with prefabricated pockets in the fabric, staples or other suitable arrangements approved by the Engineer. The fabric shall extend 2 ft above the normal water level and at least 1 ft shall extend horizontally along the soil at the bottom. Excavate a 6-in. x 6-in. trench along the bottom upstream side of the fence, wrap the bottom of the fabric around the inside of the trench and then backfill the soil into the fabric pocket so as to anchor the fence fabric.

D. Soil shall then be placed over the horizontal bottom layer of fabric to a depth of 6 in.

E. Fabric may be spliced together along the vertical edge by overlapping the pieces by one post spacing or 6 ft whichever is greater and securing the layer together at intervals of 2 in.

F. Should the required height exceed the roll width, a second roll shall be used. The width shall be overlapped a minimum of 1 ft and the layers shall be secured together at not more than 2-ft intervals along the midpoint of the overlap.

G. Installation procedures may be varied to comply with manufacturer's recommended procedures with the approval of the Engineer. The contractor may submit alternate installation procedures for approval by the Engineer.

H. When used with straw bales, an 8-inch deep and 4-inch-wide trench or V-trench shall be dug on the upslope side of the fence line. One foot of fabric shall be placed in the bottom of the trench followed by backfilling with compacted earth or gravel. Stakes shall be on the down slope side of the trench and shall be spaced such that the fence remains vertical and effective.

I. Width of fabric shall be sufficient to provide a 36-inch-high barrier after fabric is folded or trenched. Sagging fabric will require additional staking or other anchoring.

3.3 COMPOST FILTER TUBE INSTALLATION

A. Installation shall be such as to ensure good contact with the existing ground. Compost filter tubes shall be tamped along existing ground but shall not be trenched.

B. When reinforcement is necessary, tubes shall be stacked as shown on the detail or as directed by the ENGINEER.

3.4 JUTE MESH NETTING INSTALLATION

A. Installation shall be such as to ensure continuous contact with soil without folds or wrinkles. Jute mesh netting shall be laid such that upslope fabric is placed over lower slope fabric by a minimum of 3 feet. Adjoining rolls (sides) shall be overlapped a minimum 6 inches. The netting shall extend beyond at least 1 foot beyond the edge of the seeded area.

B. The Contractor shall bury the ends of the jute mesh netting 6-8 inches in anchor trenches at top and bottom of slopes.

C. Jute mesh netting shall be anchored in place with vertically driven metal staples. The staples shall be driven in until their tops are flush with the soil. Staples shall be placed at 12-inch intervals along the top of a slope and in staggered courses along the face of the slope to achieve a minimum of 3 metal staples per square yard, or at manufacturer's recommendations for the given site conditions.

D. Contractor shall reseed all trenched and otherwise disturbed areas with specified seed mix. The Contractor shall maintain the jute mesh netting and make satisfactory repairs of any areas damaged until acceptance of plantings and/or seed establishment.

3.5 SILT SACK INSTALLATION

A. Installation shall be such as to ensure no surface drainage shall bypass the sack.

B. \]]]]]]]]Sacks shall be installed within the catch basin or inlets with covers installed over them to keep them in place.

C. When the restraint cord within the Silt sack is no longer visible, the Silt sack should be emptied of sediment and reinstalled.

3.6 MAINTENANCE

A. Maintenance of the sediment control barrier shall be per this Section or per the Stormwater Pollution Prevention Plan (SWPPP), whichever is more restrictive.

B. The Contractor shall inspect the sediment barrier in accordance with relevant permits. At a minimum, barriers shall be inspected at least once every 7 calendar days and after a rain event resulting in 0.25 inches or more of rainfall. Accumulation of debris and/or silt shall be removed and properly disposed of as necessary at no additional cost. In no case shall accumulations of more than 4 inches above the original ground line be permitted to remain.

C. Contractor shall be responsible for ensuring that an effective barrier is in place and working effectively for all phases of the Contract. If a breach or other failure of the sediment control occurs, the control shall be immediately restored.

D. Barriers that decompose such that they no longer provide the function required shall be repaired or replaced as directed. If the resulting berm of compost within the fabric tube is sufficiently intact (despite fabric decay) and continues to provide effective water and sediment control, barrier does not necessarily require replacement.

E. A regular maintenance schedule for cleaning the silt sacks shall be followed, including a review of all Silt Sacks after any rain event or extensive snow melt.

3.7 REMOVING EROSION AND SEDIMENTATION CONTROL

A. Barriers shall be dismantled and/or removed, as required, when construction work is complete and upslope areas have been permanently stabilized and after receiving permission to do so from the Engineer.

B. Regardless of site context, nonbiodegradable material and components of the sediment barriers, including photo-biodegradable fabric, plastic netting, nylon twine, and sedimentation fence, shall be removed and disposed off-site by the Contractor.

C. For naturalized areas, biodegradable, natural fabric and material may be left in place to decompose on-site. In urban, residential, or other locations where aesthetics is a concern, the following shall apply:

D. Compost filter tube fabric shall be cut and removed, and compost shall be raked to blend evenly (as would be done with a soil amendment or mulch). No more than a 2-inch depth shall be left on soil substrate.

E. Silt fence, stakes, and other debris shall be removed and disposed off-site. Site shall be restored to a neat and clean condition.

F. Remove all silt sacks once grades are stabilized.

END OF SECTION

SECTION 31 50 00

EXCAVATION SUPPORT AND PROTECTION

PART 1 - GENERAL

1.1 DESCRIPTION

A. The Contractor shall properly design and furnish all labor and materials necessary and shall construct complete, all sheeting, bracing supports, and appurtenances required to perform the Work including sheet piling for construction of structures and buildings, trench support and cofferdams, permanent and temporary alike, as indicated on the Drawings and specified or as otherwise directed by the Engineer or required by agencies having jurisdiction over the Work.

B. Wood timber or steel sheeting shall be used except where otherwise indicated, specified or directed by the Engineer and agencies having jurisdiction over the work.

1.2 DESIGN RESPONSIBILITY

A. The Contractor shall be fully responsible for providing complete and adequately designed sheeting as required and/or directed by the Engineer in accordance with the provisions set forth herein. The sheeting shall be designed to resist hydrostatic pressures in accordance with the Contractor’s dewatering design.

B. The Contractor shall engage, at his own expense, the services of a fully competent and qualified Professional Engineer, hereinafter referred to as the "Contractor's Engineer", registered in the State in which the Work is being constructed, for the design of all sheeting requirements to accomplish the Work specified, and for supervising the proper on-site installation associated therewith. The Contractor's Engineer shall be acceptable to the Engineer and demonstrate a minimum of ten (10) years documented experience in the field of sheeting design and implementation. Prior to the actual employment of the Contractor's Engineer, the Contractor shall submit to the Engineer, to the full extent deemed necessary, a detailed resume stating the Contractor's Engineer's professional qualifications, related experience and references, and if requested, examples of work similar to that required for the Work specified, for a general review by the Engineer and a means of documenting the requisite experience hereinbefore specified. Only after a satisfactory review of the Contractor's Engineer's overall qualifications by the Engineer in fulfillment of the requisite experience hereinbefore specified shall the Contractor finalize such employment and begin the design aspects of the Work.

C. The Contractor's attention is directed to the fact the acceptance of the Contractor's Engineer and/or his/her qualifications by the Owner and/or Engineer shall not be an overall approval of the Contractor's Engineer nor the sheeting designs and methods of installation employed during the Work. It being understood that all sheeting requirements necessary to accomplish the Work specified and/or indicated on the Drawings shall be designed by and installed under the direct supervision of the Contractor's Engineer who shall ultimately and fully bear the responsibility for that Work.

1.3 QUALITY ASSURANCE

A. The Contractor's Engineer shall provide and maintain throughout the sheeting installation and/or Work sufficient supervision and technical guidance to the Contractor for proper sheeting materials, equipment, operations and methods to the extent necessary to assure strict compliance with the Contractor's Engineer's design, all safety procedures and standard requirements for such Work, and the successful completion of the Work. Failure to provide and/or maintain such supervision and/or technical guidance during the Work shall in no way relieve the Contractor's Engineer and/or the Contractor from their overall responsibilities and obligations under the Contract, nor shall it be a basis for any claim by either against the Owner and/or Engineer.

B. The Contractor and Contractor's Engineer shall fully indemnify and save harmless the Owner and Engineer and their agents, employees and representatives, from and against any and all claims as stipulated under the Agreement, whether directly or indirectly arising out of, relating to or in connection with the Work.

C. Quality assurances and proper safety procedures must be maintained at all times and be in strict accordance with the Contractor's Engineer's requirements and consistent with all federal, state and local regulatory agencies having jurisdiction over the Work. Should any conflict in requirements, regulations, restrictions or codes exist between that which is specified by the Contractor's Engineer and any federal, state or local agency, the more stringent application shall prevail.

1.4 PRODUCTS AND DESIGN CRITERIA

A. The overall sheeting design, quality of materials and methods of installation for all sheeting applications necessary to accomplish the Work specified shall be consistent with the established standards of the construction industry and must, as a minimum, comply with the requirements for earth support systems for excavations as defined by current US Department of Labor, Occupational Safety and Health Act (OSHA) regulation applicable thereto, and any other federal, state and local agencies having jurisdiction and/or requirements pertaining thereto including Building Code requirements for the State in which the work is being performed. The design and implementation thereof shall be in accordance with sound engineering practice and modern accepted principles of soil mechanics, and shall include the effects of hydrostatic forces and all surcharge loads which may be reasonable anticipated. The methods employed shall be to the extent necessary to permit the proper and satisfactory installation and construction of the Work specified; to withstand all loads and forces encountered; to provide soil restraint and control of water as required; to insure the safety of the workers and all other personnel on or near the site; to prevent injurious caving or erosion, or loss of ground; to maintain at all times proper and safe pedestrian, vehicular traffic on public and private streets, property and rights-of-way; and to stabilize unforeseen areas of work encountered during the execution of the Work as deemed necessary by the Owner and/or Engineer.

B. The Contractor and Contractor's Engineer's attention is directed to the fact that should any additional investigations, subsurface explorations and/or other appurtenant information be required to fulfill the needs of this design, as determined by the Contractor's Engineer above and

beyond that which is already provided under these Contract Documents, the Contractor shall obtain all such information and data required at his own expense.

1.5 SHOP DRAWINGS AND/OR DESCRIPTIVE LITERATURE

A. Prior to the installation of any sheeting, the Contractor shall submit to the Engineer for documentation ONLY, complete sheeting layout and detail drawings and sheeting descriptions bearing the Contractor's Engineer's State of Massachusetts Professional Seal and signature. Said submission shall be for informational purposes only as a means of documenting the work to be performed and will not be considered an approval or disapproval of the design and/or the implementation thereof. This submission will not relieve the Contractor of the sole responsibility for the adequacy of the system nor shall it be construed as an approval or guarantee that the Contractor's proposed equipment, materials and methods for the sheeting, bracing or appurtenances will be adequate for the work required at the locations of and for the Work required by this Contract.

B. Included as part of this submission, the Contractor's Engineer must provide a complete listing of all references, codes and specifications used by the Contractor's Engineer and required by any federal, state or local agency having jurisdiction, and to which the sheeting design conforms.

C. Specific design calculations are not to be submitted to the Engineer. In the event design calculations are submitted to the Engineer, they shall be returned to the Contractor without review nor checking by the Engineer.

1.6 CERTIFICATE OF DESIGN

A. The Contractor's special attention is directed to the required "Certificate of Design", the form of which is provided at the end of this Section. The Contractor and Contractor's Engineer shall complete this "Certificate" in its entirety for each location of work to be done, and any revisions associated there with, and submit it simultaneously with, as an integral part thereof, the sheeting submission. Any submission made without the completed "Certificate", appropriately signed and sealed, shall be returned to the Contractor. The Owner and/or Engineer hereby reserves the right to delay sheeting work and/or any work associated with, or dependent upon, the proper implementation of sheeting, without cause for claim against the Owner or Engineer, until a complete and appropriate submission is rendered. This Certification shall indicate that the sheeting, bracing and all appurtenances related thereto are designed to withstand the required loads, forces to be encountered, and to provide soil and water control, and are in compliance with these specifications and all federal, state or local agencies having jurisdiction over the Work to be performed.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Timber sheeting and bracing:

1. Timber sheeting and bracing may be of any species of wood which will satisfactorily withstand all driving and construction stresses and the loads to which the members will be subjected.

Sheeting shall not be less than 3 inches nominal thickness and shall be provided with continuous interlocks. All timber sheeting and bracing shall be free from worm-holes, windshakes, loose knots, decayed or unsound portions or other defects which might impair its strength or tightness.

B. Steel sheeting:

1. The shapes, sizes, and lengths of steel sheeting to be utilized are optional with the Contractor, providing they are satisfactory to withstand all driving and construction stresses and provided with continuous interlocks.

C. Bracing, Hardware and Fastenings:

1. Bracing and other supports whether of steel or of timber, 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. The Contractor shall provide all necessary hardware and fastenings necessary in connections with satisfactory installation of all sheeting and bracing.

PART 3 - EXECUTION

3.1 INSTALLATION

A. The Contractor shall be fully responsible for ensuring adequate safety measures are provided at all times and shall comply with all safety requirements of federal, state and local agencies having jurisdiction over the Work. Installation of the sheeting including all bracing, supports and appurtenances, shall be adequate to permit the performance of the Work and be in accordance with the requirements of the Contractor's Engineer and the sheeting design associated therewith.

B. Any movements of sheeting and/or appurtenances which prevent the proper completion of the work shall be corrected at the expense of the Contractor.

C. Sheeting shall be installed in a manner which will prevent the disturbance of the surrounding surface, subsurface conditions and/or structures. Any such disturbances shall be corrected at the Contractor's expense and to the satisfaction of the Engineer.

3.2 REMOVAL

A. No sheeting shall be removed except with specific written approval by the Engineer.

B. Sheeting shall be cut-off as directed by the Engineer.

CERTIFICATE OF DESIGN

_____(Owner)

Contract Reference:_____

_____, dated _____.

In accordance with the provisions of the above referenced Contract, as the designated Contractor,

_____

_____
(Contractor's Name and Address)

hereby certifies that _____

_____
(Contractor's Engineer's Name and Address)

(1) Is properly licensed and currently registered as a Professional Engineer in the State (or Commonwealth) of _____;

(2) Is fully qualified to design and supervise the _____

_____
(Item of work and location)

In accordance with the provision specified under the appropriate Section and/or Subsections of the Contract Documents:

(3) Has successfully designed and supervised _____

_____
(Item of work)

before and demonstrates a minimum of ten (10) documented years of proven experience in such field;

(4) Has personally examined the type(s) and locations(s) of the Work required under this Contract, and the overall conditions associated therewith, to the extent necessary to fully satisfy his or her professional responsibilities for designing and supervising the above referenced work;

(5) Has prepared the attached design in full compliance with the applications and requirements of the Contract Documents, sound engineering practice, modern accepted principles of construction, and all applicable federal, state and local laws, regulations, rules and codes having jurisdiction over the Work;

(6) Will provide sufficient supervision and technical guidance to the Contractor throughout the Work to ensure compliance with the design and all quality assurances necessary to successfully complete the Work;

(7) Hereby indemnifies and holds harmless the_____ and BETA Group, Inc.,
(name of owner)

and their agents, employees and representatives, from and against any and all claims, whether directly or indirectly, arising out of, relating to or in connection with the Work; and

(8) This "Certificate of Design" together with all applicable designs, drawings, details, specifications on other related documents necessary to complete the Work as specified, have been signed and sealed pursuant to applicable state law.

In recognition and observance of the above referenced statements, the undersigned parties hereby acknowledge and accept the responsibilities and obligations associated therewith.

contractor:	Contractor's engineer:
_____	_____
(Contractor's Name)	(Engineer's Name)
_____	_____
By: _____	By: _____
_____	_____
(Name and Title)	(Name and Title)
Date: _____	Date: _____
(SEAL)	(P.E. STAMP)

(Note: Contractor to fully reference all attachments below)

_____

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SECTION 31 62 19

GREENHEART TIMBER PILES

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Provide all labor, materials, equipment and supervision necessary to complete work specified in this Section.

B. Scope of work includes, but is not necessarily limited to, furnishing and installing the following:

1. Greenheart Timber Piles

1.2 SUBSURFACE CONDITIONS

A. The results of subsurface explorations performed at the site are presented in a geotechnical report by GEI Consultants, Inc., Woburn, Massachusetts, dated August 2023, titled Geotechnical Report, Riverwalk Park, Boardwalk Loop, and Event Space.

1. The subsurface information was obtained primarily for use in evaluating subsurface conditions and preparing geotechnical recommendations. Interpretation of the subsurface data for purposes of the work of the Contract shall be the sole responsibility of the Contractor. The Contractor should note that the subsurface data pertains only to the conditions at the exploration locations at the time of the investigations.

1.3 QUALITY ASSURANCE

A. Except as noted, work shall conform to the latest editions of the following codes specifications and standards

1. American Society for Testing and Materials (ASTM), Specifications: D25 Round Timber Piles.

American Institute of Timber Construction (AITC).

1.4 SUBMITTALS

A. Submit for approval by Owner proposals for following items:

1. Driving plan and schedule for installation of piles.
2. Method of installation of piles including size and type of pile hammer.
3. Templates and falsework to be used for support and layout of piles during driving.
4. Certification of timber pile species.

1.5 PRODUCT HANDLING

A. Piles shall be handled with care to prevent damage to pile. Damaged piles will be rejected and replaced at no additional cost to theOwner. Piles shall be stored with a space beneath the piles

and situated to prevent being exposed to standing water. Cant hooks or pike poles shall not be used.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Greenheart Piles

1. Piles shall be free from any defects, which will impair their strength, or usefulness for the purpose intended or that will prevent proper driving.
2. Greenheart piles shall be supplied by a company that operates in the Guiana Shield countries and in conformity with the International Conventions and National Forestry Regulations relating to the management of forestry concessions. Company shall enforce the protection of the endangered species listed by CITES (Convention on Trade in Endangered Species) and the biodiversity of the ecosystems. It respects the Intellectual Property Rights of the Indigenous Peoples, whose communities are the beneficiaries of the Company's field operation.
3. Greenheart piles shall be supplied by a company that stresses the need for low impact forestry operations, ensuring that its forestry extraction is state of the art while constantly monitoring the effect of its logistics systems on watershed management and its use of biodegradable wood preservatives.
4. Greenheart piles shall be banded at 12" below final cutoff elevation. Bands shall be 1¼" wide stainless steel 19 gauge. Each pile shall be double wrapped with the band.
5. Banding of greenheart piles shall occur prior to any cutting.
6. Estimated length of piles is 50 feet.
7. Minimum circumference three (3) feet from the butt shall be 38" and minimum tip circumference shall be 22".

PART 3 - EXECUTION

3.1 DRIVING EQUIPMENT

A. Pile hammers: Vibratory, air, steam or diesel-powered, of a type approved by the Owner.

1. Impact Hammers: The hammer furnished shall have a capacity at least equal to the hammer manufacturer's recommendation for the total weight of pile and character of subsurface material to be encountered. Diesel-powered hammers shall be operated at the rate recommended by the manufacturer throughout the entire driving period. Sufficient pressure shall be maintained at the hammer so that: (1) for double-acting hammer, the number of blows per minute during and at the completion of driving of a pile is equal approximately to that at which the hammer is rated; (2) for single-acting hammer, there is a full upward stroke of the ram; and (3) for differential-type hammer, there is a slight rise of the hammer base during each upward stroke.
2. Vibratory Hammers: Vibratory hammers will only be allowed when bearing capacity determination by blow count or driving energy is not required.

3. Driving helmets and cushion blocks:

   a. Use a driving helmet or cap including a cushion block or cap block of a design approved by the Owner between the top of the pile and the ram to prevent impact damage to the pile.

   b. The driving helmet or cap and cushion block combination shall be capable of protecting the head of the pile, minimizing energy absorption, and transmitting hammer energy uniformly and consistently during the entire driving period.

   c. The driving helmet or cap shall fit snugly on the top of the pile so that the energy transmitted to the pile is uniformly distributed over the entire surface of the pile head.

   d. Demonstrate to the Owner that the equipment to be used on the project performs the above functions.

   e. The cushion block may be a solid or laminated softwood block with the grain parallel to the pile axis and enclosed in a close-fitting steel housing. The thickness of block shall be suitable for the length of pile to be driven and the character of subsurface material to be encountered. Generally, thicker blocks are required for longer piles and softer subsurface material.

   f. Replace cushion block if it has been damaged, split, highly compressed, charred or burned or has become spongy or deteriorated in any manner.

   g. Under no circumstances will the use of small wood blocks, wood chips, rope or other material permitting excessive loss of hammer energy be permitted.

3.2 HANDLING

A. Inspect piles in the leads, and where the protective shell or treated wood is impaired, between cutoff and a point which will be not less than 10 feet below the ground, the piles shall be repaired as specified under Timber Treatment unless the pile is damaged to such an extent that it is rejected. Replace rejected piles at no additional cost to the Owner.

B. Support pile laterally during driving, but not unduly restrained from rotation in the leads. Where pile orientation is essential, take special care to maintain the orientation during driving. Take special care in supporting battered piles to prevent excess bending stresses in the pile.

C. When necessary, place collars around the pile head to prevent brooming. Cant hooks shall not be used. Cut piles by sawing or other means approved by the Owner. Holes for rebar shall be of a size that will ensure a driving fit.

3.3 DRIVING PILES

A. All piles shall be driven in the presence of the Engineer or his representative.

   1. Piles shall be driven using an impact hammer.

   2. Drive without interruption using an impact hammer to the specified capacity.

   3. Minimum installed pile tip elevation shall be 30 feet below finished mudline or as otherwise shown on the Contract Documents

4. All piles shall be driven to a minimum working load of 7.5 kips.
5. Piles shall be subjected to a pile load test OR for bearing piles with specified minimum working loads of 25 tons or less, bearing piles shall be driven for at least the last 12 inches using an impact hammer and the allowable working pile load shall be computed by means of the following pile driving formula using actual recorded blow counts for each pile:

   R = 2E / (S + C)
   where:
   R = Allowable pile load in pounds
   E = Actual energy delivered by the hammer per blow in foot-pounds
   S = Penetration of last blow or average penetration of last few blows experienced in inches
   C = Constant equal to 1.0 for drop hammer and 0.1 for steam, diesel or air hammer

   a. 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.
   b. Any driving resistance developed in strata overlying the bearing material shall be discounted.
   c. If the driving of the pile has been interrupted for more than one (1) hour, the value of "S" shall not be determined until the pile is driven at least an additional twelve (12) inches, except when it encounters refusal.

B. Tolerances in Driving: The center of the pile butts shall be within 3 inches horizontally of their plan location, and piles shall be cut-off within 1 inch of their cut-off elevation. Manipulation of piles to force them into position will not be permitted. Check all piles for heave. Re-drive heaved piles to the required elevation. Piles damaged, mislocated, or driven out of alignment shall be replaced or additional piles driven as directed at no additional cost to the Owner.

3.4 INSTALLATION

A. Before driving, mark and number each pile in 5-foot intervals along its entire length. In addition, provide marks at 1-foot intervals for the top 40 feet of the pile. Markings should indicate length from the pile tip and should be visible above the waterline or ground level after driving.

B. If obstructions are encountered, contractor shall make reasonable effort to remove obstruction. Reasonable efforts shall include excavation, removal and disposal if obstruction is shallow (less than 5 feet) or driving a steel pile of at least the same diameter as the timber pile to remove or bypass the obstruction. Driving steel piles shall include changing to an impact hammer to better drive past the obstruction. This work shall be considered as part of the work associated with pile installation and no additional payment will be made for dealing with obstructions.

C. Pile Cut-Offs: After completion of driving, tops of piles shall be cut off to remove damage caused by driving hammer. All cut offs shall be the property of the contractor for removal and disposal from the project site.

D. Piles that split under driving or prove otherwise unsatisfactory shall be removed and replaced from the site at the sole expense of the Contractor and to the satisfaction of the Engineer.

E. The driving of piles with followers shall not be permitted.

F. Spudding, jetting, augering or pre-drilling of piles to achieve the required penetration will not be permitted unless approved in writing by the design engineer.

G. Any pile, which may be driven in the wrong position, shall be removed and driven in the correct position. Contractor will not be paid for piles driven in a wrong position.

H. Any pile which may prove too short after driving, or which has been split, broomed, upset, or otherwise damaged during driving, shall be rejected and another satisfactory pile shall be substituted and properly driven. The Contractor shall not be paid for pile work associated with the replacement of piles in the above category.

I. Tops of piles shall be trimmed and shaped as required to connect to other work as shown on the Contract Drawings.

3.5 INSPECTIONS

A. All piles will be subject to inspection before or after shipment to the site, or both, at the option of the Engineer. Any pile that does not conform to all requirements will be rejected.

B. A line drawn from the center of the butt to the center of the tip must lie wholly within the body of the pile. Any pile that does not meet this requirement shall be rejected.

C. Observation of pile driving operations will be provided by the Engineer. No piles shall be driven except in the presence of the Engineer or his representative.

D. Approval given by the Engineer or by his agent shall not relieve the Contractor of his responsibility for performing the work in accordance with the plans and specifications.

E. Contractor shall not cut off top of pile until verification by the Engineer.

F. RECORDS

G. A complete and accurate record of each pile shall be furnished by the Contractor. The presence of the Owner or the Owner's representative will not exempt the Contractor from the requirement to keep and furnish his own records. The record shall indicate the pile location, diameter, length, hammer (make and model), number of blows per 6" for the final 36 inches of penetration, all other pertinent information. Where a vibratory hammer is used for friction piles, the time of driving shall be recorded per 6 inches for the final 36 inches of penetration.

END OF SECTION

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SECTION 31 63 26

HELICAL PILES

PART 1 - GENERAL

1.1 WORK INCLUDED

A. The design locations of the piles are shown on the contract drawings.

B. Provide all plant, labor, materials, equipment, and services for the installation of helical piles as specified herein and on the contract drawings. The helical piles for the boardwalk shall have a design bearing capacity of 7.5 kips per pile and the helical piles for the pedestrian bridge shall have design bearing capacity of 17.5 kips. Piles shall be hot-dipped galvanized, installed to achieve the design loads specified herein. The Contractor will be responsible for furnishing piles of sufficient length to obtain the specified design load. The work includes, but is not limited to, the following:

1. Providing final design and shop drawings for helical piles.
2. Fabricating and delivering piles in accordance with approved shop drawings.
3. Performing three pile load tests.
4. Installing the piles to the required torque resistance, as determined by the Contractor's design engineer.
5. Filling the inside of the helical pile shafts with cement grout.
6. Cutting off piles at the elevations shown on the contract drawings and disposing of cutoff portions.

1.2 REFERENCE STANDARDS

A. Without limiting the generality of other requirements of these specifications, perform all work in accordance with the requirements of the Massachusetts State Building Code, 9th Edition (International Building Code 2015 – Chapter 18: Soils and Foundations with Massachusetts Amendments) and the requirements of the other referenced documents to the extent that the provisions of such other documents are not in conflict with the requirements of said Code.

B. ASTM: Specifications of the American Society for Testing and Materials.

1.3 LAYOUT AND GRADES

A. Layout the plan location and elevation of the piles. Maintain and be responsible for all location and elevation stakes.

B. Show the locations of the centers of as-installed piles on a drawing in relation to the design location.

C. Perform an as-installed survey of the installed piles to the nearest ½ inch.

1.4 RECORDS

A. Maintain complete records of the installation of the piles, independent of records that may be made by the Engineer. These records shall be available at the job site for the Engineer's inspection, and a complete set of records shall be submitted to the Engineer upon completion of the work.

B. The records for each pile installation shall include:

1. Name of project and Contractor.
2. Pile designation number.
3. Date and time of installation.
4. Name and model of installation equipment.
5. Type and identification of torque indicator used.
6. Actual pile type and configuration – including lead section (number and size of helical plates), number and type of extension sections (manufacturer's SKU numbers).
7. Pile installation duration and observations.
8. Total length of installed pile.
9. Top of pile elevation immediately after installation (to the nearest 0.1 foot).
10. Tip and cut-off elevations (to the nearest 0.1 foot).
11. Inclination of pile.
12. Installation torque at one-foot intervals for the final 10 feet.
13. Comments pertaining to interruptions, obstructions, unusual behavior, or other relevant information.
14. Rated load capacities.
15. Deviation of pile top from specified plan location (in inches to the nearest ½ inch).
16. Damage (if any) to pile, description of any deviations from the approved pile design and installation procedures, and description of any unusual occurrences during installation.

1.5 CONTRACTOR SUBMITTALS

A. Shop Drawings and Design Calculations - Submit to Engineer at least three weeks before installing any piles. Design shall be performed by, and shop drawings shall be stamped by a Professional Engineer registered in the Commonwealth of Massachusetts. Shop drawings shall include:

1. Type, size, and installation torque capacity of central steel shaft.
2. Helix details and configuration (number, diameter and spacing of helical plates).
3. Connection details and details of bearing cap at top of pile.
4. d.
5. Minimum final installation torque resistance. The final installation torque resistance shall not be less than the value determined using the following correlation (Perko, 2009):

$$Q_u = \frac{22T}{d^{0.92}}$$

Where, Qu = Ultimate bearing capacity (lbs)
T = torque resistance (ft-lbs)
d = pile shaft diameter or diameter of a circle circumscribed around a square shaft (inch)

B. Detailed description of the pile installation procedures.

C. Manufacturer's literature for installation equipment.

D. Standard mill test reports shall be submitted to the Engineer in advance of shipment of any steel elements.

E. Calibration reports for each torque indicator to be used on the project shall be submitted to the Engineer before installing any piles. The calibration tests shall have been performed within 3 months of the date submitted. These calibration reports shall include, but are not limited to, the following information:

1. Name of testing agency.
2. Identification (serial number) of device calibrated.
3. Description of calibrated testing equipment.
4. Date of calibration.
5. Calibration data.
6. Installation procedures, including minimum installation torque and grouting techniques.

F. Manufacturer's literature for installation equipment.

G. Load Test: Submit design calculations, drawings, details, product information, and calibrations for the load test setup, test equipment, and measurement systems.

H. Load Test Report: Submit a pile load test report within 7 days of completing each test.

I. Standard mill test reports shall be submitted to the Engineer in advance of shipment of any steel elements.

J. Grout Mix: Submit proposed grout mix for the piles, manufacturer's product data for any additives used in the mix, and results of compressive strength tests for the grout mix.

K. Calibration reports for each torque indicator and all hydraulic gauges to be used on the project shall be submitted to the Engineer before installing any piles. The calibration tests shall have been performed within 3 months of the date submitted. These calibration reports shall include, but are not limited to, the following information:

1. Name of testing agency.
2. Identification (serial number) of device calibrated.
3. Description of calibrated testing equipment.
4. Date of calibration.

5. Calibration data.

L. Submit as-installed pile data as specified in Article 1.03 Layout and Grades, certified by a Registered Land Surveyor within 5 days after all piles are installed.

M. Submit field records of pile installation as specified in Article 1.04 Records, within 2 days after completion of each pile.

1. As-installed plans and records for any piles that are placed beyond the specified tolerances shall be provided as work progresses so that other pile locations can be adjusted for a balanced pile group.

N. Submit to the Engineer, within 2 weeks after the completion of installing all piles, a plan certified by a Registered Land Surveyor, showing the as-installed location of all piles to the nearest ½ inch. The plan shall include the following information:

1. Each pile identified by a separate number.

2. Elevation of top of each pile, prior to cutting.

3. Elevation of tip of each pile.

4. Deviation from plan location in inches.

The plan shall also include a table listing the pile number with the as-installed coordinates using the project horizontal control, and the as-installed pile cutoff elevations using the project vertical control.

1.6 PILE DESIGN REQUIREMENTS

A. The Contractor shall be responsible for design of the piles in accordance with the requirements specified in this Section and shown on the Drawings.

B. Design the piles to obtain their full design capacity in the natural sand.

C. Design the piles for the following design loads:

1. Boardwalk Piles: 7.5 kips axial compression.

2. Pedestrian Bridge Piles: 17.5 kips axial compression.

3. The Pedestrian Bridge pile design shall consider any moments in the bridge abutments imposed by the Contractor-designed pedestrian bridge.

1.7 QUALITY ASSURANCE

A. Contractor Qualifications: Demonstrate at least 5 years of experience installing piles similar to the piles specified herein.

B. Review of Contractor's Design and Procedures: Submit proposed pile design and installation procedures for review by the Owner's Engineer for compliance with the Specifications and industry standards. Work shall not proceed without written notice of the Owner's acceptance of the proposed pile design and installation procedures.

C. Design of the helical piles shall be performed by a Professional Engineer licensed in the state of Massachusetts in accordance with existing building code requirements.

D. Observation of Pile Installation: The installation of the piles must be observed by the Owner's Engineer. The work shall be performed only in the presence of the Owner's Engineer or his/her field representative. Provide 48 hours' notice to the Owner's Engineer when their presence will be needed and provide safe access to the work area.

E. Approvals given by the Engineer shall not relieve the Contractor of responsibility for performing the work in accordance with the plans and specifications.

1.8 DELIVERY, STORAGE AND HANDLING

A. All products shall be handled and transported carefully to prevent any deformation or damage. Care should be taken to prevent the accumulation of dirt, mud, or other foreign matter on the steel materials. Such accumulation shall be completely removed prior to installation.

1.9 EXAMINATION OF SITE

A. Inspect the site personally to evaluate the conditions affecting the work. No claim for additional costs will be allowed because of lack of knowledge of any existing conditions discernible from observation at the site, adjoining properties, and available sources of information. Copies of available drawings of previous or existing on-site structures may inspected at the office of the owner.

1.10 SUBSURFACE CONDITIONS

A. The results of subsurface explorations performed at the site are presented in a geotechnical report by GEI Consultants, Inc., Woburn, Massachusetts, dated August 2023, titled Geotechnical Report, Riverwalk Park, Boardwalk Loop, and Event Space.

B. The subsurface information was obtained primarily for use in evaluating subsurface conditions and preparing geotechnical recommendations. Interpretation of the subsurface data for purposes of the work of the Contract shall be the sole responsibility of the Contractor. The Contractor should note that the subsurface data pertains only to the conditions at the exploration locations at the time of the investigations.

PART 2 - MATERIALS

2.1 HELICAL PILES

A. All steel shall conform to an appropriate ASTM standard specified by the pile designer.

B. The central shaft shall consist of round pipe or tube sections with bolted couplers.

C. Helices shall be welded to the lead (bottom) section of the shaft with a pitch and spacing designed to screw into the soil without augering.

D. The tip of the lead section shall be beveled to aid in advancing the pile.

E. All pile components shall be hot-dip galvanized per ASTM A153 with a minimum coating thickness of 3 mils.

2.2 CEMENT GROUT

A. The grout shall be a fluid mixture of Portland Cement (ASTM C150, Type II) and clean potable water capable of maintaining the solids in suspension without appreciable bleed.

B. The grout shall have a minimum compressive strength of 4,000 psi at 28 days determined in accordance with ASTM C109.

C. Admixtures must be approved by the Owner's Engineer and mixed in accordance with the manufacturer's recommendations.

PART 3 - - EXECUTION

3.1 INSTALLATION EQUIPMENT

A. Shall be rotary type, hydraulic power-driven torque motor with clockwise and counter-clockwise rotation capabilities. The torque motor shall be capable of continuous adjustment to revolutions per minute (RPM's) during installation. The torque motor shall have torque capacity 15% greater than the torsional strength rating of the central steel shaft to be installed.

B. Equipment shall be capable of applying adequate down pressure (crowd) and torque simultaneously to suit project soil conditions and load requirements. The equipment shall be capable of continuous position adjustment to maintain proper pile alignment.

C. A torque indicator shall be used during pile installation. The torque indicator can be an integral part of the installation equipment or externally mounted in-line with the installation tooling. The torque indicator:

1. Shall be capable of providing continuous measurement of applied torque throughout the installation.
2. Shall be capable of measuring torque to the nearest 100 ft-lb. .
3. Shall be re-calibrated, if in the opinion of the Engineer and/or Contractor reasonable doubt exists as to the accuracy of the torque measurements.

3.2 PILE INSTALLATION

A. The lead section shall be positioned at the location as shown on the contract drawings. Battered piles can be positioned perpendicular to the ground to assist in initial advancement into the soil before the required batter angle shall be established. The pile sections shall be engaged and advanced into the soil in a smooth, continuous manner at a rate of rotation of 5 to 20 RPM's. Extension sections shall be provided to obtain the required minimum overall length and installation torque as shown on the shop drawings.

B. Sufficient down pressure shall be applied to uniformly advance the pile sections at a penetration rate per revolution that matches the pitch of the helices. The rate of rotation and magnitude of down pressure shall be adjusted for different soil conditions and depths.

3.3 TERMINATION CRITERIA

A. The torque as measured during the installation shall not exceed the allowable torsional strength rating of the central steel shaft.

B. The criteria for minimum installation torque, as shown on the shop drawings, and all helices bear at a minimum depth of 5 feet below the ground surface, shall be satisfied prior to terminating the pile.

C. If the torsional strength rating of the central steel shaft and/or installation equipment has been reached prior to achieving the minimum overall length required, the Contractor shall have the following options:

1. Terminate the installation at the depth obtained subject to the review and acceptance of the Engineer, or

2. Remove the existing pile and install a new one with fewer and/or smaller diameter helical plates. The new helix configuration shall be subject to review and acceptance of the Engineer.

D. If the minimum installation torque as shown on the shop drawings is not achieved at the minimum overall length, and there is no maximum length constraint, the Contractor shall have the following options:

1. Install the pile deeper using additional extension sections, displacement plates, and grout, or

2. Remove the existing pile and install a new one with additional and/or larger diameter helical plates. The new helix configuration shall be subject to review and acceptance of the Engineer.

E. The average torque for the last three feet of penetration shall be used as the basis of comparison with the minimum installation torque as shown on the shop drawings. The average torque shall be defined as the average of the last three readings recorded at one-foot intervals.

3.4 GROUTING HELICAL PILES

A. Fill the inside of all helical piles with cement grout.

B. Grout shall be mixed with equipment capable of providing a steady supply at the required level of production. The water – cement ratio for neat cement grouts is typically between 0.4 and 0.5. When using a pre-packaged grout, the recommended water-cement ratios listed in the mixing instructions on the package shall be followed.

C. The grout shall be placed inside the helical pile using a tremie pipe extending to the bottom of the pile. Continue grouting until the grout return at the top of the pile is of the same consistency as the grout being pumped into the pile.

3.5 OBSTRUCTIONS

A. If the pile is refused or deflected by a subsurface obstruction, the installation shall be terminated and the pile removed. The obstruction shall be removed, if feasible, and the pile re-installed. If the obstruction can't be removed, the pile shall be installed at an adjacent location, subject to prior review and acceptance of the Engineer.

B. If the Engineer determines that additional piles are required due to relocation required by obstructions, the Contractor will be reimbursed for the additional piles ordered by the Engineer.

3.6 TOLERANCES AND ACCEPTANCE CRITERIA

A. Install piles as close as practicable to the plan location. A maximum lateral deviation from the correct location at cutoff elevation equal to 1 inch will be permitted. A maximum deviation from design cutoff elevation equal to ½ inch will be permitted. Piles shall be installed to batter away from centerline of the boardwalk and within 1 degree of design alignment. Pulling piles into position is not permitted.

B. When otherwise acceptably installed piles exceed the specified tolerances and are subject to eccentric loading, the Engineer will then analytically determine the total loads on individual piles. If the load on any pile exceeds 110 percent of the specified load capacity, corrections shall be made in accordance with a design provided by the Engineer at no additional cost to the Owner. The cost of analysis and redesign of the pile cap shall be charged to the Contractor.

3.7 TRIMMING FINAL EXTENSION SECTION

A. After installation to the required depth, the top of the pile shall be cut to the specified elevation.

B. Cut off the tops of all piles square within 1 inch of the elevations shown on the Drawings. The pile cutoffs shall become the property of the Contractor, who shall remove them from the site.

3.8 DEFECTIVE, DAMAGED, AND MISINSTALLED PILES

A. Piles damaged due to internal defects or improper installation or lack of strength will not be accepted. Such defective and damaged piles, as well as piles installed out of proper location or in excess of the tolerances specified, shall be abandoned and shall be replaced by additional piles which shall be installed adjacent thereto, all as directed by the Engineer and at no additional cost to the Owner.

B. Measures for correcting any deficient pile shall consist of completely removing the defective pile and installing a new pile without any additional compensation.

3.9 QUALITY CONTROL

A. Install piles only in the presence of the Engineer or their field representative. Provide 48 hours' notice to the Engineer when their presence will be needed.

B. Provide the Engineer or their field representative free and safe access to the work areas at all times.

C. Notify the Engineer immediately of any damage or deviation that may affect the acceptability of the pile, so that corrective measures may be carried out with minimum delay.

D. Pile acceptance by the Engineer shall not relieve the Contractor of their responsibilities for performing the Work in accordance with the Specifications and the Contract Drawings.

3.10 INSTALLATION OF TEST PILES

A. Install three test piles at locations selected by the Engineer to at least the final torque resistance determined by the Contractor's design engineer. The final installation torque of the test piles will be determined by the Contractor. Provided that the pile load tests are satisfactory, the actual final installation torque for the test piles shall become the minimum required torque for the production piles. The Contractor must select lengths of test piles which are conservatively long so that the installation criteria are met and sufficient length of pile remains above the ground surface to perform the pile load test.

B. If the installation record indicates that a test pile may have been damaged, install an additional pile at an alternate location chosen by the Engineer.

3.11 PILE LOAD TEST

A. Perform three pile load tests in accordance with the provisions of the Massachusetts State Building Code, 9th Edition (Massachusetts Amendments) Section 1810.3.3.1.2 and ASTM D1143 except as modified herein.

B. Perform two load tests on Boardwalk Helical Piles and one load test on a Pedestrian Bridge Helical Pile.

C. The alternative load test procedure in Section 1810.3.3.1.11 of the Massachusetts State Building Code (Massachusetts Amendments) may be used if the test is performed on a sacrificial (non-production) test pile. If the alternative procedure is used, the loading schedule shall be the same as required for a compression load test.

D. Instrumentation of the test pile to enable measurement or computation of the load where it enters the bearing stratum is not required.

E. The test pile shall be loaded to at least 200% of the design load.

F. Do not install production piles until the load test is conducted, the results are evaluated, and the pile design is approved by the Owner's Engineer.

G. Submit to the Engineer the details of the proposed load test setup and all equipment and measurement systems to be used for the test, and obtain acceptance from the Engineer before any load test is made. All load tests shall be observed by the Engineer or his field representative. Provide 48 hours' notice to the Engineer before starting the load test.

H. The load test pile shall be identical to the production piles and installed using the same procedures.

I. Apply the load to the pile by means of a single hydraulic jack. Construct the apparatus for applying the load to the test pile so that the loads are applied axially to the pile. Provide an electronic load cell to independently measure the applied load. The required accuracy of the load application and load measurement system is 3% of the maximum test load. Calibrate the loading system (hydraulic jack and pressure gauge together as a single unit) and the load cell within one month prior to the test and submit calibration reports prior to the start of the pile load test.

J. Provide displacement measuring systems for the load test, as follows:

1. Provide a steel reference beam with a moment of inertia of no less than 105 inches4 about its neutral axis of rotation. The reference beam must be independently supported with supports firmly embedded in the ground at a distance of between 8 to 10 feet from the test pile and not less than 8 feet from any reaction pile. One end of the reference beam must be free to move as the length of the beam changes with temperature variations.
2. Mount three dial gauges equidistant from the center of the test pile and at 120-degree intervals around the pile. Attach the dial gauges rigidly to the reference beam. Align gauge stems vertically and provide smooth glass horizontal bearing surfaces for the gauge stems. Dial gauges shall have at least a 2-inch travel and shall read to 0.001 inch.
3. Establish survey monitoring points on the test pile, on the reference beam immediately adjacent to the test pile, and at each end of the loading frame. The monitoring points shall consist of a graduated scale with increments of 0.02 inch and shall be monitored during the pile load test using an optical survey level.
4. Protect the displacement measuring system against rain, wind, frost, and any other disturbances that could affect the reliability of the displacement measurements. Provide sun-shading for the measuring system for the duration of the test and for a minimum of 1 hour prior to the start of the test.

K. Apply the test loads in accordance with the loading schedule specified in the Massachusetts State Building Code.

L. Record all pertinent test data as described in ASTM D1143, including test pile as-installed information, load and displacement readings, and strain gauge readings.

M. The load test can be performed on a production pile if the test is performed by loading the pile in compression. The test must be performed on a sacrificial test pile if the alternative load test procedure in Section 1810.3.3.1.11 of the Massachusetts State Building Code (Massachusetts Amendments) is used (tested by loading the pile in tension).

END OF SECTION

SECTION 32 01 93

CONTROL OF INVASIVE PLANT SPECIES

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

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. Refer to Attachment E Project Permits, Environmental Impact Report, for background information, and Conservation Commission Order of Conditions. Conform to all permit requirements.

C. Examine all Contract Documents and all other Sections of the Specifications for requirements therein affecting the work of this Section.

1.2 DESCRIPTION OF WORK

A. The scope of work consists of all materials, equipment, labor, and services required for CONTROL OF INVASIVE PLANTS EXISTING ON SITE described here-in.

1. Previous inspections of the Site revealed extensive invasive vegetation growing along the Parkers River, in previously degraded areas. The Project proposes removing invasive species, including:
    a) Autumn olive (Elaeagnus umbellate)
    b) Bush honeysuckle (Lonicera spp.)
    c) Asiatic bittersweet (Celastrus orbiculatus)
    d) Porcelain berry (Ampelopsis brevipedunculata)
    e) Multiflora rose (Rosa multiflora)
    f) Japanese knotweed (Fallopia japonica)
2. It is anticipated that approximately 90,500 sf of area will be managed for invasive species. Within this area, it is estimated that approximately 10,800 sf is covered with invasive vegetation. The Contractor will be responsible for providing a detailed Invasive Species Control Plan.
3. Before initiating an invasive species management plan, an assessment of the relative abundance of each plant and its level of establishment may be needed to provide a baseline inventory of the plant species to assist monitoring efforts.
4. Conduct initial site walk with Engineer. Confirm/identify plant species targeted for management under this section shall be as determined in the field per the site walk, and as described herein, as specified in the IPMS (see paragraph 1.4.C) and as directed by the Engineer.

5. The work of this section includes but is not limited to identification of invasive plant species, chemical removal of invasive species, mechanical removal of invasive species, and mowing.

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. Section 31 10 00, SITE CLEARING,

1.4 SUBMITTALS

A. Submittals shall be in in accordance with Section 01 33 00, SUBMITTALS

B. Contractor shall submit for approval the qualifications and experience of the Invasive Treatment Specialist. Submittal shall include copy of current certification(s), a narrative describing the company, its expertise and experience, including herbicide treatment within sensitive ecological areas, and a list summarizing specific construction experience for a minimum of five projects.

C. Invasive Treatment Specialist to submit an Invasive Plant Management Strategy (IPMS) for the control of invasive plant species including,

1. Five (5) references from work within the last five (5) years. Provide project owner contact information including name, address, phone number and email address.

2. Provide summary of each project including specific invasive species treated, dates of treatment, methodologies used, and a summary of success and successive treatments.

3. Provide photo documentation of these projects.

4. Provide GPS coordinates of project locations, if available.

D. Crew leader must provide the following credentials,

1. Provide a valid and current Massachusetts Commercial Applicator License (CORE) for at least five (5) years.

2. Professional resume of experience in applying herbicides specifically for vegetation management.

E. All crew applicators must have a valid and current Massachusetts Commercial Applicator License (CORE). Provide all crew applicator names and license numbers.

F. Herbicide Use Report shall be submitted within two (2) weeks of application. Where applicable, the Contractor shall provide the name/s of the associated water body/bodies affected by potential discharge, per the requirements of Sections 7.1 and 7.2 of the USEPA Pesticide General Permit for the Discharges from the Application of Pesticides.

G. Submit digital photos with date and time stamp of the areas in the IPMS and follow-up reporting. Photos shall show existing conditions (pre-treatment) and post-treatment conditions.

H. The Contractor shall provide permits for herbicide application if used within a regulated resource area.

1.5 DEFINITIONS

A. Vegetation Control: All work required to control and maintain vegetation as identified. Vegetation control may be by mowing, trimming, tree-doctoring, non-chemical spray control of chemical spray control.

B. Vegetation: All plant life growing within the project areas including but not limited to grass, weeds, scrub, shrubs, trees, and overhanging branches.

C. Mowing: Mechanical trimming of grass, weeds, and other light vegetation to the required standard.

D. Trimming: Cutting by appropriate means so as to remove heavy vegetation such as scrub, shrubs and tree growth to the required standard.

E. Chemical spray control: Control of vegetation to the required standard by the use of a spray that includes herbicides.

F. Non-chemical spray control: Control of vegetation to the required standard by use of a spray that does not include herbicides.

G. Invasive Plant Species as described by the Massachusetts Invasive Plant Advisory Group (MIPAG): non-native species that have spread into native or minimally managed, plant systems in Massachusetts, causing economic or environmental harm by developing self-sustaining populations and becoming dominant and/or disruptive to those systems.

PART 2 - MATERIALS

2.1 HERBICIDES

A. All proposed herbicides shall be approved as per the IPMS. Herbicides shall be labeled for the method of treatment and shall meet all federal, state, and local regulation requirements. Application rates will depend on the herbicide proposed and shall be per the manufacturer's label for specific application.

PART 3 - EXECUTION

3.1 GENERAL

A. Prior to the start of any work, the Contractor and the Invasive Treatment Specialist shall walk the site(s) with the Engineer. The purpose of this walk is to identify the limits of the work, mark the locations of the areas designated for treatment, and mark individual plants targeted for treatment or removal according to the IPMS.

B. The Contractor shall be responsible for marking delineated areas and plants to be preserved, removed, or otherwise treated. Fencing or other materials needed for marking and delineating protected areas shall be incidental to this item.

C. Manual and mechanical means of invasive plant species removal shall include digging, hand pulling and cutting of plants found in small amounts. Mature plants found in larger quantities may be targeted with heavy equipment used for excavation of areas highly dominated with invasive

plant species. Remove the entire plant to prevent resprouting. Before plant material is properly disposed of offsite, it must be dried in black, plastic bags to limit the possibility of seed spreading.

D. Manual methods of removal should be conducted during the growing season.

E. The Owner is required to continue invasive plant management and monitoring for two additional years. The goal is re-establishing the managed areas with 75% native species.

3.2 INVASIVE PLANT REMOVAL APPROACH

A. The following table shall guide the development of Invasive Plant Management Plan.

Common Name / Scientific Name	Management Strategy	Disposal Method / Reproduction Cycle
Multiflora rose / *Rosa multiflora*	Remove by roots and standing vegetation by hand and bag. Mechanical removal utilizing an excavator or similar equipment shall be employed to remove the root matter in areas identified to be re-graded as part of the planned site work. Removal shall be performed prior to grading or re-shaping of the soil. Re-growth shall be immediately treated using an herbicide found on the Rights of Way Sensitive Area Materials List prepared by MDAR. A glyphosate formulation used late in the growing season is preferred to control this species.	Cut material shall be stockpiled or placed in dumpsters and covered with black plastic to deprive the material of sunlight and water. Legally dispose of off-site. Multiflora rose flowers in May and the fruits mature during summer and persist through the winter.
Asiatic bittersweet / *Celastrus orbiculatus*	If less than 3/8 inch in diameter, cut, and remove the roots and standing vegetation by hand and bag. If greater than 3/8 inch, the stump should be cut, then immediately treated using an herbicide found on the Rights of Way Sensitive Area Materials List prepared by MDAR. Either a triclopyr or glyphosate formulation will be effective for this plant material.	Cut/pulled material should be removed from the Site, covered in black plastic, then disposed of off-site. For this species, special care should be taken when the plant is producing fruit. Bittersweet germinates in late spring, and fruits mature in the late summer and fall.
Japanese knotweed / *Fallopia japonica*	The existing standing material (stems, leaves, etc.) shall be hand cut, bagged, and removed from the Site. Mechanical removal utilizing an excavator or similar equipment shall be employed to remove the root matter in areas identified to be re-graded as part of the planned site work. Removal shall be performed prior to grading or re-shaping of the soil.	Japanese knotweed cuttings should never be composted. This cut material should be bagged in black plastic and allowed to de-compose in the bags, or it can be piled, left to dry, then disposed of offsite or legally burned at an incinerator facility approved for this type of disposal.

Common Name / Scientific Name	Management Strategy	Disposal Method / Reproduction Cycle
	A glyphosate formulation found on the Rights of Way Sensitive Area Materials List will be injected into the stems of any plants left in-situ. Triclopyr formulations are not recommended for this species. The stem injection method can be used at any time of the year.	Japanese knotweed flowers in summer and the seeds mature in August and September.
Autumn Olive / *Elaeagnus umbellate*	Specimens less than 1.5 inches in diameter; remove by hand and bag. The entire root system shall be removed to prevent regrowth. If greater than 1.5 inches, mechanical removal utilizing a small rubber-tracked excavator or similar equipment shall be used. Resprouts or 'suckering' from broken roots left in the ground can be an issue following removal and any hand cutting of growth should be treated with a cut-stump treatment with triclopyr.	Cut/pulled material should be removed from the Site, covered in black plastic and disposed of off-site. Autumn Olive flowers from April to June and produces abundant clusters of drupes from August to October.
Bush Honeysuckle / *Lonicera spp*	Seedlings and small infestations may be hand-pulled. The entire root system must be removed to prevent regrowth. A combination of mechanical treatments and chemical control is recommended. Periodic mowing or vine cutting as necessary combined with application of triclopyr or glyphosate as a foliar treatment or cut-stump treatment.	Cut/pulled material should be removed from the Site, covered in black plastic, and disposed of offsite. Honeysuckle flowers June/July and fruits from September to November which persist through the winter.
Porcelain-berry / *Ampelopsis brevipedunculata*	Seedlings and small vines may be pulled by hand. Large plants should be controlled through cut-stump treatment with a systemic herbicide. Foliar treatment may be effective for large populations.	Cut/pulled material should be removed from the Site, dried, then chipped if hanging fruit/seed is not present. If fruits are present, the material should be dried and chipped only once the seeds/fruit have fallen. Porcelain-berry fruits in late summer/ early fall.

B. Removal of Invasive Plant Material shall conform to the following,

1. Contractor shall hand-pull, or remove using hand tools, all stems and associated roots within the designated areas specified on the drawings or as specified by the Engineer.
2. All plant parts shall be carefully placed in black plastic bags (4 mil minimum) or dumpsters lined with plastic and securely tied or sealed. Care shall be taken when pulling trucks and stems to remove as much of the root mass as possible.

3. Supplemental digging using hand tools to remove roots/ rhizomes or herbicide treatment may be required and shall be as directed by the Engineer.
4. Plant material shall be treated and/or transported in accordance with the Disposal Specifications in this Section.

C. Mechanical Removal of Invasive Plant Material

1. Mechanical methods may be used to remove large plant material such as Autum Olive.
2. Removal perimeter shall extend no less than sixteen (16) ft beyond the leading edge of the invasive species stand.
3. Excavation shall extend to a minimum depth of 4 ft below proposed final grade.
4. Excavated area shall be backfilled with excavate, supplemented with ordinary fill, covet disturbed surfaces with three (3) inches of loam.
5. All excavated soil materials, plants, roots, and other removal debris shall be transported in accordance with Disposal Specifications in this Section.

3.3 INVASIVE PLANT TREATMENT - GENERAL

A. Any herbicide used shall be subject to restrictions and setbacks from natural resources and water supplies as described in 333 CMP 11.00 and restricted to those on the MDAR Sensitive Area Materials List. Currently found at https://www.mass.gov/service-details/rights-of-way-sensitive-area-materials-list and shall be applied at lowest label rate.

B. Mixing, applying and/or disposing of herbicides shall always be in accordance with instructions on their labels and all applicable federal, state, and local regulations. Mixing shall not occur within sensitive areas, wetlands, or buffer zones.

C. The Contractor shall not spray within 2 hours prior to predicted precipitation, nor during rain events. The Contractor shall be responsible for monitoring weather conditions and adjusting the work schedule as appropriate for the herbicide and application method to be used.

D. Targeted vegetation shall be identified and marked prior to treatment. Plants treated by foliar spray, injection or glove application or other methods that leave standing vegetation, as opposed to cut-stump application, shall remain clearly marked for identification through the contract period.

E. Desirable vegetation shall be protected from both spray and other physical damage.

F. The Contractor is responsible for any damage to vegetation not designated for removal or treatment. Vegetation damaged shall be restored. Cost of replacement plants and/or restoration shall be borne by the Contractor.

G. The Contractor shall ensure that the public does not enter a work area while herbicide application or spraying is underway.

3.4 INVASIVE PLANT TREATMENT APPLICATIONS

A. Foliar Application

1. Routine guardrail treatment is typically a foliar application done with a truck-mounted spray boom, hose and handgun equipped with a low-pressure nozzle with pressure not to exceed 60 psi. For median barriers, hard to reach areas, around signposts, and in sensitive locations, treatment would be with a backpack sprayer.
2. For targeting specific plants or treating localized populations, foliar application with hose or back-pack spraying is the most used method as it is the most economical. Large infestations of knotweed adjacent to the roadway would be treated with a hose and handgun off the truck. To facilitate application and improve effectiveness of treatment, targeted vegetation, such as knotweed, may be cut earlier in the season and the re- growth sprayed in August-September.
3. Application requirements for foliar treatment are as described below under Operational Guidelines for Herbicide Application. Specific practices should be periodically checked to ensure conformance with current best practices.

B. Cut Stump Application

1. Cut stump treatment may be used to prevent sprouting or re-growth of woody species. It is most commonly used for invasive species such as Norway Maple, Black Locust, Tree of Heaven, Autumn Olive, and for Bittersweet that is climbing desirable vegetation. Application of herbicide shall be applied to the stump immediately following cutting.
2. Time of application is late spring through winter. Treatment in the spring during period of heavy upward sap flows should be avoided. Treatment may not be effective on certain species once trees are over two to four inches in caliper.

C. Frilling or Basal Bark Application

1. Cuts are made around the entire circumference of the lower 12 to 18 inches of the tree trunk with an axe or hatchet and herbicide is immediately applied into the cuts. Herbicide may be mixed with oil and applied until the bark is saturated. Treatment is from early spring to mid-fall. Some species may be treated during winter. Application during heavy upward sap flow in the spring should be avoided. This method is effective on trees of all sizes.

3.5 DISPOSAL OF INVASIVE PLANT MATERIAL

A. All material to be cleared shall become the property of the Contractor. The satisfactory disposal of all cleared plant material (seeds, roots, woody vegetation, associated soils, etc.) shall be the Contractor's responsibility.

B. Do not drag or allow invasive plant vegetation, seeds, etc. to come in contact with exposed soil on the site.

C. The Contractor shall take measures to prevent viable plant material from leading to further infestations (seeds, roots, woody material, etc.) while stockpiled, in transit, or at final disposal locations. All precautions shall be taken to avoid contamination of natural landscapes with invasive plants or invasive plant material.

D. Chipping, shredding, or on-site burning of plant material shall not be permitted unless written approval is given by the Engineer as part of the Invasive Plant Management Strategy.

E. For plant material taken to an incinerating facility per the IPMS, a receipt from that facility shall be submitted to the Engineer as proof of disposal.

F. Contractor shall be responsible for treating areas of new or re-growth due to improper storage or delay in disposal of plant material.

3.6 MONITORING

A. After initial herbicide treatment, all treated plants and areas shall be monitored on a maximum of a bi-weekly basis.

B. Monitor through visual observation and where re-growth is observed the cut end, stump of area shall be re-treated as necessary throughout the season and for the duration of the contract to obtain the stated and approved IPMS control per

C. Submit record of IPMS monitoring and discuss all follow up actions with the Engineer.

3.7 PERFORMANCE

A. Based on the type of vegetation observed, the expectation is Eighty-Five to Ninety-Five percent (85%-95%) control of the identified invasive plants achieved after the first treatment, depending on plants targeted and extent of population, and based on the expectations laid out in the IPMS. The expectation for the contract duration is 90% eradication by the end of the treatment period, unless otherwise specified in the IPMS.

END OF SECTION

SECTION 32 10 00

ASPHALT PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. This specification makes reference to the requirements of additional specifications as listed. The Contractor shall obtain and familiarize himself with all requirements referenced by this specification prior to preparation and installation of any pavements.

1. Massachusetts Department of Transportation, Highway Division, 2023 Standard Specifications for Highways and Bridges, including all addenda, (referred to as the Standard Specification).

2. American Association of State Highway and Transportation Officials (AASHTO)

   a. M323 – Standard Specification for Superpave Volumetric Mix Design

   b. MP19 – Standard Specification for Performance-Graded Asphalt Binder Using Multiple Stress Creep Recovery (MSCR) Test

   c. R35 – Standard Practice for Superpave Volumetric Design for Hot-Mix Asphalt (HMA)

   d. T209 – Standard Method of Test for Theoretical Maximum Specific Gravity (Gmm) and Density of Hot Mix Asphalt (HMA)

B. Section includes, without limitation, providing:

1. Requirements for construction of all temporary and permanent pavements on paved areas for roadways, driveways, walkways, temporary and permanent trench patching and other areas, as indicated on the drawings and as herein specified.

C. Extent: As shown, if not, as follows

1. The Contractor's attention is directed to the various pavements required under this contract, and their locations as detailed below.

2. Applicable to utility trenches and associated civil site work.

3. Shall not be applicable to landscaping elements and associated work. Paving requirements applicable to landscaping elements shall be found in the landscaping specifications.

4. All pavement thickness specified in this specification shall be of the thickness required after compaction.

Location	:	Hot Mix Asphalt Pavement – Type 1
Type:		Flexible
Requirements:		8" Gravel Borrow Type B
		2.5" Class 19.0 Hot Mix Asphalt Intermediate Course (SIC 19.0)
		1.5" Class 9.5 Hot Mix Asphalt Surface Course (SSC 9,5) .

Location:	Hot Mix Asphalt Pathway
Type:	Flexible
Requirements:	8" Gravel Borrow Type B
	2.5" Class 19.0 Hot Mix Asphalt Intermediate Course (SIC 19.0)
	1.5" Class 9.5 Hot Mix Asphalt Surface Course (SSC 9,5)

Location:	Hot Mix Asphalt Temporary Trench Patch
Type:	Flexible
Requirements:	Min 8" Gravel Borrow Type B
	2.0" Class 19.0 Hot Mix Asphalt Intermediate Course (SIC 19.0)

D. Related sections, without limitation, include:

1. Section 31 20 00 - EARTH MOVING
2. Section 31 05 16 – AGGREGATES FOR EARTHWORK
3. Section 32 16 13 – CURBS AND GUTTERS

1.2 SUBMITTALS

A. In accordance with Section 01 33 00, SUBMITTAL PROCEDURES submit Job Mix Formula for each type of hot mix asphalt pavement used on the project.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Class 9.5 Hot Mix Asphalt and Class 19.0 Hot Mix Asphalt

1. Aggregate – Shall conform to the 3 to <10 million ESAL requirements of Table 5 in AASHTO M 323. No more than 10% of the aggregate shall be natural sand. All aggregate properties of Section M3.03.0 Asphalt Emulsions of the Standard Specifications shall apply.
2. The binder shall meet the requirements of PG 64-28, Grade S as specified in AASHTO M 320 and MP 19. The contractor may use an approved warm mix additive (WMA) at a dosage rate recommended by the manufacturer. Only chemical or organic WMAs may be used. Mechanical water injection will not be allowed. If a WMA is used it shall be provided at no additional cost to the State.
3. Mix Design – HMA mixes shall conform to AASHTO M 323, "Standard Specification for Superpave Volumetric Mix Design". The design procedure shall follow AASHTO R35 "Standard Practice for Superpave Volumetric Design for Hot-Mix Asphalt (HMA)". The design specifications found in AASHTO M 323 shall supersede those found in the Standard Specifications for Road and Bridge Construction. A mix design using PG64-28 Grade S shall be used to determine the design binder content. The voids in the mineral aggregate (VMA) and VMAeffective shall be calculated for each asphalt content during the mix design process. The following specific requirements and exceptions to AASHTO M323 shall apply.
    a. Ninitial shall be 6, Ndesign shall be 50 and Nmax shall be 75 gyrations.

b. A moisture susceptibility test will not be required.

c. The mix shall be designed at 4% voids.

d. The VMA shall be greater than or equal to 16.5%.

e. The VFA shall be 70 to 80 percent.

f. The mix shall be coarse graded as defined in Section 6.1.3 of AASHTO M 323.

g. The dust to binder ratio (P0.075/Pbe) shall be 0.5 – 1.0. The design effective binder content shall be used to calculate this ratio.

h. No RAP will be allowed in the mix.

i. In addition to the sieves listed in Table 3 of AASHTO M 323, the 0.600 mm, 0.300 mm and 0.150 mm sieves will be required. The 50.0 mm and 37.5 mm sieves will not be required.

j. The following procedures shall be adhered to for the mix design:

1) Three trial blends shall be submitted and accepted before beginning the mix design procedure.

2) All trial mixture data and calculations determined for Section 9 of AASHTO R35 shall be submitted to the Engineer. The Engineer will determine which trial mixture shall be used for the mix design procedure.

3) After the mix design is completed, it shall be submitted to the Engineer for acceptance.

4) The correction factors for the ignition furnace in the plant lab shall be provided.

5) The gyratory cores and Rice (AASHTO T 209) samples at the design binder content shall be submitted to the Engineer.

6) A successful plant trial batch shall be performed before production of the HMA begins.

2.2 SOURCE QUALITY CONTROL

A. The paving plant used by the Contractor for preparation of hot mix asphalt materials shall be acceptable to the Engineer who shall have the right to inspect the plant and the making of the material.

B. Plant Laboratory – In addition to the requirements of Section 460 of the Standard Specifications, the contractor provided lab shall be equipped with the following:

1. Gyratory compactor conforming to AASHTO T 312 and two molds.

2. All equipment required to determine the theoretical maximum specific gravity in accordance with AASHTO T 209 Test Method A and Section 13.1. A metal pycnometer and electronic digital vacuum gauge shall also be provided.

3. All sieves required for the mix design process.

4. Facilities and equipment to perform a wet-wash in accordance with AASHTO T-30 and a faucet spray hose shall be provided.

C. Mix Production – A random sample will be taken at the plant every 600 tons per production day. If the quantity of HMA needed to finish the day's production is projected to be less than 600 tons, a sample may be taken at the Engineer's discretion. The following mix production tolerances shall apply:

1. The air voids (Va) shall be 3.0 – 5.0 percent.

2. The following tolerances for gradation shall apply:

Particle Size	% Passing
12.5mm	100%
9.5mm	90% - 100%
4.75mm	90% max
2.36mm	Established by the mix design ±5%
0.075mm	Greater than or equal to 2.0%

3. The production binder content shall be ±0.3% from the optimum binder content established by the mix design.

4. In-place density shall be a minimum of 92.0% of the theoretical maximum density obtained at the plant.

PART 3 - EXECUTION

3.1 PREPARATION

A. Prior to placing pavement, all backfill shall have been properly compacted as specified under SECTION 31 20 00 EARTH MOVING to eliminate settling of backfill. No pavement shall be placed over poorly compacted backfill. Backfill and gravel base course shall be compacted, brought to the proper elevation, and dressed so that new pavement construction shall be at the required grade. The Contractor shall maintain the surfaces of all excavated and disturbed areas until the pavement is placed. If there is a time lapse of more than 24 hours between completion of preparation of subgrade or placing of gravel base course and placing of paving, or if subgrade or gravel base course has been eroded or disturbed by traffic, the subgrade or gravel base course shall be restored before placing pavement.

B. When installing permanent pavement on hot mix asphalt roadway the edges of existing pavement shall be cut back 12-inches, or more as required, from the trench excavation wall or damaged area to sound undamaged material, straightened, cleaned, and painted with an accepted asphalt emulsion to ensure a satisfactory bond between it and the newly placed surface courses. Existing surface courses shall be stripped from the hot mix asphalt base course for at least a 6-inch width and trimmed square and straight so that new permanent surfacing shall be placed on undisturbed hot mix asphalt base course. Existing pavement shall be swept clean prior to placing any asphalt emulsion over it. Existing pavement that will be under new pavement shall be painted with asphalt emulsion to ensure a satisfactory bond.

C. Before permanent pavement is installed, the base shall be brought to the proper grade, and temporary pavement and excess gravel base shall be removed.

D. All manhole covers, catch basin grates, valve and meter boxes, curbs, walks, walls, and fences shall be adequately protected and left in a clean condition. Where required, the grade of manhole covers, catch basin grates, valve boxes, and other similar items shall be adjusted to conform to the finished pavement grade.

E. The Contractor shall remove and acceptably dispose of all surplus and unsuitable material.

3.2 INSTALLATION

A. General

1. All construction methods and materials shall be satisfactory to the Engineer.

2. Unless indicated otherwise, all permanent hot mix asphalt pavements shall be installed in one (1) course. Hot mix asphalt base courses shall be carefully spread and raked to a uniform surface and thoroughly rolled before application of the top course.

3. All top courses of permanent paving shall be applied with acceptable mechanical spreaders in widths of at least 9 feet.

4. The rolling for all hot mix asphalt and gravel borrow sub-base courses shall conform to the standards listed in the appropriate Subsection of the Standard Specification.

5. Pavement shall be placed so that the entire roadway or paved area shall have a true and uniform surface, and the pavement shall conform to the proper grade and cross section with a smooth transition to existing pavement.

B. Temporary Pavement

1. Temporary pavement shall be placed over all trenches in paved areas where directed by the Engineer.

2. The Contractor, upon completing the backfilling and compaction of the trenches in the streets and the placing of the gravel borrow sub-base course, shall be required to construct temporary pavement unless otherwise directed by the Engineer.

3. Temporary Pavement in roads shall be placed in one course and shall consist of 2-inch compacted thickness of Class 19.0 hot mix asphalt mix, on a 14-inch compacted thickness gravel base as directed by the Engineer.

4. The Contractor shall maintain temporary pavement in good repair and flush with the existing pavement at all times until the permanent pavement is placed.

5. The temporary pavement shall not be removed until such time that the Engineer authorizes the placement of permanent pavement.

C. Class 9.5 Hot Mix Asphalt

1. Class 9.5 Hot Mix Asphalt shall be used for surface course pavements in the locations as listed in Article 1.03 of this specification.

2. Class 9.5 Hot Mix Asphalt shall be placed to the thickness as indicated in Article 1.03 of this Specification and installed in accordance with the requirements of the Standard Specification and as detailed in the Contract Drawings.

3. Prior to placing Class 9.5 Hot Mix Asphalt, all temporary pavement and sufficient gravel base course shall be removed, to proper depths as detailed in the Contract Drawings.

D. Class 19.0 Hot Mix Asphalt

1. Class 19.0 Hot Mix Asphalt shall be used for intermediate (binder) course pavements in the locations as listed in Article 1.03 of this specification.

2. Class 19.0 Hot Mix Asphalt shall be used for temporary pavement patching, as directed, including temporary trench patching in the locations shown on the plans and directed by the Engineer.

3. Class 19.0 Hot Mix Asphalt shall be placed to the thickness as indicated in Article 1.03 of this Specification and installed in accordance with the requirements of the Standard Specification and as detailed in the Contract Drawings.

4. Prior to placing Class 19.0 Hot Mix Asphalt, all temporary pavement and sufficient gravel base course shall be removed, to proper depths as detailed in the Contract Drawings.

E. Surface Maintenance

1. During the guarantee, period, the Contractor shall maintain the bituminous surface and shall promptly make good all defects such as cracks, depressions, and holes that may occur. At all times, the surfacing shall be kept in a safe and satisfactory condition for traffic. If defects occur in surfacing constructed by the Contractor, the Contractor shall remove all hot mix asphalt and base course as is necessary to properly correct the defect. After removing hot mix asphalt and base course, the Contractor shall correct the cause of the defect and replace the base course and hot mix asphalt in accordance with these specifications.

END OF SECTION

SECTION 32 11 00

STABILIZED AGGREGATE PAVING

PART 1 - GENERAL

1.1 DESCRIPTION:

A. Stabilized Aggregate Paving covers the quality, gradation and installation requirements for the accessible trail surfacing material consisting of an aggregate mixed with an organic binder on a crushed stone base. Stabilized aggregate paving surface shall meet or exceed Americans with Disabilities Act (ADA) compliance.

1.2 RELATED WORK UNDER OTHER SECTIONS:

A. Section 31 20 00, EARTH MOVING,

1.3 SUBMITTALS

A. Submit a certified sieve analysis of aggregate materials for approval by Engineer/Designer.

B. Samples must be taken from the delivered stockpile and tested by an independent third party. Submit test results for approval by Engineer.

C. Submit binder manufacturer data for Designer approval.

D. Provide minimum 6’ x 12’ field sample for Engineer and Designer approval. Approved field sample can be used as final installation. Field samples not approved shall be removed at the contractor’s expense.

E. Qualification Data: Provide Qualification Data for firms and persons demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

PART 2 - PRODUCTS

2.1 BINDER:

A. Powdered organic binder shall be designed to be blended with paving aggregate.

B. Powdered organic binder shall be made from 100% naturally occurring materials.

C. Powdered organic binder shall be designed for foot and vehicular traffic and meet ADA accessibility requirements.

D. Binder manufacturers are:

1. Organic-Lock powdered organic binder manufactured by Envirobond Products Corporation, 6191-2100 Bloor Street West, Toronto, Ontario, Canada, M6S 5A5, 1-866-636-8476, info@envirobond.com, www.organic-lock.com.

2. "Stabilizer" binder by Stabilizer Solutions, Pheonix, Arizona, 800-336-2468.
3. Liquid polymer stabilizer, G3 Commercial Surface manufactured by TechniSoil, 877-356-2250.
4. Liquid binder, Northrock Landscape Loc Mulch & Rock Bond manufactured by TCC Materials, 651-688-9116, https://www.tccmaterials.com.
5. Or approved equal.

2.2 AGGREGATE MATERIALS:

A. The work to install Stabilized Aggregate Paving within the area designated on the Plans shall conform to applicable sections of the MassDOT Standard Specifications including Subsections 120 and 402.

B. Base Aggregate: Shall be a 3/8" – ½" Crushed Stone as per M2.01.6 of the Standard Specifications.

C. Paving Aggregate: Shall be a hard, crushed aggregate conforming to the following sieve chart:

Paving Aggregate Gradation		
Sieve	Sieve Size (mm)	Percent Passing
4	4.75	80% - 100%
8	2.36	65% - 90%
16	1.18	40% - 65%
30	0.6	25% - 55%
50	0.3	15% - 35%
100	0.15	10% - 20%
200	0.075	5% - 15%

D. Paving aggregate shall be delivered pre-mixed with the Binder material per manufacturer's / supplier's recommendations.

PART 3 - EXECUTION

3.1 PREPARATION:

A. Prior to the installation of the Stabilized Aggregate Paving, the Contractor shall insure that the existing subgrade is at the required depth to accommodate the required depth of surface material to meet the finish grade. The subgrade shall be compacted to ninety-five percent (95%) of maximum density as determined by AASHTO T-180.

3.2 INSTALLATION:

A. Ensure that the subgrade and base are properly graded and compacted as shown on the drawings and according to applicable MassDOT Standard Specifications and here within. Do not install the aggregate during rain. Rain within 3-5 days after installation will increase curing time. Protect all nearby surfaces, plants, and structures from possible contamination from materials or damage by

equipment. Do not install when temperatures are below 40 degrees Fahrenheit. Install pre-blended paving aggregate according to Manufacturer's recommendations.

B. Maximum running slope for accessible area access following AAB/ADA rules, regulations and standards shall not exceed 5%. Cross slope of all stabilized aggregate paving shall be a minimum of 1% and a maximum of 2%.

C. Spreading:

1. The use of a paving machine is highly recommended for large projects to evenly spread preblended aggregate and binder at the specified depth. It's recommended to screed the material to ensure the depth is consistent for smaller projects or projects with tight areas.
2. Spread the loose, pre-blended, and uncompacted paving aggregate with binder over the compacted base aggregate material.
3. Typically, a lift of 4 inches of loose, pre-blended paving aggregate will compact to the required 3-inch depth for Foot-Traffic / Trail Pathways.

D. Compaction:

1. For Foot-Traffic / Trail Pathways: The Aggregate Binder Mix shall be placed and compacted to a finished thickness of nine inches (9). Six (6) inches of compacted base depth with three (3) inches of pre-blended paving aggregate. Compaction shall be by a one-ton double or single static drum roller, or equivalent. Heavier static rollers are acceptable. Compact pre-blended paving aggregate in one lift.
2. For Vehicular Pathways, the full depth required is sixteen (16) inches with twelve (12) inches of compacted base aggregate with four (4) inches of compacted pre-blended paving aggregate. Compact base aggregate in four (4) inch lifts.
3. Compaction will vary with different aggregates due to particle shape and size. It will compact 20-25% less if using paving machinery. This level of compaction needs to be monitored as early as possible (starting during test plot) to determine the actual degree of compaction. It is better to put down too much material and remove it from the top than to put too little and add a layer later.
4. Vibratory compaction is acceptable for the base material, but generally not suitable for the Aggregate Binder Mix as it may allow the fines and moisture to migrate to the surface, causing the surface to take on a smooth, concrete-like appearance.
5. For tight spaces that are not accessible by drum rollers, a hand tamper is recommend. However, in certain circumstances, a vibratory or plate tamper can be used where the installer deems it to be more effective as hand-tampering over large spaces will create inconsistent results.
6. Provided the moisture content of the Binder Mix blended aggregate is adequate, additional hydration should not be necessary. On dry, sunny days, however, the surface layer may start to dry out while installing, in which case, a light misting would be appropriate to prevent surface cracks from appearing during compaction.

E. Completing Installation:

1. Apply a light spray to the surface of the material to give a clean appearance.
2. Apply water until the water begins to run-off.
3. Do not allow any traffic on the newly installed pathway until fully cured, a minimum of 24-72 hours.

F. Repairs and Protection

1. Excavate the damaged area and scarify exposed Powdered Organic Binder Mix aggregate.
2. Pre-blend the replacement crushed stone aggregate material with the Powdered Organic Binder Mix at 28-34 lbs./ton. Apply the material to the excavated area and compact. Thoroughly water the material to achieve an 8-10% moisture content. Use the 'snowball test' to determine moisture content.
3. Allow the newly installed area to cure, but not completely dry out.
4. Re-compact the material, ensuring that the final grade and crown area maintained.
5. Once the work has been completed the contractor shall repair any damage to the adjacent surfaces as a result of this operation as directed by the Engineer, at no additional cost.

G. Slope and Drainage

1. Stabilized aggregate paving surface shall meet Americans with Disabilities Act (ADA) compliance and all stabilized aggregate paving surfaces shall be free of puddling or standing water.

END OF SECTION

SECTION 32 12 43

POROUS FLEXIBLE PAVING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

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 Section.

1.2 DESCRIPTION OF WORK

A. Section Includes the following:

1. Flexible Porous Pavement
2. Aggregate setting bed for flexible porous pavement.

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. SECTION 31 05 16 AGGREGATES FOR EARTHWORK
2. SECTION 31 05 19.13 GEOTEXTILES FOR EARTHWORK
3. SECTION 31 20 00 EARTH MOVING

1.4 SUBMITTALS

A. In accordance with Section 01 33 00 SUBMITTAL PROCEDURES submit the following.

B. Product Data: For materials other than aggregates.

C. Product Data: For the following:

1. Flexible Porous Pavement
2. Aggregate Materials

D. Sieve Analyses: For aggregate materials, according to ASTM C136.

E. Samples:

1. 6” diameter full depth core of finished material
2. Aggregate materials

1.5 INFORMATIONAL SUBMITTALS

A. Material Certificates: Include statements of material properties indicating compliance with requirements, including compliance with standards. Provide for each product.

B. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency indicating compliance with the manufacturer's specifications and testing requirements.

C. Mixing and installation instructions.

D. Site handling and storage instructions.

E. Color samples from full manufacturer's color line.

1.6 QUALITY ASSURANCE

A. Control strip: Construct control strip if required by Engineer to verify performance standards for materials and execution.

B. Contractor's bidding on the installation of flexible porous paving shall show at least 3 similar installations carried out in the last 5 years.

C. The Contractor shall:

1. Furnish all labor, materials, tools, equipment, and incidentals required to install the flexible porous pavement.

2. Provide an adequate number of skilled workers who are trained and experienced with installing the flexible porous paving and are familiar with the specified contract requirements and the methods needed for its installation.

3. Reduce the risk of damage to the Flexible Porous Paving surface by not allowing track vehicles (metal or rubber), or similar heavy equipment that may damage finished pavement on paving either during or following installation.

4. Avoid tracking dirt or other deleterious material across the porous pavement during construction or after complation. Pavement to be vacuumed if directed by the Engineer to remove dirt and debris.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store aggregates where cross contamination with any other materials is avoided.

1.8 WEATHER

A. In accordance with the requirements of Section 450.42 Weather Limitations of the Standard Specifications.

B. The Contractor shall not install material on days when rain or snow is forecast unless a change in the weather results in favorable paving conditions as determined by the Engineer. In the event of rain on days prior to installation, the subbase must be dry and not contain any standing or moving water.

PART 2 - PRODUCTS

2.1 FLEXIBLE POROUS PAVING

A. Porous Asphalt Surface Course: Shall be open-graded friction course hot mix asphalt conforming to the following:

1. In accordance with the applicable provisions for Open Graded Friction Course pavement of Section 450 Hot Mix Asphalt Pavement of the Standard Specifications .
2. Performance Graded Asphalt Binder (PGAB) – The binder shall meet the requirements of PG 64-28, Grade E as specified in AASHTO M 320 and MP 19. The non-recoverable creep compliance versus percent recovery of the binder shall fall above the curve in Figure X2.1 in Appendix X2 of TP-70 when plotted.
3. The contractor shall use an approved warm mix additive (WMA) at a dosage rate recommended by the manufacturer for any OGFC placed after October 15th and before May 1st. If a WMA is used it shall be provided at no additional cost to the Town of Yarmouth.
4. Mix Design – Open graded friction course HMA mixes shall conform to the "Mix Design" section of NAPA Publication IS115, "Design, Construction, and Maintenance of Open-Graded Asphalt Friction Courses," with the following modifications:
   a. The following procedures shall be adhered to for the mix design:

   - The trial blend shall be submitted and accepted before beginning the mix design procedure.
   - After the mix design is completed it shall be submitted to the Engineer for acceptance.
   - The correction factors for the ignition furnace in the plant lab shall be provided.
   - The maximum abrasion loss for the unaged compacted specimens shall be 20%.
   - The maximum abrasion loss for the aged compacted specimens shall be 30%.
   - Air voids shall be 20% minimum.

5. The gyratory cores and Rice (AASHTO T 209) samples at the design binder content shall be submitted to the Engineer.
6. A successful plant trial batch shall be performed before production of the HMA begins.

2.2 CHOKER COURSE

A. Shall be ¾ inch crushed stone conforming to the applicable requirements of Section M.2.01.0, Table M2.01.0 – Tabulation of Stone Sizes Percent by Weight Passing Through, M2.01.4 ¾ In. of the Standard Specifications, with the additional requirement that all stone be thoroughly washed and free of fines (particles smaller than the minimum sieve size allowed for the material). The presence of fines in the choker course could compromise the proper function of the porous pavement.

2.3 FILTER COURSE

A. Shall be bank run gravel borrow conforming to Section M1.03.0 Gravel Borrow of the Standard Specifications. Gravel borrow shall be Type C.

2.4 FILTER BLANKET

A. Shall be 3/8" peastone conforming to the applicable requirements of Section M.2.01.0, Table M2.01.0 – Tabulation of Stone Sizes Percent by Weight Passing Through, M2.01.6 3/8 In. of the Standard Specifications.

2.5 RESERV OIR COURSE

A. Shall be ¾ inch crushed stone conforming to the applicable requirements of Section M.2.01.0, Table M2.01.0 – Tabulation of Stone Sizes Percent by Weight Passing Through, M2.01.4 ¾ In. of the Standard Specifications, with the additional requirement that all stone be thoroughly washed and free of fines (particles smaller than the minimum sieve size allowed for the material). The presence of fines in the reservoir course could compromise the proper function of the porous pavement.

2.6 GEOTEXTILE FILTER FABRIC

A. Non-woven Permeable Geotextile: The non-woven permeable geotextile shall meet the following minimum requirements:

Property (Unit)	Unit	Test Method	Minimum Requirements
Grab Tensile Strength	lbs	ASTM D4632	160
Grab Tensile Elongation	%	ASTM D4632	50
Puncture Strength	lbs	ASTM D6241	410
Trapezoid Tear Strength	lbs	ASTM D4533	65
Apparent Opening Size (AOS)	US Std. Sieve (mm)	ASTM D4751	70 (0.212)
Permittivity	sec -1	ASTM D4491	1.5
Flow Rate	gal/min/sf	ASTM D4491	110
Ultraviolet Resistance (Strength retained at 500 hrs)	%	ASTM D4355	70

PART 3 - EXECUTION

3.1 SUBGRADE PREPARATION

A. The existing native subgrade material under all bed areas shall NOT be compacted or subject to excessive construction equipment traffic prior to stone bed placement.

B. Where erosion of the native material subgrade has caused accumulation of fine materials and/or surface ponding at the base of the excavation, this material shall be removed with light equipment and the underlying soils scarified to a minimum depth of 6 inches. Prior the placement of the

reservoir course, the Engineer shall inspect the subgrade to verify that it is suitable for placement of the reservoir course stone.

3.2 GRADE CONTROL

A. Establish and maintain required lines and elevations. The Engineer shall be notified for review and approval of final stake lines for the work before construction work is to begin. Finished surfaces shall be true to grade and even, free of roller marks, and free of puddle-forming low spots. All areas must drain freely. Excavation elevations should be within +/- 0.1 ft.

B. If, in the opinion of the Engineer, based upon reports of the testing service and inspection, the quality of the work is below the standards which have been specified, additional work and testing will be required until satisfactory results are obtained.

3.3 INSTALLATION

A. Geotextile Filter Fabric

1. Non-Woven Permeable Geotextile shall be placed on the side slope in accordance with the manufacturer's recommendations and as shown on the plans.

B. Reservoir Course:

1. Shall be installed in 6-inch maximum lifts, and shall be stabilized in place using an eight (8) to ten (10) ton smooth-drum vibratory roller. Care shall be taken not to over-roll. Rolling shall stop whenever the stone is observed to be sliding/shifting in place.

C. Filter Blanket & Filter Course

1. Shall each be installed to a minimum of 90% and a maximum of 95% relative density, as determined by standard Proctor compaction testing (AASHTO T99). In addition, the Contractor shall determine the D15 and D85 particle sizes for both materials, and shall provide testing results to the Engineer for evaluation.

2. The Contractor shall be responsible for locating and procuring materials that meet the requirements of these specifications, and the Engineer shall reserve the right to reject any materials that do not substantially conform to the grain size distributions and/or the target D15 and D85 particle sizes. No materials for these two courses shall be installed until the Engineer has reviewed and approved of the sieve analyses and D15 and D85 particle sizes.

D. Choker Course

1. Shall be installed in one (1) lift, and shall be stabilized in place using an eight (8) to ten (10) ton smooth-drum vibratory roller. Care shall be taken not to over-roll the lift. Rolling shall stop whenever the stone is observed to be sliding/shifting in place.

E. Porous Asphalt Surface Course

1. Shall be placed in accordance with the applicable procedures included in Section 450 of the Standard Specifications.

2. Batch Plant shall be a MassDOT certified plant with an approved Open Graded Friction Course mix formula.

3. Job Mix Formula shall be approved prior to production of the open Graded Friction Course.
4. Hauling and Mix Placement – Open graded friction course HMA mixes shall be hauled and placed in conformance with the "Mix Production and Placement" section of NAPA Publication IS115, "Design, Construction, and Maintenance of Open-Graded Asphalt Friction Courses".

3.4 MAINTENANCE AND PROTECTION

A. Once installation of the flexible porous pavement is complete, the contractor shall protect the surface from damage by not allowing any traffic (pedestrian or vehicular) on the surface for a minimum of 24 hours. Pavement shall be protected from vehicular traffic and construction damage until substantial completion of the project is achieved. If any areas are damaged during construction, the areas shall be repaired or replaced at no additional cost to the owner.

B. The contractor shall keep the surface clean and clear of debris to maintain the hydraulic conveyance capacity of the flexible porous pavement over time as well as maintaining the aesthetic appeal of the surface.

C. Prior to the completion of the project, the contractor shall undertake an inspection to evaluate the condition of the surface.

D. The contractor shall inspect the surface for evidence of sediment deposition, organic debris, staining or ponding. If any signs of clogging are noted, schedule a vacuum sweeper (no brooms or water spray) to remove deposited material. Cleaned sections may then be tested by pouring water from a five-gallon bucket to ensure full hydraulic conveyance capacity has been restored.

E. If upon inspection, the structural integrity of the flexible porous surface shows damage or surface deterioration, such as raveling, slumping, cracking, etc., the contractor shall replace or repair affected areas, as necessary.

END OF SECTION

SECTION 32 12 45

PLAYGROUND SAFETY SURFACING – POURED IN PLACE

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

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 Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Coordinate with such trades to assure.

1.2 DESCRIPTION OF WORK

A. The work of this section shall include all labor, tools, materials, and appurtenances necessary to provide the installation of Poured-in-Place (P.I.P.) Permeable Polyurethane Safety Surfacing, within the Contract Limit Line as required by the drawings, as specified herein or as directed by the Engineer.

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. Section 31 20 00, EARTH MOVING
2. Section 11 68 13, PLAYGROUND EQUIPMENT

1.4 SUBMITTALS

A. Submittals shall be in in accordance with Section 01 33 00, SUBMITTALS

B. Provide manufactures literature, data, catalog cut(s) for the safety surfacing.

C. Provide Installer Certification.

D. Color and Color Mix samples for each of the color mixes (12” x 12” squares, pre-mixed and adhered with submitted binder).

E. Manufacturer’s Certificate of Compliance for materials and testing for the following:

Requirement	ASTM Testing
Impact Attenuation	ASTM F 1292
Tensile Strength	ASTM D 412
Tear Strength	ASTM D 624

Coefficient of Friction	ASTM C 1028, D 2047
Skid Resistance	ASTM E 303
Flammability	ASTM D 2895
Water Permeability	ASTM F 1551

F. Testing data showing material conforms to quality assurance shall be supplied after installation and prior to payment. Tests shall be supplied by an independent testing agency and be conducted as per ASTM F 1292.

G. Edge Restraint product literature.

1.5 QUALITY ASSURANCE

A. Supplier must certify that polyurethane safety surface depth provided meets US Consumer Product Safety Commission's Technical Guidelines for playground surfacing as follows:

B. "RECOMMENDATIONS - when tested in accordance with suggested test method in ASTM F355 Procedure C: A surface should not impact a peak acceleration in excess of 200 G's to an instrumented ANSI head-form dropped on a surface from the maximum fall height as delineated in the standard specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment Designated F1292-91."

C. The surface shall meet the Head Injury Criteria (HIC) of less than 1000.

D. Supplier must provide copies of testing procedures and results performed by independent testing source (s) which demonstrates compliance with C.P.S.C. Guidelines as described in item 1 under "Special Requirements."

E. Supplier must provide complete installation instructions.

F. A certificate of insurance must be provided by the supplier which shall provide coverage for products liability with the limit of liability not less than $1,000,000.

G. Provide proof that the installer is International Play Equipment Manufacturers Association (IPEMA) certified.

H. Provide warranty for review.

1.6 PROJECT CONDITIONS

A. Proceed with installation only when existing and forecasted weather conditions permit playground surface system installation to be performed according to manufacturers' written instructions and warranty requirements.

1.7 WARRANTY

A. Shall be guaranteed against failure or defect for workmanship and fall height not to exceed HIC 1,000 and GMAX not to exceed 200, during normal use and operation for a period of five (5) years.

B. Any defective elements or areas shall be replaced in part or whole by the Contractor at no cost to the Owner.

C. The Contractor and the manufacturer shall hold the Owner and Engineer harmless from any damages or liability resulting from negligent acts or omissions on the part of the Contractor or manufacturer or improperly installed material.

1.8 CERTIFICATION

A. Following completion of the installation of playground equipment and polyurethane surfacing, the Contractor shall prepare a certification letter to the Owner that states that the equipment has the required safety zone areas for all playground equipment as confirmed by a Certified Playground Safety Inspector (CPSI). Final payment will not be made without receipt of this certification.

PART 2 - MATERIALS

2.1 POLYURETHANE SAFETY SURFACING

A. Shall be a poured-in-place, resilient, seamless rubber surface designed to impart impact attenuation when installed over a specified substrate and tested for non-slip characteristics under ASTM E-303 over the specified base.

B. Material and depth of surfacing shall meet or exceed current Consumer Product Safety Commission (CPSC) guidelines issued in 'A Handbook for Public Playground Safety (latest edition)' for a minimum fall height of 7 feet, current Americans with Disabilities Act Guidelines (ADAG), and current American Society for Testing and Materials (ASTM) F¬1292-91 requirements.

C. Material shall be porous so as to allow water to percolate at the minimum rate of 10 GPM per square foot.

D. Polyurethane safety surfacing shall pass flammability resistance tested in accordance with ASTM D2859-76 and BS-5696.

2.2 MATERIALS:

A. Cushion Course - shall be a monolithic poured-in-place cushioned pad, made from a field-mix blend of recycled styrene butyrene rubber (SBR) ground into 3/8" shredded strands and a polyurethane binder. Depth of cushion course within each piece of play equipment and associated fall zone shall be coordinated with the manufacturer's requirements.

B. Top Wearing Course - shall be a monolithic 1/2" poured-in-place top surface made from a blend of ethylene propylene diene monomer (EPDM) colored rubber particle measuring 1 to 3 mm and an ALIPHATIC binder.

C. Aromatic binders will not be accepted. Binders utilizing latex or emulsion type binder will not be accepted. Prefabricated shock pads will also not be considered equal. Binder shall weigh at least 8.9 lbs/gallon.

D. Two colors for the top wearing course shall be selected by the Owner from the manufacturer's range of standard colors during the Shop Drawing Process. Colors shall be solid. Layout poured in place shall be in a design to be provided by the Owner or Engineer during the Shop Drawing Process.

E. Acceptable Manufacturers/Products:

1. Pro-Techs Surfacing

   Sharon Center, OH 44274
   Phone: (330) 576-6058
   Website: www.pro-techsurfacing.com

2. Surface America (an ECORE Company)

   Cheektowaga, NY, 14225
   Phone: (800) 999-0555
   Website: www.surfaceamerica.com

3. Sports Surface Specialties (a Playcore Company)

   East Aurora, NY 14052
   Phone: (716) 652-2039
   Website: www.sportsurface.net

2.3 CRUSHED STONE

A. Crushed stone shall be ¾ inch as specified in Section 31 05 16, AGGREGATES FOR EARTHWORK.

2.4 GEOTEXTILE FABRIC

A. Geotextile fabric shall be as specified in Section 31 05 19.13 GEOTEXTILES FOR EARTHWORK.

PART 3 - EXECUTION

3.1 GEOTEXTILE FABRIC

A. Install Geotextile Fabric according to manufacturer's recommendations. Install to surround the compacted gravel (bottom, sides and top) under the polyurethane safety surfacing.

3.2 CRUSHED STONE

A. Crushed stone shall be installed and compacted per Section 31 05 16, AGGREGATES FOR EARTHWORK.

B. Crushed stone shall have a smooth and level plane prior to pouring the polyurethane.

3.3 PIP POLYURETHANE SAFETY SURFACING

A. Contractor shall coordinate the delivery and installation of the safety surfacing. Safety surfacing shall be installed immediately following the installation of the play equipment and curing of concrete footings.

B. Installation shall be as recommended by the manufacturer and shall be to the depths and widths indicated on the drawings. Note that depth of wearing course is increased at impact areas noted on the drawings.

C. Installation of PIP Edge between various adjacent surfaces include cement concrete walk, stabilized aggregate paving, engineered wood fiber and plantings. Contractor shall follow manufacturer's details for loose, tapered, and flush conditions.

D. Binder to rubber percentage shall be as follows:

1. Wearing Course: 20% min.
2. Base Course: 18% min.

E. Consult with manufacturer for limitations caused by weather and temperature.

F. For poured polyurethane surfacing, the Contractor is responsible for overnight security during the period of curing; no foot traffic shall be permitted until the surface has fully cured (allowing for variations in weather and temperature).

3.4 FIELD QUALITY CONTROL

A. Perform impact attenuation testing according to ASTM F1292 in presence of Owner's representative within 30 days of installation.

1. Confirm Impact Attenuation Performance of Poured-in-Place rubber as follows:
   a. G-max Score: Less than 200
   b. Head Injury Criteria (HIC) Score: Less than 1,000.
2. Test Equipment Operator Qualifications
   a. National Recreation and Parks Association/National Playground Safety Institute (NRPA/NPSI) Certified Playground Safety Inspector (CPSI).
   b. Trained in the proper operation of Triax impact test equipment by competent agency.
   c. Tester/Test Agency and Test Equipment Operator shall be independent of Contractor.
   d. Determine compliance with ASTM F 1292, unless otherwise specified in this Section.

3.5 ACCEPTANCE STANDARDS FOR PIP POLYURETHANE SAFETY SURFACING

A. Polyurethane Safety Surfacing will be rejected by the Owner's Representative for the following reasons and as determined by the Owner's Representative:

1. Upon installation horizontal or vertical curves do not meet the shapes and profiles shown on the Drawings. Curves that have broken backs, sags, saddles, tangents, or kinks will be rejected.
2. Grade of safety surfacing does not comply with ADA or AAB or the Contract Documents.
3. Finish is inconsistent in material, texture, and/or color.

END OF SECTION

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SECTION 32 12 47

PLAYGROUND SAFETY SURFACING – WOOD FIBER MULCH

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

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 Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Coordinate with such trades to assure.

1.2 DESCRIPTION OF WORK

A. The work of this section shall include all labor, tools, materials, and appurtenances necessary to provide the installation of:

1. Wood Fiber Mulch (also referred to herein as engineered wood fiber).

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. Section 31 20 00, EARTH MOVING
2. Section 11 68 13, PLAYGROUND EQUIPMENT
3. Section 32 12 45, PLAYGROUND SAFETY SURFACING – POURED IN PLACE

1.4 SUBMITTALS

A. Submittals shall be in in accordance with Section 01 33 00, SUBMITTALS

B. Provide manufactures literature, data, catalog cut(s) for the engineered wood fiber.

C. Provide IPEMA Certification for engineered wood fiber material and installer.

D. Manufacturer's Certificate of Compliance for materials and testing for the following:

Requirement	ASTM Testing
Impact Attenuation	ASTM F 1292
Purity and Quality	ASTM F 2075
Accessibility	ASTM F 1951

E. Edge Restraint product literature.

F. Product warranty.

1.5 QUALITY ASSURANCE

A. Supplier must certify that safety surface depth provided meets US Consumer Product Safety Commission's Technical Guidelines for playground surfacing and is IPEMA Certified.

1.6 PROJECT CONDITIONS

A. Proceed with installation only when existing and forecasted weather conditions permit playground surface system installation to be performed according to manufacturers' written instructions and warranty requirements.

PART 2 - MATERIALS

2.1 GEOTEXTILE FABRIC

A. Geotextile fabric shall be as specified in Section 31 05 19.13, GEOTEXTILES FOR EARTHWORK.

2.2 WOOD FIBER MULCH

A. Wood fiber mulch shall be processed hardwood containing no bark, leaves, twigs, or foreign material. Material shall be in conformance with IPEMA material standards for engineered wood fiber.

B. Wood fiber mulch shall meet the following:

Sieve Size	Percent Passing
2” inch	100
1” inch	75
No. 16	10

PART 3 - EXECUTION

3.1 GEOTEXTILE FABRIC

A. Install Geotextile Fabric according to manufacturer’s recommendations. Install to surround the compacted sub-base (bottom, sides and top) under the proposed engineered wood fiber.

3.2 METAL EDGE RESTRAINT

A. Metal edge restraint shall be installed prior to installation of the wood fiber mulch surfacing.

B. Preparation: Ensure that all utilities are located and will not interfere with the proposed layout of the metal edging before beginning work.

C. Install edging per manufacturer’s instructions.

D. Backfill both sides of edging and compact backfill material.

E. Acceptance: Edging shall be tight and secure with true lines and proper finished grade elevations.

3.3 ENGINEERED WOOD FIBER

A. Place playground surface system materials including manufacturer's standard amount of excess material for compacting naturally with time to required depths after installation of playground equipment support posts and foundations in conformance with ASTM F 1292. Depth of engineered wood fiber shall be shown on the drawings.

B. Hand rake to a smooth finished surface and to required elevations, graded according to manufacturer's standard specification for material consistency for playground surfaces and for accessibility according to ASTM F 1951.

END OF SECTION

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SECTION 32 14 00

COBBLE PAVEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section 01 11 00, SUMMARY OF WORK.

1.2 SUMMARY

A. This Section includes the following:

1. Granite cut-stones installed as part of LS-1 through LS-3.
2. Granite cobble set in mortar setting beds.

B. Related Sections include the following:

1. Division 31 Section 31 20 00, EARTH MOVING
2. Division 32 Section32 10 00, ASPHALT PAVING
3. Division 32 Section 32 16 13, CURBS AND GUTTERS

1.3 SUBMITTALS

A. Product Data: For the following:

1. Granite cut stones.
2. Granite cobble.
3. Mortar and grout materials.

B. Samples: Submit three (3) samples of each granite type for color and texture.

C. Qualification Data: for firms and persons specified in “Quality Assurance” article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names, and addresses of architects and owners, and other information specified.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed cobble pavement installations similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Source Limitations: Obtain each type of cobble, joint material, and setting material from one source with resources to provide materials and products of consistent quality in appearance and physical properties.

C. Mockups: Before installing cobble pavement, build mockups for each form and pattern of unit pavers required to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for the completed Work, including same base construction, special features for expansion joints, and contiguous work as indicated:

1. Build mockups in the location and of the size indicated or, if not indicated, minimum 4' x 4'.
2. Demonstrate the proposed range of aesthetic effects and workmanship.
3. Obtain Engineer's approval of mockups before starting cobble pavement installation.
4. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
5. Demolish and remove mockups when directed.
6. Approved mockups may not be part of the completed Work.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store cobbles on elevated platforms in a dry location. If cobbles are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

C. Store aggregates where grading and other required characteristics can be maintained, and contamination avoided.

1.6 PROJECT CONDITIONS

A. Cold-Weather Protection: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds. Remove and replace unit paver work damaged by frost or freezing.

PART 2 - PRODUCTS

2.1 GRANITE COBBLE

A. Cobble Pavement at Rotary and Traffic Islands mortared on concrete slabs.

1. Cobbles: Square paving blocks, split with two sides sawn, made from granite complying with ASTM C 615.
   a. Granite Color and Grain: Light gray with medium grain.
   b. Thickness: 4 inches

c. Face Size: 4 by 8 inches

d. Woodbury Gray, Chester Gray, Old Berkshire or approved equal.

e. Cobbles to be selected so that they may be laid out with one-half (1/2) inch to three-quarter (3/4) inch joints.

2.2 MORTAR SETTING-BED

A. Cement mortar shall meet the requirements of Subsection M4.02.15.

B. Mortar shall be composed of one (1) part Portland cement and two (2) parts of sand by volume with sufficient water to form a workable mixture.

C. Portland Cement shall conform to the requirements of AASHTO M 85.

D. Sand: ASTM C 144.

E. Water: Potable.

F. Welded Wire Fabric: Refer to Division 32, Section “Concrete Pavement and Curbs”.

2.3 CEMENT CONCRETE FOR BASE COURSE

A. General: Cast-in-place concrete base course shall conform to the requirements in Section 485, except final finishing and brooming is not necessary for the cobblestoned area as this is a base course.

B. Concrete: Minimum twenty-eight (28) day compressive strength shall be 4,000 psi, aggregate size shall be a maximum of three-quarter (3/4) inch conforming to the requirements of Section 901. Concrete shall be air-entrained 6 percent minimum +/- 1 percent, with a three (3) inch to four (4) inch slump. Depths shall be as noted on the Plans. Welded Wire Mesh: Welded Wire Mesh (WWM) reinforcement shall conform to the applicable requirements of ASTM A 185. Mesh reinforcement shall be furnished in flat sheets. Mesh reinforcement in rolls will not be permitted. Provide six (6) inches by six (6) inches W2.9 by W2.9 WWM for four (4) inch thick concrete pavement.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas indicated to receive cobble pavement, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Proof-roll prepared subgrade according to requirements in Division 31 EARTHWORK to identify soft pockets and areas of excess yielding. Proceed with unit paver installation only after deficient subgrades have been corrected and are ready to receive subbase and base course for unit pavers.

3.3 CONCRETE

A. Concrete placement, testing, reinforcing and protection and formwork shall be as specified in Section 701 and as directed in these Special Provisions. No spray or curing compounds shall be used in construction of concrete base course for cobblestones. Concrete covering over wire mesh shall be as indicated on the Plans and as specified herein. Mesh reinforcement shall be held firmly in place against vertical or transverse movement. All forms shall be smooth, free from warp, or sufficient strength to resist deflection and of a depth to conform to the thickness of the proposed base course. All forms shall be joined neatly and tightly, shall be set true to line and grade, well staked, and braced, and shall have uniform bearing throughout their length. All forms and stakes shall be removed before placing HMA. Concrete base shall be placed in one course, to full depth, as detailed on the Plans.

B. Adequate protection shall be provided whenever temperatures of forty degrees (40°) Fahrenheit or lower occur during placing of concrete, and during the early curing period. The minimum temperature of fresh concrete after placing, and for the first three (3) days, shall be maintained above fifty-five degrees (55°) Fahrenheit. In addition to the above requirements, an additional three (3) days of protection from freezing shall be maintained. Expansion joints shall be placed twenty (20) feet on center and/or as indicated on the Plans. Follow the manufacturer's application recommendations for joint filler and sealer. Expansion joints shall be one-half (1/2) inch wide. Joint alignment shall be straight and true.

C. At the cobblestoned area, after floating the concrete off to the desired elevation, apply a pattern to the surface that shall provide a roughened texture to the concrete without affecting the finish grade.

D. Prior to setting the pavers, the surface shall be wetted or otherwise kept moist throughout a minimum six (6) day curing period through the use of polyethylene film, wetted burlap, or by a spray applied curing compound. The concrete surface shall be protected from all traffic or other disturbance during the curing period. The Contractor shall perform any cleaning necessary to the cement concrete base to provide a clean base surface, free from oil, grease, other impurities, or loose or friable particles. The Contractor shall not begin installation of pavers until the Engineer has accepted finish grade of pavement base.

3.4 MORTAR SETTING BED

A. Lay cobble pavers in a full mortar bed at the proper level, in the pattern indicated on the Plans. Mortar joints shall be one-half (½) inch to three-quarter (3/4) inch in width.

B. Fill joints between granite cobbles and adjacent flush granite curb to a full depth with mortar, using a small tool to assure a full joint. Do not smear grout on adjoining surfaces.

C. Cure joints for at least seven (7) days after installation by covering with curing paper or other non-staining material as approved.

3.5 REPAIRING AND CLEANING

A. Remove and replace cobbles that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Provide new units to match adjoining units and install in same manner as original units, with same joint treatment and with no evidence of replacement.

B. Cleaning: Remove excess grout from exposed paver surfaces; wash and scrub clean.

1. Remove temporary protective coating from brick pavers as recommended by protective coating manufacturer and as acceptable to unit paver and grout manufacturer. Trap and remove coating to prevent it from clogging drains.

END OF SECTION

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SECTION 32 16 13

CURBS AND GUTTERS

PART 1 - GENERAL

1.1 SUMMARY

A. Related documents:

1. Massachusetts Department of Transportation, Highway Division, 2023 Standard Specifications for Highways and Bridges, including all addenda, (referred to as the Standard Specification).

B. Section includes, without limitation, providing:

1. The work to be done under this Section consists of furnishing all materials, labor, tools and equipment, and performing all operations necessary for the installation of all new vertical granite, sloped granite curb, granite curb inlets, asphaltberms, and detectsble warning panels as shown on the Drawings or as directed by the Engineer and as herein specified.

C. Extent: As shown.

D. Submittals

1. Submit Shop Drawings in accordance with SECTION 01 33 00, SUBMITTAL Procedures for the following:

a. Granite Curb

1) Fabricator's data sheets.

b. Granite Curb Inlet

1) Fabricator's data sheets.

c. Hot Mix Asphalt Curbs and Berms

1) Submit material certificates signed by the material producer and the Contractor certifying that the asphalt concrete mixture complies with the specified requirements.

2) Submit profiles of templates detailed for approval prior to execution of work.

d. Detectable Warning Panels

1) Fabricator's data sheets.

E. Related sections, without limitation, include:

1. Section 03 30 00 CAST IN PLACE CONCRETE
2. Section 31 20 00, EARTH MOVING
3. Section 32 10 00, ASPHALT PAVING

PART 2 - PRODUCTS

2.1 MATERIALS

A. Granite Curb – Type 1

1. Granite Curb Type 1 shall meet the relative requirements of Section M9.04.1 of the s Standard Specifications.
2. Type VA4 - 6”x18” Straight, Transition and Curved as shown of the Plans.
3. Top edge of curb facing street shall have a ¾” chamfer except where installed as flush. flush.

B. Granite Curb – Type 2

1. Granite Curb Type 2 shall meet the relative requirements of Section M9.04.1 of the Standard Specifications.
2. Sloped face curb with the following dimensions
   a. Width – 11”
   b. Depth (back) – 16’’
   c. Depth (front) – 12”

C. Granite Curb Inlet

1. Granite Curb Inlets shall meet the relative requirements of Section M9.04.5 of the Standard Specifications

D. Hot Mix Asphalt Berms

1. In accordance with, Section M3.07.0 of the Standard Specifications

E. Detectable Warning Panels

1. The detectable warning panels shall be a prefabricated cast iron detectable warning plate as manufactured by Neenah Enterprises, Inc., Duralast by EJ Corporationr approved equal The plate shall conform to the dimensions shown on the plans.

F. Signage

1. Unless specified elsewhere, all street name and stop signs shall conform to the requirements of MassDOT Standard Section 828.
2. The support for the signs shall conform to the requirements of Section 840 and shall be of the breakaway type.

PART 3 - EXECUTION

3.1 GENERAL

A. Granite Curbing

1. Granite curbing to be installed to the lines and grades shown on the plans and as directed by the Engineer.
2. The trench for Granite Curb Type 1 shall be excavated to a width of 18 inches.
3. The trench for Granite Curb Type 2 shall be excavated to a width of 23 inches.
4. Foundation for granite curb shall consist of gravel spread upon the subgrade and after being thoroughly compacted by tamping shall be 6 inches in depth.
5. All spaces under the curb, shall be filled with gravel thoroughly compacted so that the curb will be completely supported throughout its entire length.
6. Curb shall be fitted together as closely as possible.
7. After the curb is set, the space between it and the wall of the trench shall be filled with cement concrete to a depth of 6 inches, as shown on the plans or as directed, care being taken not to affect the line or grade of the curb.
8. The joints between curbstones (both front and back) or edging shall be carefully filled with cement mortar and neatly pointed on the top and front exposed portions. After pointing, the curbstones shall be satisfactorily cleaned of all excess mortar that may have been forced out of the joints.

B. Gravel Base Course

1. The Contractor shall establish horizontal and vertical control. The Contractor will be required to furnish all lines, grades and measurements from the control points necessary for the proper prosecution and control of the work contracted for under these specifications.

C. Granite Curb Inlet

1. Granite curb inlets shall be installed in accordance with the requirements of Section 500 Curbing and Edging of the Standard Specifications. Curb inlets to be installed at the locations shown on the plans or as directed. Inlets shall be set in a full bed of mortar to the proper line and grade as shown.

D. Hot Mix Asphalt Berm

1. HMA berm to be installed to the lines and grades shown on the plans or as directed.
2. HMA berm mixture shall be placed and compacted by a mechanical paver or berm machine.
3. The underlying surface for HMA berms shall be as shown on the plans, or as directed.
4. All berm shall exhibit satisfactory workmanship, including: cleaning loose material and debris, compacting to a satisfactory density, and tying in fully with the surrounding pavement surface in order to provide a smooth transition.

E. Detectible Warning Panels

1. The detectable warning panels for new construction shall be set directly in poured concrete according to the plans and the manufacturer's specifications or as directed by the Engineer. The contractor shall place concrete blocks or sandbags on each tile to prevent the tile from floating after installation in wet concrete.

END OF SECTION

SECTION 32 17 23

PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Requirements to furnish and install,
   1. Reflectorized white and yellow line markings (thermoplastic),
   2. Reflectorized pavement markings (paint),

B. Requirements to remove existing pavement markings

1.2 RELATED SECTIONS

A. Section 32 10 00, APHALT PAVING

1.3 REFERENCES

A. This specification makes reference to the requirements of additional specifications as listed. The Contractor shall obtain and familiarize himself with all requirements referenced by this specification prior to preparation and installation of any reflectorized pavement markings.
   1. The Commonwealth of Massachusetts, Department of Transportation, Standard Specifications for Highways and Bridges, dated 2023, together with all errata addenda additional revisions, and supplemental specifications, all of which are hereinafter referred to as the MassDOT Standard Specifications.

1.4 SUBMITTALS

A. In accordance with Section 01 33 00, SUBMITTALS

PART 2 - PRODUCTS

2.1 MATERIALS

A. For newly paved roadways and drives
   1. Materials for reflectorized white lines (thermoplastic) shall conform to the requirements of Sub Section M7.01.03 of the MassDOT Standard Specifications. Materials for reflectorized yellow lines (thermoplastic) shall conform to the requirements of Sub Section M7.01.04 of the MassDOT Standard Specifications.

   Material for precut symbols and legends to be 3M “Stamark” Brand Pliant Polymer Pavement Markings (Inlay) or approved equal
      a. Series SMS-900

B. For existing pavement and bituminous patch work on existing streets with painted pavement markings,

1. Material and methods of installing painted reflectorized white lines shall conform to the requirements of Sub Section M7.01.05 of the MassDOT Standard Specifications.

2. Material for crosswalks and stop bars shall conform to the requirements of Sub Section M7.01.05 of the MassDOT Standard Specifications.

PART 3 - EXECUTION

3.1 INSTALLATION OF TEMPORARY AND PERMANENT PAVEMENT MARKINGS

A. Installation of reflectorized markings shall be in accordance with Section 860 of the MassDOT Standard Specification.

B. Reflectorized markings shall be installed only after permanent pavement has been installed in accordance with Specification Section 32 10 00 ASHPALT PAVING and approved by the Engineer.

C. All pavement marking shall be in accordance with Manual on Uniform Traffic Control Devices

D. The contractor shall notify the Engineer 48 hours in advance of installation of pavement marking.

E. The contractor shall furnish adequate protection to freshly completed markings to keep traffic off of them until thoroughly dry.

F. Pavement markings shall be installed on temporary pavement at the direction of the Owner.

3.2 REMOVAL OF EXISTING PAVEMENT MARKINGS

A. Removal of existing pavement markings shall be in accordance with Section 850 of the MassDOT Standard Specification.

B. Pavement markings shall be removed to the fullest extent possible as shown on the plans by an approved method. Any damage to the pavement or surface caused by pavement marking removal shall be repaired by the Contractor at his expense.

END OF SECTION

SECTION 32 31 29

WOOD FENCES AND GATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section "Summary."

1.2 SUMMARY

A. This Section includes the following:

1. Wood Split Rail Fence
2. Rustic Post Fence

B. Related Sections include the following:

1. Division 31 Section 31 20 00, EARTH MOVING
2. Division 03 Section 03 30 00, CAST-IN-PLACE CONCRETE

1.3 QUALITY ASSURANCE

A. Conditions: Comply with the conditions of the Contract and Division 1 Specification Sections.

B. Lumber: Comply with American Softwood Lumber Standard PS-20-70. Provide species complying with grading rules of the following associations:

1. Southern Pine: Standard Grading Rules for Southern Pine Lumber published by Southern Pine Inspection Bureau (SPIB).
2. Western Red Cedar: Western Lumber Grading Rules published by Western Wood Products Association (WWPA), or Standard Grading Rules for West Coast Lumber 16 published by West Coast Lumber Inspection Bureau (WCLIB).

C. Omit grade markings: Provide lumber grading agency certificate of inspection and grade compliance with each shipment.

D. Lumber Treatment: Comply with American Wood Preservers Association (AWPA) Standards for wood preservatives treatment scheduled.

1.4 SUBMITTALS

A. Submit lumber certificates of grade compliance.

B. Wood Treatment: Submit certification indicating processes and chemicals used in manufacturing and compliance with specified requirements. Include MSDS sheets.

C. Submit shop drawings and product data on all hardware and attachments.

D. Construct one full-size mockup panel for review and approval by the Owner or Owner's Representative.

1.5 DELIVERY, STORAGE AND HANDLING

A. Keep wood materials dry during delivery. Stack materials to ensure proper drainage and ventilation. Store off the ground avoiding direct contact with soil. Protect from weather damage, soiling, and staining.

B. Store gate hardware in covered location prior to installation to protect from damage.

1.6 PROJECT CONDITIONS

A. Do not begin fence construction or installation before completion of final grading.

1.7 COORDINATION

A. Coordinate installation of fences with Site Contractor, and other trades.

B. Field verify locations of all utilities and septic lines prior to work.

PART 2 - PRODUCTS

2.1 WOOD SPLIT RAIL FENCE:

A. Wood Split Rail Fence shall be a three (3) rail split rail fence, as shown on the drawings.

B. Wood shall be White Cedar with a natural finish.

C. All components shall be furnished smooth and free of splintering.

D. All posts shall be 4" diameter with a chamfered top (1/4" +/-).

E. Provide end posts at the end of fence assemblies and line posts at intermediate post locations.

2.2 RUSTIC POST FENCE

A. End Posts shall be 3-4" diameter round Eastern Red Cedar Posts, set at varying heights as shown on the drawings. Post shall have an angled top and tops shall have a ¼" chamfer. End Posts shall be set in concrete, as shown on the plans and in compliance with Section 03 30 00 CAST-IN-PLACE CONCRETE.

B. Intermediate Posts shall be 3" diameter round Eastern Red Cedar, set at varying heights and embedded 18" below finish grade as shown on the drawings.

C. Threaded rods shall be 1" diameter galvanized steel threaded rod.

D. Threaded nuts shall be 1" diameter galvanized steel leveling nuts.

2.3 FINISH

A. Finish shall be a clear waterproofing with UV protection similar to Cabot Clear Wood Protector or approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine final grades and installation conditions. Do not start wood construction until satisfactory conditions are corrected.

3.2 PREPARATION

A. Layout complete fence line. Coordinate location of fences with other proposed site amenities. Locate and mark intermediate and end post positions. Space line posts equally and at maximum on center spacing. Obtain Engineer approval of location prior to installation.

3.3 INSTALLATION

A. Install wood fences of the type, design and height indicated on the plans.

B. Remove from site all debris and equipment. Repair all damage resulting from wood construction.

C. Rustic Post Fence

1. A continuous threaded rod shall be used horizontally to secure the posts and pickets together. 1" diameter leveling nuts shall be used to adjust the pickets. Pickets shall be adjusted to be set plumb and to not exceed the tolerances provided on the plans.
2. Contractor shall wrap the posts and connections with a 1" diameter braided rope. Installer shall wrap the rope around the post 1.5 times and a minimum of 3 times between wood posts and pickets.

3.4 FINISH

A. Finish all wood construction with one coat of stain preservative as per manufacturer's recommendations.

END OF SECTION

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SECTION 32 32 54

LANDSCAPE STONE

PART 1 - GENERAL

1.1 SUMMARY

A. The work included in this Section is for the construction of Landscape Boulder Groupings and installation of Existing Stone Slabs from Stockpile. Work includes the on-site retrieval, collection, stockpiling, loading, hauling, organizing, and laying out of Landscape Stone, including shaping, cutting, finishing and setting of both stone slabs (ES Groupings) and boulders identified on the plans Landscape Boulders comprised of on-site weathered boulders.

1.2 REFERENCES

A. National Building Granite Quarries Association, Inc. (NBGQA)

1.3 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, requirements, apply to this Section.

B. Related Sections: The following sections contain requirements that relate to this section.

1. Section 31 20 00 EARTH MOVING,
2. Section 31 05 16 AGGREGATE FOR EARTHWORK,
3. Section 04 40 00 GRANITE CUT STONE,

1.4 DEFINITIONS

A. The definition of trade terms used in these specifications shall be those published by the National Building Granite Quarries Association, Inc. (NBQGA).

1. Arris: Sharp edge or exterior corner formed by the intersection of two surfaces.
2. Face: The exposed major surface of a piece with its specified finish.
3. Joint: The end or side surface of a piece that which is covered when a piece is set in place. Also refers to the open space or filled space that extends the full width of the top surface then vertically or angled downward between the adjacent pieces set in place.
4. Start: The beginning of a crack, caused by quarrying techniques, piece fabrication or handling.
5. Seam: Crack or Fissure.

1.5 SUBMITTALS

A. The Contractor shall provide qualifications for the following:

1. Landscape Stone Installer: Provide Company Name, location, years in business (minimum of eight (8) years of related experience) with photographic samples or other proof of projects featuring similar types of projects or related work with regard to scale, size, shape fit and finish. Provide a minimum of three (3) references, with full contact information.

2. Foreman: Provide the name and credentials of the person assigned to oversee the implementation process, including the on-site activities. The foreman shall be an experienced installer who has completed Stonework, fabrication, and installations similar in material, design, and extent to that indicated for this Project and whose work has resulted in constructions with a record of successful in-service performance. Provide a minimum of five (5) previous projects for which the Foreman was directly responsible.

1.6 QUALITY CONTROL

A. All installed Landscape Boulders or ES Stone shall be free from jagged, raw or exposed shards, flaws, reeds, rifts, laminations, cracks, seams, or other such defects.

B. Field fitment when setting stone may require removal of protrusions or faceted portions of the stone to obtain general alignment required. Any fabrication cuts shall be concealed from view or distressed and rusticated. Exposed surfaces of stone shall be free from spots, spalls, chips, stains, discoloration and other defects including variations that would affect the appearance outside the approved sample range.

C. Set stones shall not move, rock or tip. All stone when fully set shall be immoveable. The Engineer may reject any installation that is deemed unbalanced or unstable and require re-setting or re-arrangement of the slabs or boulders.

1.7 HANDLING STONE

A. Landscape Boulders: Landscape boulders may be handled directly with equipment suitable for retrieval, such as excavators with mechanical or hydraulic thumbs. Chains may be used to limit damage to existing vegetation during retrieval operations. The Contractor shall use care when handing the boulders and shall not dump stone on top of stone or fracture, split or otherwise damage intact stones. Boulders damaged beyond useful condition shall be replaced at no cost to the Owner.

B. Existing Stone Slabs: All slabs shall be handled with nylon straps. The use of chains is not permitted. Stone shall be handled carefully to prevent chipping, breakage soiling or other damage. All lifting shall be conducted with wide belt nylon slings or straps. Do not utilize lifting straps containing tar, grease or any other substances which might mar or cause staining to the surfaces of the stone. Slabs damaged beyond useful condition shall be replaced at no cost to the Owner.

PART 2 - PRODUCT

2.1 ON SITE LANDSCAPE BOULDERS AND EXISTING STONE SLABS

A. Retrieve, sort, and organize for re-use existing on-site boulders and stone slabs to be reset as Specified herein and as shown on the Drawings.

PART 3 - EXECUTION

3.1 INSTALLATION: GENERAL

A. Landscape Boulders are broadly scattered across the site. Conduct site walk with Engineer to identify boulders for reuse. The Contractor shall retrieve and stockpile stone for re-use, using care to not damage the boulders or existing vegetation.

B. The Owner has organized the Existing Stone Slabs (ES Stones) on site. The Owner will provide a list or inventory of the Slabs on site by approximate size. Review inventory list and existing stone stockpile with the Engineer. Measure, mark, sort, group or otherwise collect and organize stone by general size, identify with chalk or other non-permanent marking. Complete inventory and categorize stones to be reset. Match stones to locations indicated on plans and confirm quantities.

C. Select stones that are similar in general appearance and dimensional qualities when shown to intersect or connect to one another or relate to other built elements. Review fitment and composition. Maintain all desired relationships as shown on the plans.

3.2 INSTALLATION: SPECIFIC

A. The Contractor shall verify that all conditions are ready for placement of the stone or boulders. Verify that all lay-out and grade information is accurate and complete. Install local reference points or grade stakes for verification.

B. Ensure that excavation is complete and crushed stone bed is installed with geotextile where so indicated to prevent soils from migrating between any spaces between stones.

C. All setting shall be performed under qualified supervision. Avoid lifting stone overhead. Always lift to the lowest working height feasible.

D. Select best stones for each location configuration as shown on the plans.

E. ES Stone and Boulders shall be set to the described line and grade. Coordinate with Landscape Contractor installing plantings to provide plant pockets within Landscape Boulder Groupings.

F. Set slabs plumb and generally level unless directed otherwise. Shim as necessary. Set and backfill, compacting in lifts not greater than 6 inches.

G. Obtain close fit between existing slab stones. Joints shall be at the specified thickness as indicated on the plans, not to exceed 1-1/2 inches. Ease otherwise sharp exterior corners of stones.

H. Fill any space between ES Stone Groupings when setting as cheek walls and Landscape Stair assemblies for opening large than one inch fill with gravel borrow, then compact and top with stone dust to eliminate voids. For voids smaller than one inch, utilize stone dust.

END OF SECTION

SECTION 32 33 00

SITE FURNISHINGS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

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 Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Coordinate with such trades to assure.

1.2 DESCRIPTION OF WORK

A. The work of this section shall include all labor, tools, materials, and appurtenances necessary to provide and install site furnishings, as specified herein and as shown in the contract documents, including,

1. Bollard – Type 1
2. Bollard – Type 2
3. Chain
4. Bike Rack – Type 1
5. Bike Rack – Type 2
6. Bike Rack – Type 3
7. Accessible Picnic Table
8. Benches – Add Alternate No. 2 (refer to note A. under Section 2.8, this specification)
9. Shade Structure – Add Alternate No. 2
10. Barrier Gate

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. Section 03 30 00, CAST IN PLACE CONCRETE
2. Section 32 10 00, ASPHALT PAVING

1.4 SUBMITTALS

A. Submittals shall be in in accordance with Section 01 33 00, SUBMITTALS

B. Provide Product literature, color/finish chart, installation drawings for items as listed below.

1. Bollard – Type 1
2. Bollard – Type 2
3. Chain
4. Bike Rack – Type 1
5. Bike Rack – Type 2
6. Bike Rack – Type 3
7. Accessible Picnic Table
8. Benches
9. Shade Structure

C. Clearly indicate on the shop drawings any deviations from the plans and specifications.

D. Shop drawings shall indicate profiles, sizes, dimensions, connection attachments, size and type of fasteners, accessories, and color and finish as indicated in these specifications and the plans.

E. Provide stamped shop drawings by a Registered Structural Engineer for footings not shown on the plans. Drawings shall indicate approved equipment manufacturer and model number.

F. Provide stamped shop drawings by a professional engineer showing shade structure footings, posts, and shade sails. Footings and posts shall be designed to withstand 100 mph winds.

1.5 DELIVERY, STORAGE AND HANDLING

A. Store delivered site furnishings in a dry and safe environment as required by the manufacturer.

B. Site furnishings which become rusted or damaged due to improper storage or handling shall be rejected and shall be replaced without additional cost to the Owner.

C. Take all necessary precautions to protect all items from moisture, chipping, cracking, or other damage, during the transportation of these materials to the project, unloading and storage on the site. After delivery take all necessary precautions to prevent all items from chipping, cracking, construction dust and debris, or damage of any kind. Damaged units will not be allowed to be installed and should any damaged units be found in constructed work, such units shall be removed immediately and replaced with new units, and the Contractor shall assume all expenses incurred.

D. Stored materials shall be adequately protected against moisture by (1) stacking in such a manner as to allow a complete circulation of air under each stack, and (2) covering each stack, top and sides with a waterproof paper or membrane. Coverings shall remain in place at all times, when not working from the particular stack.

1.6 WARRANTY

A. All manufactured products to be free from defects in material and/or workmanship for a minimum period of three (3) years from the date of invoice.

B. This warranty does not apply to damage resulting from accident, alteration, misuse, tampering, negligence, or abuse.

C. The manufacturer will, at its option, repair, replace, or refund the purchase price of any items found defective upon inspection by an authorized company service representative.

PART 2 - PRODUCTS

2.1 BOLLARD – TYPE 1

A. Bollard Type 1 shall be a 6"x6" timber bollard with a chamfered top, as detailed on the plans and the indicated herein.

2.2 BOLLARD – TYPE 2

A. Bollard Type 2 shall be Model R-8464-RA, Double Locking Retractable Bollard, by Reliance Foundry, Unit 207 6450 – 148 Street, Surrey BC V3S 7G7, Canada. 1-877-789-3245. www.reliance-foundry.com.

1. Material shall be Type 316 Stainless Steel.
2. Finish shall be Polyester Powder Coated. Color shall be Black.
3. Reflective tape shall be white.
4. Or approved equal.

2.3 CHAIN

A. Chain shall be 3/8" Type 316 Stainless Steel.

B. Chain shall come with Type 316 stainless steel chain eyes and Type 316 Stainless Steel quick links. I-hooks shall also be furnished and installed as part of Bollard-Type 1 and Chain, as Type 316 Stainless Steel.

2.4 BIKE RACK - TYPE 1

A. Bike Rack - Type 1 shall be "Pelican" as manufactured by MadRax Bicycle Security, 1080 Uniek Drive, Waunakee, Wisconsin 53597, 800-448-7931, www.madrax.com

1. Mounting style shall be Surface Mount.
2. Finish shall be Powder Coated.
3. Color shall be selected by the Owner during the Shop Drawing process from the manufacturer's range of standard color options.
4. Or approved equal.

2.5 BIKE RACK - TYPE 2

A. Bike Rack - Type 2 shall be "Heron" as manufactured by MadRax Bicycle Security, 1080 Uniek Drive, Waunakee, Wisconsin 53597, 800-448-7931, www.madrax.com

1. Mounting style shall be Surface Mount.
2. Finish shall be Powder Coated.
3. Color shall be selected by the Owner during the Shop Drawing process from the manufacturer's range of standard color options.
4. Or approved equal.

2.6 BIKE RACK - TYPE 3

A. Bike Rack - Type 3 shall be "Dolphin" as manufactured by MadRax Bicycle Security, 1080 Uniek Drive, Waunakee, Wisconsin 53597, 800-448-7931, www.madrax.com

1. Mounting style shall be Surface Mount.
2. Finish shall be Powder Coated.
3. Color shall be selected by the Owner during the Shop Drawing process from the manufacturer's range of standard color options.

2.7 ACCESSIBLE PICNIC TABLE

A. Accessible Picnic Table shall be furnished installed as part of Additive Alternate No. 2. Concrete base for Accessible Picnic Table shall be installed as part of the Base Bid.

B. Accessible Picnic Table shall be Model 298-60-2PL as manufactured by Dumor, Inc., PO Box 142, Mifflintown, Pennsylvania 17059. 800-598-4018, www.dumor.com

1. Mounting style shall be Surface Mount.
2. Recycled Plastic Table and Bench Surface and Metal Frame Color shall be selected by the Owner during the Shop Drawing process from the manufacturer's range of standard color options.
3. Or approved equal.

2.8 BENCH

A. Boardwalk Bench shall be TimberForm® PrismÔ series model No. 2380, Manufacturer, Columbia Cascade Company, www.timberform.com, 800/547-1940

1. Backed bench, shall be 5'-0" in length, IPE wood slats, mounting style shall be surface mount. Color finish selected by the Owner, in the quantity shown on project drawings. Or approved equal.
2. Boardwalk Benches shall be installed as part of the Base Bid.

B. Park Bench shall be Model 131 Armrest as manufactured by Dumor Inc., PO Box 142, Mifflintown, Pennsylvania 17059. 800-598-4018, www.dumor.com

1. Backed bench with arm-rests, shall be six (6) feet in length. Mounting style shall be Surface Mount. Recycled Plastic Seat and Back and Metal Frame. Color shall be selected by the Owner during the Shop Drawing process from the manufacturer's range of standard color options or approved equal.

2. Park Benches shown within the PARC Grant Limits shall be furnished and installed as part of the Base Bid, all other Park Benches shall be part of Additive Alternate No. 2.

2.9 SHADE STRUCTURE (ADDITIVE ALTERNATE NO. 2)

A. Shade Structure and all appurtenances shall be furnished and installed as part of Additive Alternate No. 2.

B. Shade Structure shall be made up of several components:

1. Shade Sails shall be 20' X 20' 10' EH Triangle Sails as manufactured by Poligon, 4240 136th Avenue, Holland, Michigan 49424. 1-616-888-3500. www.poligon.com.

a. Or approved equal.

2. Steel columns and reinforced concrete foundations shall be designed and stamped by a professional engineer for shade structure and all of its appurtenances to be able to sustain wind speeds up to 120 mph.

2.10 TRASH RECEPTACLE (BY OTHERS)

A. Trash receptacle shall be furnished and installed by the Owner.

B. Contractor shall install Concrete Pads for Trash Receptacles, at the locations shown on the Drawings. Final locations shall be coordinated with the Owner.

2.11 BARRIER GATE

A. Barrier Gate A shall be HCG-H-4X12B-KIT-G as manufactured by Hoover Fence Co., 4521 Warren Ravenna Road, Newton Falls, Ohio 44444.

1. Barrier Gate A shall be a single swing, 12' wide gate. Provide Galvanized post and latch opposite side of gate post.

2. Or approved equal.

B. Barrier Gate B shall be HCG-H-4X16B-KIT-G as manufactured by Hoover Fence Co., 4521 Warren Ravenna Road, Newton Falls, Ohio 44444.

1. Barrier Gate B shall be a single swing, 16' wide gate.

2. Provide Galvanized post and latch opposite side of gate post.

3. Or approved equal.

2.12 GROUT

A. Non-shrink grout for anchoring site improvements shall be as specified in Section 03 60 10 CEMENTITIOUS GROUT.

PART 3 - EXECUTION

3.1 MANUFACTURED SITE FURNISHING INSTALLATION

A. Install manufactured site furnishings including benches, tables, and bike racks, in accordance with the manufacturer's instructions on cement concrete pads where shown and detailed on the drawings or as directed by the Engineer.

B. Boardwalk benches shall be installed on the boardwalk. Coordinate with carpentry work to ensure adequate blocking below decking. Utilize tamper-proof fasteners.

C. All site furnishings to be installed level. Shim with metal washers to level, without rocking.

D. Anchor site furnishings to surfaces as detailed on the drawings.

E. Repair minor damages to finish in accordance with manufacturer's instructions and as approved by the Engineer.

F. For component damage, remove and replace damaged components that cannot be repaired as determined by the Engineer.

3.2 SHADE STRUCTURE

A. Install shade structure foundations as per approved engineered and stamped shop drawings and manufacturer's recommendations.

B. Excavate for footings per approved layout. Form and place rebar, install all embedded items. Pour and finish concrete. Allow to cure 28 days.

C. Coordinate steel support columns and confirm specific installation locations: ensure tensioner plates align correctly with the shade sail cables and tensioners. Install vertical support columns, bolt in place, shim and set plumb. Torque bolts to specified setting.

D. Install shade sails per approved shop drawings and manufacturer's recommendations.

E. Rec-heck and adjust tension as required.

3.3 BARRIER GATE

A. Lay out Barrier gates for approval by the Engineer.

B. Excavate for footings per approved layout. Form and place rebar, install all embedded items. Pour and finish concrete. Allow to cure 28 days.

C. Install barrier gate and hang gate leaf sections as per the drawings, approved shop drawings and manufacturer's recommendations.

END OF SECTION

SECTION 32 91 13

SOIL PREPARATION FOR SEEDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DESCRIPTION OF WORK:

A. Provide all materials, equipment, and labor necessary to complete the work as indicated on the drawings or as specified herein.

B. The principal work of this section includes, but may not be limited to, the following:

1. Grading and Spreading Loam.
2. Preparations of Areas for Seeding and Sodding.
3. Application of Limestone.
4. Application of Lawn Starter Fertilizer.
5. Application of Turf Maintenance Fertilizer.
6. Applying Jute Mesh.

1.3 QUALITY ASSURANCE:

A. Subcontract work to a firm specializing in such work unless contractor is fully experienced and qualified.

B. Do not make substitutions without written approval. If specified materials are not available, obtain approval for substitution from the Owner's Representative.

1.4 SUBMITTALS:

A. Certified analysis and source of off-site loam to be provided. Certification shall list soil additives to loam including rates and type.

B. Certification and/or labels of proposed soil additives stating names of each.

1.5 PRODUCT DELIVER, STORAGE AND HANDLING:

A. Protect all products from weather vandalism or other damaging or deteriorating conditions.

PART 2 - PRODUCTS

2.1 SCREENED LOAM:

A. Screened fertile, friable, medium textured sandy loam with no admixture of refuse or any natural or introduced materials toxic to plant growth and free from subsoil and stumps, roots, brush, stones, clay lumps or other extraneous matter over one inch (1") in any diameter and which will prevent the healthy development of the grass.

B. Sandy loam shall possess good filtration and permeability rates, and shall possess a mechanical analysis where: N 85% of sand size is 0.5 to 1.0 mm and N 95% of sand mix is between 0.5 and 2.0 mm and no more than 5% of mix is less than 0.5 mm.

C. Acidity range of approximately pH 5.5 to 7.5 when tested according to methods of testing or A.O.A.C. and organic content not less than 3% nor more than 20% as determined by wet combustion method (Chromic acid reduction). Topsoil may be amended to meet such requirements. Provide analysis prior to delivering topsoil to site, including recommended rates and types of soil additives to achieve desired mix.

D. On site topsoil (stockpiles) shall be free of debris, roots, and branches. It shall be made to conform to the requirements for sandy loam furnished from the site as specified herein.

2.2 LIMESTONE:

A. Dolomitic limestone contains up to 50% magnesium carbonate in a dry, granular form. Limestone shall be ground to such a fineness that at least 50% will pass through a 100-mesh sieve and 90% to 100% will pass through a 20-mesh sieve.

2.3 LAWN STARTER FERTILIZER:

A. Complete fertilizer in granular form, from commercial sources bearing manufacturer's analysis; 10-20-10 ratio of N-P-K.

B. Significant quantities of trace elements such as iron, boron, etc. shall be contained in the fertilizer.

C. Fifty percent (50%) of available nitrogen shall be in a slow-release form as found in certain urea form products or natural organic forms or a combination of both.

D. The salt shall not exceed 35.

2.4 TURF MAINTENANCE FERTILIZER:

A. Complete fertilizer in granular form, from commercial sources bearing manufacturer's analysis 20-5-10 ratio of N.P.K.

2.5 JUTE MESH:

A. Jute mesh shall be uniform, open, plain weave of undyed and unbleached single jute yarn, a minimum of four (4) feet in width plus or minus one (1) inch. There shall be 78 warp ends per

width and 41 weft ends per yard. Weight shall average 1.22 pounds per linear yard, plus or minus 5%.

B. Staples for Erosion Control Materials: 9-gauge staples shall be used with jute mesh: 11-gauge with woven paper.

2.6 WATER:

A. Clean, fresh potable water.

PART 3 - EXECUTION

3.1 GRADING AND SPREADING LOAM:

A. Remove all debris and other inorganic materials on any prepared subgrades, and reshape and dress any damaged or eroded slopes, swales, and other areas. Scarify and loosen subgrade to a minimum depth of four inches (4") by discing, or other approved method. Establish a friable surface condition in all areas designated to receive loam, employ multiple passes to scarify where compaction may have occurred. Loam shall not be placed until subgrade is in suitable condition and free of foreign objects, excessive moisture, or frozen materials. Stockpiled and off-site loam shall be spread as required on all disturbed and bare areas to produce a total depth of no less than four inches (4") in any location with final depths as shown on the plans and details. Place fill soils and compact to eliminate any irregularities or depressions in existing grades with suitable fill material as specified in Section 31 20 00 prior to spreading loam, then shape and finish grade to the depth of loam as shown in the plans and as specified herein.

B. Areas to receive loam shall be progressively fine graded, and both machine and hand raked, with stockpiled and off-site loam placed as required to correct depressions and other irregularities, to produce smooth and unbroken finish grades and the depth of topsoil required. Where additional topsoil is placed on existing loam incorporate soil with discing or other approved method to mix soil layers fully to four-inch (4") depth.

C. Drawings show grading design intent to achieve a uniform grade not less than 1.25% slope. Finish grades shall conform to lines, grades, sections, and shapes of lawn areas as required. Always provide positive drainage unless specifically noted otherwise. Provide smooth, uniform, rounded transitions at all grade changes and breaks in grade. Loam is to be finished for seed at a consistent depth of 1/2" below any adjacent pavement surfaces.

D. Starter fertilizers: All required materials shall be spread and distributed into the soil at rates and amounts specified herein.

E. After establishment of finish grade, entire area shall be hand raked and hand rolled.

3.2 PREPARATION OF AREAS FOR SEEDING:

A. GENERAL DESCRIPTION: This work shall consist of the preparation of the seed bed. Work shall be done as described herein:

1. Areas shall be finely raked to a finished grade. Substantially, all sticks, litter, wire, weeds, cable, or stones larger than one (1") inch in greater dimension shall be removed from the finished grade surface and disposed of off-site or as directed by the Engineer.
2. Where the soil has become compacted, prior to fine raking, areas to be seeded shall be scarified by discing, york raking, or other approved method to a minimum depth of two (2) inches.
3. No seeding will be permitted on areas where the seed bed has not been properly prepared or where the soil is compacted.
4. The Contractor shall request inspection of the finished work for approval of the Engineer before proceeding with seeding.

3.3 APPLICATION OF LIMESTONE:

A. When applied dry, limestone shall be spread evenly and incorporated thoroughly into the soil by discing or other approved means.

B. When applied hydraulically, no discing will be necessary.

C. Granular treatment to be applied at the rate of 25 to 50 lbs. per 1,000 square feet or as required by soil pH test to produce a pH of 6.0 to 6.5.

3.4 APPLICATION OF LAWN STARTER FERTILIZER:

A. After the incorporation of ground limestone into the seed bed, then apply the fertilizer.

B. Fertilizer shall be applied at the rate of 20 lbs. per 1,000 square feet.

C. Apply fertilizer according to manufacturer’s recommendations.

3.5 APPLICATION OF TURF MAINTENANCE FERTILIZER:

A. One application of turf maintenance fertilizer will be required before final acceptance of seeded areas.

B. Fertilizer shall be applied at the rate of 2 lbs. per 1,000 square feet after seeding has been established.

C. Fertilizer should be applied at a time, which shall be requested in writing by the Contractor, and approved in writing by the Owner's representative.

3.6 APPLYING JUTE MESH:

A. Jute Mesh shall be installed on all seeded and planted slopes 3:1 or greater.

B. Apply just mesh loosely but smoothly to fit the contour of the finished grade, parallel to and in same direction as the flow of water. The up-slope end of each separate strip or piece of jute mesh shall be buried in a six (6) inch minimum vertical anchor slot of junction slot with the soil tamped firmly against the mesh. Where more than one width of material is required, edges shall overlap a minimum of twelve (12) inches, and the up-slope section of mesh will be on top. Down-hill ends of the jute mesh shall be folded under approximately four (4) inches and stapled in place. Staples will be inserted through the mesh along edges, overlaps, and in the center of all jute mesh strips at intervals not greater than three (3) feet. All anchor slots, junction slots, check slots, and terminal folds shall have five (5) staples spaced not more than nine (9) inches on center across widths.

C. On seeded banks, jute mesh shall be applied immediately after seeding. On shrub banks, apply jute after finish grading. Cut openings in mesh for each plant and plant and mulch plants as specified. Staple mesh in place to secure openings made for plants.

END OF SECTION

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SECTION 32 91 19

PLANTING SOIL AND FINE GRADING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. The work of this Section consists of providing all labor, equipment, materials, incidental work, and construction methods necessary to perform all 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:

   a. Furnishing, testing, placing, spreading, amending and grading of planting soil.

   b. Stripping, stockpiling screening and respreading existing topsoil.

B. Related Sections

1. Section 31 25 00, EROSION AND SEDIMENTATION CONTROLS
2. Section 31 20 00, EARTH MOVING
3. Section 32 92 19, SEEDING AND LAWN ESTABLISHMENT
4. Section 32 93 00, PLANTS; TREES, SHRUBS, GROUND COVERS

1.2 QUALITY ASSURANCE

A. Qualification of Landscape Contractor: The work of this Section 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.

1.3 SUBMITTALS

A. Submit proof of landscape contractor's experience to the Engineer in accordance with QUALITY ASSURANCE paragraph of this Section.

1. Experience: The Contractor shall submit two copies of the proof of experience for the Landscape Contracting firm for this project to the Engineer for review and approval.

B. Testing shall be at the Contractor's expense. Collect samples per the requirements of the testing laboratory. 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, Engineer of Massachusetts, Amherst, MA 01003, (413) 545-2311 or approved equal. Existing on-site screened topsoil shall meet the same testing requirements as loam borrow material.

C. Loam analysis shall include:

1. Soil pH by water pH and buffer (smp) pH tests, percentage organic content, nitrate nitrogen, ammonium nitrogen, phosphorus, potassium, calcium, aluminum, magnesium, manganese, Micronutrients, Toxins including but not limited to lead, cadmium, arsenic and mercury, Saturated hydraulic conductivity per ASTM D5856, Calculated CEC.

2. Soil analysis tests shall show recommendations for new lawns for soil additives to correct soils deficiencies as necessary, and for additives necessary to accomplish the work as specified.

3. Test results: test data and recommendations for soil amendments including but not limited to nitrogen, phosphorus, potassium and limestone.

D. Limestone: Submit supplier's certification that the limestone being supplied conforms to these Specifications

E. Fertilizer: Submit product data of seeding 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.

F. Compost: The Contractor shall submit two 10-lb samples of compost to be used in backfill mix accompanied by certified laboratory test results per the requirements of this special provision.

1. Planting Soil Installation Procedures: Contractor shall submit written program containing but not limited to the following:

a. Schedules of work

b. Description of the equipment that will be used for transport, compaction, and installation of Planting Soil on the Project site.

c. Cleanup

d. Removal of environmental protections

2. Acceptance of the program does not relieve the Contractor from the responsibility to conduct the work in strict accordance with the requirements of Federal, State, and local regulations, standards and laws, the Project specifications, or to adequately protect the health and safety of all workers involved in the Project, any members of the public who may be affected by the Project, and the surrounding environmental resources.

1.4 EXAMINATION OF CONDITIONS

A. All areas to be improved shall be inspected by the Contractor before starting work and any defects such as incorrect compaction, grading or drainage problems shall be reported to the Engineer prior to beginning this work. The commencement of work by the Contractor shall indicate acceptance of the areas to be improved, and assumption of full responsibility for the work of this Section.

B. The Contractor shall be solely responsible for judging the full extent of work requirements involved.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Loam

1. Loam shall be "fine sandy loam" or "sandy loam" determined by mechanical analysis (ASTM D-422) and based on the "USDA Classification System". Loam shall have the following mechanical analysis:

Textural Class	% of Total Weight	Avg%
Sand (0.05 - 2.0 mm dia. range)	50 - 70	60
Silt (0.002-0.05 mm dia. range)	25 - 35	30
Clay (less than 0.002 mm dia. range)	5 - 15	10

2. Loam shall contain not less than 3.5 percent nor more than 4.5 percent organic matter as determined by the loss on ignition of oven-dried samples.
3. Loam shall be free of debris and other extraneous matter. It shall be uncontaminated by salt water, foreign matter and substances harmful to plant growth. The electrical conductivity (EC2) of a 1:2 soil-water suspension shall be equal to or less than 1.0 millimhos/cm. (Test minus sieve #10 material). Soils shall not have levels of extractable aluminum greater than 200 parts per million.
4. No loam shall be delivered to the site until the review and approval of loam test results by the Engineer.
5. Loam shall be altered per the testing recommendations to support seed germination and turf establishment. Amend as required to ensure the following:
    a. The loam shall have an acidity range of 6.2 pH to 6.8 pH.
    b. Macro and Micronutrients levels recommended per the test report.

B. Screened on-site topsoil.

1. Existing on-site topsoil shall be stripped and stockpiled for re-use. Stripping shall be conducted to minimize mixing topsoil with subgrade materials, roots and other deleterious matter.
2. Protect stockpile with perimeter erosion controls and/or cover to prevent erosion. Temporarily seed stockpile if stockpile is in place for greater than 60 days.
3. Screen topsoil to remove deleterious matter and larger stones. Amend topsoil as needed to meet requirements for loam or as otherwise approved.

C. Manufactured Compost

1. Manufactured Compost shall be mature, stable, weed free, and produced by aerobic decomposition of organic matter. Compost feedstock may include, but is not limited to agricultural, food or industrial residuals; class A biosolids as defined in the EPA CFR Title 40, Part 503; yard trimmings, or source-separated municipal solid waste. The product must not contain any visible refuse or other physical contaminants, substances toxic to plants, or over

5% sand, silt, clay or rock material by dry weight. The product shall possess no objectionable odors.

2. Manufactured Compost must meet all applicable USEPA CFR, Title 40, Part 503 Standards for Class A biosolids. The moisture level shall be such that no visible water or dust is produced when handling the material.
3. In addition, Manufactured Compost shall have the following properties:
    a. pH: 5.5 – 7.5
    b. Organic matter (% dry weight basis): 30 – 65
    c. Soil salt (electrical conductivity): maximum 5 dS/m (mmhos/cm)
    d. Moisture content %, wet weight basis: 30 – 60
    e. Particle size, dry weight basis: 98% pass through 3/4 inch screen or smear
    f. Stability carbon dioxide evolution rate: mg CO2-C/ g OM/ day < 2
    g. Solvita maturity test: > 6
    h. Physical contaminants (inerts), %, dry weight basis: <1%
    i. Chemical contaminants, mg/kg (ppm): meet or exceed US EPA Class A standard, 40CFR § 503.13, Tables 1 and 3 levels.
    j. Biological contaminants select pathogens fecal coliform bacteria, or salmonella, meet or exceed US EPA Class A standard, 40 CFR § 503.32(a) level requirements.

D. Soil Additives

1. General: Soil additives shall be used to counteract soil deficiencies as recommended by the soils analysis and as supplements for Planting Soil construction as specified herein.
2. Ground limestone for adjustment of Planting Soil pH shall contain not less than 85 percent of total carbonates and shall be ground to such fineness that 40 percent shall pass through 100 mesh sieve and 95 percent shall pass through a 20 mesh sieve. Contractor shall be aware of Planting Soils pH and the amount of lime needed to adjust pH to meet the requirements of the testing lab recommendations.
3. Commercial fertilizer shall be a product complying with the State and United States fertilizer laws. Deliver fertilizer to the site in the original unopened containers bearing the manufacturer's certificate of compliance covering analysis and which shall be furnished to the Engineer’s Representative. Fertilizer shall contain not less than the percentages of weight of ingredients as recommended by the soil analysis.
    a. One hundred percent of the nitrogen content shall be derived from organic materials. Nitrogen source shall be coated to ensure slow release. Fertilizer percentages of weight of ingredients shall be as recommended by the soil testing and analysis specified, performed, and paid for under this Section.

PART 3 - EXECUTION

3.1 FILLING AND COMPACTION

A. Perform all earthwork in accordance with Sections 31 20 00, EARTH MOVING of this Specification.

3.2 GENERAL

A. Planting Soil shall be protected from erosion at all times. Materials shall be spread as soon as possible after completion of the work of rough grading and excavation and filling has been completed.

B. Unscreened topsoil shall not be permitted.

C. Evenly distribute and spread Planting Soil to depths required across the project site.

D. No Planting Soil shall be handled, planted, or seeded in any way if it is in a wet or frozen condition. A moist Planting Soil is desirable.

3.3 LAWN AREA / FINE GRADING

A. Immediately prior to dumping and spreading Planting Soil in locations shown on the Contract Documents, the subgrade shall be cleaned of all stones greater than 2 inches and all debris or rubbish. Such material shall be removed from the site, not raked to the edges, and buried. Notify the Engineer that the subsoil has been cleaned and request his/her attendance on site to review and approve subgrade conditions prior to spreading Planting Soil.

B. After Planting Soil has been spread in turf areas, spread fertilizer and limestone across the surface of the spread Planting Soil and till the Planting Soil to a depth of 6 inches to integrate fertilizer and limestone into the top layer of the Planting Soil.

C. Remove all large stiff clods, lumps, brush, roots, stumps, litter, and other foreign matter from the Planting Soil. Remove from unscreened soils all stones over 1 inch in diameter from the top 6 inches of the Planting Soil bed.

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 re-graded 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 turf areas to the required compaction levels as described herein. At the edges of bituminous concrete walkway, the Contractor shall install Planting Soil at a higher level to anticipate any reduction of Planting Soil volume due to settling during the warranty period.

1. Compact Planting Soil to the required density as specified herein.

2. Maximum dry density for Planting Soil shall be determined in accordance with ASTM D698. In lawn areas the following percentages of minimum to maximum dry densities shall be achieved:

Minimum	Maximum
83%	86%

3. The surface area of each lift hall shall be scarified by raking prior to placing the next lift.

G. In addition to the range cited above, compact each lift sufficiently to reduce settling but not enough to prevent the movement of water and feeder roots through the soil. The Planting Soil in each lift should feel firm to the foot in all areas and make only slight heel prints. At completion of the Planting Soil installation, the soil should offer a firm, even resistance when a soil sampling tube is inserted from lift to lift. In the presence of the Engineer's Representative probe installed Planting Soil with Penetrometer to verify Planting Soil compaction is no greater than existing conditions probed at the start of the Contract.

H. Select equipment and otherwise phase the installation of the Planting Soil to ensure that equipment does not travel over already installed soil. Contractor shall back his way out of the project site.

I. Disturbed areas outside the limit of lawn work shall be graded smooth and spread with a minimum of 6 inches of Planting Soil to the finished grade.

3.4 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 precede 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

REINFORCED TURFGRASS

PART 1 - GENERAL

1.1 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Protect reinforced turfgrass units/rolls from damage during delivery and store rolls upright, under tarp, to protect from sunlight, when time for delivery to installation exceeds one week.

C. Store Hydrogrow in a dark and dry location

D. Handling: Protect materials during handling and installation to prevent damage

1.2 MAINTENANCE SERVICE

A. Warranty on reinforced turfgrass shall match loam and seed areas, as defined in Section 32 92 19, SEEDING AND GRASS ESTABLISHMENT.

B. Project Conditions

1. Maintain environmental conditions within limits recommended by manufacturer for optimum results.
2. Do not begin installation of porous pavements until all hard surface paving adjacent to porous pavement areas, including concrete walks and asphalt paving, has been complete.
3. Protect partially completed paving against damage from other construction traffic when work is in progress.
4. Adequately water grass seed to assure germination of seed and growth of root system.
5. Grass coverage on the sand filled Reinforced Turfgrass rings must be completed within one week.
6. DO NOT DRIVE, PARK ON, or use Reinforced Turfgrass system for two or three mowing cycles until grass root system has matured (6 to 8 weeks for seeded areas). Any barricades constructed must still be accessible by emergency and fire equipment during and after installation.

1.3 SUBMITTALS

A. Submit manufacturer's product data.

PART 2 - PRODUCTS

2.1 REINFORCED TURFGRASS SYSTEM

A. Reinforced Turfgrass shall be GrassPave2 by Invisible Structures, Inc., which is located at:

3510 Himalaya Rd. Suite 200
Aurora, CO 80011
Tel: 303-233-8383
Web: www.invisiblestructures.com.

a. Or approved equal.

B. Composition shall be:

1. High density polyethylene (HDPE): 100 percent recycled materials.
2. Color: black
3. Color Uniformity: Uniform color throughout all units rolls.
4. Carbon Black for ultraviolet light stabilization.
5. Hydrogrow soil amendment and fertilizer, provided by manufacturer with Grasspave2.
   a. Or approved equal.

C. Performance Properties:

1. Maximum Loading Capability: 15,940 psi (2.29 million psf, 109,906 kPa) when filled with sand.
2. Wheelchair Access testing for ADA Compliance: Passing ASTM F 1951-08.
3. Wheelchair Access testing for ADA Compliance: Passing Rotational Penetrometer testing.
4. Tensile strength, pull-apart testing: 458 lbf/in from ASTM D638 Modified.
5. System Permeability: 2.63 to 38.55 inches of water per hour.
6. Effective Imperviousness (E.I.): 10%.

2.2 SYSTEM MATERIALS

A. Base Course shall be Gravel Borrow, as defined in Section 31 05 16 Aggregates for Earthwork.

B. Sand Fill for Rings and Spaces Between Rings: Clean sharp sand (washed concrete sand).

1. Coarse, well-draining sand, such as washed concrete sand conforming to AASHTO M6 or ASTM C-33 or United States Golf Association (USGA) greens, section - sand mix “The Root Zone Mixture.”

C. Turf Conditioner:

1. Hydrogrow a proprietary soil amendment manufactured by Invisible Structures, Inc. and provided with Grasspave2.
   a. Or approved equal.

2.3 GRASS:

A. Grass

1. Seed: Use seed materials, of the preferred species for local environmental and projected traffic conditions, from certified sources. Seed shall be provided in containers clearly labeled

to show seed name, lot number, net weight, % weed seed content, and guaranteed % of purity and germination. Pure Live Seed types and amount shall be as shown on plans.

a. Topsoil – obtain specified topsoil for a light "dusting" (no more than ½" or 13mm) above rings filled with sand for seeding germination.

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine subgrade and base course installed conditions. Do not start porous paving installation until unsatisfactory conditions are corrected. Check for improperly compacted trenches, debris, and improper gradients.

B. For fire lane installations: prior to installing base course for turf paving, obtain approval of local fire authorities of sub-base.

C. Start of installation constitutes acceptance of existing conditions and responsibility for satisfactory performance. If existing conditions are found unsatisfactory, contact Architect for resolution.

3.2 PREPARATION

A. Subgrade Preparation:

1. Prepare subgrade as specified in Section 32 10 00. Verify subgrade in accordance with porous paving system manufacturer's instructions.
2. Proper subgrade preparation will enable the rolls/units to connect properly and remain level and stationary after installation.
3. Excavate area allowing for unit thickness, the engineered base depth (where required), and 0.5 inch (1.25 cm) for depth of topsoil germination area (when applicable).
4. Provide adequate drainage from excavated area if area has potential to collect water, when working with in-place soils that have poor permeability.
5. Ensure in-place soil is relatively dry and free from standing water.
6. Uniformly grade base.
7. Level and clear base of large objects, such as rocks and pieces of wood.

B. Base Preparation:

1. Install Base as specified in Section 32 10 00.
2. Leave .5 inch (1.25 cm) for depth of topsoil germination area.

3.3 HYDROGROW INSTALLATION

A. Spread all Hydrogrow mix provided (spreader rate = 4.53 kg per 100 m2 (10 lbs per 1076 ft2) evenly over the surface of the base course with a hand-held, or wheeled, rotary spreader.

B. The Hydrogrow mix should be placed immediately before installing the rings.

3.4 REINFORCED TURFGRASS INSTALLATION

A. Install the reinforced turfgrass units by placing units with rings facing up, and using snap-fit connectors, pegs and holes, provided to maintain proper spacing and interlock the units. Units can be easily shaped with pruning shears or knife. Units placed on curves, slopes, and high traffic areas shall be anchored to the base course, using 40d common nails with fender washer, as required to secure units in place. Tops of rings shall be between 6 mm to 13 mm (0.25" to 0.5") below the surface of adjacent hard-surface pavements.

B. Install sand in rings as they are laid in sections by "back-dumping" directly from a dump truck, or from buckets mounted on tractors, which then exit the site by driving over rings already filled with sand. The sand is then spread laterally from the pile using flat bottomed shovels and/or wide "asphalt rakes" to fill the rings. A stiff bristled broom should be used for final "finishing" of the sand. The sand must be "compacted" by using water from hose, irrigation heads, or rainfall, with the finish grade no less than the top of rings and no more than 6 mm (0.25") above top of rings.

3.5 INSTALLATION OF GRASS

A. Grass coverage on the sand-filled rings must be completed within one week. Sand must be re-installed and leveled and checked for integrity if rings become exposed due to wind, rain, traffic, or other factors. (Choose one paragraph below to meet grass installation method desired.)

1. Install grass seed at rates per grass type. A light "dusting" of commercial topsoil mix, not to exceed 1/2" (25 mm) will be placed above the rings and seed mix to aid germination rates. Seeded areas must be fertilized and kept moist during development of the turf plants.). DO NOT DRIVE ON SYSTEM: Seeded areas must be protected from any traffic, other than emergency vehicles, for a period of 6 to 8 weeks, or until the root system has penetrated and established well below the units.

B. Adequately water grass seed to assure germination of seed and growth of root system.

3.6 PROTECTION

A. Seeded areas must be protected from any traffic, other than emergency vehicles, for a period of 4 to 8 weeks, or until the grass is mature to handle traffic.

3.7 FIELD QUALITY CONTROL

A. Remove and replace segments of units where three or more adjacent rings are broken or damaged, reinstalling as specified, so no evidence of replacement is apparent.

B. Perform cleaning during the installation of work and upon completion of the work. Remove all excess materials, debris, and equipment from site. Repair any damage to adjacent materials and surfaces resulting from installation of this work.

3.8 MAINTENANCE

A. Maintain grass in accordance with manufacturer’s instructions and as specified in Section 32 92 19 Seeding and Lawn Establishment.

B. Lawn Care: Normal turf care procedures should be followed, including de-thatching.

C. DO NOT AERATE. Aerator will damage the units. Aeration in not necessary in a sand root zone.

D. When snow removal is required, keep a metal edged plow blade a minimum of ¾ inch (17 mm) above the surface during plowing operations to avoid causing damage to the units, or

   1. Use a plow blade with a flexible rubber edge, or

   2. Use a plow blade with skids on the lower outside corners set so the plow blade does not come in contact with the units.

END OF SECTION

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SECTION 32 92 19

SEEDING & GRASS ESTABLISHMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. The work of this Section consists of providing all labor, equipment, materials, incidental work, and construction methods necessary to provide maintained turfgrass as well as naturalizing native grass areas, with work including but not limited to seeding of all mixes, establishment, maintenance, and protection.

B. Related Sections

1. Section 31 20 00, EARTH MOVING,
2. Section 32 91 19, PLANTING SOIL AND FINE GRADING,

1.2 QUALITY ASSURANCE

A. Qualification of Landscape Contractor: The work of this Section 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 eight (8) years' experience. Proof of this experience shall be submitted per SUBMITTALS paragraph of this Section.

B. The Contractor shall provide qualifications for the following: Name, location, years in business (minimum of eight (8) years of related experience) with photographic samples or other proof of projects featuring similar types of projects or related work with regard to scale, size, shape fit and finish. Provide a minimum of three (3) references, with full contact information.

1.3 REFERENCES

A. None

1.4 SUBMITTALS

A. Submit proof of Landscape Contractor's experience to the Engineer in accordance with QUALITY ASSURANCE paragraph of this Section.

B. Fertilizer, erosion control systems for steep slopes, limestone, fiber mulch used for hydroseeding, additives for amendment of soils, and other miscellaneous materials required by this Section: Submit product literature and certificates showing composition and analysis.

C. 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.

D. Submit program for turf establishment to the Engineer for review and consideration. Acceptance by the Engineer of the submitted program does not reduce Contractor obligation to establish a full and healthy turf landscape in all areas.

1.5 EXAMINATION OF CONDITIONS

A. All areas to be seeded shall be inspected by the Contractor performing the seeding before starting work. The rough grade condition shall be approved. Any defects such as incorrect grading or drainage problems shall be reported to the Engineer prior to beginning this work.

B. Ensure all substrate is scarified and placed loam is trimmed, graded, and compacted appropriately.

C. The commencement of work by the Contractor shall indicate acceptance of the areas to be seeded, and the assumption of full responsibility for the work of this Section.

D. The Contractor shall be solely responsible for judging the full extent of work requirements involved.

PART 2 - PRODUCTS

2.1 MATERIALS

A. LOAM

1. Loam shall be accordance with Section 32 91 19 – Planting Soil and Fine Grading.

B. SOIL ADDITIVES

1. Soil additives if so required, shall be provided under Section 32 91 19, Planting Soil and Fine Grading.

2. Additional applications of fertilizer shall be provided under this, based upon recommendations from soil analysis and testing as specified under Section 32 91 19, Planting Soil and Fine Grading.

C. SEED-GENERAL

1. The Landscape Plans Identify five (5) seed blends for the site. Refer to Overall Planting Plan Sheet L.1.2.

2. Seed mixture shall be fresh, clean, new crop seed. Grass shall be of the previous year's crop and in no case shall the weed seed content exceed 0.25% by weight. The seed shall be furnished and delivered in the proportion specified below in new, clean, sealed and properly labeled containers.

3. Seed shall be mixed by a dealer. Contractor shall furnish the Engineer the dealer's guaranteed statement of the composition of the mixture.

4. All seed shall comply with State and Federal seed laws and shall carry ‘Certified State of Origin’ tags on their bags or containers at the time of seeding. Seed shall conform to applicable state seed laws and standards of minimum purity, minimum germination, maximum crop seed, maximum weed seed, and be free of noxious weed seed as specified in this Section.

2.2 SEED MIXES

A. GENERAL:

1) Seed Mix Type A - Maintained Lawn
2) Seed Mix Type B - Restoration Mix for Dry Sites 35 lbs./acre.
3) Seed Mix Type C - Restoration Mix for detention Basins and Moist Sites 35 lbs./acre.
4) Seed Mix Type D - Restoration/Conservation Mix 20 lbs./acre.
5) Seed Mix Type E - Wet Meadow Mix 35 lbs./acre.

B. SOURCE OF SEED for Seed Mix

New England Wetland Plants	Ernst Conservation Seeds
820 West St.	884 Mercer Pike
Amherst MA	Meadville PA 16335
413.548.8000	800.873.3321
www.newp.com	www.ernstseed.com

C. Turf type grasses shall be selected for the following desirable traits:

D. Tall fescue, Perennial ryegrass, Fine fescue cultivars/selections shall have a Turf Quality rating greater than or equal to 6.0 on average for the preceding 4 years as determined by cited turf trials. Fine fescues shall be selected so that, in aggregate, the cultivars/selections provide high turf density, quick establishment, tolerance to summer heat and humidity, and disease resistance.

a. Seed Mixture - Event Space / Maintained Turfgrass

40% Aztec II Tall Fescue

35% Escalade Tall Fescue

15% Allaire II Perennial Ryegrass

10% Blue Bonnet Kentucky Bluegrass

b. Seeding rate for the Maintained Lawn Areas – Seed Mix shall be 8 pounds per 1,000 square feet.

E. FERTILIZERS

1. Fertilizer shall be a commercial product complying with the State and United States fertilizer laws. Deliver to the site in the original unopened containers that shall bear the manufacturer's certificate of compliance covering analysis. Fertilizer shall contain not less than the percentages of weight of ingredients as recommended by the soil analysis specified, performed, and paid for under the Section 32 91 19, PLANTING SOIL AND FINE GRADING

F. EROSION CONTROL BLANKETS

1. Erosion control blankets shall be utilized on all slopes 3:1 or greater and shall be for short-term use with functional longevity of no less than 12 months duration.

2. Blankets shall have consistent thickness with straw evenly distributed over the entire area of the mat. Matrix of straw fiber shall be 0.5 lbs/yd2.
3. The blanket shall be covered on the top and bottom sides with 100 percent biodegradable woven natural jute fiber netting. Top netting shall be 9.3 lbs/1000 ft2. Bottom netting shall be 7.7 lbs/1000 ft2.
4. Thread shall be degradable.
5. Erosion control blankets shall meet all requirements of the Erosion Control Technology Council Specification and the FHWA Standard Specification FP-03 Section 713.17, type 2.D Short-term Double Net Erosion Control Blanket

G. HERBICIDES, CHEMICALS, AND INSECTICIDES

1. Provide chemicals and insecticides as needed for fungus or pest control.
2. Provide post emergent crab grass control throughout the maintenance period to ensure a germinated and mown lawn free of crab grass.

H. WATER

1. Contractor shall provide all water, machinery and labor required to establish turfgrass in maintained areas. During the establishment and maintenance period the Contractor shall irrigate as required to ensure sufficient water is applied to all seeded areas to ensure germination, growth, and establishment of all permanent grass species. Soluble salt levels in irrigation water shall be less than 1 mmhos/cm (ds/m).

PART 3 - EXECUTION

3.1 SOIL PLACEMENT

A. Coordinate with other phases of the work. See Section 32 91 19, PLANTING SOIL AND FINE GRADING.

B. Inspect site conditions prior to loam placement. Verify subsurface of areas to receive loam were adequately scarified to a minim depth of two (2) inches and that loam was incorporated into the sub grade.

C. Once loam is placed protect it from excessive compaction from foot traffic, machinery, materials stockpiles, excessive rain etc. that will harden the surface and restrict grass establishment.

D. Loam for seed beds in Infiltration Basins shall be dumped and left slightly irregular. Variations of up to 3” shall be allowed.

3.2 SEEDING

A. Contractor shall obtain Owner Representative’s 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. The actual planting of seed shall be done, however, only during periods which are normal for such work as determined by weather conditions and by accepted practice in this locality.

D. To prevent compaction, 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 within 5 Days of spreading the soils.

E. Seed only when the bed is in a friable condition, not muddy or compacted.

F. Means and methods of seeding shall be determined by the Contractor based on his/her experience, site conditions, season of seeding, weather conditions and any, all, or other environmental conditions. Seeding may be by Hydroseeding other method selected by the Contractor and accepted by the Engineer.

G. Application rate for seeding shall be as described above or if not explicitly listed, as per plan sheet L.1.2 Overall Planting Plan.

3.3 EROSION CONTROL MATTING

A. Erosion and sediment controls shall be in accordance with Section 31 25 00, EROSION AND SEDIMENTATION CONTROLS

B. Install Erosion control blankets on slopes of 3:1 and greater and in drainage swales where erosion could occur and as directed by the engineer. Erosion Control shall be installed immediately after seeding operations. Install blankets in accordance with manufacturer's written instruction.

C. Blankets shall be installed perpendicular to slopes and shall extend at least 3 feet beyond slope crest. Fibers shall be placed in contact with the soil for the entire length of the blanket. Provide check slot at top of slope and anchor slot at bottom of slope where indicated.

D. Do not stretch the fabric. In drainage swales, center the fabric along the flow line. Install the matting in a check slot at the top and bottom of the slope of the area to be covered. Check slots shall be 6 inches deep and 6 inches wide. Fabric shall extend down one wall of the check slot and across the full width of the base. Overlap edges of matting rolls 4 inches minimum and overlap the ends 18 inches at a minimum.

E. Install staples in check slots, edges, center and ends of rolls by driving specified steel staples 2 feet on center over the entire area to be covered, except at check slots and ends of rolls, where staples shall be placed 6 inches on center.

F. Fill check slots with Topsoil and tamp firmly.

G. Following blanket installation, roll the entire area with a smooth drum roller weighing between 50 and 75 pounds per linear foot of roller. The finished installation of blanket shall be firmly in contact with the soil and provide a smooth, finished appearance free from lumps or depressions.

3.4 TURFGRASS ESTABLISHMENT

A. The following general requirements shall apply to all maintained turfgrass establishment:

B. Submit program for turf establishment of all seed types to the Engineer for review and consideration. Acceptance by the Engineer of the submitted program does not reduce Contractor obligation to establish a full and healthy turf grass in areas indicated.

C. Perform all seeding, mulching and/or culti-packing operations in a manner that will prevent erosion. Soil erosion by wind, rainwater, snow melt or over irrigation resulting in damage to or loss of seed bed, germinated cotyledons or growing turf will require restoration and re-establishment of planting soils and grasses and an extension of the maintenance and guarantee period at no addition cost to the Owner.

D. Ensure direct seed to soil contact. Under no circumstances shall seed be separated from direct contact with the planting soil. Any program element that does not include direct seed to Topsoil contact will be rejected.

E. Seed distribution shall be uniform, even, and consistent in all areas. Seed application system(s) shall accommodate different seed types, shapes, weights, and sizes.

3.5 TURFGRASS MAINTENANCE

A. Maintenance shall begin immediately after any area is seeded and shall continue until Final Acceptance of the project. In the event that seeding operations are completed too late in the fall season for adequate germination and growth of grass, then maintenance shall continue into the following spring for the minimum 120 Day period or until Final Acceptance, whichever occurs later. Install blankets or netting to prevent loam degradation and movement over the winter. Submit product literature and samples of erosion control system to the Engineer for review and approval. Blankets and netting shall be placed in a timely manner at no additional cost to the Owner.

B. Maintenance shall include reseeding, mowing, watering, weeding, fertilizing a minimum of two times in addition to the fertilizer incorporated by harrowing as part of the placement of the loam soil, and resetting and straightening of protective barriers. Maintained lawn areas may require maintenance to 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 of water over small areas, and prevent damage to the finished surface by the watering equipment.

1. The Contractor shall provide all labor and manage all watering necessary to establish an acceptable lawn. In the absence of adequate rainfall, watering shall be performed daily or as often as necessary to maintain moist soil to a depth sufficient to provide germination, growth, and establishment. At no time shall a tank truck be allowed on the seeded beds.

2. Watering shall be done in a manner that will provide uniform coverage, prevent erosion due to application of excessive quantities over small areas, and prevent damage to the finished surface by the watering equipment. The Contractor shall furnish sufficient watering equipment to apply water to the loam bed to ensure germination, growth, and establishment until Final Acceptance.

3. Watering may be performed by the installation of a temporary irrigation system, utilizing yard hydrants installed as part of the park improvements. The Contractor is responsible for all irrigation components and watering operation.
4. Municipal water utilized for the project shall be metered and paid for by the Contractor.

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.

F. Reseeding operations shall be timed to maximize germination, based on weather conditions and temperature and season. Work includes any necessary aeration to address poor root development as a result of excess compaction, along with any necessary grading, fertilizing, and topdressing, performed at the Contractor's expense.

G. The Contractor shall keep turf grass areas mowed until Acceptance of the contract by cutting to a height of 2 inches when growth reaches 3 inches or as directed by the Engineer.

H. At each mowing, the Contractor shall edge the walks, drives, plant beds, and other border conditions shall be edge trimmed by hand or machine to produce straight and uniform edge conditions.

I. Remove and discard from paved areas only clippings and debris generated by each mowing and edging operation legally off-site. Engineer, if practical and aesthetic, may allow sweeping (not blowing) clippings back into grass. Mowers shall be equipped with mulching blades. Do not remove from grass areas any clippings that have been generated by mowing operations. Do not mow grass when wet.

J. Fertilizing: The first application of fertilizer is specified, purchased, performed, and paid for under the 32 91 19, PLANTING SOIL AND FINE GRADING. A second application of fertilizer shall be quick release and shall be applied to seeded lawn, slope and buffer areas at the time of the first mowing and shall be performed and paid for under this Section 32 92 19. This second application shall be applied at a rate that ensures that one-half pound of nitrogen is applied per 1,000 square feet. Phosphorus and potassium shall be applied proportionally in accordance with the recommendations of the soil tests and the quantities previously integrated into the soil during the first application. A third application of 100 percent slowly soluble or slow release nitrogen fertilizer shall be applied to seeded areas approximately two months after the second application. This third application shall correspond to the following application rates dependent upon the month of application. Fertilizer application rates shall be based upon soil testing results.

1. May 1-15: Apply 1.0 pound of nitrogen per 1,000 square feet.
2. June 15-30: Apply 1.0 pound of nitrogen per 1,000 square feet.
3. August 15 through September 15: Apply 1.0 pound of nitrogen per 1,000 square feet.
4. November 1-15: Apply 1.5 pounds of nitrogen per 1,000 square feet.

K. Reset and replace all lawn protection fencing as required to prevent access onto lawn areas.

L. 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.

1. The Contractor shall provide all labor and arrange for all watering necessary to establish an acceptable lawn. In the absence of adequate rainfall, watering shall be performed daily to promote the germination and growth of specified grass species and varieties.
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.

M. The Contractor shall return to the site at the beginning of the next seeding season and spread limestone across all lawn areas installed under this Contract. Limestone shall be spread at rates determined by the soil tests specified.

3.6 TURFGRASS ACCEPTANCE

A. Following the minimum required maintenance periods for turfgrass areas. The Contractor shall request the Engineer in writing for a formal inspection of the completed work. Request for inspection shall be received by the Engineer at least 10 Days before anticipated date of inspection.

B. Acceptance Requirements

1. At the end of the maintenance period, seeded areas shall have a close stand of grass as defined above with no weeds present and no bare spots greater than 3 inches in diameter over greater than 5 percent of the overall seeded area. At least 90 percent of the grass established shall be permanent grass species. If seeded areas are deficient, the Contractor's responsibility for maintenance of all seeded areas shall be extended until deficiencies are corrected. Seeded areas to be corrected shall be prepared and reseeded in accordance with the requirements of this specification.
2. At the time of acceptance, the Contractor shall remove temporary barriers used to protect lawn areas.

C. Furnish full and complete written instructions for maintenance of the lawns to the Owner at the time of acceptance in conformance with Submittals requirements.

D. Engineer’s inspection shall determine whether maintenance shall continue in any part.

3.7 SEED OF NATURALIZING AREAS

A. Submit program for establishment of all naturalizing seed types to the Engineer for review and consideration. Acceptance by the Engineer of the submitted program does not reduce Contractor obligation to establish a full and healthy stand of naturalizing grasses in areas indicated.

B. Ensure surfaces to receive seed are weed free and bare. Remove any mulch or wood chips or other surficial material that would prevent the seed from contacting soil. Soil surface set to receive seed must not be overly compacted.

C. Insert a ½” dia. rebar three (3”) inches into the loam seed bed to verify seed bed is adequately prepared. If penetration is less than 3’ the seed bed shall be harrowed or rototilled to achieve a friable condition.

D. Perform all seeding with mulching operations in a manner that will prevent erosion. Soil erosion by wind, rainwater, snow melt or over irrigation resulting in damage to or loss of seed bed and will require restoration and re-establishment of planting soils and grasses and an extension of the maintenance and guarantee period at no addition cost to the Owner.

E. Ensure direct seed to soil contact. Under no circumstances shall seed be separated from direct contact with the planting soil.

F. Seed distribution shall be uniform, even and consistent in all areas. Seed application system(s) shall accommodate different seed types, shapes, weights and sizes.

3.8 CLEAN UP

A. Absolutely no debris may be left on the site. Excavated material shall be removed daily by the Contractor as directed. Repair any damage to site or structures to restore them to their original condition, as directed by the Landscape Architect, at no cost to the Owner.

END OF SECTION

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SECTION 32 93 00

PLANTS: TREES, SHRUBS, AND GROUNDCOVERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION OF WORK

A. Provide all materials, equipment, and labor necessary to complete the work as indicated on the drawings or as specified herein.

1. The principal work of this section includes, but may not be limited to, the following:
    a. Layout and Excavation of Plant Holes
    b. Planting and Backfilling
    c. Watering
    d. Pre-emergent Weed Control
    e. Mulching
    f. Fertilizing
    g. Staking and Guying
    h. Anti-desiccant Application
    i. Tags and Labels
    j. Plant Replacement Guarantee

1.3 REFERENCES

A. ANSI Z260.1 - Nursery Stock, latest edition, published by the American Association of Nurserymen, Inc. (AAN).

1. SPN: “Standardized Plant Names,” latest edition, by the American Joint Committee on Horticultural Nomenclature.
2. AOAC: “Association of Official Agricultural Chemists”.
3. Massachusetts Standard Specifications – Latest edition of the Standard Specifications for Highways, Bridges, and Waterways, The Commonwealth of Massachusetts, Department of Public Works, Latest Edition.
4. Pruning Standards: ANSI A300 Practices for Trees, Shrubs & Other Woody Plant Maintenance: Secretariat, National Arborist Association, PO Box 1094 Amherst, NH 03031.

1.4 QUALITY ASSURANCE

A. The planting shall be done by horticultural skilled workers, trained, and experienced in accepted nursery practices. The work shall be done under the supervision of a qualified planting supervisor demonstrating a background in landscape operations.

1. An arborist, licensed by the state in which the work is to be performed, is required for all pruning work.
2. At least one tree and one shrub of each variety is to be tagged with a waterproof tag or seal bearing legible designation of botanical and common names, and all other standard products shall be delivered sealed and unbroken.
3. Do not make substitutions without written approval. If specified landscape material is not available, obtain approval for substitution from the Owner.
4. At least thirty (30) days prior to intended use, the Contractor shall provide the following samples and submittals for approval. Do not order materials until Owner's approval of submittal has been obtained. Delivered materials shall closely match the approved samples. Should the source of supply be changed within the course of the contract, the Contractor shall submit new samples or submittals for approval per the original submission.

B. Plant Material: Contractor shall provide written certification as to source of plant material and species/cultivars to be supplied.

C. Loam for Plants: The Contractor shall provide samples as necessary for the testing laboratory's use, from each proposed source.

D. Fertilizer: Submit one (1) sample packet of fertilizer and six certificates showing composition and analysis for fertilizer, also submit invoices of total purchased material for this contract.

E. Planting Mulch: Submit a one- (1) cubic foot sample.

F. Tree Staking Accessories – Submit manufacturer's literature and sample.

G. Suppliers receipted invoices for moisture retention material and fertilizer packets. Invoice shall state that material was furnished for this project.

H. Watering Schedule: See 3.2 and 3.4

1. Where formal planting arrangements are shown, select stock with uniform height and spread, and label with numbers to assure symmetry in planting.
2. The Owner reserves the right to inspect all plant materials for compliance with specifications, and to reject unsatisfactory or defective work at any time during progress of work.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. All areas to be planted shall be inspected by the Contractor before starting work and any defects shall be reported to the Owner prior to beginning this work. The commencement of work by the Contractor shall indicate acceptance of the areas to be planted and assumption of full responsibility for the work of this Section.

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 trees temporarily and/or re-handling plants prior to final installation.

C. Protect all plants and products from weather or other damaging or deteriorating conditions.

D. Plants which have been damaged or have deteriorated in transit or storage are not acceptable.

E. Keep plants moist, fresh, and protected against exposure to sun, wind, and freezing temperatures whether in the receiving yard, in transit, while being handled, or at the job site awaiting planting.

F. Deliver trees, shrubs, and groundcover after preparations for planting have been completed and plant immediately.

G. Planting Dates: Prepare a proposed planting schedule. Schedule dates for each type of landscape work during normal seasons for such work. Once accepted, revise dates only as approved in writing, after documentation of reasons for delays.

1.	Planting Deciduous material:	Spring:	March 15 to June 15
		Fall:	September 15 to December 1
2.	Evergreen material:	Spring:	March 15 to May 30
		Fall:	August 15 to November 15

H. All trees shall be planted within the same season that they are dug. No heeling in of trees over the winter or planting out of season will be permitted.

1. Those species known to be fall digging hazards shall be dug during the spring season only. Fall planting of these species shall be permitted only with certification from the nursery at the time of digging, and at the discretion of the Owner.

2. Correlate planting schedule with specified maintenance periods to provide maintenance to date of acceptance.

3. Coordination with Lawns: Plant trees, shrubs, and groundcover after final grades are established and prior to planting of lawns, unless otherwise acceptable to Owner. If planting of trees and shrubs occurs after lawn work, protect lawn areas and promptly repair damage to lawns resulting from planting operations.

1.6 SPECIAL CONDITIONS

A. Should discrepancies exist between plant quantities or plant sizes as shown in the Planting Schedule and on the Planting Plan, quantities and sizes shown on the Planting Plan shall govern. Contractor shall then install all plants as shown on the plan at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 SCREENED LOAM

A. Screened loam shall be fertile, friable, medium textured sandy loam with no admixture of refuse or any natural or introduced materials toxic to plant growth and free from subsoil and stumps,

roots, brush, stones, clay lumps or other extraneous matter over one inch (1") in any diameter and which will prevent the healthy development of the plantings.

B. Sandy loam shall possess good filtration and permeability rates, and shall possess a mechanical analysis where: N 85% of sand size is 0.5 to 1.0 mm and N 95% of sand mix is between 0.5 and 2.0 mm and no more than 5% of mix is less than 0.5 mm.

C. Acidity range of approximately pH 5.5 to 7.5 when tested according to methods of testing or A.O.A.C. and organic content not less than 3% nor more than 20% as determined by wet combustion method (Chromic acid reduction). Topsoil may be amended to meet such requirements. Provide analysis prior to delivering topsoil to site, including recommended rates and types of soil additives to achieve desired mix.

D. On site topsoils (stockpiles) shall be free of debris, roots, and branches. It shall be made to conform to the requirements for sandy loam furnished from the site as specified herein.

2.2 ANTI-DESICCANT

A. Emulsion which permits transpiration while retarding excessive loss of moisture from plants. Deliver in manufacturer's fully identified containers and mix according to manufacturer's direction.

2.3 TREE AND SHRUB FERTILIZER

A. Fertilizer for amending loam to meet test laboratory requirements for the particular type of planting to be done shall be a non-phytotoxic bio stimulant formulated to promote rapid root growth and regeneration. It shall be derived from organic composts and humus extracts and is compatible with fertilizers, herbicides, pesticides, fungicides and absorbent gels.

B. In addition to the soil amendment required above, fertilizer shall be provided for each plant through the use of slow-release fertilizer packets, packaged in plastic sacks with micropore holes, which provide for a controlled release of nutrients gradually over a minimum eight-year period. Tablets are acceptable.

C. Each packet shall consist of four ounces of water-soluble fertilizer with a minimum guaranteed analysis of available elements as follows:

1. Nitrogen 16%
2. Phosphoric Acid 8%
3. Potash 16%
4. mycirrhizal fungal innoculant
5. Mychorrizal fungal inoculant shall contain both endo and ecto mycorrhizae.
6. Mychorrizal fungal inoculant shall be:
7. Mycor Tree Saver Transplant by Plant Health Care, Inc., Pittsburg, PA.
8. MycoApply by Mycorrhizal Applications, Grants Pass, OR.
9. Mycorrhizal Landscape Inniculant by BioOrganics, New Hope, PA.

10. Or approved equal.

2.4 STAKE AND GUYING MATERIALS

A. Guy web: Shall be a low abrasion woven fiber webbing with a break strength of 900 pounds or better. The width of the webbing shall be no less than 5/8 inch, nor greater than ¾ inch. The length shall be sufficient enough to be attached to the tree trunk and stake.

B. Stakes: Shall be on a hardwood source, free of knots, insects, and fungi. Stakes shall be of uniform size and shape and shall be a minimum of two inches (2") x three inches (3") x eight feet (8'). Stakes shall be pointed with a taper of no less than four inches (4") and driven three feet into the ground.

C. The above ground stake height shall be eight inches (8") above the point of attachment. The type of stakes shall be uniform throughout the job. The top ten inches (10") of the stakes shall be tapped with red duct tape.

2.5 PRE-EMERGENT WEED CONTROL

A. Pre-emergent weed control shall be provided for all trees, shrubs, and groundcover plant beds. Deliver in manufacturer's fully identified containers and apply according to manufacturer's directions.

2.6 MULCH

A. Pine Bark Mulch shall be derived from softwood evergreen tree bark aged to a minimum of six months and no more than eighteen months. The bark shall be shredded so that the resulting pieces are no more than one half inch (1/2") thick and no longer than three inches (3"). The mulch shall be free of stringy material and shall not contain an excess of fine particles. The mulch shall be brown in color, free of leaves, twigs, sod, weeds, shavings, and other foreign materials which are injurious to healthy plant growth.

B. Mulch shall be ninety-eight (98) percent organic matter with a pH range of 3.5 to 4.5. Moisture content of packaged material is not to exceed thirty-five (35) percent.

2.7 WATER

A. Clean, fresh potable water, free from injurious chemicals and other toxic substances harmful to plant life. No brackish water will be permitted.

2.8 PLANT MATERIALS

A. General: Plant materials shall conform in size, grade, and quality to the "American Association of Nurserymen Standards for Nursery Stock," as approved by the American National Standards Institute (ANSI) in effect at the time of bidding.

1. Plants of other kinds than those named in the Plant Schedule on the Drawings shall not be accepted without written approval of Owner.

2. All plant material shall comply with the state and federal law with respect to inspection for plant disease and insect infestation.
3. Replacement plants larger in size than those specified may be used if approved by Owner, provided use of larger plants does not increase Contract price.
4. If use of larger plants is approved, increase ball of earth for spread of roots in proportion to size of plant.

2.9 SELECTION OF NURSERY STOCK:

A. At least fourteen (14) days prior to the date on which the plant selections are to be made and at least 28 days prior to the expected planting date, the Contractor shall request, in writing, that the Owner designate a representative from its technical staff to select and tag trees to be furnished.

B. The letter of request shall also have attached a certification from the supplier attesting to the fact that the stock to be selected from is, in fact, the particular plants required under this Section. No substitutions will be permitted.

C. The Contractor shall arrange for and bear the cost of transportation, meals in transit, and overnight accommodations, if necessary, for the Owner's representative during the period of time required to select and tag the required number of stock.

D. All trees shall be tagged at the source prior to digging. The Owner will inspect and tag all trees with the Contractor.

E. The Owner shall provide the necessary tags or seals for identifying the trees at the source. The tags are of durable construction and are numbered sequentially with raised lettering.

2.10 GENERAL QUALIFICATIONS:

A. Plants shall be good examples of their species or variety, with uniform, well developed branch structure, balanced head, and single leader.

B. All plants shall be in accordance with the American Standard for Nursery Stock of the American Association of Nurserymen.

C. Trees shall be freshly dug. No plants from cold storage or previously heeled in stock will be accepted.

D. All plants shall be nursery grown. No collected plants will be accepted.

E. Only plants grown with in Hardiness Zones 1 through 5, as established by the Arnold Arboretum, Jamaica Plain, Massachusetts, or USDA zones 2-6 will be accepted. The Contractor shall certify in writing that the stock has been grown under Zone 5 or hardier conditions. Plants will not be accepted without such certification.

F. Plants shall be sound, healthy, and vigorous of growth, free of disease, insect pests, eggs, or larvae. All parts shall be moist and show active green cambium when cut.

2.11 TREE ROOTS

A. The root system of each tree shall be well provided with dense, fibrous roots.

B. Root systems shall be solid natural balls of earth firmly wrapped with untreated eight (8) ounce organic burlap, securely held in place by stout cord or wire. Processed or manufactured root balls or inorganic (plastic) burlap will not be accepted. No trees will be accepted if the ball of earth surrounding its roots has been badly cracked or broken.

C. The diameter and depth of the root ball must be sufficient to encompass the fibrous and feeding root system necessary for healthy development of the tree.

2.12 TREE TRUNK

A. The trunk of each tree shall be a single uncut leader and straight trunk growing from a single unmutilated crown of roots. No part of the trunk shall be conspicuously crooked as compared with normal trees of the same variety. No trees, which have had their leaders cut, scared, scraped, bruised, or wounded, will be accepted.

B. The trunk shall be free from sunscald, frost cracks, or wounds resulting from abrasions, fire, insect or disease damage, or other causes. No pruning wounds shall be present having a diameter exceeding two inches and such wounds must show vigorous bark growth on all edges. Trees shall not be pruned prior to delivery.

2.13 TREE HEIGHT:

A. When indicated, the overall height of the trees (measured from the crown of the roots to the tip of the top branch) shall be not less than the minimum size designated.

B. Height from the ground to the lowest branch shall be eighty (80) inches. The required height to the lowest branch may be accomplished by pruning after installation if, in the Owner's opinion, this does not detract from the shape or form of the tree or cause unsightly scars.

2.14 HANDLING:

A. Plants shall be dug, handled, and transported to prevent damage of any sort including but not limited to breakage of branches, scraped or bruised trunk, or broken root ball.

B. Plants shall be protected from desiccation during digging, storage, and transportation by watering, covering, and application of anti-desiccants, as necessary to ensure their continued health and viability.

C. When plants cannot be transported and planted immediately upon being dug they shall be stored and protected from desiccation and extremes in temperature by being heeled in, watered, and/or sprayed with an anti-desiccant.

2.15 INSPECTION UPON DELIVERY:

A. Inspection and approval of plants at the source shall not impair the right of subsequent inspection and rejection upon delivery to the site, if the Owner finds that the plants have declined noticeable due to handling abuse, lack of maintenance, or other causes. Costs of replacements for plants found deficient at time of delivery shall be borne by the Contractor.

PART 3 - EXECUTION

3.1 PLANTING

A. Layout: Determine location of underground utilities and layout plants so as to avoid possible damage to such structures. Plant pits and bed locations, per plans, shall be staked on ground by contractor and approved by the Engineer prior to excavation. Should discrepancies exist between plant quantities in Planting Schedule and Planting Plan, quantities shown on the Planting Plan shall govern. Adjustments in locations and outline shall be made as directed in field. Labor, equipment, and new smooth stakes are to be furnished by the Contractor for this purpose.

B. The Contractor shall coordinate with the Engineer to locate Plant Accent Modules. Modules shall be located on a site-specific basis, based on field conditions.

C. Excavation: Planting beds and pits shall conform to the approved staked locations and outlines. Holes dug for plantings shall, in all cases, be large enough to accommodate the complete root system of the plant (tree, shrub, and groundcover) to be received, as well as sufficient amounts of approved backfill around the periphery of the root ball as shown on the details.

D. Scarify all sides, edges, and the bottom of the holes to a 2" minimum depth in a manner that promotes soil mixing and root development. Conduct additional excavation or scarifying based on field conditions, as directed by the Engineer.

E. All sod, weeds, roots, cobbles, and stones and other objectionable materials excavated from the plant holes which is unsuitable for use as backfill, shall be removed from the site immediately and disposed of legally. If the subsoil appears to be injurious to plant health, the Contractor shall, at the Owner's direction, fill the planting pit with enough planting backfill mix to provide a twelve (12) inch depth when firmly tamped in place, prior to setting trees in place. If the subsoil does not appear to be deleterious, the root ball shall be set directly on level, undisturbed subgrade.

F. Plant Hole Size: The minimum plant hole size, unless otherwise specified on the plans or directed by the Owner's Representative, shall be as follows:

1. Trees and Shrubs - The planting hole shall be twice the diameter of the root ball in width, and no deeper than two inches (2") less than the distance from the bottom of the root ball to the root flare (i.e. a 12" tall ball will require a 10" deep hole). Any excavation in excess of that required, shall be replaced and compacted to eighty-five percent (85%) of maximum density.

2. Groundcover - The planting hole shall be twice the diameter of the root ball in width and equal to the depth from the bottom of the root ball to the level at which it was grown in the nursery. Any excavation in excess of that required shall be replaced and compacted to eighty-five percent (85%) of maximum density.

    a. Any rocks or underground obstructions shall be removed to a depth necessary for planting as specified unless alternate locations for the planting are approved by the Engineer. If removal of obstructions results in a deeper hole than specified for planting, backfill material shall be added and compacted to eighty-five percent (85%) of maximum density to the correct depth.

1) Plant Backfill Mix: Add Loam for Plants to soils excavated from the planting hole to create mix for all plants installed, unless otherwise directed by the Engineer. Plant Backfill Mix shall be at least thirty-three percent (33%) loam.

3.2 SETTING PLANTS

A. Plants shall be handled in such a manner that the soil of the root ball will not be loosened from the roots. Carefully place plant into the prepared hole. Cut and remove rope and wires and remove or layback the top 2/3 of burlap off the root ball, if the ball is wrapped in burlap and rope tied. Do not pull burlap and wires out from under the root ball. Remove all non-biodegradable root ball materials if present. Set plants plumb and fill in around the football to two thirds (2/3) the depth of the hole with backfill mix. Thoroughly tamp the backfill mix to eighty-five percent (85%) of maximum density.

B. Fertilizer tablets and Mycorrhizal inoculant shall be added to the backfill material in quantities as per each products manufacturer.

1. Fill remaining area of planting hole with water.

2. Once the water has completely drained, fill remaining area of hole with backfill mix and thoroughly tamp to eighty-five percent (85%) of maximum density. Form a six inch (6”) saucer around the edge of the backfill hole by constructing a berm. The finish height of the compacted berm shall be three inches (3”). No excess soil shall be allowed to remain within the plant saucer. Fill saucer with water.

3.3 PRUNING OF NEW PLANT MATERIAL

A. Prune each tree in accordance with the workmanship requirements of “Pruning Standards” to preserve the natural character of the plant. All pruning shall be by a certified arborist.

B. Prune only dead, broken, badly bruised, or deformed branches, and all suckers, and in such a manner as to preserve natural character of plant.

C. Perform all pruning with clean, sharp tools, and with cuts flush and clean. Do not apply paint or asphalt emulsion tree wound compound on cut area.

D. Contractor to encourage apical dominance by removing one co-dominant leader as required.

E. Pruning shall be undertaken to encourage good scaffold branching.

F. Trees which have had their leaders cut, or so damaged that cutting is necessary, will not be accepted. There shall be no abrasion of bark, nor fresh cuts of limbs over one-half inch (1/2").

G. All pruning shall be done in the presence of the Engineer.

3.4 WATERING

A. The plants shall be watered immediately following planting.

1. Soak the plants thoroughly again within a twenty-four (24) hour period after the initial planting.

2. Establish temporary water or irrigation as required to obtain plant development, root growth and establishment.
3. Water shall be furnished at the expense of the Contractor.

B. Additional watering shall be made at least once every three weeks, unless otherwise directed, until final acceptance of the plant material.

3.5 FERTILIZING

A. Install fertilizer packets at depth of six (6) to eight (8) inches equally spaced around the plant, as it is being backfilled. Packets shall be installed per the manufacturer's instructions. Packets shall not be cut, ripped, or damaged. The application rates for fertilizer packets shall be one packet for each inch of tree trunk caliper. As documentation of compliance with this requirement the Contractor shall provide the Owner with receipted invoice showing the project name and quantity of packets supplied.

3.6 GUYING AND STAKING

A. Immediately after planting, stake trees as indicated on detail drawing or as directed by Owner.
1. Place two stakes outside of the planting pit, exercising care not to damage the soil berm.
2. Guy all trees with a caliper of two inches (2") or greater and all evergreen trees greater than four feet (4'). Guy webbing shall be attached at a point no higher than one half (1/2) the height of the tree, nor lower than one-third (1/3) the height of the tree.
3. Guy trees to each stake near top of stake and intertwine webbing at tree trunk. The guy webbing shall lay flat against the trunk. Draw guy webbing tight enough to remove slack but not enough to cause deflation or strain to the plant.

3.7 MULCHING PLANTS

A. Application of mulch should only occur after planting operations have been completed and initial watering has taken place. Mulch shall be applied no later than forty-eight (48) hours after planting.

B. Prior to the placement of mulch, the contractor shall apply a pre-emergent weed control within the entire area to be mulched. Pre-emergent weed control shall be applied by a commercial applicator, licensed in the state in which the work is being performed, at a rate in accordance with the manufacturer's installation.

C. Mulch shall be applied a minimum of three (3) inches in depth for all individual trees and planting beds, as indicated graphically or verbally on the drawings.

D. Where mulch abuts seeded lawn areas or other finish grade materials, edge of planting bed shall be cut smooth and cleanly. Mulch shall be placed carefully so as not to spill into adjacent areas. Any excess or spilled mulch shall be promptly removed from the project area.

3.8 TRUNK WRAPPING

A. Remove all trunk wrap and trunk protection devices prior to staking and guying operations unless otherwise directed by the Owner's Representative.

3.9 ANTI-DESICCANT SPRAYING

A. Spray anti-desiccant as directed by the manufacturer's recommendation and as approved by the Owner's Representative.

3.10 TAGS AND LABELS

A. Leave all tree tag and label seals unbroken and visible on plant material until final inspection. Remove all seals immediately after final inspection.

3.11 PLANTING ON BANKS

A. For planting on bank 2:1 or steeper or as directed by the Owner's Representative, apply jute mesh loosely but smoothly to fit the contour of the finished grade parallel to, and in same direction as, the flow of water. The up-slope end of each separate strip or piece of jute mesh shall be buried in a six inch (6") minimum vertical anchor slot or junction slot with the soil tamped firmly against the mesh. Where more than one width of material is required, edges shall overlap a minimum of twelve inches (12"), and the up-slope section of mesh will be on top. Down-hill ends of the jute mesh shall be folded under approximately four inches (4") and stapled into place. Staples will be inserted through the mesh along edges, overlaps, and in the center of all jute mesh strips at intervals not greater than three feet (3'). All anchor slots, junction slots, check slots, and terminal folds shall have five (5) staples spaced not more than nine inches (9") on center across widths.

   1. On seeded banks, jute shall be applied immediately after seeding. On shrub banks, apply jute after finish grading. Cut openings in mesh for each plant and mulch as specified.

3.12 PRELIMINARY ACCEPTANCE

A. After the completion of planting and all other related operations the Contractor shall make written request to the Owner for a formal inspection of the work. If plant materials and workmanship are acceptable upon inspection, written notice will be given to the Contractor stating that the work has received Preliminary Acceptance and that the Establishment Period has commenced from the date of the notice.

3.13 PLANT REPLACEMENT GUARANTEE

A. Following completion of the Establishment Period the trees shall be guaranteed for a period of one (1) year. At the end of the guarantee period, a Final Inspection with the Contractor and Owner will be held to determine whether any plant material replacements are required.

B. During the guarantee period the Contractor shall provide tree care as required to produce an acceptable planting at the Final Inspection. To be found acceptable at that time each tree shall

have been established in place for at least one (1) year, shall show at least 75% healthy growth and shall have the natural character of its species as determined by the Owner.

C. Trees found unacceptable or dead shall be removed promptly from the site and replaced during the specified planting season. Replacements shall be of the same species and size and shall conform in all respects to the specifications for furnishing and installing new plants. Replacements shall be maintained and guaranteed as specified for the original plantings. If, at the end of the guarantee period for the replacement planting, the replacement is not in acceptable condition, the Owner may elect to accept a credit in lieu of a second replacement.

D. Cost of replacements shall be borne by the Contractor, except when such replacement is required due to vandalism or neglect by others.

E. At the end of the Guarantee period the Contractor shall remove and dispose of all stakes and guys, as a condition of final acceptance and release of retainage.

F. "Vandalism" is intended to mean: any acts, whether intentional or accidental, by other persons occurring following final acceptance which clearly result in breakage or other damage to individual plants or plant beds, and which may reasonably be considered to be beyond Contractor's reasonable control, as determined by the Owner's Representative.

END OF SECTION

SECTION 33 05 16.23

CLEANOUTS

PART 1 - GENERAL

1.1 SUMMARY

A. Related documents:

1. This specification makes reference to the requirements of additional specifications as listed. The Contractor shall obtain and familiarize himself with all requirements referenced by this specification.

   a. Massachusetts Department of Transportation, Highway Division, 2023 Standard Specifications for Highways and Bridges, including all addenda, (referred to as the Standard Specification).

   b. Town of Yarmouth, Massachusetts, requirements

2. Materials and construction methods shall conform to all applicable manufacturer's instructions and recommendations.

B. Section includes, without limitation, providing:

1. Requirements for sanitary sewer cleanouts.

C. Extent: As shown.

D. Related sections

1. Section 31 05 16 – Aggregates for Earthwork
2. Section 33 31 00 – Sanitary Utility Sewerage Piping

1.2 SUBMITTALS

A. Shop Drawings – In accordance with Specification Section 01 33 00 – SUBMITTAL Procedures.

PART 2 - PRODUCTS

2.1 FRAME AND LID

A. Frame and Lid shall be General Foundries 30562 or approved equal with stainless steel cap and screw lid closure.

B. Lid shall say "SEWER"

2.2 ELBOWS, END CAPS, RISER PIPES, AND FITTINGS

A. Drainpipe, elbows, end caps, riser pipes, and associated fittings shall be manufactured by ADS (type N-12 WT/IB) or approved equal.

B. Sanitary pipe, elbows, end caps, riser pipes, and associated fittings shall be PVC in accordance with Section 33 31 00.

2.3 CONCRETE

A. Concrete shall be 4,000 PSI Concrete as specified in Section 03 30 00 CAST IN PLACE CONCRETE and in the Standard Specifications.

PART 3 - EXECUTION

3.1 RECEIVING, STORAGE AND HANDLING

A. Each part must be inspected and approved by the Engineer immediately prior to final placement, and no cracked, damaged, or defective sections will be allowed in the work. Any parts not approved for use in this work shall be removed from the site and satisfactorily disposed of.

3.2 INSTALLATION

A. Excavate to a sufficient horizontal distance outside the cleanout for proper installation of same. Sides of the excavation shall be sloped back as necessary to avoid collapse.

B. Install the cleanout as shown on the drawings and as required or recommended by the manufacturer.

C. The frame and lid shall be set with the tops conforming accurately to the grade of the pavement or finished ground surface or as indicated on the drawings or as directed.

D. Crushed stone shall be used as backfill.

E. Form and pour concrete as shown on the drawings. Proceed with installation only after unsatisfactory conditions have been corrected.

END OF SECTION

SECTION 33 05 61

PRECAST CONCRETE MANHOLES

PART 1 - GENERAL

1.1 SUMMARY

A. Related documents:

1. Materials and construction methods shall conform, insofar as applicable, to the requirements of:

   a. The Massachusetts Department of Transportation, Highway Division, 2023 Standard Specifications for Highways and Bridges, including all addenda, (referred to as the Standard Specification).

   b. Town Yarmouth, Massachusetts, requirements.

B. Materials and construction methods shall conform to all applicable manufacturer's instructions and recommendations.

C. American Society for Testing and Materials (ASTM)

1. A48, Standard Specification for Gray Iron Castings.
2. A615 Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
3. C32, Standard Specification of Sewer and Manhole Brick (Made from Clay or Shale), AASHTO Designation M91-42, Red Sewer Brick Only Grade SS.
4. C144, Standard Specification for Aggregate for Masonry Mortar.
5. C150, Standard Specification for Portland Cement.
6. C207, Standard Specification for Hydrated Lime for Masonry Purposes.
7. C270, Standard Specification for Mortar for unit Masonry
8. C443, Standard Specification for Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.
9. C478, Standard Specification for Precast Reinforced Concrete Manhole Sections.
10. C923, Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals.
11. D4101, Standard Specification for Propylene Plastic Injection and Extrusion Materials.

D. Section includes, without limitation, providing:

1. Requirements for modular precast concrete manhole sections with tongue-and-groove joints, cast iron covers, accessories, and appurtenances. These include sewer manholes, communication manholes, outlet control structures and inspection manholes.

1.2 SUBMITTALS

A. In accordance with Section 01 33 00 SUBMITTALS submit for review drawings showing the precast concrete sections, joints, gaskets and other details of manholes to be furnished for the project. All manholes furnished under the contract shall be manufactured only in accordance with the specifications and the reviewed drawings.

1.3 QUALITY ASSURANCE

A. Precast concrete manholes shall be made by a manufacturer of established good reputation in the industry and in a plant adapted to meet the design requirements of the project.

B. Related sections, without limitation, include:

1. Section 03 30 00, CAST IN PLACE CONCRETE
2. Section 33 31 00, SANITARY UTILITY SEWAGE PIPING
3. Section 33 41 00, STORM UTILITY DRAINAGE PIPING

C. Design Requirements

1. Manholes shall conform in shape, size, dimensions, materials, and other respects to the details indicated in the Contract drawings.
2. All manholes shall have concrete bases. Invert channels, where required, shall be formed of brickwork upon the base.
3. Manhole walls (barrels and cones) shall be precast concrete sections. The top of the cone (not to be more than 12-in.) shall be built of brickwork to permit adjustment of the frame to meet the finished surface.
4. The inverts shall conform accurately to the size of the adjoining pipes. Side inverts shall be curved and main inverts (where direction changes) shall be laid out in smooth curves of the longest possible radius which is tangent, within the manhole, to the centerlines of adjoining pipelines.
5. Precast manholes, frames and covers shall be designed for H20 loading.

PART 2 - PRODUCTS

2.1 PRECAST CONCRETE

A. Conform to the ASTM C478 with the following exceptions and additional requirements:

1. All cast in place concrete shall be 4,000 PSI and shall conform to the requirements specified under Section 03 30 00, CAST IN PLACE CONCRETE.
2. Wall sections to be 5-inch thick minimum.
3. Type II cement in accordance with ASTM C150.
4. Sections shall be cured by subjecting them to thoroughly saturated steam at a temperature between 100 and 130 degrees F. for a period of not less than 12 hours or, when necessary

for such additional item as may be needed to enable the sections to meet the strength requirements.

5. No more than two lift holes may be cast or drilled in each section.
6. The date of manufacture and the name or trademark of the manufacturer shall be clearly marked on the inside of the barrel.
7. Acceptance of the sections will be on the basis of material tests and inspection of the completed product.

B. Flat Slab Tops

1. Thickness and reinforcement as indicated on the drawings and in accordance with ASTM C 478.

C. Cones

1. Cones shall be precast sections of construction similar to above.

D. Bases

1. The tops of the bases shall be suitably shaped by means of accurate bell-ring forms to receive the barrel sections.
2. All holes for pipes shall be cast in the base sections so that there is a clear distance of four inches minimum between the inside bottom of the base section and the pipe invert.
3. Base pad shall be pre-cast with extended base as indicated on drawings and herein specified.
4. Openings for pipe and materials to be embedded in the wall of the base for these joints shall be cast in the base at the required locations during the manufacture of the base.

2.2 COMPONENTS

A. Pipe Seals

1. Premolded elastomeric-sealed joints fitted or cast integrally into the pipe opening of the manhole base and/or wall section.
2. Provide a watertight joint.
3. Maximum 10-degree omni-directional deflection.
4. Conform to ASTM C-923.
    a. Seals to be Lock Joint Flexible Manhole Sleeve made by Interpace Corp., Parsippany, NJ; Kor-N-Seal made by National Pollution Control Systems, Inc., Nashua, NH; A-LOK manhole pipe seal made by A-LOK Corp., Trenton, NJ; or an acceptable equivalent product.
    b. All materials, accessories and construction methods used in making the joints shall be supplied or approved by the manufacturer of the premolded elastomeric-sealed joint. Furnish manufacturer's written instructions to the Engineer.
5. Exterior Coating

a. The material shall be Carboline Bitumastic 300M by Somay Products, Inc., Miami, FL or Sonoshield HLM 5000 by Sonoborn, Shakopee, MN or acceptable equivalent product.

6. Rubber Gaskets (between manhole sections)
   a. In accordance with ASTM C443.
   b. Gasket configuration per manufacturers recommendation.
7. Butyl Resin Gaskets (between manhole sections)
   a. In accordance with ASTM C990.
   b. Gasket configuration per manufacturer's recommendation.

2.3 ACCESSORIES

A. Manhole Frames and Covers

1. Furnish all cast-iron manhole frames and covers conforming to the details shown on the drawings, or as hereinbefore specified.
2. Castings shall be of good quality, strong, tough, even-grained cast iron, smooth, free from scale, lumps, blisters, sandholes, and defects of every nature which would render them unfit for the service for which they are intended. Contact surfaces of covers and frame seats shall be machined to prevent rocking of covers.
3. Casting shall be thoroughly cleaned and subject to a careful hammer inspection.
4. Castings shall be at least Class 25 conforming to the ASTM A48.
5. Standard storm drain and sewer manhole frames and covers to have 24 inch clear opening (26 inch diameter covers) and minimum 6 inch high frames, manufactured by East Jordan Iron Works (formerly LeBaron Foundry, Inc.), or approved equal. Pattern of cover and lettering shall comply with the Owner's standards or as directed.
6. Watertight sewer manhole frames to have 26 inch diameter covers with 6 stainless steel bolts, and watertight gasket, manufactured by East Jordan Iron Works (formerly LeBaron Foundry, Inc.) or approved equal. Pattern of cover and lettering shall comply with the Owner's standards.

B. Bricks

1. The brick shall be sound, hard, and uniformly burned brick, regular and uniform in shape and size, of compact texture, and satisfactory to the Engineer. Brick shall conform to ASTM C32 for Grade SS, hard brick, except that the mean of five tests for absorption shall not exceed 8 percent by weight.
2. Rejected brick shall be immediately removed from the work.

C. Mortar For Brickwork

1. The mortar shall be composed of Portland cement, hydrated lime, and sand, in which the volume of sand shall not exceed three times the sum of the volumes of cement and lime. The proportions of cement and lime shall be as directed and may vary from 1:1/4 for dense,

hard-burned brick to 1:3/4 for softer brick. In general, mortar for Grade SS Brick shall be mixed in the proportions of 1-1/2:4-1/2.

2. Cement shall be Type II Portland cement conforming to the ASTM C150.
3. Hydrated lime shall be Type S conforming to the ASTM C207.
4. The sand shall comply with the specifications for fine aggregate, specified in Section 03 30 00 Cast-in-Place Concrete, except that all of the sand shall pass a No. 8 sieve.

2.4 INSPECTION, TESTS AND ACCEPTANCE

A. Acceptance will be on the basis of tests of materials, absorption tests, plant load-bearing tests, pressure tests, and inspection of the complete product. The quality of all materials used in the manufacturing of catch basin units, the process of manufacture, and the finished units shall be subject to inspection by the Engineer. Inspection may be made at the place of manufacture, or on the work site after delivery, or both, and the units shall be subject to rejection at any time due to failure to meet any of the specification requirements, even though sample units may have been accepted as satisfactory at the place of manufacture. All units that are rejected shall be immediately removed from the project site by the Contractor.

B. All tests shall be made in accordance with the latest applicable ASTM specifications.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General

1. Manholes to be set on a compacted base of ¾ inch crushed stone with a minimum thickness of six (6) inches.
2. Manholes to be set level and plumb to the elevations shown on the plans or as directed.
3. The top grade of the precast concrete cone section or flat top section shall be set sufficiently below finished grade to permit a maximum of five (5) and a minimum of two (2) courses (laid in the flat position) of brick to be used as risers to adjust the grade of the manhole frame.

B. Manhole Sections

1. Rubber gaskets shall be installed in all joints in accordance with the manufacturer's recommendations.
2. All holes in sections used for their handling shall be thoroughly plugged with rubber plugs made specifically for this purpose or with mortar. The mortar shall be one part cement to 1-1/2 parts sand, mixed slightly damp to the touch (just short of "balling"), hammered into the holes until it is dense, and an excess of paste appears on the surface, and then finished smooth and flush with the adjoining surfaces.

C. Rubber and/or Butyl Resin Gaskets (between manhole sections)

1. In accordance with manufacturers recommendation.

2. Install in all joints between precast sections.

D. Brickwork

1. Only clean bricks shall be used.
2. Bricks shall be moistened by suitable means, until they are neither so dry as to absorb water from the mortar nor so wet as to be slippery when laid.
3. Each brick shall be laid in a full bed and joint of mortar without requiring subsequent grouting, flushing, or filling, and shall be thoroughly bonded.
4. All sewer inverts shall be constructed in-place after installation of sewer piping to manhole is complete. The bench shall be even with the crown of the pipe. Above ground construction of manhole inverts is not acceptable.

E. Plastering And Curing Brick Masonry

1. Outside faces of brick masonry adjustment courses shall be plastered with mortar to a thickness of 1/2-inch.
2. If required, the masonry shall be properly moistened prior to application of the mortar.
3. The plaster shall be carefully spread and troweled. After hardening, the plaster shall be carefully checked by being tapped for bond and soundness.
4. Unbonded or unsound plaster shall be removed and replaced.
5. Brick masonry and plaster shall be protected from too rapid drying by the use of burlaps kept moist, or by other suitable means, and shall be protected from the weather and frost, to insure maximum strength.

F. Exterior Coating

1. The exterior surfaces of all manholes shall be given two coats of bituminous waterproofing material totaling a minimum of 14 mils in thickness.
2. The waterproofing material shall be applied by brush or spray and in accordance with the instructions of the manufacturer.
3. Time shall be allowed between coats to permit sufficient drying so that the application of the second coat has no effect on the first coat.

G. Setting Frames and Covers

1. Frames and covers shall be set with the tops conforming accurately to the grade of the finished ground surface or as indicated on the drawings or directed. Frames shall be adjusted to finish grade using a maximum of five(5) and a minimum of two (2) courses of brick. Circular frames shall be set concentric with the top of the masonry and in a full bed of mortar so that the space between the top of the manhole masonry and the bottom flange of the frame shall be completely filled and made watertight. A thick ring of mortar extending to the outer edge of the masonry shall be placed all around and on the top of the bottom flange. The mortar shall be smoothly finished and have a slight slope to shed water away from the frame.
2. Covers shall be left in place in the frames on completion of work.

3.2 FIELD QUALITY CONTROL

A. Testing

1. Gravity Sewer Manholes shall be vacuum tested in accordance with ASTM C1244.
2. Lift holes shall be plugged and pipes entering the manhole shall be temporarily plugged.
3. A vacuum of 10 inches of mercury shall be drawn on the manhole.
4. The manhole shall pass if the time for the vacuum reading to drop from 10 inches of mercury to 9 inches of mercury meets or exceeds the values in the Table below.
5. If the manhole fails the initial test, necessary repairs shall be made by a method approved by the Engineer. The manhole shall then be retested, and repairs shall be made until a satisfactory test is obtained.

Table 1 Minimum Test Times for Various Manhole Diameters

Depth	Diameter (in.)								
Ft	30	33	36	42	48	54	60	66	72
	Time (sec)								
8	11	12	14	17	20	23	26	29	33
10	14	15	18	21	25	29	33	36	41
12	17	18	21	25	30	35	39	43	49
14	20	21	25	30	35	41	46	51	57
16	22	24	39	34	40	46	52	58	67
18	25	27	32	38	45	52	59	65	73
20	28	30	35	42	50	53	65	72	81

B. CLEANING

C. Manholes to be free of construction debris prior to final inspection.

END OF SECTION

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SECTION 33 11 13.13

DUCTILE-IRON PUBLIC WATER UTILITY DISTRIBUTION PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Related documents:

1. Town of Yarmouth, Massachusetts Water Department requirements.
2. American Water Works Association (AWWA)/American National Standards Institute (ANSI)
   a. C104/A21.4 Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
   b. C105/A21.5 Polyethylene Encasement for Ductile Iron Pipe Systems
   c. C110/A21.10 Ductile-Iron and Gray-Iron Fittings, 3-48-inch for Water & Other Liquids.
   d. C111/A21.11 Rubber-Gasket Joints for Ductile-Iron and Pressure Pipe and Fittings.
   e. C115/A21.15 Flanged Ductile Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
   f. C150/A21.50 Thickness Design of Ductile-Iron Pipe.
   g. C151/A21.51 Ductile-Iron Pipe, Centrifugally Cast for Water.
   h. C153/A21.53 Ductile-Iron Compact Fittings, 3-24 inches, and 54-64 inches for Water Service
   i. C600, Installation of Ductile-Iron Water Mains and Their Appurtenances
   j. C65l, Disinfecting Water Mains
3. American Society of Testing and Materials (ASTM)
   a. A536, Standard Specification for Ductile Iron Castings

B. Section includes, without limitation, providing:

1. Requirements to furnish, lay, joint, and test ductile-iron pressure pipe, fittings (including special castings), and appurtenant materials and equipment indicated on the Drawings and specified in this Section.
2. Extent: As shown, if not, as follows:
3. Requirements:
   a. Ductile iron pipe used for water mains shall meet the requirements of the Town of Yarmouth Water Department, size as indicated on the drawings.
   b. Ductile iron pipe used for water mains shall meet the requirements of the American Water Works Association (AWWA)/American National Standards Institute (ANSI)
   c. Location of restrained joints shall be based on Thrust Restraint Design for Ductile Iron Pipe (Second Edition), published by Ductile Iron Pipe Research Association.

1.2 SUBMITTALS

A. In accordance with SECTION 01 33 00 submit the following:

1. Shop Drawings

a. Piping layouts in full detail.

b. Location and type of backup block or device to prevent separation.

c. Schedules of all pipes, fittings, special castings, couplings, expansion joints, restrained joints and other appurtenances.

B. Certificates

1. Sworn certificates of shop tests showing compliance with specified standard.

C. Manufacturer's Literature

1. Catalog cuts of joints, couplings, harnesses, expansion joints, restrained joints gaskets, fasteners and other accessories.

2. Brochures and technical data of coatings and linings and proposed method of application.

1.3 QUALITY ASSURANCE

A. Pipe and fittings shall be inspected and tested at the foundry as required by the corresponding standards listed in Article 1.1A of this specification.

B. Owner reserves right to inspect and/or test by independent service at manufacturer's plant or elsewhere at his own expense.

C. Related sections, without limitation, include:

1. Section 31 05 16 AGGREGATES FOR EARTHWORK

2. Section 31 20 00 EARTH MOVING

3. Section 33 10 00 COPPER UTILITY PIPING AND TUBING

4. Section 33 12 00 WATER UTILITY DISTRIBUTION EQUIPMENT

PART 2 - PRODUCTS

2.1 GENERAL

A. All ductile-iron pipe and fittings shall conform to the Town of Yarmouth Water Department requirements

2.2 PIPE

A. Ductile-Iron Pipe

1. Designed in accordance with AWWA/ANSI C150/ A21.50.

2. Manufactured in accordance with AWWA/ANSI C151/A21.51.

3. Unless otherwise indicated or specified, ductile-iron pipe shall be at least thickness Class 52.

B. Pipe For Use with Couplings

1. As specified above except that the ends shall be plain (without bells or beads)
2. Cast or machined at right angles to the axis.

2.3 FITTINGS

A. General

1. Push-on or mechanical-joint fittings shall be all-bell fittings unless otherwise indicated or specified.
2. In accordance with AWWA/ANSI C110/A21.10.
3. Pipe 24-inches in diameter and less shall be pressure Class 350.
4. Pipe 30-inches to 48-inches in diameter shall be at least pressure Class 250.
5. Compact fittings in accordance with AWWA/ANSI C153/A21.53 and shall have a working pressure rating of 350 psi.

B. Nonstandard Fittings

1. Fittings having nonstandard dimensions and cast especially for this project shall be of acceptable design.
2. Manufactured to meet the requirements of these specifications and shall have the same diameter and thickness as standard fittings, but their laying lengths and types of ends shall be determined by their positions in the pipelines and by the particular piping to which they connect.

2.4 ADAPTERS

A. Where it is necessary to joint pipes of different type, furnish and install the necessary adapters unless solid sleeves are indicated on the drawings or permitted. Adapters shall have ends, conforming to the above specifications for the appropriate type of joint, to receive the adjoining pipe. Adapters joining two classes of pipe may be of the lighter class provided that the annular space in bell-and-spigot type joints will be sufficient for proper jointing.

2.5 JOINTS

A. Push-On and Mechanical

1. In accordance with AWWA/ANSI C111/A21.11.
2. The plain end of push-on pipe shall be factory machined to a true circle and chamfered to facilitate fitting the gasket.
3. Push-on and mechanical-joint pipe and fittings shall be provided with sufficient quantities of accessories conforming to AWWA/ANSI C111/A21.11.

B. Restrained

1. Restraining glands will be required on all fittings.

2. Pipe, fittings and appurtenances for restrained joints shall be in accordance with AWWA/ANSI C110/A21.10 for full body fittings or AWWA/ANSI C153/A21.53 for compact fittings. Only restraining glands which impart multiple wedging action against the pipe increasing its pressure as the pipe pressure increases will be allowed. Flexibility of the joint shall be maintained after burial. Glands shall be manufactured of ductile iron conforming to ASTM A536. Twist off nuts shall be used to insure proper actuating of the restraining device.
3. Mechanical joint restraint shall have a working pressure rating of at least 250 psi.
4. Manufactured by EBAA Iron, Inc., Eastland, Texas, or equal.

C. Gaskets

1. Gaskets shall be of a composition suitable for exposure to the product that the pipe is intended to carry.

2.6 COUPLINGS

A. Flexible Connections

1. Where flexible connections in the piping are specified or indicated on the drawings, they shall be obtained by the use of sleeve-type couplings, split couplings, or mechanical-joint pipe and/or fittings as herein specified.

B. Sleeve Type Couplings

1. Pressure rating at least equal to that of the pipeline in which they are to be installed.
2. Provide cast style 441 by Smith Blair, Inc., Texarkana, Texas, or acceptable equivalent product.
3. Provided with galvanized-steel bolts and nuts, unless noted otherwise.
4. Provided with gaskets of a composition suitable for exposure to the liquid within the pipe.
5. Provided gaskets with metallic tips for electrical continuity through joints.

C. Solid Sleeve Couplings

1. Solid sleeve couplings and accessories shall be of a pressure rating at least equal to that of the pipeline in which they are to be installed.
2. Couplings shall be ductile iron with gaskets of a composition suitable for exposure to the liquid within the pipe.

2.7 ACCESSORIES

A. Tapped Connections

1. Tapped connections in pipe and fittings shall be made in such manner as to provide a watertight joint and adequate strength against pullout. The maximum size of taps in pipe or fittings without bosses shall not exceed the listed size in the appropriate table of the Appendix to the above-mentioned ANS A21.51 based on 3 full threads for cast iron and 2 full threads for ductile iron.
2. Where the size of the connections exceeds that given above for the pipe in question, a boss shall be provided on the pipe barrel, the tap shall be made in the flat part of the intersection

of the run and branch of a tee or cross, or the connection shall be made by means of a tapped tee, branch fitting and tapped plug or reducing flange, or tapping tee and tapping valve, all as indicated or permitted by the Engineer.

3. All drilling and tapping of cast-iron pipe shall be done normal to the longitudinal axis of the pipe; fitting shall be drilled and tapped similarly, as appropriate. Drilling and tapping shall be done only by skilled mechanics. Tools shall be adapted to the work and in good condition so as to produce good, clean-cut threads of the correct size, pitch, and taper.

2.8 FINISHES

A. Lining

1. Inside of pipe and fittings shall be coated with double thickness cement lining and bituminous seal coat conforming to AWWA/ANSI C104/A21.4.

B. Coating

1. Outside of pipe and fittings shall be coated with the standard bituminous coating conforming to AWWA/ANSI C151/A21.51
2. Outside surfaces of castings to be encased in concrete shall not be coated.
3. Machined surfaces shall be cleaned and coated with a suitable rust-preventative coating at the shop immediately after being machined.

PART 3 - EXECUTION

3.1 GENERAL

A. The installation of the ductile iron pipe and fittings shall be performed in accordance with the Town of Yarmouth Water Department requirements.

3.2 HANDLING

A. Pipe and Fittings

1. Every care shall be taken in handling and laying pipe and fittings to avoid damaging the pipe, scratching or marring machined surfaces, and abrasion of the pipe coatings.
2. Any fitting showing a crack and any pipe or fitting which has received a severe blow that may have caused an incipient fracture, even though no such fracture can be seen, shall be marked as rejected and removed at once from the Work.
3. In any pipe showing a distinct crack and in which it is believed there is no incipient fracture beyond the limits of the visible crack, the cracked portions, if so approved, may be cut off by and at the expense of the Contractor before the pipe is laid so that the pipe used is perfectly sound. The cut shall be made in the sound barrel at a point at least 12-inches from the visible limits of the crack.

3.3 CUTTING

A. Pipe

1. Except as otherwise approved, all cutting shall be done with a machine having rolling wheel cutters, knives, or saws adapted to the purpose. Hammer and chisel or so-called wheel span cutters shall not be used to cut pipe. All cut ends shall be examined for possible cracks caused by cutting.
2. Cut ends to be used with push-on joints shall be carefully chamfered to prevent cutting the gasket when the pipe is laid or installed.

3.4 INSTALLATION

A. Pipe and Fittings

1. No defective pipe or fittings shall be laid or placed in the piping, and any piece discovered to be defective after having been laid or placed shall be removed and replaced by a sound and satisfactory piece.
2. Each pipe and fitting shall be cleared of all debris, dirt, etc., before being laid and shall be kept clean until accepted in the complete work.
3. Pipe and fittings shall be laid accurately to the lines and grades indicated on the drawings or required. Care shall be taken to ensure a good alignment both horizontally and vertically.
4. Pipe shall have a firm bearing along its entire length.
5. The deflection of alignment at a joint shall not exceed the appropriate permissible deflection as specified in the tabulation titled PIPE DEFLECTION ALLOWANCES.

PIPE DEFLECTION ALLOWANCES		
Maximum permissible deflection, in.*		
Size of Pipe	Push-on Joint	Mechanical Joint
4	19	31
6	19	27
8	19	20
10	19	20
12	19	13 ½
14	11	13 ½
16	11	13 ½
18	11	11
20	11	11
24	11	9
30	11	9
36	11	8
42	½	7 ½
48	½	7 ½
54	5 ½	

*Maximum permissible deflection for 18-ft. lengths; maximum permissible deflections for other lengths shall be in proportion of such lengths to 18 ft.

6. When mechanical joint, push-on joint or similar pipe is laid, the bell of the pipe shall be cleaned of excess tar or other obstructions and wiped out before the cleaned and prepared spigot of the next pipe is inserted into it. The new pipe shall be shoved firmly into place until properly seated and held securely until the joint has been completed.

B. Castings

1. Castings to be encased in masonry shall be accurately set with the bolt holes, if any, carefully aligned.
2. Immediately prior to being set, castings shall be thoroughly cleaned of all rust, scale and other foreign material.

C. Temporary Plugs

1. At all times when pipe laying is not actually in progress, the open ends of pipe shall be closed by temporary watertight plugs or by other approved means. If water is in the trench when work is resumed, the plug shall not be removed until all danger of water entering the pipe has passed.

D. Appurtenances

1. Valves, fittings and appurtenances shall be set and jointed as indicated on the drawings.

3.5 ASSEMBLING

A. Push-On Joints

1. Make up by inserting the gasket into the groove of the bell and applying a thin film of special nontoxic gasket lubricant uniformly over the inner surface of the gasket that will be in contact with the spigot end of the pipe.
2. The chamfered end of the plain pipe shall be inserted into the gasket and then forced past it until it seats against the bottom of the socket.

B. Bolted Joints

1. Before the pieces are assembled, rust-preventive coatings shall be removed from machined surfaces.
2. Pipe ends, sockets, sleeves, housings, and gaskets shall be thoroughly cleaned and all burrs and other defects shall be carefully smoothed.

C. Mechanical Joints

1. Surfaces against which the gasket will come in contact shall be thoroughly brushed with a wire brush prior to assembly of the joint. The gasket shall be cleaned. The gasket, bell, and spigot shall be lubricated by being washed with soapy water.
2. The gland and gasket, in that order, shall be slipped over the spigot, and the spigot shall be inserted into the bell until it is correctly seated.

3. The gasket shall then be seated evenly in the bell at all points, centering the spigot, and the gland shall be pressed firmly against the gasket.
4. After all bolts have been inserted and the nuts have been made up finger tight, diametrically opposite nuts shall be tightened progressively and uniformly all around the joint to the proper tension, preferably by means of a torque wrench.
5. The correct range of torque as indicated by a torque wrench and the length wrench (if not a torque wrench) used by an average man to produce such range of torque, shall not exceed the values specified in the tabulation titled TORQUE RANGE VALUES.

TORQUE RANGE VALUES			
Nominal Pipe Size, in.	Bolt Diameter, in.	Range of Torque, ft-lb.	Length of Wrench, in.
3	⅝	40-60	8
4 thru 24	¾	60-90	10
30, 36	1	70-100	12
42, 48	1 ¼	90-120	14

Note: If the effective sealing of the joint is not attained at the maximum torque indicated above, the joint shall be disassembled and thoroughly cleaned, then reassembled. Bolts shall not be over stressed to tighten a leaking joint.

D. Restrained Joints
1. Install in accordance with manufacturers written instructions.
2. Do not exceed manufacturer's permissible pipe deflection allowance.

E. Sleeve-Type Couplings
1. Prior to the installation of sleeve-type couplings, the pipe ends shall be cleaned thoroughly for a distance of 8-inches
2. Soapy water may be used as a gasket lubricant.
3. A follower and gasket, in that order, shall be slipped over each pipe to a distance of about 6-inches from the end, and the middle ring shall be placed on the already laid pipe end until it is properly centered over the joint.
4. The other pipe end shall be inserted into the middle ring and brought to proper position in relation to the pipe already laid.
5. The gaskets and followers shall then be pressed evenly and firmly into the middle ring flares.
6. After the bolts have been inserted and all nuts have been made up finger tight, diametrically opposite nuts shall be tightened progressively and uniformly all around the joint, preferably by use of a torque wrench of the appropriate size and torque for the bolts. The correct torque as indicated by a torque wrench shall not exceed the manufacturers recommended values
7. After assembly and inspection and before being backfield, all exterior surfaces of buried sleeve-type couplings, including the middle and follower rings, bolts, and nuts, shall be

thoroughly coated with an approved heavy-bodied bituminous mastic. Care shall be taken and appropriate devices used to ensure that the undersides, as well as the more readily accessible parts, are well coated.

3.6 PIPING SUPPORT

A. Where necessary, bends, tees, and other fittings in pipelines buried in the ground may be backed up with Class B concrete placed against undisturbed earth where firm support can be obtained. If the soil does not provide firm support, then restraining devices shall be provided.

3.7 CLEANING

A. Cleaning shall be performed in accordance with the Town of Yarmouth Water Department requirements.

B. Prior to the pressure and leakage tests, thoroughly clean piping of all dirt, dust, oil, grease and other foreign material. This work shall be done with care to avoid damage to linings and coatings.

3.8 TESTING

A. Testing shall be performed in accordance with Town of Yarmouth Water Department requirements.

B. Except as otherwise directed, pipelines shall be given combined pressure and leakage tests in sections of approved length.

C. Furnish and install suitable temporary testing plugs or caps; all necessary pressure pumps, pipe connections, meters, gages, relief valves, other necessary equipment; and all labor required.

D. Subject to approval and provided that the tests are made within a reasonable time considering the progress of the project as a whole, and the need to put the section into service, the Contractor may make the tests when he desires.

E. However, pipelines to be embedded in concrete shall be tested prior to placing of the concrete and exposed piping shall be tested prior to field painting.

F. Unless it has already been done, the section of pipe to be tested shall be filled with water of approved quality, and all air shall be expelled from the pipe. If hydrants or blow offs are not available at high points for releasing air the Contractor shall make the necessary excavations and do the necessary backfilling and make the necessary taps. After completion of the tests, if directed by the Engineer, remove corporations and plug said holes.

G. The section under test shall be maintained full of water for a period of 24 hours prior to the combined pressure and leakage test being applied.

H. The pressure and leakage test shall consist of first raising the water pressure (based on the elevation of the lowest point of the section under test and corrected to the gage location) to a pressure in pounds per square inch numerically equal to the pressure rating of the pipe, but not to exceed 200 psi. Do not apply this pressure to items of equipment known to be incapable of withstanding such pressure.

I. If the Contractor cannot achieve the specified pressure and maintain it for a period of two hours with no additional pumping, the section shall be considered as having failed to pass the test.

J. If the section fails to pass the pressure and leakage test, the Contractor shall do everything necessary to locate, uncover, and repair or replace the defective pipe, fitting, or joint, all at his own expense and without extension of time for completion of the work. Additional tests and repairs shall be made until the section passes the specified test and is accepted by the Engineer.

K. If, in the judgment of the Engineer, it is impracticable to follow the foregoing procedure exactly for any reason, modifications in the procedure may be made as required and approved by the Engineer, but in any event, the Contractor shall be fully responsible for the ultimate tightness of the line within the above leakage and pressure requirements.

L. All testing to be witnessed by the Engineer.

3.9 DISINFECTION AND FLUSHING

A. The Contractor shall disinfect the lines carrying potable water. Disinfection and flushing shall be performed in accordance with the Town of Yarmouth Water Department requirements.

B. Furnish all equipment and materials necessary to do the work of disinfecting and shall perform the work in accordance with the procedure outlined in the AWWA Standard C651 except as otherwise specified herein.

C. During the disinfection period, care shall be exercised to prevent contamination of water in existing mains.

D. The dosage shall be such as to produce a chlorine concentration of not less than 10 PPM (mg/l) after a contact time of not less than 24 hours.

E. After treatment, the main shall be flushed with clean water until the residual chlorine content does not exceed 0.2 PPM (mg/l).

F. Before disposing of the water used in disinfecting and flushing water mains thoroughly neutralize it through the application of a reducing agent, as referenced in AWWA C651.

G. Dispose of the water used in disinfecting and flushing in an approved manner.

H. Bacteriological sampling and testing shall be done in accordance with AWWA C651 for each main and each branch. Sampling shall be accomplished with sterile bottles treated with sodium thiosulfate, as required by Standard Methods. No hose or fire hydrants shall be used in collection of samples. A corporation stop installed on the main, with a removable copper tube gooseneck assembly, is the recommended method.

I. Testing shall be done by a laboratory approved by the Engineer, in accordance with Standard Methods, and shall show the absence of coliform organisms. A standard plate count may be required at the option of the Engineer.

END OF SECTION

SECTION 33 11 16

UTILITY IDENTIFICATION

PART 1 - GENERAL

1.1 SUMMARY

A. Related documents:
   1. A.P.W.A. - American Public Works Association

B. Section includes, without limitation, providing:
   1. Requirements for furnishing and installing metallic (detectable) and non-metallic (non-detectable) marking tape over buried pipelines and conduits.

C. Extent: As shown; if not, as follows:
   1. Description
      a. Marking tape to be installed over all pipelines and conduits installed under this Contract.
      b. Marking tape for non-ferrous pipe or conduits to be Detectable, magnetic type.
      c. Marking tape for ferrous pipe or conduits to be Non-detectable, non-magnetic type.
      d. Tape to be 6-inches wide.

1.2 SUBMITTALS

A. Shop Drawings
   1. Submit in accordance with SECTION 01 33 00, SUBMITTALS.

B. Samples
   1. Provide samples of submitted products.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide products by one of the following:
   1. Underground utility marking tape to be:
      a. Detectable:
         1) Magnatec by THOR Enterprises, Inc., Sun Prairie, WI.
      b. Non-detectable:
         1) Shieldtec by THOR Enterprises, Inc., Sun Prairie, WI.
         2) Or product deemed equal by the Engineer.

2.2 MATERIALS

A. Detectable Underground Utility marking Tape

1. Minimum overall thickness: 5.0 mil (0.005”).
2. Aluminum foil core: 35 gauge (0.00035”) minimum.
3. Foil visible from both sides of tape.
4. Protective plastic jacket applied to both sides of foil.
5. Jacket adhesive applied directly to the film and foil.
6. No printing to extend to the edges of the tape.
7. No dilutants, pigments or contaminants in the adhesive.
8. Adhesive formulated to resist degradation by elements normally found in soil.

B. Non-detectable Underground Utility marking Tape

1. Minimum overall thickness: 4.0 mil (0.004”).
2. Polyethylene plastic film: 100% virgin, low density acid and alkali resistant.
3. Printing: Permanent, black, environmentally safe.
4. Coloring: color-fast, lead free, organic pigments suitable for direct burial and prolonged exposure to the elements normally found in soil.

C. Marking

1. Tape to printed with “BURIED UTILITY LINE BELOW”, replacing the word “UTILITY” with the word “WATER”, “SEWER”, “DRAIN”, “ELECTRIC”, “GAS”, or otherwise appropriate, repeating continuously every 30-inches max.

D. Color Code in accordance with A.P.W.A. Standards as follows:

1. Safety Red: Electric power and high voltage lines
2. High Visibility Safety Yellow Gas and oil distribution/transmission and dangerous materials/steam
3. Safety Alert Orange: Fiber optic/telephone/CATV
4. Safety Precaution Blue: Water and irrigation lines
5. Safety GreenSewer/storm/sanitary systems, non-potable water
6. Safety Brown: Force mains and effluent lines
7. Alert Purple: Reclaimed and effluent re-use lines

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install marking tape directly above the pipeline or conduit tape is to identify, approximately 18-inches below the proposed finished grade.

B. Install marking tape in accordance with manufacturers' recommendations.

C. Install marking tape over existing utilities disturbed by the Contractors operation.

END OF SECTION

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SECTION 33 12 00

WATER UTILITY DISTRIBUTION

PART 1 - GENERAL

1.1 SUMMARY

A. Work to furnish and install water service and on-site distribution system including, pipes, valves, hydrants, fittings, and all related appurtenances.

B. RELATED DOCUMENTS

1. Town of Yarmouth, Massachusetts, Yarmouth Water Department Standard Documents for Water Materials, and Installation, including
    a. 02222 Earthwork for water Distribution Systems
    b. 02611 Buried Ductile Iron Pipe and Fittings
    c. 2640 Buried Valves and Appurtenances
    d. 02645 Hydrants
    e. 02650 Joint Restraints
    f. 02660 Service Connections
    g. 02675 Disinfecting Water Mains
    h. 02676 Testing Water Piping Systems
2. The Massachusetts Department of Transportation, Highway Division, 2023 Standard Specifications for Highways and Bridges, including all addenda.
3. Associated General Contractors of America, Inc. (AGGCA) Manual of Accident Prevention
4. Occupational Safety and Health Administration, U.S. Dept. of Labor Requirements.
5. American Society for Testing and Materials (ASTM)
    a. A48, Standard Specification for Gray Iron Castings
    b. A536, Standard Specification for Ductile Iron Castings
6. American Water Works Association (AWWA)
    a. AWWA C500, Standard for Metal-Seated Gate Valves for Water Supply Service.
    b. AWWA C502, Standard for Dry-Barrel Fire Hydrants.
    c. AWWA C504, Rubber-Sealed Butterfly Valves
    d. AWWA C509, Resilient-Seated Gate Valves for Water-Supply Service
    e. AWWA C515, Reduced-Wall, Resilient-Seated Gate Valves for Water-Supply Service

f. AWWA C550, Protective Epoxy Interior Coatings for Valves and Hydrants

7. National Standards Institute (ANSI)

a. ANSI C111/C21.11, Standard for Rubber-Gasket Joints for Ductile-Iron and Pressure Pipe and Fittings

C. Section includes, without limitation, providing:

1. Requirements for furnishing and installing piping, gates, valves, corporation stops, curb stops, fire hydrants, yard hydrants, flush mount hydrants and miscellaneous pipe fittings, appurtenances, as indicated on the drawings.

2. Work shall conform to Yarmouth Water Department Standards, and as specified. If there is a discrepancy in products, equipment or execution between the specification included herein and the Town of Yarmouth Water Department Standards, the Water Department Standards shall govern, unless otherwise approved by the Engineer.

1.2 SUBMITTALS

A. In accordance with Section 01 33 00 SUBMITTAL PROCEDURES submit for review shop drawings and manufacturers data/catalog cuts, as well as exploded diagrams, material lists, performance characteristics, recommended spare parts lists, for all pipe, fittings, valves, boxes, hydrants, yard hydrants, flush hydrants, corporation stops, handholes, and related appurtenances to be furnished for the project.

1.3 COORDINATION

A. The Contractor shall notify the Yarmouth Water Department sufficiently in advance of connecting new main to existing main. All work and materials shall be subject to approval by the DPW and shall conform to the applicable Town Standards.

B. The Contractor shall be responsible for making all arrangements with the Town and paying all fees if not waived by the municipality that may be associated with the water system installation.

1.4 QUALITY ASSURANCE

A. All water distribution equipment shall be made by a manufacturer of established good reputation in the industry and in a plant adapted to meet the design requirements of the project.

B. Related sections, without limitation, include:

1. Section 33 31 00 SANITARY UTILITY SEWAGE PIPING

2. Section 33 41 00 STORM UTILITY DRAINAGE PIPING

PART 2 - PRODUCTS

2.1 MATERIALS

A. Pipe, Pipe fittings, Hydrant Anchor Tees, Couplings, Repair clamps, and Insulation per Yarmouth Water Department Standards.

1. All pipe shall meet the requirements of ANSI/AWWA C151/A21.51 and ANSI/AWWA C150/A21.50.
2. Class: 52
3. Joints: Push-on meeting the requirements of ANSI/AWWA C111/A21.11.
4. Gaskets: Conform to ANSI/AWWA C111/A21.11.
5. Lining: Conforming to ANSI/AWWA C104/A21.4
6. Thickness of cement-mortar lining:
    a. 1/8 inch for pipes 12 inches and smaller.
    b. 3/16 inch for pipe 14 inches and larger.
7. Cement-mortar lining to be seal coated per AWWA C104/A21.4.
8. Machined surfaces shall be cleaned and coated with a suitable rust preventative coating at the shop immediately after being machined per AWWA A21.4.
9. Accessories: Pipe shall be provided with all necessary accessories to make-up the joint (glands, tee head bolts, hex nuts, brass wedges, etc.).
10. Pipe shall be manufactured in North America.

B. Gate Valves and Appurtenances

1. Valves, and all appurtenances shall meet the requirements of Town of Yarmouth requirements.
2. Manufactured by Mueller Co., or acceptable equivalent.
3. General
    a. Gates shall conform to all applicable sections of AWWA [C509 or C515].
    b. Valve bodies shall be manufactured of ductile iron.
    c. Valve stems shall be bronze.
    d. Gate valves shall be open left (counter-clockwise).
    e. All valves shall allow replacement of upper “O” rings while the valve is under pressure in a fully-opened position.
    f. Valves shall have a two-inch operating nut or hand-wheel as required for the particular application and as shown on the Drawings.
    g. Exterior surfaces of all valves shall be coated with epoxy coated solution, on a rust-free casting, prior to shipment. Valve interiors shall have a two-part

thermostat epoxy-protective coating system and meet all requirements of AWWA C550. The epoxy coating shall not impart taste or odors to the water. The coating shall comply to the NSF/ANSI Standard 61 for use in potable water and shall be so listed in the most current NSF summary of approved products. The coating shall be applied and cured in strict conformance with the coating manufacturer's cautions and instructions. The coating shall be applied by the valve manufacturer under controlled factory conditions, and field application is strictly prohibited.

4. Valves shall be designed for working water pressure of 200 psi and tested to 400 psi.

C. Corporation and Curb Stops

1. Fittings and accessories shall conform to the requirements of ANSI/AWWA C800 unless noted otherwise.
2. Corporation Stops shall be CC thread by compression connection.
3. Curb Stops shall be compression connection.
4. Other connection styles as approved by the Engineer.
5. Fittings shall be manufactured by Clow Corporation, Chicago, IL; Mueller Co., Decatur, IL; Red Head Mfg. Co., Boston, MA; or an acceptable equivalent.
6. Brass goods furnished under this specification shall be new and unused.
7. Any metal part of the fitting in contact with the water must be made of Sebiloy II per ASTM B584 (UNS Alloy C89520). Brass alloys not assigned an ASTM/UNS alloy designation are not acceptable. Plated components in contact with the water not made of Sebiloy II are not approved.
8. Metal components that do not contact the water shall comply with the requirements of ASTM B62 or ASTM B584 copper alloy number C83600.
9. All seats/seals must be of an elastomeric material that has verifiable experience in water systems using chloramines for disinfection. Fluoroelastomers such as unfilled Teflon that exhibit poor tear and cut growth characteristics are not approved.
10. All service fitting shall be certified as suitable for contact with drinking water by an ANSI accredited organization in accordance with NSF/ANSI 61.
11. All fittings shall be stamped or embossed with a mark or name indicating that the product is manufactured from the low-lead alloy as specified.
12. Stops shall be ball valve style and have ends as required to suit type of pipe or tubing to be connected, and a combined cap and tee handle.

D. Hydrants

1. Hydrants shall be Mueller Super Centurion A-423 only. This is a Town of Yarmouth Standard.

2. Provisions:

   a. Hydrant design shall be in accordance with AWWA C502, be suitable for buried depth of 5'-6" and be of positive automatic drain type to prevent freezing.

   b. The hydrant shall have a 5-1/4-in. valve, one 4-1/2-in. pumper and two 2-1/2-in. hose connections. The hose and pumper connections shall have National Standard Thread. The operating nuts shall be pentagonal in shape, 1-1/2-in. from point to opposite flat and shall open left (counter-clockwise). The hydrant shall be the hub or mechanical-joint type having a 6-in. pipe connection.

   c. Hydrant shall be factory painted green with white bonnet and hubs.

E. Yard Hydrants

1. Yard hydrants shall be post mounted ¾ inch cast iron compression hydrant, Model M75 by Murdock Manufacturing Company, or approved equal.

2. Yard hydrants shall include all pipe, and appurtenances including back flow preventer necessary to make connection to the water main.

3. Yard hydrants shall have the capability to fully drain the standpipe.

4. Yard hydrants shall be freeze resistant with a minimum burial depth of 4 feet.

F. Flush Hydrants

1. Flush hydrants shall be Box Type Non-Freeze Post Hydrants with Heavy Duty Cover and ¾ inch hose connection, Model 5950 by JR Smith Company, or approved equal.

2. Flush hydrants shall include all pipe, and appurtenances including back flow preventer necessary to make connection to the water main.

3. Flush hydrants shall include cast iron box and cover designed for H20 loading. "WATER" shall be cast into the cover.

4. Flush hydrants shall have the capability to fully drain the standpipe.

5. Flush hydrants shall be freeze resistant with a minimum burial depth of 4 feet.

G. VALVE BOXES

1. Manufactured in North America.

2. Valve boxes shall be adjustable, telescoping, heavy-pattern type with the lower part manufactured of cast iron and the upper part of steel or cast iron. The valve box shall be designed and constructed to prevent direct transmission of traffic loads to the pipe or valve. Boxes shall be adjustable through at least 6 in. vertically without reduction of lap between sections to less than 4 in. inside diameter of boxes for valves at least 4-1/2 in. and at least 3-in. for stops, and lengths as necessary for depths of the valves or stops with which the boxes are to be used. The top of the cover shall be flush with the top of the box rim. A cast arrow and the word open shall be on the cover to indicate direction of turning to open the valve in top of valve covers.

3. Valve Box Riser

   a. Shall be Trumbull Industries 367-5030 to 367-5038 series, or equal.

b. Manufactured in North America.

c. Designed for sliding type 5 ¼ inch shaft valve box and to fit standard lid.

PART 3 - EXECUTION

3.1 INSTALLATION

A. DUCTILE IRON PIPE

1. Care shall be taken in handling and laying pipe and fittings to avoid damaging the pipe and linings, scratching, or marring machined surfaces, and abrasion of the pipe coating or lining.

2. Any fitting showing a crack and any fitting or pipe which has received a severe blow that may have caused an incipient fracture, even though no such fracture can be seen, shall be marked as rejected and removed at once from the work.

3. In any pipe showing a distinct crack and it is believed there is no incipient fracture beyond the limits of the visible crack, the cracked portions, if so approved, may be cut off by and at the expense of the Contractor before the pipe is laid so that the pipe used shall be perfectly sound. The cut shall be made in the sound barrel at a point at least 12 in. from the visible limits of the crack.

4. Except as otherwise approved, all cutting shall be done with a machine suitable for cutting ductile iron pipe. Hydraulic squeeze cutters are not acceptable for cutting ductile iron pipe. Travel type cutters and guillotine or rotary type abrasive saws may be used. All cut ends shall be examined for possible cracks caused by cutting.

5. The Contractor's attention is directed to the fact that damage to the lining of pipes or fittings shall render them unfit for use; he shall use the utmost care in handling and installing lined and coated pipe and fittings to prevent damage. Protective guards shall not be removed until the pipe is to be installed.

6. PIPE INSTALLATION

   a. Piping shall be installed as indicated on the Drawings. Where exact locating dimensions of piping are not indicated on the Drawings, the Designer's approval shall be obtained for proposed locations before installation.

   b. Ductile iron pipe and fittings shall be installed in accordance with ANSI/AWWA C600, Laying Condition Type 4.

   c. Bottom of trench excavation shall be kept dry and free of water during pipe installation. Adequate measures shall be taken to prevent flotation of pipe in the trench.

   d. Each pipe length shall be installed to form a close joint with the next adjoining length and bring inverts to the required grade.

   e. Each pipe length shall have a firm bearing along its entire length. No pipe or fitting shall be permanently supported on saddles, blocking, or stones.

   f. Piping shall be properly graded, free from pockets.

g. Pipe shall be thoroughly cleaned before installation and shall be maintained free from foreign matter during installation.

7. Where necessary, tight-fitting temporary wood bulkheads shall be employed to close ends of pipeline at end of each day's work.

8. Entire length of pipe shall be thoroughly flushed clean following completion of backfill.

9. Concrete Thrust Blocks and Restraint Joints

10. Changes in direction, both vertical and horizontal, of water pipelines shall be braced with concrete thrust blocks and/or restraint joints (Mega Lugs, Star or approved equal).

11. Detectable Warning Tape

12. Warning tape shall be installed along the whole length of the installed pipe and shall be placed on the top of the embedment material as indicated on the drawings.

B. MECHANICAL JOINT RESTRAINTS

1. Mechanical joint restraint shall require conventional tools and installation procedures per AWWA C600, while retaining full mechanical joint deflection after assembly.

2. Proper actuation of the gripping wedges shall be ensured with torque limiting twist off nuts.

C. TAPPING SLEEVE AND VALVE

1. Tapping sleeve and valve shall be installed in accordance with the valve manufacturer's recommendations. The tapping sleeve shall be bolted around the existing water main and bolts tightened. Valve shall be bolted to the flanged outlet of the sleeve with the valve open, the tapping machine bolted on, and the tap made. The cutter shall then be withdrawn, the valve closed, and the tapping machine removed.

D. VALVES

1. Erect and support valves in respective positions free from distortion and strain on appurtenances during handling and installation. Inspect the material for defects in workmanship and material. Clean out debris and foreign material from valve openings and seats, test-operating mechanisms to check proper functioning, and check nuts and bolts for tightness. Repair, at no additional compensation, valves and other equipment that do not operate easily or are otherwise defective.

2. Valves installed with stems below the horizontal, will not be allowed.

3. Set plumb and support valves adequately in conformance with instructions of manufacturer.

4. Provide valves with extension stems where required for convenience of operation. Provide extension stems for valves installed underground and elsewhere so that the operating wrench does not exceed 8 ft. in length.

E. HYDRANTS

1. The installation of hydrants shall conform shall conform to the requirements of the Town of Yarmouth, Massachusetts and as shown on the plans.

2. Set hydrants plumb, and center buried valve and valve box. Tamp earth fill carefully around the valve box to a distance of 4 ft. on all sides of the box, or to undisturbed trench face, if less than 4 ft. Install at least the same depth of cover on hydrant and connecting pipe as on the distributing main. Set the hydrant upon a slab of stone or concrete not less than 4-in. thick and 14-in. square. Firmly wedge side of hydrant opposite pipe connections against vertical face of trench with concrete thrust block. Place not less than 7 cu. ft. of crushed stone around the base of the hydrant at the location of drain holes. Backfill around hydrants as specified under Section 33 2000. Clean hydrant and valve interiors of all foreign matter before installation and inspect in opened and closed positions. Hydrants shall be painted in accordance with Owner's color scheme.

F. YARD HYDRANTS

1. The installation of yard hydrants shall conform shall conform to the requirements of the Town of Yarmouth, Massachusetts, and as shown on the plans.
2. The nozzle of yard hydrants shall be placed 28" – 36" above grade, unless otherwise approved.

G. FLUSH YARD HYDRANTS

1. The installation of yard hydrants shall conform shall conform to the requirements of the Town of Yarmouth, Massachusetts, and as shown on the plans.
2. Cast iron box shall be set to finish grade in a cement concrete collar.

H. VALVE BOXES

1. Provide a valve box for each buried valve.
2. Set valve boxes plumb to match adjacent finish grade.

3.2 TESTING

1. A formal pressure/leakage test shall be required of the water mains, valves and appurtenances in the system constructed. General test requirements.
2. The pressure/leakage test shall be conducted in accordance with these specifications and the applicable requirements of AWWA C600, Section 4.
3. Where any section of a water main is provided with concrete thrust blocks, the test shall not be made until at least 5 days have elapsed since the concrete was placed.
4. If high-early-strength cement is used in the concrete thrust blocks, the test shall not be made until at least two days have elapsed since the concrete was placed.
5. Prior to testing, the pipeline or section thereof, the section to be tested shall be thoroughly flushed, and all air expelled. All air shall be expelled by appropriate methods including the use of corporation stops installed by the Contractor, at no additional cost to the Department of Public Works, at high points along the water main.
6. After all the air has been expelled, and the corporation stops closed, the test pressure shall be applied by means of a pump connected to the pipe.

7. The pump, pipe connections, and all necessary apparatus including the gages, shall be furnished by the Contractor.

8. Unless otherwise specified, the test pressure shall be 150 psi or 150 percent of the working pressure, whichever is greater, but in no case shall the pressure exceed 250 psi. This pressure shall be maintained for two hours.

9. Any excessive indicated leakage, as determined by the pressure test, shall be located and repairs made. The total leakage from the pipeline or sections thereof shall not exceed the amount shown in Table 1 of this Specification Section in accordance with AWWA standards.

10. Should the pipeline or sections thereof not come within the permissible leakage limits, the Contractor (at his own expense) shall be required to excavate and locate the source of leakage and make repairs.

11. After the Contractor has notified the Yarmouth Water Department that repairs have been made, the test shall be repeated until the pipeline or sections thereof are within the allowable leakage.

12. The Contractor shall notify the DPW sufficiently in advance of connecting new main to existing main. All work and materials shall be subject to approval by the Yarmouth Water Department and shall conform to the applicable Town Specifications.

13. The Contractor shall be responsible for making all arrangements with the Town and paying all fees (if required) associated with the water system installation.

14. Notice of tests shall be made in writing to the Engineer, the Yarmouth Water Department, and the Plumbing Inspector, and received by them not less than five days before the date of test.

    a. Promptly following satisfactory completion of leakage testing, a report fully describing test procedures and listing test results shall be submitted to the Engineer. The report shall be signed by the Contractor's Superintendent.

DUCTILE AND GRAY CAST IRON MAINS
ALLOWABLE LEAKAGE PER 1000 FT.

Avg. Test Pressure	**Nominal Pipe Diameter (in.)**			
(psi)	6	8	10	12
350	0.84	1.12	1.40	1.69
300	0.78	1.04	1.30	1.56
250	0.71	0.95	1.19	1.42
200	0.64	0.85	1.06	1.28
150	0.55	0.74	0.92	1.10
100	0.45	0.60	0.75	0.90

J DISINFECTION

1. After completion of all water main related construction, except water service connection installation, all water mains, valves, hydrants, hydrant connections and other appurtenances installed under this Contract shall, be disinfected in accordance with AWWA Standard C651, Section 4.4.3 (Continuous Feed Method), as modified herein.

2. All existing hydrants and valves shall be operated by the Yarmouth Water Department personnel only. The contractor is not permitted to operate City owned hydrants and valves.

3. Taps for flushing, chlorination and sampling shall be installed by the Contractor at no additional expense to the Owner.

4. Flush the new water mains with potable water to remove any contaminants and debris that may have entered the water mains during construction.

5. The flushing velocity in the new water mains shall not be less than 2.5 feet per second. In the absence of a flow meter, flow rate shall be determined either by placing a pitot gage at the discharge or by measuring the time to fill a container of a known volume.

6. Prepare a chlorine solution that shall be continuously fed into the potable water that is used to fill the new water mains.

7. The chlorine solution shall be applied to the new water mains with a chemical feed pump designed to feed chlorine solutions.

8. Completely fill the new water mains with the chlorinated, potable water to remove any air pockets. The point of application shall be no more than 10 ft. downstream from the beginning of the new water mains.

9. The chlorine solution shall be of sufficient strength to provide a minimum residual chlorine concentration of 25 milligrams per liter (mg/l) in the filled water mains.

10. New valves and hydrants shall be operated to insure their proper disinfection.

11. Isolation valves shall be maintained in a closed position to prevent chlorinated water from entering the existing water distribution system.

12. Chlorinated water shall remain in the main for a minimum of 48 hours.

13. The minimum residual chlorine concentration at the end of the 48-hour holding period shall be 10 mg/l.

14. After the 48-hour retention period, chlorinated water shall be flushed from every hydrant branch on the main until the chlorine concentration leaving the main is no higher than that generally in the system or less than 1.0 mg/l.

15. Chlorinated water shall be discharged in a manner that shall not adversely affect flora and fauna or drainage courses and shall conform to applicable State regulations for waste discharge.

16. Chlorinated water that is flushed from the mains shall be neutralized by the addition of a dechlorinating agent so that the residual chlorine concentration is zero.

17. The location of the discharge for the dechlorinated water shall be approved by the Water Department.

3.3 DISINFECTION/BACTERIOLOGICAL TESTS

1. A minimum of 48 hours after flushing and before the new water mains are placed in service, the Contractor shall collect water samples for testing of the bacteriological quality of the water.
2. No hose or fire hydrant shall be used in the collection of samples.
3. A sampling tap shall consist of a standard corporation stop installed in the main with a PVC gooseneck assembly.
4. Samples for bacteriological testing shall be collected in sterile bottles treated with sodium thiosulfate and furnished by the state certified laboratory that shall perform the tests.
5. A private company specializing in this field shall chlorinate the main, take the samples and have the same tested by an approved laboratory.
6. Unless otherwise directed by the Water Department, the minimum number of samples for bacteriological analysis shall be as follows:
   a. One sample every 1,000 linear feet of newly installed water mains.
   b. One sample at the end of the newly installed water mains.
   c. One sample at each branch.
7. All bacteriological tests shall be performed by a state certified laboratory.
8. Two bacteriological tests shall be performed on all samples:
   a. One coliform bacteria, and
   b. One heterotrophic plate count (HPC) bacteria.
9. Test results on all samples and a copy of the chain of custody shall be mailed directly to the Yarmouth Water Department from the laboratory.
10. The disinfection procedure shall be considered satisfactory only if the results of all tests confirm the following:

    a. The absence of coliform bacteria in all samples taken and the HPC bacteria are 10 or less colony forming units per milliliter (cfu/ml) in all samples taken (unless the water supplier has established a stricter HPC limit from baseline data for their water distribution system, in which case the results of the HPC bacteria tests shall meet the stricter limit).
11. The new water mains may be placed in service if the results of the disinfection procedure are satisfactory, and the Water Department has granted permission.

3.4 FIELD QUALITY CONTROL

1. In accordance with the requirements of the Yarmouth Water Department.
2. Proceed with installation only after unsatisfactory conditions have been corrected.
3. Touch-up abraded areas of shop coat with paint of the same type as shop coat, even to the extent of applying entire coat if necessary, and clean deteriorated surfaces before applying touch-up coat.
4. Shop coat exposed ferrous surfaces, not painted, with grease or other suitable protective coating. Uncoated surfaces in contact with potable water shall not be coated.

3.5. RECORD DRAWINGS / AS-BUILTS

A. The Contractor shall provide the Designer with as-builts of all the newly installed lines. The as-built shall include swing tie locations and depths to all pipes and fixtures, and shall be shown on a site plan and in AutoCAD format. The Contractor shall also supply the Engineer with the model/serial number of all tapping sleeves, and water meters installed as part of the compiled project Operating Manual.

END OF SECTION

SECTION 33 31 00

SANITARY UTILITY SEWERAGE PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Related documents: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1. Town of Yarmouth, Massachusetts, requirements
2. American Society for Testing and Materials (ASTM) Publications
    a. D3034, Specification for Type PSM Poly (vinyl chloride) (PVC) Sewer Pipe and Fittings.
    b. D3212, Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastometric Seals.
    c. F477, Specification for Elastometric Seals (Gaskets) for Joining Plastic Pipe.
    d. F679, Specification for Polyvinyl Chloride (PVC) Large - Diameter Plastic Gravity Sewer Pipe and Fittings.

B. Section includes, without limitation, providing:

1. Requirements for furnishing, installing and testing polyvinyl chloride (PVC) gravity sewer pipe, polyvinyl chloride pipe (PVC) force main and fittings.

C. Extent: As shown.

1.2 SUBMITTALS

A. Shop Drawings

1. In accordance with SECTION 01 33 00, SUBMITTALS.
2. Submit for review shop drawings showing pipe dimensions, joints, joint gaskets, and other details for each size of pipe to be furnished for the project.
3. All pipe furnished under the contract shall be manufactured only in accordance with the Specifications and the reviewed drawings.

B. Samples

1. Submit samples of products if requested by the Engineer.

1.3 QUALITY ASSURANCE

A. Certifications

1. All pipe delivered to the job site shall be accompanied by test reports certifying that the pipe and fittings conform to the herein-mentioned ASTM specifications.

2. Pipe shall be subject to thorough inspection and tests, the right being reserved for the Engineer to apply such tests as he deems necessary.

3. All tests shall be made in accordance with the methods prescribed by the herein-mentioned ASTM specifications, and the acceptance or rejection shall be based on the test results.

4. Assist the Engineer in inspecting the pipe upon delivery.

5. Pipe not conforming to the requirements of this contract will be rejected and shall be immediately removed from the site by the Contractor.

B. Related sections, without limitation, include:

1. Section 31 05 16 AGGREGATES FOR EARTHWORK

2. Section 31 20 00 EARTH MOVING

3. Section 33 05 61 PRECAST CONCRETE MANHOLES

1.4 DELIVERY, STORAGE, AND HANDLING

A. Storage and Protection

1. All pipe shall be stored at the site until installation in accordance with the manufacturer's recommendations.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Graivity Pipe, Fittings, And Specials

1. Diameters 4-inch through 15-inch, in conformance with ASTM D3034

2. Diameters 18-inch through 27-inch in conformance with ASTM F679 (Wall thickness T-1).

3. Gravity pipe shall be gasketed SDR35 PVC, unless otherwise indicated and/or approved by the Engineer. Glued joints are not acceptable for exterior sanitary sewer piping.

B. Pressure Pipeand Fittings

1. Pressure pipe shall meet the requirement of AWWA C 900, for Pressure Class 250 (DR 17) unless otherwise indicated and/or approved by the Engineer.

2. Pressure pipe shall be manufactured from clean, virgin, approved Class 12454 compounds, conforming to ASTM D1784, with an established hydrostatic design minimum of 4,000 psi for water at 73.4 degrees. F.

3. Pipe shall be furnished in maximum 20 foot laying lengths with integral bell joints formed so as to contain a rubber sealing gasket.

4. Fittings for use with polyvinyl chloride (PVC) pressure pipe shall be push-on joint, injection molded conforming to AWWA C907. Fittings shall be of a pressure classification at least equal to that of the piping with which they are to be used.

5. Pipe shall meet all requirements of the Underwriters' Laboratory.

C. Straight Pipe

1. Lengths of not more than 13 ft.

D. Y-branches

1. Lengths of not more than 3 ft., unless otherwise permitted by the Engineer.
2. Saddle Y-branches will not be allowed.

E. Specials

1. Conform to the specifications for straight pipe as applicable and to the details indicated on the drawings or bound into the back of the specifications.

F. Joints

1. Conforming to ASTM D3212.
2. Push-on bell and spigot joints using elastomeric ring gaskets

G. Gaskets

1. Conforming to ASTM F477.
2. Securely fixed into place in the bells so that they cannot be dislodged during joint assembly.
3. Composition and texture that is resistant to common ingredients of sewage and industrial wastes (including oils and groundwater), and which will endure permanently under the conditions of the proposed use.

H. Lubricant

1. In accordance with manufacturers requirements.

PART 3 - EXECUTION

3.1 PREPARATION

A. Inspection of Pipe

1. Inspect each pipe unit before being installed.
2. No single piece of pipe shall be laid unless it is generally straight and undamaged.
3. 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 in. per ft. of length.
4. If a piece of pipe fails to meet this required check for straightness, it shall be rejected and removed from the site.
5. Any pipe unit or fitting discovered to be defective either before or after installation shall be removed and replaced with a sound unit.

B. Handling of Pipe

1. Each pipe unit shall be handled into its position in the trench, by such means as acceptable to the Engineer. Care shall be taken to avoid damaging the pipe and fittings.

3.2 INSTALLATION

A. Placement

1. Except as otherwise indicated on the drawings, support pipe with compacted Crushed Stone in accordance with Specification SECTION 31 05 16. No pipe or fitting shall be permanently supported on saddles, blocking, or stones.
2. Provide suitable depressions in crushed stone to accept pipe bells, so that after placement, only the barrel of the pipe receives bearing pressure from the supporting material.
3. Clear pipe and fittings of debris, dirt, etc., before being installed, and keep clean until accepted in the completed work.
4. Install pipe and fittings to the lines and grades indicated on the drawings or as required by the Engineer. Care shall be taken to ensure true alignments and gradients.

B. Joining Pipe

1. Before any joint is made, the previously installed unit shall be checked to assure that a close joint with the adjoining unit has been maintained and that the inverts are matched and conform to the required grade.
2. The pipe shall not be driven down to the required grade by striking it with a shovel handle, timber or other unyielding object.
3. All joint surfaces shall be cleaned. Immediately before joining the pipe, the bell or groove shall be lubricated in accordance with the manufacturer's recommendation.
4. Each pipe unit shall then be carefully pushed into place without damage to pipe or gasket.
5. Suitable devices shall be used to force the pipe units together so that they will fit with a minimum open recess inside and outside and have tightly sealed joints.
6. Care shall be taken not to use such force as to wedge apart and split the bell or groove ends.
7. Joints shall not be "pulled" or "cramped" unless permitted by the Engineer.
8. Where any two pipe units do not fit each other closely enough to enable them to be properly jointed, they shall be removed and replaced with suitable units.
9. Gasket installation and joint assembly shall follow the directions of the manufacturers of the joint material and of the pipe, all subject to review by the Engineer. The resulting joints shall be watertight and flexible.
10. Open ends of pipe and branches shall be closed with polyvinyl chloride stoppers secured in place in an acceptable manner.

C. Rejecting Pipe

1. Pipe of a particular manufacturer may be rejected if there are more than five unsatisfactory joint assembly operations or "bell breaks" in 100 consecutive joints, even though the pipe and joint conform to the appropriate ASTM Specifications as hereinbefore specified. If the pipe is unsatisfactory, as determined above, the Contractor shall, if required, remove all pipe of that manufacturer of the same shipment from the work and shall furnish pipe from another manufacturer which will conform to all of the requirements of these specifications.

D. Bedding Pipe

1. After each pipe has been properly placed, enough crushed stone shall be placed between the pipe and the sides of the trench, and thoroughly compacted, to hold the pipe in correct alignment.

2. Bell holes (depressions), provided for jointing, shall be filled with crushed stone and compacted, and then crushed stone shall be placed and compacted to complete the pipe bedding, as indicated on the drawings.

E. Protecting Pipe

1. Take all necessary precautions to prevent flotation of the pipe in the trench.

2. Close the open ends of the pipe with temporary watertight plugs, at all times pipe installation is not in progress.

3. If water is in the trench when work is to be resumed, the plug shall not be removed until suitable provisions have been made to prevent water, earth, or other substances from entering the pipe.

4. Pipelines shall not be used as conductors for trench drainage during construction.

F. Backfilling Pipelines

1. In accordance with SECTION 31 20 00, EARTH MOVING.

3.3 ALLOWABLE PIPE DEFLECTION

A. Pipe provided under this specification shall be installed not exceeding a maximum deflection of 7.5 percent. Deflection shall be computed by multiplying the amount of deflection (nominal diameter less minimum diameter when measured) by 100 and dividing by the nominal diameter of the pipe.

B. Upon completion of a section of sewer, including placement and compaction of backfill, the Contractor shall measure the amount of deflection by pulling a specially designed gauge assembly through the completed section. The gage assembly shall be in accordance with the recommendations of the pipe manufacturer and be acceptable to the Engineer.

C. Should the installed pipe fail to meet this requirement, the Contractor shall do all work to correct the problem as the Engineer may require without additional compensation.

3.4 CLEANING

A. Care shall be taken to prevent earth, water, and other materials from entering the pipeline. As soon as possible after the pipe and manholes are completed, clean out the pipeline and manholes, being careful to prevent soil, water, and debris from entering any existing sewer.

3.5 FIELD QUALITY CONTROL

A. Pipeline Flushing

1. Care shall be taken to prevent earth, water, and other materials from entering the pipe. As soon as possible after the pipe and manholes are completed on any street, flush out the new pipeline, using a rubber ball ahead of the water, flushing water or debris will not be permitted to enter any existing sewer.

B. Inspection By Light

1. The alignment of the pipe will be checked by shining a flashlight through the pipe from one manhole to the adjacent manhole. The inspector must be able to see the full circumference of the lighted pipe for its entire length when looking through the pipe from the adjacent manhole towards the manhole from which the light is being emitted.

C. Leakage Tests

1. The pipeline shall be made as nearly watertight as practicable, and leakage tests and measurements shall be made after the pipeline has been backfilled.
2. Where the groundwater level is more than 1 ft. above the top of the pipe at its upper end, the Contractor shall conduct either infiltration tests or low pressure air tests.
3. Where the groundwater level is less than 1 ft. above the top of the pipe at its upper end, conduct either exfiltration tests or low-pressure air tests.
4. At the time of the test, determine the groundwater elevation from observation wells, excavations or other means, all subject to review by the Engineer.
5. For making the infiltration and exfiltration tests, furnish suitable test plugs, water pumps, and appurtenances, and all labor required to properly conduct the tests on sections of acceptable length.
6. The sewers shall be tested before any connections are made to buildings.
7. Provide all instruments, weirs, bulkheads, water and equipment required to test the sewer.
8. Should the sections under test fail to meet the requirements, the Contractor shall do all work of locating and repairing leaks and retesting as the Engineer may require without additional compensation.
9. If, the in the judgment of the Engineer, it is impracticable to follow the procedures specified in this Specification for any reason, acceptable modifications in the procedures shall be made as required, but in any event, the Contractor shall be responsible for the ultimate tightness of the line.

D. Low Pressure Air Test

1. For making the low-pressure air tests, use equipment specifically designed and manufactured for the purpose of testing sewer pipelines using low-pressure air. The equipment shall be provided with an air regulator valve or air safety so set that the internal air pressure in the pipeline cannot exceed 8 psig.

2. The leakage test using low pressure air shall be made on each manhole-to-manhole section of pipeline after placement of the backfill.

3. Pneumatic plugs shall have a sealing length equal to or greater than the diameter of the pipe to be tested. Pneumatic plugs shall resist internal test pressures without requiring external bracing or blocking.

4. All air used shall pass through a single control panel.

5. Low-pressure air shall be introduced into the sealed line until the internal air pressure reaches 4 psig. greater than the maximum pressure exerted by the groundwater that may be above the invert of the pipe at the time of the test. However, the internal air pressure in the sealed line shall not be allowed to exceed 8 psig. When the maximum pressure exerted by the groundwater is greater than 4 psig., conduct only an infiltration test.

6. At least two minutes shall be allowed for the air pressure to stabilize in the section under test. After the stabilization period, the low-pressure air supply hose shall be quickly disconnected from the control panel. The time required in minutes for the pressure in the section under test to decrease from 3.5 to 2.5 psig (greater than the maximum pressure exerted by groundwater that may be above the invert of the pipe) shall not be less than that shown in the following table:

Pipe diameter in inches	Minutes	Pipe diameter in inches	Minutes
6	3.0	18	9.0
8	4.0	21	10.0
10	5.0	24	11.5
12	5.5	27	13.0
15	7.5		

E. Infiltration Test

1. For making the infiltration tests, underdrains, if used, shall be plugged and other groundwater drainage shall be stopped to permit the groundwater to return to its normal level insofar as practicable.

2. Upon completion of a section of the sewer, dewater it and conduct a satisfactory test to measure the infiltration for at least 24 hours. The amount of infiltration, including manholes, tees, and connections, shall not exceed 200 gal. per inch diameter per mile of sewer per 24 hours.

F. Exfiltration Test

1. For making the exfiltration tests, the sewers shall be subjected to an internal pressure by plugging the pipe at the lower end and then filling the pipelines and manholes with clean water to a height of 2 ft. above the top of the sewer at its upper end. Where conditions between manholes, may result in test pressures which would cause leakage

at the stoppers in branches, provisions shall be made by suitable ties, braces, and wedges to secure the stoppers against leakage resulting from the test pressure.

2. The rate of leakage from the sewers shall be determined by measuring the amount of water required to maintain the level 2 ft. above the top of the pipe.

3. Leakage from the sewers under test shall not exceed the requirements for leakage into sewers as hereinbefore specified.

END OF SECTION

SECTION 33 41 00

STORM UTILITY DRAINAGE PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Related documents:

1. Materials and construction methods shall conform, insofar as applicable, to the requirements of:

   a. The Massachusetts Department of Transportation, Highway Division, 2023 Standard Specifications for Highways and Bridges, including all addenda, (referred to as the Standard Specification).

   b. Town of Yarmouth, Massachusetts, requirements.

2. Materials and construction methods shall conform to all applicable manufacturer's instructions and recommendations.

3. American Society for Testing and Materials (ASTM).

   a. D2321, Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity Flow Applications.

   b. F477, Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

4. American Association of State Highway and Transportation Officials (AASHTO)

   a. M294, Specification for 12" to 36" Corrugated Polyethylene (PE) Pipe.

B. Section includes, without limitation, providing:

1. Requirements for furnishing and installing corrugated polyethylene pipe (CPP) of all sizes and types, including but not limited to couplings, cleanouts, adapters, flared end sections and any additional fittings required to completely install the drainage pipe as indicated on the drawings.

2. The work shall include but not be limited to all excavation, pipe placement, backfill and compaction, and installation of all drain line connections as depicted on the plans or as directed by the Engineer.

C. Extent: As shown.

1.2 SUBMITTALS

A. In accordance with Section 01 33 00 SUBMITTALS submit for review drawings showing the pipe dimensions, joints, gaskets and other details for each type and class of pipe to be furnished for the project. All pipe furnished under the contract shall be manufactured only in accordance with the specifications and the reviewed drawings.

1.3 QUALITY ASSURANCE

A. Corrugated polyethylene pipe (CPP) shall be made by a manufacturer of established good reputation in the industry and in a plant adapted to meet the design requirements of the pipe.

1. Related sections, without limitation, include:

a. Section 32 05 16, AGGREGATES FOR EARTHWORK

b. Section 31 05 19.13, GEOTEXTILES FOR EARTHWORK

c. Section 31 20 00, EARTH MOVING

PART 2 - RODUCTS

2.1 PIPE

A. In all cases, materials shall conform to the appropriate section of the Standard Specifications.

B. CPP and polyethylene fittings for stormwater system applications shall be solid pipe (non-perforated), dual wall, smooth interior watertight pipe as manufactured by ADS (type N-12 WT/IB), or approved equal.

C. CPP and polyethylene fittings for subdrain and infiltration system applications shall be perforated pipe, smooth interior watertight pipe as manufactured by ADS (type N-12 WT/IB), or approved equal.

D. Specials, if required, shall conform to the specifications for straight pipe insofar as applicable. Special design or construction necessary for specials shall be subject to acceptance by the Engineer.

E. Use of pipe from alternate manufacturer(s) shall be subject to acceptance by the Engineer. Pipes not meeting all of the standards of the specified ADS pipe shall not be considered.

2.2 JOINTS

A. Materials shall conform to the appropriate section of the Standard Specifications.

B. All joints shall be gasketed and watertight.

2.3 INSPECTION, TESTS AND ACCEPTANCE

A. Acceptance will be on the basis of tests of materials, absorption tests, plant load-bearing tests, pressure tests, and inspection of the complete product. The required tests are enumerated hereinafter. The quality of all materials used in the pipe, the process of manufacture, and the finished pipe shall be subject to inspection by the Engineer. Inspection may be made at the place of manufacture, or on the work site after delivery, or both, and the pipe shall be subject to rejection at any time due to failure to meet any of the specification requirements, even though sample pipe units may have been accepted as satisfactory at the place of manufacture. All pipes that are rejected shall be immediately removed from the project site by the Contractor.

B. Tests and certified copies in triplicate of test results will be required for the materials and the finished pipe units as described herein. If less than 100 units of a given size and class of pipe are

required, the Contractor may submit certified copies of tests made on identical pipe units made by the same manufacturer within the past year. If more than 100 units of a given size and class of pipe are required, the Contractor shall, at his own expense, engage the services of an acceptable independent testing laboratory to perform or witness all tests, other than mill tests on reinforcing steel and cement, and certify the results. In addition, the Owner reserves the right to have any or all pipe units inspected or tested, or both, by an independent testing laboratory at either the manufacturer's plant or elsewhere. Such additional inspection and/or tests shall be at the Owner's expense and shall be the test results of record.

C. All pipe units to be tested shall be selected at random by the Engineer. Unless otherwise permitted, all load-bearing tests on pipe units shall be made in the presence of the Engineer.

D. All tests shall be made in accordance with the latest applicable ASTM specifications.

2.4 FLARED END SECTIONS

A. Flared End Sections shall be manufactured from the same material as the pipe they are connected to.

B. Flared End Sections shall be of a compatible size with the diameter of the pipe they are connected to.

PART 3 - EXECUTION

3.1 CORRUGATED PLASTIC PIPE (SOLID AND PERFORATED)

A. PROTECTION OF EXISTING STRUCTURE, ULTILITIES, AND PAVEMENT

1. Maintain all excavations, and dewatering systems to protect existing structures, utilities, and other facilities that are to remain in service.

2. Obtain utility locations from the Owner and protect all existing utilities so that no damage occurs from construction. The contractor shall be solely responsible for all damage to utilities. Observe all rules and regulations governing utilities and notify utility owners in advance of all intended work involving or affecting utilities.

B. HANDLING PIPE

1. Each pipe unit shall be handled into its position in the trench only in such manner and by such means as is acceptable to the Engineer. In no case shall pipes be dropped or otherwise subjected to impact forces in the course of unloading or installation.

2. The Contractor will be required to furnish suitable devices to permit satisfactory support of all parts of the pipe unit when it is lifted.

C. REPAIR

1. Repair or replace all damaged pipe. Any section of the pipe with a gash, blister, abrasion, nick, scar, or other deleterious fault greater in depth than ten percent (10%) of the wall thickness, shall not be used and must be removed from the site. However, a defective area of the pipe may be cut out and the joint fused in accordance with the procedures stated above. In addition, any section of the pipe having other defects such as concentrated ridges, discoloration, excessive spot roughness, pitting, variable wall thickness or any other defect

of manufacturing or handling as determined by the Engineer shall be discarded and not used.

D. INSTALLATION

1. Installation shall conform to the appropriate section of the Standard Specifications, ASTM D2321, and the manufacturer's recommendations.
2. In no case shall the pipe be installed at less than the manufacturer's minimum recommended depth for H-25 loading.
3. Each pipe unit shall be inspected before being installed. Any pipe discovered to be defective, either before or after installation, shall be removed and replaced with a sound pipe.
4. Except as otherwise indicated on the drawings, the pipe shall be supported by compacted crushed stone. No pipe or fitting shall be permanently supported on saddles, blocking, or stones unless otherwise directed. Crushed stone shall be as specified under Aggregate Materials.
5. When applicable, suitable bell holes shall be provided, so that after placement only the barrel of the pipe receives bearing pressure from the supporting material.
6. All pipe units shall be cleared of all debris, dirt, etc., before being installed and shall be kept clean until accepted in the completed work.
7. Pipe and fittings shall be installed to the lines and grades indicated on the drawings or as required by the Engineer. Care shall be taken to ensure true alignments.
8. Before any joint is made the unit shall be checked to assure that a close joint with the next adjoining unit has been maintained and that the inverts are matched and conform to the required grade. The pipe shall not be driven down to the required grade by striking it with a shovel handle, timber, or other unyielding object.
9. All joint surfaces shall be cleaned. Immediately before joining the pipe, the bell or groove shall be lubricated in accordance with the manufacturer's recommendation. Each pipe unit shall then be carefully pushed into place without damage to pipe or gasket. Suitable devices shall be used to force the pipe unit together so that they will fit with a minimum open recess inside and outside and have tightly seated joints. Care shall be taken not to use such force as to wedge apart and split the bell or groove ends. Joints shall not be pulled or cramped without the permission of the Engineer.
10. Immediately after the pipe joint is completed, the position of the gasket in the joint shall be inspected using a suitable feeler gage furnished by the Contractor, to be sure it is properly put together and is tight. Joints in which the gasket is damaged or not properly positioned shall be pulled apart and remade using a new gasket.
11. Where any two pipe units do not fit each other closely enough to enable them to be properly jointed, they shall be removed and replaced with suitable units and new gaskets.
12. Details of gasket installation and joint assembly shall follow the directions of the manufacturer of the joint materials and of the pipe, all subject to acceptance by the Engineer. The resulting joints shall be watertight and flexible.
13. After each pipe to be supported on crushed stone has been properly bedded, enough gravel shall be placed between the pipe and the sides of the trench, and thoroughly compacted, to

hold the pipe in correct alignment. Bell holes provided for jointing shall be filled with screened gravel and compacted, and then screened gravel shall be placed and compacted to complete the pipe bedding, as indicated on the drawings.

14. The Contractor shall take all necessary precautions to prevent flotation of the pipe in the trench prior to backfilling.
15. At all times when pipe installation is not in progress, the open ends of the pipe shall be closed with temporary watertight plugs or by other suitable means. If water is in the trench when work is to be resumed, the plug shall not be removed until all conditions are suitable to prevent water, earth, or other material from entering the pipe.
16. Pipelines shall not be used as collectors or conductors for trench or other drainage during construction.

E. CLEANING

1. Care shall be taken to prevent earth, water, and other materials from entering the pipeline. As soon as possible after the pipe, basins and manholes are completed, the Contractor shall clean out pipelines, basins, and manholes, being careful to prevent soil, water, and debris from entering any existing pipe.
2. All material and debris removed from pipes, basins and manholes shall be removed from the site and legally disposed of and shall not be used in any other portion of the construction.

F. INSPECTION, TESTS AND ACCEPTANCE

1. All pipe delivered to the job site shall be accompanied by test reports certifying that the pipe and fittings conform to the herein-mentioned ASTM and AASHTO specifications.
2. Pipe shall be subject to thorough inspection and tests; the right being reserved for the Engineer to apply such tests as he deems necessary.
3. All tests shall be made in accordance with the methods prescribed by the herein-mentioned ASTM and AASHTO specifications, and the acceptance or rejection shall be based on the test results.
4. Assist the Engineer in inspecting the pipe upon delivery.
5. Pipe not conforming to the requirements of this contract will be rejected and shall be immediately removed from the site by the Contractor.

3.2 FLARED END SECTIONS

A. Install at pipe outlets at the locations shown on the plans and as directed by the Engineer.

B. Install on a compacted ¾" crushed stone bed to provide an even stable surface.

C. Connect to adjacent pipe per manufacturer's recommendations and at the specified invert.

END OF SECTION

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SECTION 33 42 31

STORMWATER AREA DRAINS AND INLETS

PART 1 - GENERAL

1.1 SUMMARY

A. Related documents:

1. Materials and construction methods shall conform, insofar as applicable, to the requirements of:
    a. The most recent edition of the Massachusetts Department of Transportation, Highway Division, 2020 Standard Specifications for Highways and Bridges, including all addenda, (referred to as the Standard Specification).
    b. Town of Yarmouth, Massachusetts, requirements.
2. Materials and construction methods shall conform to all applicable manufacturer's instructions and recommendations.
3. American Society for Testing and Materials (ASTM).
    a. A48, Specification for Gray Iron Castings.
    b. C32, Specification for Sewer and Manhole Brick (Made from Clay or Shale).
    c. C139, Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes.
    d. C150, Specification for Portland Cement.
    e. C207, Specification for Hydrated Lime for Masonry Purposes.
    f. C478, Specification for Precast Reinforced Concrete Manhole Sections.

B. Section includes, without limitation, providing:

1. Requirements for furnishing and installing area drains of the type and size shown on the plans and as directed..
2. Requirements for furnishing and installing check gate on corrugated plastic pipe outlet as shown on the plans and as directed..
3. Requirements for furnishing and installing trench drain as shown on the plans and as directed.
4. Requirements for furnishing and installing grey iron curb inlets.
5. The work shall include but not be limited to all excavation, placement of geotechnical fabric, placement crushed stone, backfill and compaction as depicted on the plans or as directed by the Engineer.

1.2 SUBMITTALS

A. In accordance with Section 01 33 00 SUBMITTALS submit for review drawings showing the precast concrete sections, joints, gaskets and other details basins to be furnished for the project. All precast leaching basins furnished under the contract shall be manufactured only in accordance with the specifications and the reviewed drawings.

1.3 QUALITY ASSURANCE

A. Precast concrete leaching basins shall be made by a manufacturer of established good reputation in the industry and in a plant adapted to meet the design requirements of the pipe.

B. Related sections, without limitation, include:

1. Section 03 30 00, CAST IN PLACE CONCRETE
2. Section 31 05 16, AGGREGATES FOR EARTHWORK
3. Section 31 05 19.13, GEOTEXTILES FOR EARTHWORK
4. Section 31 20 00, EARTH MOVING
5. Section 32 16 13, CURBS AND GUTTERS

PART 2 - PRODUCTS

2.1 CHECK GATE

A. Check gate to be suitable product to prevent backflow of water when installed on the outlet end of corrugated plastic pipe. Check gate will open out to allow flow from the pipe and close automatically when flow stops to prevent backflow.

B. Check gate to be sized to fit the appropriate diameter corrugated plastic pipe.

2.2 AREA DRAIN

A. Area drain to be high density polyethelene construction of the sizes and types shown on the plans and as directed.

B. Area Drain type I shall be Part No. 1200 12” x 12” Catch Basin with Part No. 1216 12” x 12” Catch Basin Riser by NDS or approved equal. Color shall be black.

C. Area Drain type II shall be Part No. 1200 12” x 12” Catch Basin by NDS or approved equal. Color shall be black.

2.3 TRENCH DRAIN

A. Trench Drain shall be a cast in place concrete trench drain with frame and grate of the dimensions shown on the plans. Precast trench drain will be considered as a substitution with approval of the Engineer

B. Frame and grate shall be cast iron designed to meet Americans with Disabilities Act requirements for grate openings and configuration.

2.4 CURB INLET

A. Curb inlet to be provided as inlet to the trench drain.

B. Curb inlet to be Everggrate Model C1246T or approved equal.

C. curb inlet to be grey iron unless otherwise approved.

2.5 GEOTECHNICAL FILTER FABRIC

A. In accordance with Section Section 31 0519.13 GEOTEXTILES FOR EARTHWORK

.2.6 STONE

A. Crushed Stone in accordance with Section 31 05 16 AGGREGATES FOR EARTHWORK

PART 3 - .EXECUTION

3.1 CHECK GATE

A. Install check gate at end of corrugated plastic pipe outlet at locations shown on the plans and as directed.

B. Install per manufacturer's recommendations to provide a workable, functional installation.

3.2 AREA DRAINS

A. Install plumb and true on compacted ¾" crushed stone bed to the elevations shown on the plans and as directed. Set frame and grate elevation to match adjacent finish grade.

B. Connect drain pipe to area drains at the invert elevations shown on the plans and as directed.

3.3 CURB INLET

A. Install curb inlet adjacent to trench drain at locations shown on the plans and as directed.

B. Install in accordance with manufacturer's reccommendations.

C. Install curb inlet to provide a continuous curb alignment with adjacent curbing.

3.4 TRENCH DRAIN

A. Trench drain to be installed at locations shown on the plans and as directed.

B. Set forms to the line and grade shown on the plans or as directed by the Engineer to provide the specified depth and width.

C. Set frame securely in concrete to proper elevation so that grate is flush with adjacent finish grade.

END OF SECTION

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SECTION 33 46 54

SUBSURFACE INFILTRATION SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. Related documents: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1. Materials and construction methods shall conform, insofar as applicable, to the requirements of:

a. The Massachusetts Department of Transportation, Highway Division, 2023 Standard Specifications for Highways and Bridges, including all addenda, (referred to as the Standard Specification).

b. Town of Yarmouth, Massachusetts requirements.

2. Materials and construction methods shall conform to all applicable manufacturer's instructions and recommendations.

B. Section includes, without limitation, providing:

Requirements for furnishing and installing subsurface stormwater infiltration system capable of providing storge volume as indicated on the plans including accepting connections from drainage pipes of multiple sizes and at multiple locations and elevations.

1.2 QUALITY CONTROL INSPECTION

A. The quality of materials, the process of manufacture, and the finished sections shall be subject to inspection by the Engineer. Such inspection may be made at the place of manufacture, or on the work site after delivery, or at both places, and the sections shall be subject to rejection at any time on account of failure to meet any of the specification requirements, even though sample sections may have been accepted as satisfactory at the place of manufacture. Sections rejected after delivery to the site shall be marked for identification and shall be removed from the site at once. All sections 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.

B. All sections shall be inspected for general appearance, dimensions, soundness, etc.

C. Any damaged sections shall be rejected and replaced with new sections.

D. Related Sections

1. Section 31 05 16, AGGREGATES FOR EARTHWORK

2. Section 31 05 19.13, GEOTEXTILES FOR EARTHWORK

3. Section 31 20 00, EARTH MOVING

1.3 SUBMITTALS

A. Shop Drawings

1. In accordance with SUBMITTAL REQUIREMENTS, submit Shop drawings consisting of catalog cuts or fabricator drawings showing the prefabricated chambers, layout, elevations, inspection ports, stone and pipe connections to the Engineer for approval.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Infiltration Chambers

1. The infiltration chambers shall be made of high molecular weight, high density polyethylene plastic. The chambers shall be joined end to end by the use of an interlocking rib system. Infiltration chambers shall be Stormtech units as manufactured by ADS or approved equal.

2. The infiltration chambers shall have a cross section that provides the required capacity utilizing the same length and number of rows of chambers as shown on the plans.

B. Stone Bedding

1. Crushed stone for use below, around and above the infiltration chambers shall be 1”-2” angular washed stone as specified in Section 31 05 16, AGGREGATES FOR EARTHWORK

C. Filter Fabric

1. Filter fabric shall be utilized in conjunction with all subsurface infiltration systems. The fabric shall be equivalent to fabric specified by the chamber manufacture and shall meet or exceed ASTM standards for grab tensile strength, puncture, UV resistance, apparent opening size, permittivity and flow rate. Filter fabric shall be in conformance with Section 31 05 19.13 GEOTEXTILES FOR EARTHWORK.

PART 3 - EXECUTION

3.1 RECEIVING, STORAGE, AND HANDLING

A. The Contractor shall furnish and use suitable slings, hooks, cables, or such other means as they may elect to handle infiltration chambers. In no case shall chambers be dropped or otherwise subjected to impact forces in the course of unloading or installation.

B. Each section must be inspected and approved by the Engineer immediately prior to final placement, and no cracked, damaged, or defective sections will be allowed in the work. Any sections not approved for use in this work shall be removed from the site and satisfactorily disposed of.

3.2 INSTALLATION

A. Subgrade Preparation

1. Excavate to a sufficient horizontal distance outside of the perimeter of the proposed infiltration field to allow for proper installation of infiltration chambers, and to the proposed

elevation of the bottom of stone. Sides of the excavation shall be sloped back as necessary to avoid collapse.

2. Excavate to remove existing pavement and unsuitable A & B horizon soils to the depth shown on the plans or as directed by the Engineer. Replace with suitable sand borrow in conformance with Section 31 05 16, AGGREGATES FOR EARTHWORK to the depth shown on the plans or as directed by the Engineer but at least one (1) foot below the bottom of the crushed stone layer.

3. Care shall be taken not to overly compact any area of the subgrade during installation. Use of heavy vehicles within the excavation shall be avoided to the maximum extent practicable.

B. Filter Fabric

1. Install filter fabric beneath the entire footprint of the proposed crushed stone and infiltration unit system and extend fabric up the side slope of the excavation to a sufficient distance to allow the material to be secured on the surface. The filter fabric shall be installed and secured as required by the manufacturer with adequate overlap between sections to insure maintenance of fabric coverage during backfilling.

2. The Owner shall assume no liability, and the Contractor is solely responsible for ensuring that the fabric is installed to the manufacturer's specifications and satisfaction, and that the manufacturer's warranty is not voided by the installation.

C. Crushed Stone

1. Place and level crushed stone base to the specified depth and limits without compacting.

D. Infiltration Chambers

1. Install the infiltration chambers as shown on the drawings and as required or recommended by the manufacturer. All infiltration chambers shall be laid with extreme care as to grade and alignment. Each section shall be so laid as to form a close joint with the next adjoining section and to bring the inverts continuously to the required grade.

2. The Owner shall assume no liability, and the Contractor is solely responsible for ensuring that the chambers are installed to the manufacturer's specifications, and that the manufacturer's warranty is not voided by the installation.

E. Backfill

1. Crushed stone shall be used to backfill around and between all infiltration chambers to the proposed top of stone elevation.

2. The filter fabric to the sides of the infiltration system shall be wrapped over the top of the crushed stone, and additional fabric shall be installed to provide full coverage of the top of the stone envelope, with adequate overlap between sections to insure maintenance of fabric coverage during backfilling.

F. Fill material for the remainder of the infiltration system shall be gravel borrow to the bottom elevation of roadway pavement or loam and seed.

3.3 OBSERVATION

A. Upon activation of the infiltration system and for the first six (6) months thereafter, the contractor shall inspect the infiltration system after any storm event generating at least one (1) inch of rainfall in a twenty-four-hour period, and shall verify that the infiltration system is completely drained within seventy-two (72) hours of the end of the storm event (i.e. no standing water remaining in any observed portion of the system).

B. In the event of failure of any portion(s) of the infiltration system to drain the Contractor shall notify the Owner and Engineer to determine an appropriate course of action to rectify the situation. If failure of the system to properly drain is found to be due to poor construction and workmanship, the Contractor shall be responsible for correcting the deficiency at the contractor's expense.

END OF SECTION

SECTION 35 00 00

WATERWAY AND MARINE CONSTRUCTION

KAYAK LAUNCH FACILTY

(ADDITIVE ALTERNATE)

PART 1 - PART GENERAL

1.1 SCOPE OF WORK

A. Scope of work includes, but is not necessarily limited to design, manufacture, supply, and installation of the following:

1. Kayak Launch Facility including
    a. Elevated boardwalk approach and landings.
    b. Helical Piles supporting the boardwalk approach.
    c. Timber Piles supporting landing areas and attachment points for the gangways.
    d. Aluminum gangways, including all hardware, fasteners, and assemblies.
    e. Kayak Launch float, plates, brackets, stand-offs, railings, benches, and hardware.
    f. Kayak Launch Float mooring system, chains, ropes hardware and helical anchors.

B. The Contractor shall supply any and all labor, materials, tools, equipment, trucking, disposal, permits, survey, supervision and any incidentals necessary to complete the work under this Section.

1.2 RELATED WORK SPECIFIED IN OTHER SECTIONS

A. The following items of related work are specified and included in other Sections of the Specifications:

1. SECTION 06 10 00, ROUGH CARPENTRY.
2. SECTION 06 15 00, WOOD DECKING LUMBER & TIMBERS.
3. SECTION 31 63 26, HELICAL ANCHOR SYSTEM.
4. SECTION 31 62 19, GREENHEART TIMBER PILES.
5. Aluminum fabrications, fasteners, under DIVISION 05 METALS

B. Examine all Drawings and all Sections of the Specifications for requirements and provisions affecting the work of this Section.

1.3 QUALITY ASSURANCE

A. Except as noted, work shall conform to the latest editions of the following codes specifications and standards.

1. American Society for Testing and Materials (ASTM)

2. American Welding Society (AWS)
3. American Institute of Steel Construction (AISC)
4. American Institute of Timber Construction (AITC)
5. American Wood-Preservers Association (AWPA)
6. Commonwealth of Massachusetts, Highway Department, Standard Specifications Highways and Bridges.

B. Manufacturers of the float system must meet the following requirements.

1. Have a minimum of 5 years' experience in the design, production, and installation of commercial floating dock systems.
2. Warrant the product for a minimum of two years.
3. Life of the product is to be a minimum of 15 years with minor maintenance.

1.4 SUBMITTALS

A. The Contractor is responsible for producing a coordinated, fully functional Kayak Launch design include of timber piles, gangways, landings, float, mooring stays and river bottom mooring system, inclusive of all assemblies and hardware necessary to create a stable, accessible float platform for the purpose of berthing and launching non-motorized personal watercraft.

B. Submit for approval by the Engineer the following items.

1. Examples of previous design/installments of similar systems
2. Overall plan, cross-section, and details of the proposed system
3. Material list and specifications
4. Schedule and method for installation of the system.
5. Design calculations of all structural components and connections in a clear organized and readable form acceptable to the Engineer, complete with the signature and seal of a Registered Professional Engineer, licensed in the Commonwealth of Massachusetts, responsible for the work. Design calculations shall be comprehensive package including floats, connections, guides.
6. Shop drawings: Detailed shop drawings illustrating all structural members and connections for review and acceptance and shall indicate all material thicknesses, dimensions and show in detail all connections for approval prior to fabrication. Include descriptions of anticipated installation sequence, construction methodologies and duration, of activities, noting compliance with specified time of year restrictions.

C. Certificates

1. Certify that all materials are new and meet or exceed specification requirements.
2. Certify that the system meets or exceeds the specified performance requirements.

1.5 PRODUCT HANDLING

A. System components shall be handled and stored with care to prevent damage. Damaged members will be rejected and replaced at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 KAYAK LAUNCH BOARDWALK APPROACH

A. The Contractor shall provide a complete, safe coordinated ADA compliant system configured as shown to provide access to the Kayak Launch Float. Construction materials shall match those of the Elevated Boardwalk Per DIVISION 06 WOOD PLASTICS AND COMPOSITES.

2.2 HELICAL ANCHORS

A. The Contractor shall support the boardwalk approach with coordinated helical anchor system configured as shown. Construction materials shall match those of the Helical Anchor System Per SECTION 31 63 26.

2.3 TIMBER PILES

A. The Contractor shall utilize timber piles configured as shown. Construction materials shall match those of Timber Piles Per SECTION 31 62 19.

2.4 ALUMINUM GANGWAYS

A. Gangways shall be fabricated of aluminum architectural square and rectangular tubing, angle, bar, channel and flat stock, round pipe, and plate.

B. Gangways shall be constructed to the lengths, size and proportions indicated on the plans. Gangways shall include integral attachment and hinge components, include of transition plates and ADA compliant hardware.

C. All aluminum components shall be isolated from steel components with high grade, durable exterior US stable rubber bushings, washers, or similar hardware.

D. A manufacturer that makes a gangway system that meets these requirements is:

1. Ravens Marine, Inc. 3295 Orange Ave, Kissimmee Fl. 34744 tel. 407.935.9799 www.ravensmarine.com.

2.5 KAYAK LAUNCH FLOAT

A. The Kayak Launch Float shall be configured as shown on the plans, adjusted per approved shop drawings. The float shall be made up of interconnected, pre-manufactured float modules assembled to create both level and sloped areas, with kayak launch channels and a ‘sub-zero-entry ‘for paddle-on zone on one side of the float. Float shall be designed for use in saltwater conditions, by personal, non-motorized watercraft. Float configuration, surfaces and components shall be compliant with the Americans with Disabilities Act.

1. Floatation Unit: All units shall be rotationally molded for seamless, one-piece construction providing a heavy-duty UV-resistant high-grade high-density polyethylene thermoplastic (HDPE) seamless flotation unit.

    a. High Density Polyethylene – UHMW Polyethylene used in any of the float or pile guide appurtenances shall conform to the following:

Izod Impact	ASTM D256	27 ft.-lb/inch (min.)
Ult. Tensile	ASTM D638	4.5 ksi (min.)
Coeff. Friction	ASTM D1894	0.20 static/kinetic (max.)

2. Floatation unit shall be 20”x20”x 16” tall with a surface area of approximately 2.8SF. All walking surfaces shall be textured to provide a no-slip surface.
3. Floatation unit displacement shall be approximately 200lbs.Nominal wall thickness of 0.15”. Color shall be black.
4. Floatation units shall be secured to create a uniform surface using purpose-built HDPE fasteners or pins connected thru reinforced tabs integral to the floatation units. Fasteners shall allow the float to flex evenly in a stable manner except in locations where additional rigidity is required for gangway or mooring connections.
5. Floatation Units shall be designed to be ballasted on site to achieve a sub-zero entry condition.

B. The floating dock system must be designed and manufactured such that the float connection components can be easily inspected, repaired, or replaced, if necessary, without alterations to the system.

C. Pipe rails and benches affixed to the float to provide accessible entry and exit to personal watercraft, configured in a manner that allows for both berthing and launching of the vessel. -

1. All hardware shall be as indicated on the Contract Drawings. All plates, posts and tie-downs shall be through-bolted to the float structure and have sufficient bolting and structure to withstand 1.5 times the rated strength capacity of the hardware. All tie-downs and hardware shall be of non-corrosive metal.
2. Affix reflective tape to bench edges and pipe rail extensions and overhangs that project above the waterline.

D. All steel utilized within the system shall either be hot-dip galvanized according to ASTM A-123 and A-153 or stainless steel unless specified otherwise.

1. All structural steel components and plates shall be fabricated from ASTM A-36 grade steel or better and shall be hot dip galvanized unless otherwise noted. Minimum steel thickness shall be 3/8”.
2. All corner brackets shall be Heavy Duty with min ½” thick steel.
3. All bolts, nuts, and washers with a nominal diameter greater than ½” shall conform to ASTM 307 and shall be hot dip galvanized unless noted otherwise.
4. All fasteners with a nominal diameter of ½” or less shall be stainless steel unless indicated otherwise.

5. All stainless steel shall conform to type 18-8 (300 Series), 304 or 316.

E. Gangway and ramp landings on floats shall have a bearing plate (1/4 inch minimum thickness) with sufficient length and width for maximum gangway movement and shall be field attached to float where new gangway or ramp bears on new timber float. Plates shall be secured with low profile, ADA compliant hardware.

1. Aluminum members shall be grade 6061-T6 with bolted or welded connections.

2. All bolts or fasteners in contact with aluminum members shall be non-metallic or 6061 aluminum or 316 stainless steel.

F. A manufacturer of flotation units and dock systems that meets these requirements is:

1. Kayak Dock, 630B 4H Park Road Queenstown MD. 21658. Tel. 410758.1225 www.kayakdock.com

2.6 FLOAT STAND-OFFS

A. Mooring system shall utilize integrated rigid, adjustable arm with reinforced hinge points designed to produce a geometric assembly that allows the kayak float system to maintain float position and reduce torsional loading of the gangways systems under normal and severe conditions.

B. Stand-offs shall be affixed to the kayak launch float and timber piles. All components shall be stainless steel or aluminum, with accompanying hardware. Fastener hardware shall be grade 8 steel bolts or pins, not less than 5/8” diameter.

2.7 MOORING SYSTEM

A. Mooring System shall consist of elastomeric bands, chains and ropes secured to helical anchors installed in the bottom of the river. The system design and all components proposed for final use shall be fully coordinated by the Contractor.

B. Elastic Rodes – Pre-tensioned, heavy-duty elastomeric bands purpose built for mooring floating docks in salt water environments, capable of withstanding the tidal range and conditions indicated.

1. Configured as a triple band system with integral clevis connection points.

2. 70kn Working Load and 240kn Break Strength.

3. Quantity as required to secure the float to the river bottom anchors, with sufficient flexibility to withstand the horizontal and vertical forces outlined in this section.

C. Rope, cable, and chain assemblies

1. Brindel assembly and pendant rope or cable with wire rope clips, thimbles, hardware, swivels, and clevis assembly with float(s) and chafe sleeve at friction points, configured to secure the elastomeric stays to the mooring chain.

2. Grade 40 one-half inch (1/2”) mooring chain made of high tensile strength steel, hot dipped galvanized. Chain shall have a weight of not less than 2.35 lbs. per linear foot. Chain strength shall not be less than 6,900 lbs Working load limit shall and chain size shall be as required

per the approved design of the float mooring system. Chain and clevis assembly suitable to secure float brindle lead to elastomeric hardware.

3. All associated components and hardware shall be Hot Dipped Galvanized Steel, 316 Stainless Steel or marine-grade, aluminum alloy, type 6061-T6. No other metals or aluminum alloy types will be considered.

D. A manufacturer that fabricates products that meet this specification is:

1. Hazlett Marine, 15 Palmer Ct. Suite 212A, South Burlington Vermont 05403. 1.919.561.9283 or www.hazlet marine.com

2.8 HELICAL ANCHORS

A. Helical Anchors for river bottom mooring system configured to secure the floating dock utilizing elastomeric band, rope brindle system. System design shall be fully coordinated.

B. Components shall be hot dipped galvanized steel and shall include lead section, helical extension, internal forged coupling, and plan extension with terminal end configured to receive clevis and shackles.

C. Anchor shaft diameter, wall thickness and helical paddle size shall be as determined by design calculations.

D. Tension and Resisting force calculations shall be the responsibility of the Contractor. Based on the mooring system and float design.

2.9 FLOAT PERFORMANCE

A. Each float shall be of non-articulated design and shall function as a unified structure resisting twist and pitch, providing a suppressed conformance to wave forms. The connection between units shall be subject to approval of the Engineer. Modules shall be unsinkable even if structurally damaged. The Contractor shall be responsible for the float meeting the following minimum performance requirements to the approval of the Engineer.

1. Walking surfaces of adjacent floatation units shall align. A difference in elevation of ¼ inch or more is unacceptable. Assembled floats shall be slightly separated one from the other when pinned together such that they do not rub together. Floats shall be +/- 1/8 inch of design dimensions and shall assemble into a unified structure without field trimming or modification.

2. The contractor shall warranty float materials, accessories, workmanship, and performance for one full year from date of final acceptance of float installation.

2.10 KAYAK FLOAT DESIGN AND LOADING REQUIREMENTS

A. All floats shall have the following characteristics:

1. Freeboard shall be approximately 16 inches (+/- 1 inch) under all dead loads including ramps, gangways, rails, benches, fenders, and other permanently attached components.

2. Length shall be as required to meet layout shown on Contract Drawings.

3. Widths shall be as defined on project drawings.

4. Provisions such as cleats or locking shackles or clevis assemblies shall be made for tie-up of lightweight, personal watercraft, with points of attachment not less than 6 feet O.C.

B. Site Environmental Conditions

1. Site exposure: Site exposure is predominately from the East and South. Float Manufacturer shall perform their own assessment of exposure conditions including fetch, water depth and both natural and maritime vessel wave refraction and reflection conditions as may be required for design. Assumptions shall be included with calculations.
2. Wind Conditions: Float Manufacturer shall make their own assessment of wind conditions for design of their float system but minimum wind criteria is listed in this section.
3. Wave Conditions: Float Manufacturer shall make their own assessment of wave conditions for design of their float system. Minimum wave criteria as listed in this section.

C. Floats shall be designed for "Survival" Load condition and "Normal" Load condition.

1. Survival Condition:
    a. Design for Survival Condition shall at minimum meet the following:
        1) Stress in any component of the system shall not exceed yield stress under survival load condition.
        2) Floating docks shall be able to withstand survival conditions with repairable damage.
        3) Survive, without failure, one million cycles of a 1-foot displacement over a 30-foot length. Direction of wave shall be applied in the direction that provides the worst-case loading to the system.
2. Normal Condition:
    a. Design for Normal Condition shall at minimum meet the following:
        1) Stress in any component of the system shall not exceed design allowable stress under normal unfactored load condition.
        2) LRFD Design may be used with appropriate load factors.

D. The following design loads shall be considered the minimum loads to which the floating docks will be submitted. The floats shall be able to resist these loads in any combination throughout the life of the structure.

1. Vertical loads
    a. Dead Loads: Include actual weights of all permanent components including ramps, gangways, utilities, lights and all other placed and attached parts.
    b. Uniformly distributed live loads:
        1) All docks shall be designed structurally for 100psf live load distributed uniformly over the entire deck surface.
    c. Gangway Load:

1) Floating docks supporting the gangway shall be designed such the dock fully supports the gangway dead load plus 20psf live load on the full walking area of the gangway while maintaining the freeboard requirements of the project.

2. Horizontal Loads

a. Wind loads: shall be based on a minimum design wind speed based on location and exposure.

1) Design wind, Survival Condition:

b. 70 MPH, 30 second gust

c. Load applied in direction the produces highest member loads.

1) Design wind, Normal Condition:

d. 60 MPH, 30 second gust

e. Load applied in direction the produces highest member loads.

E. Wake/Wave loads: The design shall include the wave and wake loading criteria as defined below. The system must also be designed to withstand fatigue/torsional loads from wake/wave action.

1. Design wave – Survival Condition

a. Wave Height: H10 = 2.25 feet

b. Wave Period: 2.4

2. Design Wave– Normal Condition

a. Wave Height: H10 = 1.8 feet

b. Wave Period: 2.1 sec

3. Impact Loads –

a. The installed float system is required to withstand vessel mooring loads associated with non-motorized sea kayaks, canoes, paddleboards, and similar watercraft.

4. All horizontal loadings will be transmitted through the docking system to the anchor system. The anchor system will consist of timber piles and the connection to the floats. These connection points represent a "hard point" in the dock system and must be accounted for in the design.

5. Pile guide and its support shall be designed to the maximum design load, but not less than a working load of 10,000 pounds.

F. Flotation Requirements

1. Dead Loads: Include actual weights of all permanent components including ramps, gangways, utilities, lights and all other placed and attached parts. All floating docks shall have 20 inches of freeboard under dead loads and shall have a level floating dock surface.

2. Uniformly distributed live loads (Condition 1):

a. Entire area of float decking including areas shadowed by gangways: 40 psf

b. Gangway uniformly distributed live load: 15 psf (for flotation design only)

c. All floating docks shall have a minimum of six inches of freeboard under above live loads.

3. Uniformly distributed live loads (Condition 2):
   a. Entire area of float decking including areas shadowed by gangways: 20 psf.
   b. Gangway uniformly distributed live load: 15 psf (for flotation design only)
   c. All floating docks shall have a minimum of eight inches of freeboard under above live loads.
4. Concentrated live load of 300 pounds:
   a. Concentrated load shall be applied within 1' of any edge while maintaining a minimum freeboard of 6 inches.

2.11 SPARE PARTS AND SYSTEM MANUALS

A. Manufacturer shall provide two (2) sets of system assembly and installation manuals for the float system.

B. Spare parts for the float system provided. Flotation units Two (2) each size installed, fastening pins, twelve (12) and the same quantity of any associated specialized fasteners, plugs, hardware, bolts, and washers.

PART 3 - EXECUTION

3.1 INSPECTION

A. A pre-installation meeting on site is required.

B. Prior to installing the system, the Engineer shall be contacted by the Contractor for inspection of all components.

3.2 ALUMINUM FABRICATION

A. All aluminum fabrication shall comply fully with DIVISION 05 METALS.

3.3 INSTALLATION

A. The Kayak Launch system shall be designed in a coordinated manner with integral components installed and connected to create a uniform, accessible public float for berthing and launching of personal watercraft.

B. The system design shall be inclusive of the river bottom helical anchor mooring system, elastomeric bands, ropes, and chains.

C. Install components in sequence in the manner approved on the Shop Drawings and as per the recommendation of the manufacturer.

D. Bolts shall be tightened to provide a solid connection. No more than 1 washer shall be installed under the bolt head or nut. Bolt threads shall project no more than one bolt diameter beyond the nut.

E. Joints are to be square, tight, and well-fastened with all members assembled in accordance with the Contract Drawings.

F. Surfaces are to be uniform, with ADA compliant, smooth transitions,

3.4 DEFECTIVE WORK

A. Any damaged portions shall be replaced as directed by the Engineer at no additional cost to the Owner.

B. Any improperly installed components shall be removed and replaced or corrected as directed by the Engineer at no additional cost to the Owner.

C. Failure of the kayak launch system (Gangways, floats, mooring stays, chains etc.) to articulate smoothly based on tidal range, wave and wake conditions providing a level and stable float under Normal Conditions shall be considered a defect. Contractor shall make the necessary changes to correct the defect to the satisfaction of the Engineer. Any such work shall be performed at no additional cost to the Owner.

END OF SECTION

ATTACHMENT G

PLANS ISSUED FOR BID

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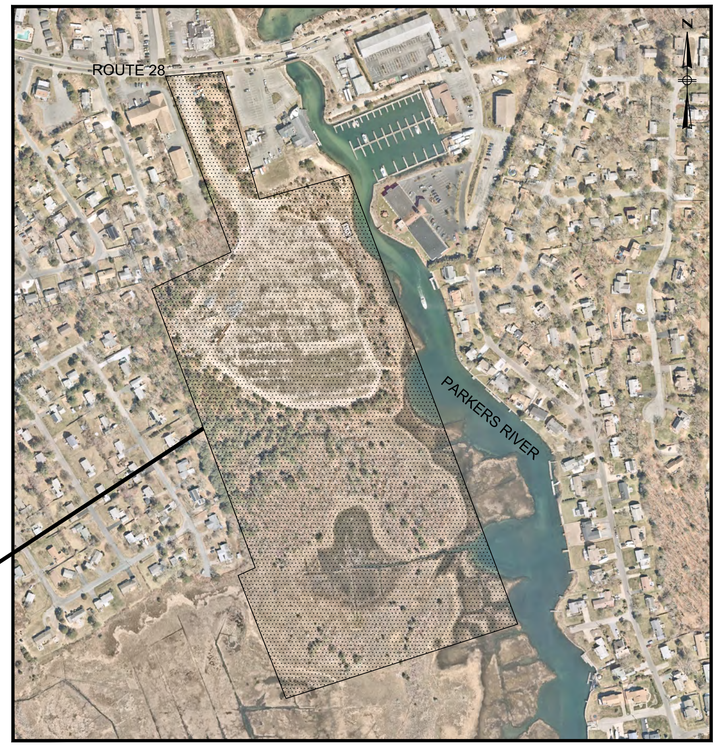
TOWN OF YARMOUTH, MASSACHUSETTS

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE PHASE 1

BID DOCUMENTS

APRIL 2024



Project Location

PROJECT LOCATION

LOCATION MAP
1" = 250' - 0"

TOWN OF YARMOUTH
1146 ROUTE 28
SOUTH YARMOUTH, MA 02664

TOWN ADMINISTRATOR
ROBERT L. WHRITENOUR, JR.

WILLIAM P McGRATH CIVIL No. 33716 REGISTERED PROFESSIONAL ENGINEER

CIVIL
WILLIAM P. McGRATH, PE
BETA GROUP, INC.

LIST OF SHEETS:
C.1.4 - C.1.5, C.2.1 - C.2.4, C.3.1 - C.3.3, C.4.1 - C.4.2, C.6.1 - C.5.10, C.6.1 - C.6.7, C.7.8 - C.7.1 - C.7.24, U.1.1 - U.1.5

COMMONWEALTH OF MASSACHUSETTS AREK W. GALLE NO. 1211 REGISTERED LANDSCAPE ARCHITECT

LANDSCAPE ARCHITECT
AREK W. GALLE, RLA, AICP
BETA GROUP, INC.

LIST OF SHEETS:
L1.1 - L1.12, L2.1

COMMONWEALTH OF MASSACHUSETTS PETER J. KOTOWSKI STRUCTURAL No. 52285 REGISTERED PROFESSIONAL ENGINEER

STRUCTURAL
PETER J. KOTOWSKI, SE
BETA GROUP, INC.

LIST OF SHEETS:
S.1.1 - S.6.3

COMMONWEALTH OF MASSACHUSETTS MICHAEL J. COTTER ELECTRICAL No. 40999 REGISTERED PROFESSIONAL ENGINEER

MECHANICAL, ELECTRICAL & PLUMBING
MICHAEL COTTER, PE
SAR ENGINEERING, INC.

LIST OF SHEETS:
E.0.1 - E.2.2

PREPARED BY:

BETA
www.BETA-Inc.com

ISSUE DATE: 04/05/2024

SHEET INDEX

GENERAL NOTES:

1. ALL WORK SHALL CONFORM TO THE MASSACHUSETTS STATE BUILDING CODE AND ITS APPLICABLE REFERENCED STANDARDS.
2. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS AS THEY RELATE TO NEW CONSTRUCTION. REPORT TO THE OWNER'S REPRESENTATIVE ALL OBSERVATIONS AND ANY DISCREPANCIES BEFORE PROCEEDING WITH WORK.
3. WORK WITHIN THE LOCAL RIGHT-OF-WAY SHALL CONFORM TO LOCAL MUNICIPAL STANDARDS. WORK WITHIN THE STATE RIGHT-OF-WAY SHALL CONFORM TO THE LATEST EDITION OF THE STATE HIGHWAY DEPARTMENTS STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.
4. CONTRACTOR SHALL NOTIFY "DIG-SAFE"(1-888-344-7233) AT LEAST 72 HOURS BEFORE EXCAVATING. THE CONTRACTOR SHALL RECORD THE LOCATION OF ANY/ALL DIG-SAFE UTILITY MARKINGS ON PROJECT RECORD DOCUMENTS.
5. THE LOCATION, SIZE, AND MATERIAL OF EXISTING UTILITIES ARE SHOWN AS APPROXIMATE REPRESENTATIONS ONLY. THE OWNER OR ITS REPRESENTATIVE HAVE NOT INDEPENDENTLY VERIFIED THIS INFORMATION. THE UTILITY INFORMATION SHOWN DOES NOT GUARANTEE THE ACTUAL EXISTENCE, SERVICEABILITY, OR OTHER DATA CONCERNING THE UTILITIES THAT MAY BE PRESENT. PRIOR TO ORDERING MATERIALS AND BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY AND DETERMINE THE EXACT LOCATIONS, SIZES, AND ELEVATIONS OF THE POINTS OF CONNECTIONS TO EXISTING UTILITIES AND SHALL CONFIRM THAT THERE ARE NO INTERFERENCES WITH EXISTING UTILITIES WITHIN PROJECT LIMITS AND THE PROPOSED UTILITY ROUTES, INCLUDING ROUTES WITHIN THE PUBLIC RIGHT-OF-WAY.
6. THE CONTRACTOR SHALL TAKE EVERY PRECAUTION TO PREVENT DAMAGE TO ALL UTILITIES (BOTH ABOVE AND BELOW GRADE) WITHIN THE PROJECT AREA. DAMAGE TO ANY UTILITIES AS A RESULT OF ACTIONS BY THE CONTRACTOR SHALL BE RESTORED BY THE CONTRACTOR, AT THE CONTRACTOR'S EXPENSE, TO CONDITIONS EQUAL TO CONDITIONS PRIOR TO THE DAMAGE.
7. UPON AWARD OF CONTRACT, CONTRACTOR SHALL MAKE NECESSARY CONSTRUCTION NOTIFICATIONS AND APPLY FOR AND OBTAIN NECESSARY PERMITS, PAY FEES, AND POST BONDS ASSOCIATED WITH THE WORK INDICATED ON DRAWINGS, IN THE SPECIFICATIONS, AND IN THE CONTRACT DOCUMENTS. DO NOT CLOSE OR OBSTRUCT ROADWAYS, SIDEWALKS, AND FIRE HYDRANTS, WITHOUT APPROPRIATE PERMITS.
8. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.
9. THE CONTRACTOR SHALL PREVENT DUST, SEDIMENT, AND DEBRIS FROM EXITING THE SITE AND SHALL BE RESPONSIBLE FOR CLEAN-UP, REPAIRS, AND CORRECTIVE ACTION IF SUCH OCCURS.
10. DAMAGE RESULTING FROM CONSTRUCTION LOADS SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
11. ANY DAMAGE TO EXISTING PAVEMENT, BRIDGES, SIDEWALKS, FENCES, ETC. CAUSED BY THE CONTRACTOR SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
12. TOPOGRAPHIC SURVEY IS BASED ON AN ON-THE-GROUND SURVEY PERFORMED BY ALPHA SURVEY GROUP, LLC BETWEEN MARCH 7 & APRIL 3, 2017 AND BETWEEN AUGUST 9 & AUGUST 12, 2021.
13. THE PROJECT IS HORIZONTALLY REFERENCED TO THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD83), CORS ADJUSTMENT (NA2011/GEOID 12a) AS DETERMINED BY REDUNDANT GPS OBSERVATIONS MADE ON MARCH 7, 2017.
14. THIS PROJECT IS VERTICALLY REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), BASED ON THE FOLLOWING BENCHMARKS: MASSDOT BM#8149 BRASS RIVET IN PARKER RIVER BRIDGE WITH A PUBLISHED ELEVATION OF 6.11 FT.; CB/TOWN OF YARMOUTH DISK STATION NO. 8, ELEV.= 5.20 FT; CHISELED SQUARE ON N.E. CORNER OF PARKER RIVER CONC. BRIDGE WALL ELEV.=6.18 FT. (LOUIS BERGER DRAINAGE & UTILITY PLAN 75% DESIGN SHEET 8 OF 20 YARMOUTH MAIN STREET (RTE. 28) PROJECT).
15. LAND OUTSIDE THE PROPOSED LIMIT OF WORK SHALL NOT BE DISTURBED BY THE CONTRACTOR.
16. ALL WORK AND MATERIALS SHALL COMPLY WITH ALL TOWN OF YARMOUTH REGULATIONS AND CODES AND O.S.H.A. STANDARDS.
17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING ALL CONTROL POINTS AND BENCH MARKS NECESSARY FOR THE WORK.
18. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND PAYING FOR ANY PERMITS AND/OR CONNECTION FEES REQUIRED TO CARRY OUT THE WORK INCLUDING BUT NOT LIMITED TO DEMOLITION.
19. ALL DIMENSIONS AND RADII ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
20. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL OF RELOCATIONS THAT CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE DRAWINGS, INCLUDING BUT NOT LIMITED TO, ALL UTILITIES, STORM DRAINAGE, SIGNS, TRAFFIC SIGNALS & POLES, ETS. AS REQUIRED. ALL COSTS SHALL BE BORNE BY THE CONTRACTOR.

CONSTRUCTION NOTES:

1. THE CONTRACTOR SHALL CALL "DIG-SAFE" AT 1-888-344-7233 AT LEAST 72 HOURS PRIOR TO EXCAVATION IN ACCORDANCE WITH STATE OF MASSACHUSETTS, GENERAL LAWS.
2. THE CONTRACTOR SHALL NOTIFY ALL APPROPRIATE AGENCIES AND UTILITY COMPANIES IN WRITING 48 HOURS PRIOR TO ANY CONSTRUCTION WITHIN 15 FEET OF A UTILITY LINE.
3. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL SAFETY CODES, REGULATIONS, LEGAL REQUIREMENTS, PERMIT CONDITIONS, ETS.
4. THE CONTRACTOR SHALL TAKE ADEQUATE PRECAUTIONS TO PROTECT ALL WALKS, STREETS, PAVEMENTS, HIGHWAY GUARDS, CURBING, EDGING, TREES AND PLANTINGS ON OR OF THE PREMISES, AND SHALL REPAIR AND REPLACE OR OTHERWISE MAKE GOOD AT HIS/HER OWN EXPENSE AS DIRECTED BY THE ENGINEER ANY ITEMS DAMAGED AS A RESULT OF THE CONTRACTOR'S WORK.
5. THE CONTRACTOR SHALL PROVIDE ADEQUATE BRACING AND SHORING OF ALL EXCAVATIONS IN ACCORDANCE WITH THE REQUIREMENTS OF GOVERNING CODES AND REGULATIONS.
6. ALL SURFACES OUTSIDE THE LIMIT OF WORK THAT ARE DISTURBED SHALL BE RESTORED TO THEIR ORIGINAL CONDITION, AS DETAILED, OR AS SPECIFIED BY THE ENGINEER.
7. ALL EXISTING PIPING AND STRUCTURES EXPOSED DURING EXCAVATION SHALL BE ADEQUATELY SUPPORTED, BRACED, OR OTHERWISE PROTECTED DURING CONSTRUCTION ACTIVITIES.
8. WHERE NEW PAVEMENT MEETS EXISTING PAVEMENT (INCLUDING DRIVEWAYS), SAW CUT EXISTING PAVEMENT SMOOTH AND STRAIGHT. WHERE NEW BITUMINOUS CONCRETE MEETS EXISTING BITUMINOUS CONCRETE SURFACES, SAW CUT EDGES ARE TO BE SEALED WITH BITUMEN AND BACK SANDED.
9. WORK WITHIN PUBLIC WAYS SHALL COMPLY WITH APPLICABLE MUNICIPAL AND STATE REQUIREMENTS.
10. IF ANY EXISTING STRUCTURES TO REMAIN ARE DAMAGED DURING CONSTRUCTION IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR AND/OR REPLACE THE EXISTING STRUCTURE AS NECESSARY TO RETURN IT TO EXISTING CONDITIONS OR BETTER.
11. THE CONTRACTOR SHALL RE-USE EXISTING GRANITE CURB IN GOOD CONDITION THAT IS RECOVERED FROM DEMOLITION ACTIVITIES.

SOIL EROSION AND SEDIMENTATION CONTROL NOTES:

1. ALL REFERENCED SOIL EROSION AND SEDIMENTATION CONTROLS INCLUDING MATERIALS USE, APPLICATION RATES, AND THE INSTALLATION PROCEDURES SHALL BE PERFORMED IN ACCORDANCE WITH THE MASSACHUSETTS DEP SPECIFICATIONS.
2. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN ALL SOIL EROSION AND SEDIMENT CONTROLS ON THE PROJECT FOR THE ENTIRE DURATION OF THE CONSTRUCTION PERIOD. THE CONTRACTOR SHALL FOLLOW THE DIRECTION OF THE OWNER'S REPRESENTATIVE WITH REGARD TO INSTALLATION, MAINTENANCE, AND REPAIR OF ALL SOIL EROSION AND SEDIMENTATION CONTROLS ON THE PROJECT SITE. TEMPORARY SOIL EROSION AND SEDIMENTATION CONTROLS (HAY BALES, SILT FENCE, ETC.) SHALL BE MAINTAINED UNTIL ALL EXPOSED SOILS ARE SATISFACTORILY STABILIZED.
3. THE HAY BALE / SILT FENCE LINE ILLUSTRATED ON THESE PLANS, IS TO BE STAKED IN THE FIELD PRIOR TO CONSTRUCTION AND SHALL SERVE AS THE STRICT LIMIT OF DISTURBANCE FOR THE PROJECT. NO ALTERATIONS, INCLUDING VEGETATIVE CLEARING OR SURFACE DISTURBANCE, SHALL OCCUR BEYOND THE HAY BALE / SILT FENCE LINE.
4. SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSPECTED AT LEAST ONCE EVERY SEVEN (7) CALENDAR DAYS AND WITHIN TWENTY-FOUR (24) HOURS AFTER AN EVENT WHICH GENERATES .25 INCHES OF RAIN IN A TWENTY-FOUR (24) HOUR PERIOD. MAINTENANCE SHALL INCLUDE CLEAN OUT OF ACCUMULATED SEDIMENT BEHIND THE BALES IF ½ THE ORIGINAL HEIGHT OF THE BALES / FENCE BARRIER BECOMES FILLED WITH SEDIMENT. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE HAS BEEN REMOVED SHOULD BE ADDRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED, AND SEEDED.
5. THE TOE OF ANY FILL SLOPE IS TO REMAIN AT LEAST ONE (1) FOOT INSIDE OF ALL EROSION CONTROLS. UNDER NO CIRCUMSTANCE SHALL THE CONTRACTOR COVER ANY PORTION OF THE EROSION CONTROLS WITH FILL MATERIAL. ANY FILL MATERIAL WHICH IS PLACED ON ANY EROSION CONTROLS BY THE CONTRACTOR, SHALL BE IMMEDIATELY REMOVED BY THE CONTRACTOR, AND ANY NECESSARY REPAIRS TO THE EROSION CONTROLS ACCOMPLISHED, AT NO COST TO THE OWNER.
6. THE CONTRACTOR SHALL INSTALL ALL EROSION CONTROL DEVICES FOR OUTLET PROTECTION PRIOR TO CLEANING AND FLUSHING STORM WATER DRAINAGE. EROSION CONTROL DEVICES SHALL REMAIN IN PLACE UNTIL ALL FLUSHED SEDIMENTS ARE REMOVED. AT ALL OUTFALL LOCATIONS WHERE PIPES ARE TO BE CLEANED AND FLUSHED, OUTLET PROTECTION SHALL BE INSTALLED TO TRAP SEDIMENTS. THESE SEDIMENTS SHALL THEN BE REMOVED AND DISPOSED OF LEGALLY BEFORE THE OUTLET PROTECTION DEVICES ARE REMOVED. IF OUTLET PROTECTION AT THE OUTFALL IS NOT FEASIBLE, THEN THE OUTLET PIPE OF THE LAST DRAINAGE STRUCTURE TO BE CLEANED SHALL BE PLUGGED TO CAPTURE ALL MATERIALS FLUSHED FROM PIPES. AFTER THE MATERIALS ARE REMOVED FROM THE DRAINAGE STRUCTURES, THE OUTLET SHALL BE UNPLUGGED TO RESUME NORMAL FUNCTIONING.

SITE PREPARATION & DEMOLITION NOTES:

1. ALL ITEMS DESIGNATED TO BE REMOVED AND DISPOSED (R&D) SHALL BE TAKEN FROM THE SITE AND LEGALLY DISPOSED.
2. ALL ITEMS DESIGNATED TO BE REMOVED AND STOCKPILED (R&S) SHALL BE DISASSEMBLED AND STOCKPILED AT A LOCATION DETERMINED BY THE OWNER'S REPRESENTATIVE.
3. DEBRIS OF ANY NATURE SHALL NOT BE ALLOWED TO ACCUMULATE IN THE STREETS, PARKING LOT, SIDEWALK AREAS OR GROUNDS SURROUNDING THE PROJECT AREA.
4. FOR ALL HOLES, PITS OR OTHER HAZARDOUS DEPRESSIONS ADJACENT TO OR WITHIN EIGHT (8) FEET OF ANY SIDEWALK AREA AND ARE UNPROTECTED, A TEMPORARY GUARD FENCE SHALL BE IMMEDIATELY ERECTED FOR THE PROTECTION OF PEDESTRIANS. THE FENCING MATERIAL SHALL BE FREE FROM NAILS, FASTENINGS OR SPLINTERS AND SHALL PRESENT A REASONABLY SMOOTH SURFACE ON THE SIDES OF POSSIBLE CONTACT. SUCH TEMPORARY FENCES SHALL BE LEFT IN PLACE AND SHALL BE PROPERLY MAINTAINED UNTIL THE HOLES, PITS OR DEPRESSIONS HAVE BEEN PROPERLY FILLED.
5. ALL STUMPS AND ROOTS OF TREE AND SHRUBS INDICATED TO BE REMOVED AND DISPOSED SHALL BE LEGALLY DISPOSED OF OFF SITE. IN SPECIFIC LOCATIONS, STUMPS MAY BE GROUND IN PLACE, AS SHOWN.
6. ALL EXISTING VEGETATION (TREES, SHRUBS, GRASSES, ETC.) TO REMAIN SHALL BE PROTECTED FROM INJURY. INDIVIDUAL TREES AND SHRUBS TO BE SAVED WITHIN THE DESIGNATED WORK AREA SHALL BE PROTECTED AS SPECIFIED HEREIN. THE CONTRACTOR SHALL REMOVE ALL PROTECTIVE BARRIERS ONLY AS DIRECTED BY THE OWNER'S REPRESENTATIVE.
7. THE CONTRACTOR SHALL STRIP AND STOCKPILE EXISTING LOAM FROM THOSE AREAS WHICH ARE TO BE EXCAVATED OR FILLED. STOCKPILED LOAM SHALL NOT BE MIXED WITH ANY SUBSOIL OR OTHER UNSUITABLE MATERIAL UNLESS DIRECTED BY THE OWNER'S REPRESENTATIVE. ALL STOCKPILED LOAM REMAINS THE PROPERTY OF THE OWNER.
8. ALL STOCKPILED LOAM OR OTHER SOIL MATERIAL SHALL BE SURROUNDED BY EROSION CONTROL DEVICES.
9. THE CONTRACTOR IS RESPONSIBLE FOR KEEPING THE SITE CLEAN OF MISCELLANEOUS DEBRIS THROUGHOUT THE CONSTRUCTION PERIOD. ALL WASTE MATERIALS SHALL BE DISPOSED OF IMMEDIATELY TO A LEGAL, OFF-SITE LOCATION UNLESS OTHERWISE INDICATED ON THE PLAN.
10. DURING THE DEMOLITION PROCESS THE CONTRACTOR SHALL USE SUFFICIENT WATER OR NON-SALVABLE MATERIALS TO PREVENT EXCESSIVE SPREADING OF DUST DURING OPERATIONS.
11. THE REMOVAL AND DISPOSAL OF ALL MATERIALS SHALL BE DONE IN ACCORDANCE WITH THE APPROPRIATE STATE AND TOWN ORDINANCES, RULES AND REGULATIONS.
12. UNVEGETATED SLOPES SHALL NOT BE UNATTENDED OR EXPOSED FOR PERIODS IN EXCESS OF TWO (2) WEEKS OR THROUGH THE INACTIVE WINTER SEASON.
13. ALL SIDEWALK AND DRIVEWAYS DESIGNATED FOR REPLACEMENT SHALL BE CUT AND MATCHED AT LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY THE OWNER'S REPRESENTATIVE.
14. PRUNING STANDARDS:
    - 14.A. PRUNE TREE ACCORDING TO ANSI A300.
    - 14.B. EXPERIENCED WORKMEN UNDER THE IMMEDIATE SUPERVISION OF A LICENSED ARBORIST SHALL PERFORM ALL TREE TRIMMING.
    - 14.C. CLIMBING IRONS OR OTHER EQUIPMENT INJURIOUS TO TREES SHALL NOT BE PERMITTED.
    - 14.D. CUT BRANCHES WITH SHARP PRUNING INSTRUMENTS; DO NOT BREAK OR CHOP.
    - 14.E. PRUNE TREES TO REMAIN THAT ARE AFFECTED BY TEMPORARY AND PERMANENT CONSTRUCTION.
    - 14.F. ALL DOWNED AND CUT PLANT MATERIAL TOGETHER WITH MISCELLANEOUS DEBRIS FROM THIS WORK SHALL BE REMOVED BY THE CONTRACTOR FROM THE PROJECT ON A DAILY BASIS. MATERIALS FROM THE WORK WILL NOT BE PERMITTED TO REMAIN ON SITE RESULTING IN DELAYING OR IMPEDING OTHER WORK ON PROJECT SITE.
    - 14.G. NO MATERIAL OR DEBRIS SHALL BE DUMPED WITHIN THE LIMITS OF THE SITE OR ABUTTING PROPERTY.

PREPARED BY
BETA
www.BETA-Inc.com

REGISTERED PROFESSIONAL

REGISTERED PROFESSIONAL

PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

GENERAL NOTES

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

NONE

Bid Documents

SHEET NO.

G.2

LEGEND

GENERAL SYMBOLS

EXISTING	PROPOSED	
		CURB OR BERM (TYPE AS NOTED)
		EDGE OF PAVEMENT
CB	CB	CATCH BASIN (OR GUTTER INLET, LEACHING BASIN, DROP INLET, CATCH BASIN CURB INLET)
EHH	EHH	ELECTRIC HANDHOLE (NUMBER AS NOTED)
E	EMH	ELECTRIC MANHOLE
T	TMH	TELEPHONE MANHOLE
W	WMH	WATER MANHOLE
S	SMH	SEWER MANHOLE
D	DMH	DRAINAGE MANHOLE
GG	GG	GAS GATE
WG	WG	WATER GATE
CS	CS	CURB STOP
HYD.	HYD	HYDRANT
FA	FAB	FIRE ALARM BOX
PM	PM	PARKING METER
LP		STREET LIGHT POLE
UP	UP	UTILITY POLE
UPL	UPL	UTILITY POLE w/ LIGHT
		SIGN
GUY	GUY	GUY POLE
12" RCP	10'-12" RCP	DRAIN PIPE (SIZE AS NOTED)
8" VCP	10'-8" PVC	SEWER MAIN (SIZE AS NOTED)
	10'-8" PVC	
E		ELECTRIC DUCT
4" HP	10'-4" HP	GAS MAIN (SIZE AS NOTED)
8" CI	10'-8" DI	WATER MAIN (SIZE AS NOTED)
W	10'-8" PVC	
T		TELEPHONE DUCT (SIZE AS NOTED)
EOH	OHW	OVERHEAD WIRE
MB	MB	MAIL BOX
		WOOD GUARD RAIL STEEL BEAM GUARD, WOOD OR STEEL POSTS (TYPE AS NOTED)
		STEEL GUARD RAIL, STEEL POSTS (TYPE NOTED)
		STONE WALL
		RETAINING WALL (TYPE NOTED)
BND	BND	HIGHWAY/PROPERTY BOUND (TYPE AS NOTED)
SHLO (Date of Layout)		STATE HIGHWAY LAYOUT LINE (SHLO)
		CITY, TOWN OR COUNTY LAYOUT LINE (R.O.W.)
Boundary Name		CITY, TOWN, COUNTY OR STATE BOUNDARY LINE
℄		PROPERTY LINE
		EASEMENT LINE (TYPE NOTED)
2+00		CONSTRUCTION BASELINE
N00°00'00"E 000.00'		SURVEY LINE
		RAILROAD OR STREET RAILWAY TRACKS WITH SIDELINES
		WHEELCHAIR RAMP
24" PINE		TREE (SIZE AND TYPE AS NOTED)
		HEDGE/SHRUBS
WF-1	x x x	FENCE (SIZE AND TYPE AS NOTED)
		EDGE OF WETLAND W/ FLAGGED NUMBER
		EDGE OF RIVER/STREAM LINE
		100-FT. WETLAND BUFFER LIMIT
		100-FT. RIVER FRONT LIMIT
		200-FT. RIVER FRONT LIMIT
		WOODED AREA / LIMIT OF CLEARING
x 00.0	x 00.00	SPOT GRADE
		SAW CUT LINE
	TP-1	TEST PIT
	B-1	BORING
ECB	ECB	EROSION CONTROL BARRIER/COMPOST FILTER TUBES

ABBREVIATIONS

GENERAL

ABAN.	ABANDON
ADJ.	ADJUST
ALT.	ALTERATION
APPROX.	APPROXIMATE
℄	BASELINE
B.B.	BITUMINOUS BERM
B.C.	BITUMINOUS CURB
BD OR BND	BOUND
BLDG.	BUILDING
B.O.	BY OTHERS
BOS	BOTTOM OF SLOPE
BOW	BOTTOM OF WALL
BSW	BACK OF SIDEWALK
C.C.	CONCRETE CURB
CEM.	CEMENT
CLF	CHAIN LINK FENCE
CONC.	CONCRETE
CONST.	CONSTRUCTION
CONT.	CONTINUOUS
DWY	DRIVEWAY
E.P., EOP	EDGE OF PAVEMENT
EL.	ELEVATION
ESMT.	EASEMENT
EXIST.	EXISTING
FDN.	FOUNDATION
GRAN.	GRANITE
GC	GRANITE CURB
HOR.	HORIZONTAL
IP	IRON PIPE
JCT	JUNCTION
LP	LOW POINT
MB	MAIL BOX
MHB	MASSACHUSETTS HIGHWAY BOUND
O.C.	ON CENTER
PCC	POINT OF COMPOUND CURVATURE
PC	POINT OF CURVATURE
PRC	POINT OF REVERSE CURVATURE
PI	POINT OF INTERSECTION
PT	POINT OF TANGENCY
PVC	POINT OF VERTICAL CURVATURE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
PERM.	PERMANENT
PGL	PROFILE GRADE LINE
PROP.	PROPOSED
PVC	POINT OF VERTICAL CURVATURE
PVMT.	PAVEMENT
R	RADIUS OF CURVATURE
R&D	REMOVE AND DISCARD
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
REM.	REMOVE
REMOD.	REMODEL
RET.	RETAIN
RR	RAILROAD
RT.	RIGHT
SB	SOUTH BOUND OR STONE BOUND
SDWK.	SIDEWALK
SHT.	SHEET
SHLD.	SHOULDER
STA.	STATION
TEMP.	TEMPORARY
TOS	TOP OF SLOPE
TOW	TOP OF WALL
TYP.	TYPICAL
VAR.	VARIABLE
VERT.	VERTICAL
VGC	VERTICAL GRANITE CURB
WCR	WHEELCHAIR RAMP

TRAFFIC SIGNAL SYSTEMS

R	STEADY CIRCULAR RED
Y	STEADY CIRCULAR AMBER
G	STEADY CIRCULAR GREEN
FR	FLASHING CIRCULAR RED
FY	FLASHING CIRCULAR AMBER
←FY	FLASHING YELLOW LEFT ARROW
R→	STEADY RED RIGHT ARROW
Y→	STEADY AMBER RIGHT ARROW
G→	STEADY GREEN RIGHT ARROW
←R	STEADY RED LEFT ARROW
←Y	STEADY AMBER LEFT ARROW
←G	STEADY GREEN LEFT ARROW
W	STEADY WALK (PERSON WALKING) - LUNAR WHITE
DW	STEADY DON'T WALK (HAND) - PORTLAND ORANGE
FDW	FLASHING DON'T WALK (FLASHING HAND) - PORTLAND ORANGE

UTILITIES

ACCMP	ASPHALT COATED CORRUGATED METAL PIPE
CAP	CORRUGATED ALUMINUM PIPE
CB	CATCH BASIN
CBCI	CATCH BASIN WITH CURB INLET
CI	CURB INLET
CIP	CAST IRON PIPE
CIT	CHANGE IN TYPE
CMP	CORRUGATED METAL PIPE
C	CONDUIT
CPP	CORRUGATED PLASTIC PIPE
CSP	CORRUGATED STEEL PIPE
DI	DROP INLET
DIP	DUCTILE IRON PIPE
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FM	FORCE MAIN
GI	GUTTER INLET
GIP	GALVANIZED IRON PIPE
GG	GAS GATE
HDW	HEADWALL
HYD.	HYDRANT
INV.	INVERT ELEVATION
LP	LIGHT POLE
MH	MANHOLE
PVC	POLY-VINYL-CHLORIDE PIPE
PWW	PAVED WATER WAY
RCP	REINFORCED CONCRETE PIPE (CLASS III UNLESS NOTED)
SD	SUBDRAIN
SMH	SEWER MANHOLE
TS	TRAFFIC SIGNAL
TSV&B	TAPPING SLEEVE, VALVE AND BOX
UP	UTILITY POLE
UPL	UTILITY POLE w/ LIGHT
UPT	UTILITY POLE w/ TRANSFORMER
VCP	VITRIFIED CLAY PIPE
WIP	WROUGHT IRON PIPE
WG	WATER GATE
WM	WATER METER/WATER MAIN

TRAFFIC SIGNAL SYMBOLS

EXISTING	PROPOSED	
		CONTROL CABINET GROUND MOUNTED WITH FOUNDATION
		CONTROL CABINET POLE MOUNTED
	Ø2	CONTROLLER PHASE
	MA-1	MAST ARM, SHAFT & BASE (ARM LENGTH AS NOTED)
		VEHICULAR SIGNAL HEAD (ALPHA-NUMERIC DESIGNATION AS NOTED)
		VEHICULAR SIGNAL HEAD, OPTICALLY PROGRAMMED
		VEHICULAR SIGNAL HEAD (REMOVED & RESET)
		FLASHING BEACON
		PEDESTRIAN SIGNAL HEAD
		PEDESTRIAN SIGNAL HEAD, OPTICALLY PROGRAMMED
HH		PULL BOX 12"x12" OR HANDHOLE
		LOOP DETECTOR
		PEDESTRIAN PUSH BUTTON, SIGN (DIRECTIONAL ARROW AS SHOWN) AND SADDLE
		PRE-EMPTION DETECTOR
		PRE-EMPTION CONFIRMATION STROBE
		SIGNAL CONDUIT (SINGLE RUN)
		SIGNAL CONDUIT (DOUBLE RUN)
		SIGNAL POST & BASE
M	M	MAGNETIC DETECTOR
		SCHOOL ZONE SPEED LIMIT SIGN
		MICROWAVE OR ULTRASONIC DETECTOR
		VIDEO DETECTION CAMERA
		VIDEO DETECTION ZONE

PAVEMENT MARKINGS AND SIGNING SYMBOLS

PROPOSED

CW	CROSSWALK, 2 - 12" WHITE LINES (8" WIDTH)
SL	STOP LINE - 12" WHITE LINE 4' BEHIND CW (TYP.)
SWEL	SOLID WHITE EDGE LINE - 4"
SWCHL	SOLID WHITE CHANNELIZING LINES - 12" (SPACING NOTED)
SWGL	SOLID WHITE GORE LINE 12" @ 33°, (SPACING NOTED)
SWLL	SOLID WHITE LANE LINE - 4"
SWPL	SOLID WHITE PARKING LINE - 4"
BWLL	BROKEN WHITE LANE LINE - 4"
DWLEx	DOTTED WHITE LANE EXTENSION LINE - 4" (2' LINE & 6' GAP)
DYLEx	DOTTED YELLOW LANE EXTENSION LINE - 4" (2' LINE & 6' GAP)
BYCL	BROKEN YELLOW CENTERLINE - 4"
DYCL	DOUBLE YELLOW CENTERLINE - 2 - 4" LINES
SYEL	SOLID YELLOW EDGE LINE - 4"
SYGL	SOLID YELLOW GORE LINE 12" @ 33°, (SPACING NOTED)
SYLL	SOLID YELLOW LANE LINE - 4"
SYCTEL	SOLID YELLOW CYCLE TRACK EDGE LINE - 4"
DYCTCL	DOTTED YELLOW CYCLE TRACK CENTERLINE - 4" (3' LINE & 9' GAP)
SCHOOL	SCHOOL ZONE - WHITE
	HANDICAP SYMBOL - WHITE
	PAVEMENT ARROW - WHITE
ONLY	LEGEND "ONLY" - WHITE

PREPARED BY

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

LEGEND AND ABBREVIATIONS

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
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SCALE

NONE

Bid Documents

SHEET NO.

G.3

G:\PLANNING LANDSCAPE\10000S\10056 - YARMOUTH, MA RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLAN SET\CONSTRUCTION DOCUMENTS - PHASE 1\10056_LEGEND_ABBREV.DWG

G:\PLANNING LANDSCAPE\10000S\10056 - YARMOUTH, MA RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLAN SET\CONSTRUCTION DOCUMENTS - PHASE 1\10056_SITE AERIAL PLAN.DWG

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

OVERALL SITE PLAN

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
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BETA JOB NO.:	10056

SCALE

200 0 200 400
SCALE IN FEET: 1"=200'

Bid Documents

SHEET NO.

C.1.1

MATCH LINE

N/F OCALLAGHAN JAMES C 32 NIAGARA LN ASSESS. MAP 24 PARCEL ID: 24/83 A.B. D1164350

N/F SIKONSKI EDWARD M TRS 28 NIAGARA LN ASSESS. MAP 24 PARCEL ID: 24/ 82 L.C. D1233726

N/F DASILVA JANICE 24 NIAGARA LN ASSESS. MAP 24 PARCEL ID: 24/ 81 L.C. D1282677

N/F WILLIAMS ROBERT J 18 NIAGARA LN ASSESS. MAP 24 PARCEL ID: 24/ 80 L.C. D806694

N/F KASS BRADLEY S 14 NIAGARA LN ASSESS. MAP 24 PARCEL ID: 24/ 79 L.C. D1318233

N/F PERRY JOHN D 8 NIAGARA LN ASSESS. MAP 24 PARCEL ID: 24/ 78 L.C. D998674

N/F NYAGOLOV LYUBOMIR 2 & 4 NIAGARA LN ASSESS. MAP 24 PARCEL ID: 24/ 77 L.C. C218079

N/F SILVA THATIANA D 41 PINEWOOD RD ASSESS. MAP 32 PARCEL ID: 32/ 144 DEED BK 27868 PAGE 193

PINEWOOD RD

N 19° 43' 29" W
849.57'

CBDH FND

EXIST. WOODED AREA

EXIST. 8" DICL WATER MAIN (LOCATION SHOWN AS APPROXIMATE)

N/F HOLT DAVID R 31 &33 COURTLAND WAY ASSESS. MAP 32 PARCEL ID: 32/ 129 DEED BK 11516 PAGE 200

COURTLAND WAY

ECH 9" / MAG. SET N: 2699012.35 E: 1004645.15 EL: 6.17

EXIST. WOODED AREA

EXIST. GRANITE STONE TO BE REUSED (ES STONES)

5 MAG N: 2698908.60 E: 1004753.00 EL: 5.75

N/F STAMULI GREGORY 32 &34 COURTLAND WAY ASSESS. MAP 32 PARCEL ID: 32/ 128 DEED BK 26635 PAGE 18

N 69° 52' 24" E
326.40'

MAP 32 LOT 123 N/F NAFSAKA E MITROKOSTAS TR & S & N REALTY TRUST 657 ROUTE 28 DB 12694 PG 113

#657

N/F MITROKOSTAS NAFSIKA E TR 657 ROUTE 28 ASSESS. MAP 32 PARCEL ID: 32/ 123 DEED BK 12694 PAGE 113

EXIST. TREE LINE (TYP.)

EXIST. PROPERTY LINE (TYP.)

EXIST. ASPHALT PAVEMENT

649.71'
S 20° 48' 09" E

CGB P&P FND

WETLAND AREA "3"

35' VEGETATIVE BUFFER

50' NO STRUCTURE BUFFER

6 SPK SET N: 2698360.08 E: 1005151.32 EL: 5.33

EXIST. WOODED AREA

EXIST. 2" WATER LINE (LOCATION SHOWN AS APPROXIMATE)

EXIST. ASPHALT PAVEMENT

EXIST. WOODED AREA

N 89° 01' W
89.01'

EXIST. WOODED AREA

N 10° 46' 37" W
163.37'

APPROXIMATE LIMITS OF TOWN PUMP STATION NO. 23-10

COORDINATE WORK WITH TOWN PROJECT

S 18° 44' 44" W
58.02'

EXIST. WETLAND AREA 1

MA ROUTE 28

N/F MANNING GERALD TRS 668 ROUTE 28 ASSESS. MAP 32 PARCEL ID: 32/ 91 DEED BK 30321 PAGE 158

CMHB P&P

10 SPK N: 2698559.23 E: 1005299.16 EL: 6.88

EXIST. UPWELLER ACCESS DRIVE

EXIST. SNOW FENCE

EXIST. BOULDERS

EXIST. WOODED AREA

S 69° 53' 14" W
181.57'

EXIST. PROPERTY LINE (TYP.)

11 SPK SET N: 2699302.11 E: 1005018.48 EL: 7.93

S 20° 06' 46" E
68.76'

N/F GOLD VILLAGE WATERSIDE LLC/FFER 679 & 681 ROUTE 28 ASSESS. MAP 32 PARCEL ID: 32/ 121 DEED BK 20345 PAGE 145

100' WPA BUFFER

SPK/PUNCH N: 2699714.50 E: 1004954.60 EL: 5.21

3 REBAR N: 26998 E: 10049 EL: 1.78

BENCHMARK BRASS PIN EL: 6.11

BENCHMARK CHISSELED SQ. EL: 6.18

CB/DH FND

EXIST. UPWELLER FACILITY

EXIST. RIVER EDGE

PARKERS RIVER

M.H.W. = ELEV. 2.05'

M.L.W. = ELEV. −0.7'

EBB

FLOOD

LIMIT OF COASTAL BARRIER RESOURCE SYSTEM AREA

100' RIVERFRONT AREA

200' RIVERFRONT AREA

BOTTOM OF BANK PROPERTY LINE

#701–703

N/F AUSKAS BERNARD J

MATCH LINE

ZONE AE (EL 13)

ZONE AE (EL 12)

FEMA X ZONE

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

EXISTING CONDITIONS PLAN - 1

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
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SCALE

50 0 50 100

SCALE IN FEET: 1"=50'

Bid Documents

SHEET NO.

C.1.2

G:\PLANNING LANDSCAPE\10000S\10056 - YARMOUTH, MA RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLAN SET\CONSTRUCTION DOCUMENTS - PHASE 1\10056_EXIST CONDITIONS PLAN.DWG

N/F
TOWN OF YARMOUTH
1146 ROUTE 28
ASSESS. MAP 24
PARCEL ID: 24/92
DEED BK 8979
PAGE 44

122.28 ACRES

N/F
TOWN OF
YARMOUTH
669 ROUTE 28
ASSESS. MAP 32
PARCEL ID: 32/122
DEED BK 4985
PAGE 181

23.32 ACRES

NIAGARA

MATCH LINE

N/F
NANCY MILES
42 & 44 NIAGARA LN
PARCEL ID: 24/85
L.C.D777821

N/F
MAYNARD MARGARET
38&40 NIAGARA LN
ASSESS. MAP 24
PARCEL ID: 24 / 84
L.C. D972391

N/F
OCALLAGHAN JAMES C
32 NIAGARA LN
ASSESS. MAP 24
A.A. PARCEL ID: 24/83
A.B. D1164350

S 70° 17' 51" W
107.43'

S 19° 42' 09" E
182.90'

EXIST. SALT MARSH

EXIST. WOODED AREA

EXIST. SALT MARSH

EXIST. WOODED AREA

EXIST. WOODED AREA

WETLAND AREA "3"

EXIST. WETLAND AREA 3

EXIST. PROPERTY LINE (TYP.)

S 24° 36' 05" W
384.80'

7
SPK SET
N: 2698210.26
E: 1005193.29
EL: 3.84

6
SPK SET
N: 2698360.08
E: 1005151.32
EL: 5.33

PIPE FND

N 69° 25' 36" W
35.99'

EXIST. WOODED AREA

S 5° 47' 26" E
36.14'

N 20° 12' 26" W
106.50'

BDH FND

N 55° 14' 26" W
47.00'

N 45° 50' 15" W
146.98'

BDH FND

S 36° 14' 26" E
41.50'

N 77° 32' 54" E
147.00'

EXIST. WOODED AREA

SPK SET
N: 2697887.91
E: 1005448.42
EL: 2.56

MAP 24 LOT 92
N/F TOWN OF YARMOUTH
DB 8979 PG 44

CB DIMPLE SET

SPK SET
N: 2698178.02
E: 1005655.32
EL: 2.05

SPK SET
N: 2698252.33
E: 1005621.40
EL: 2.69

LCB FND

PARKERS RIVER

EBB
FLOOD

EBB
FLOOD

MATCH LINE

100' RIVERFRONT AREA

M.H.W. = ELEV. 2.05'

M.L.W. = ELEV. -2.95'

G:\PLANNING LANDSCAPE\10000S\10056 - YARMOUTH, MA RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLAN SET\CONSTRUCTION DOCUMENTS - PHASE 1\10056_EXIST CONDITIONS PLAN.DWG

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

EXISTING CONDITIONS PLAN - 2

BID DOCUMENTS

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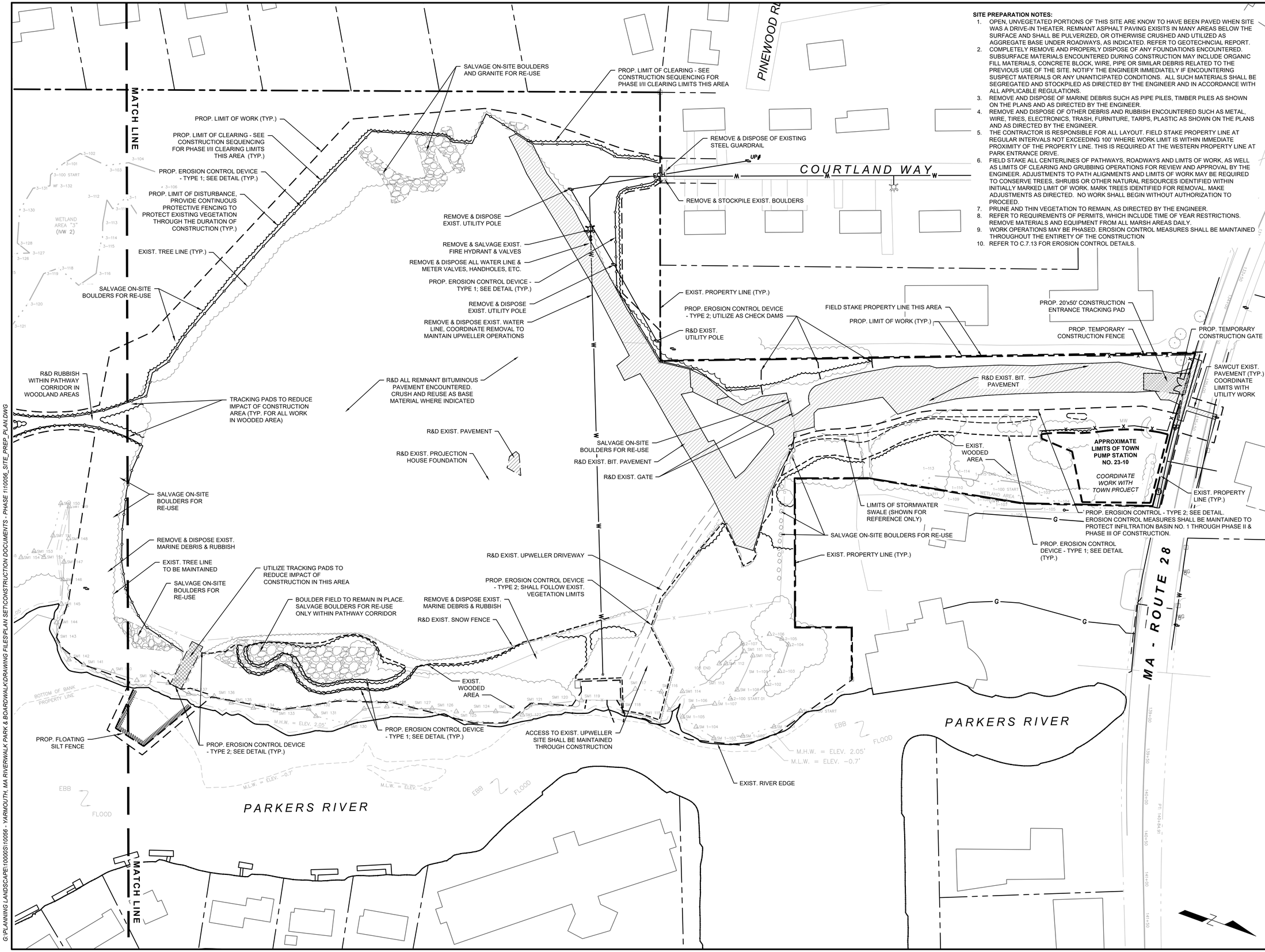
SCALE

50 0 50 100
SCALE IN FEET: 1"=50'

Bid Documents

SHEET NO.

C.1.3



SITE PREPARATION NOTES:

1. OPEN, UNVEGETATED PORTIONS OF THIS SITE ARE KNOW TO HAVE BEEN PAVED WHEN SITE WAS A DRIVE-IN THEATER. REMNANT ASPHALT PAVING EXISITS IN MANY AREAS BELOW THE SURFACE AND SHALL BE PULVERIZED, OR OTHERWISE CRUSHED AND UTILIZED AS AGGREGATE BASE UNDER ROADWAYS, AS INDICATED. REFER TO GEOTECHNCIAL REPORT.
2. COMPLETELY REMOVE AND PROPERLY DISPOSE OF ANY FOUNDATIONS ENCOUNTERED. SUBSURFACE MATERIALS ENCOUNTERED DURING CONSTRUCTION MAY INCLUDE ORGANIC FILL MATERIALS, CONCRETE BLOCK, WIRE, PIPE OR SIMILAR DEBRIS RELATED TO THE PREVIOUS USE OF THE SITE. NOTIFY THE ENGINEER IMMEDIATELY IF ENCOUNTERING SUSPECT MATERIALS OR ANY UNANTICIPATED CONDITIONS. ALL SUCH MATERIALS SHALL BE SEGREGATED AND STOCKPILED AS DIRECTED BY THE ENGINEER AND IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS.
3. REMOVE AND DISPOSE OF MARINE DEBRIS SUCH AS PIPE PILES, TIMBER PILES AS SHOWN ON THE PLANS AND AS DIRECTED BY THE ENGINEER.
4. REMOVE AND DISPOSE OF OTHER DEBRIS AND RUBBISH ENCOUNTERED SUCH AS METAL, WIRE, TIRES, ELECTRONICS, TRASH, FURNITURE, TARPS, PLASTIC AS SHOWN ON THE PLANS AND AS DIRECTED BY THE ENGINEER.
5. THE CONTRACTOR IS RESPONSIBLE FOR ALL LAYOUT. FIELD STAKE PROPERTY LINE AT REGULAR INTERVALS NOT EXCEEDING 100' WHERE WORK LIMIT IS WITHIN IMMEDIATE PROXIMITY OF THE PROPERTY LINE. THIS IS REQUIRED AT THE WESTERN PROPERTY LINE AT PARK ENTRANCE DRIVE.
6. FIELD STAKE ALL CENTERLINES OF PATHWAYS, ROADWAYS AND LIMTS OF WORK, AS WELL AS LIMITS OF CLEARING AND GRUBBING OPERATIONS FOR REVIEW AND APPROVAL BY THE ENGINEER. ADJUSTMENTS TO PATH ALIGNMENTS AND LIMITS OF WORK MAY BE REQUIRED TO CONSERVE TREES, SHRUBS OR OTHER NATURAL RESOURCES IDENTIFIED WITHIN INITIALLY MARKED LIMIT OF WORK. MARK TREES IDENTIFIED FOR REMOVAL. MAKE ADJUSTMENTS AS DIRECTED. NO WORK SHALL BEGIN WITHOUT AUTHORIZATION TO PROCEED.
7. PRUNE AND THIN VEGETATION TO REMAIN, AS DIRECTED BY THE ENGINEER.
8. REFER TO REQUIREMENTS OF PERMITS, WHICH INCLUDE TIME OF YEAR RESTRICTIONS. REMOVE MATERIALS AND EQUIPMENT FROM ALL MARSH AREAS DAILY.
9. WORK OPERATIONS MAY BE PHASED. EROSION CONTROL MEASURES SHALL BE MAINTAINED THROUGHOUT THE ENTIRETY OF THE CONSTRUCTION
10. REFER TO C.7.13 FOR EROSION CONTROL DETAILS.

PREPARED BY

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

SITE PREPARATION & EROSION CONTROL PLAN - 1

BID DOCUMENTS

NO.	REVISIONS	DATE

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DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

50 0 50 100

SCALE IN FEET: 1"=50'

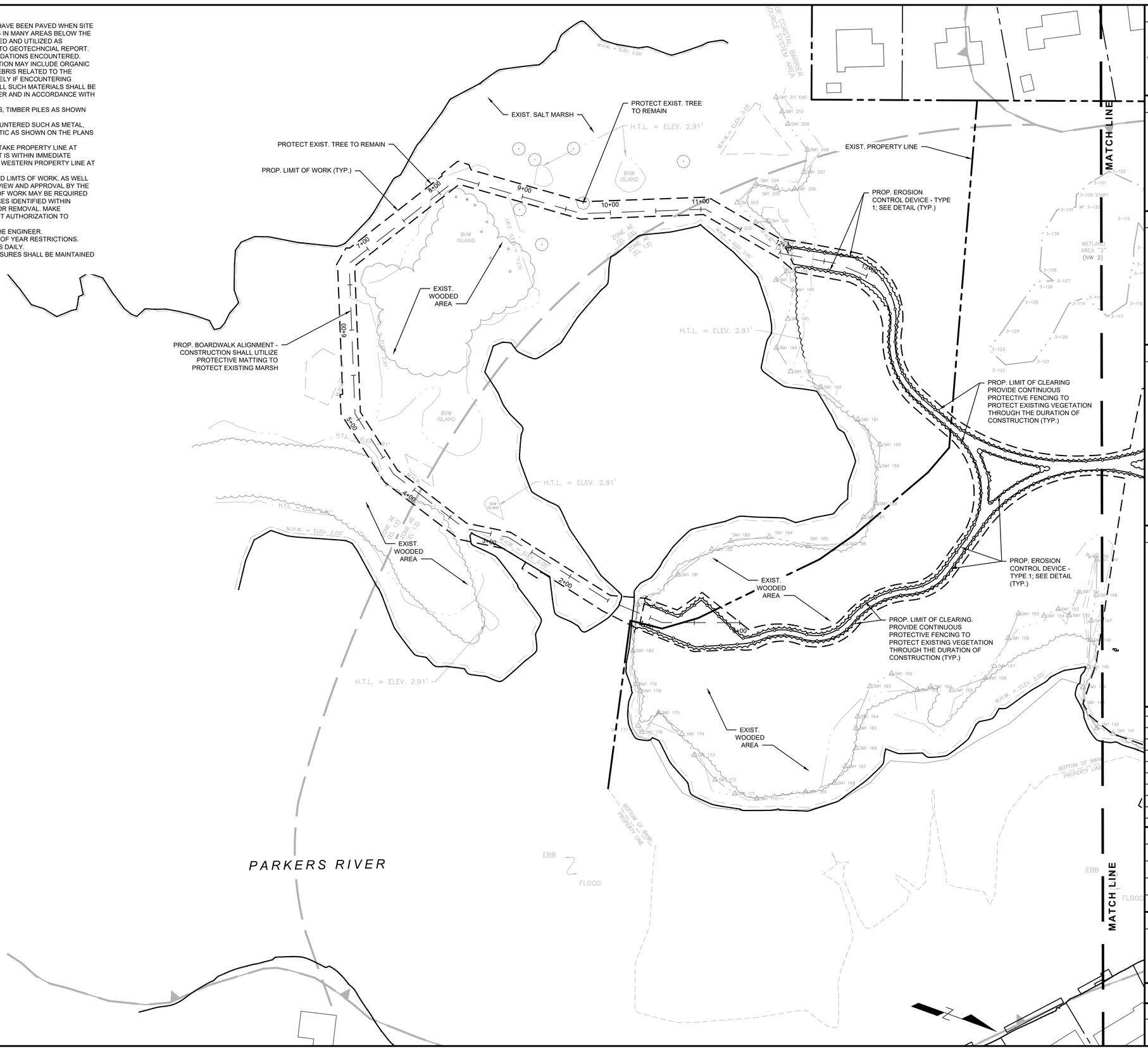
SHEET NO.

C.1.4

G:\PLANNING LANDSCAPE\10000S\10056 - YARMOUTH, MA RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLAN SET\CONSTRUCTION DOCUMENTS - PHASE 1\10056_SITE_PREP_PLAN.DWG

SITE PREPARATION NOTES:

1. OPEN, UNVEGETATED PORTIONS OF THIS SITE ARE KNOW TO HAVE BEEN PAVED WHEN SITE WAS A DRIVE-IN THEATER. REMNANT ASPHALT PAVING EXISITS IN MANY AREAS BELOW THE SURFACE AND SHALL BE PULVERIZED, OR OTHERWISE CRUSHED AND UTILIZED AS AGGREGATE BASE UNDER ROADWAYS, AS INDICATED. REFER TO GEOTECHNCIAL REPORT.
2. COMPLETELY REMOVE AND PROPERLY DISPOSE OF ANY FOUNDATIONS ENCOUNTERED. SUBSURFACE MATERIALS ENCOUNTERED DURING CONSTRUCTION MAY INCLUDE ORGANIC FILL MATERIALS, CONCRETE BLOCK, WIRE, PIPE OR SIMILAR DEBRIS RELATED TO THE PREVIOUS USE OF THE SITE. NOTIFY THE ENGINEER IMMEDIATELY IF ENCOUNTERING SUSPECT MATERIALS OR ANY UNANTICIPATED CONDITIONS. ALL SUCH MATERIALS SHALL BE SEGREGATED AND STOCKPILED AS DIRECTED BY THE ENGINEER AND IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS.
3. REMOVE AND DISPOSE OF MARINE DEBRIS SUCH AS PIPE PILES, TIMBER PILES AS SHOWN ON THE PLANS AND AS DIRECTED BY THE ENGINEER.
4. REMOVE AND DISPOSE OF OTHER DEBRIS AND RUBBISH ENCOUNTERED SUCH AS METAL, WIRE, TIRES, ELECTRONICS, TRASH, FURNITURE, TARPS, PLASTIC AS SHOWN ON THE PLANS AND AS DIRECTED BY THE ENGINEER.
5. THE CONTRACTOR IS RESPONSIBLE FOR ALL LAYOUT. FIELD STAKE PROPERTY LINE AT REGULAR INTERVALS NOT EXCEEDING 100' WHERE WORK LIMIT IS WITHIN IMMEDIATE PROXIMITY OF THE PROPERTY LINE. THIS IS REQUIRED AT THE WESTERN PROPERTY LINE AT PARK ENTRANCE DRIVE.
6. FIELD STAKE ALL CENTERLINES OF PATHWAYS, ROADWAYS AND LIMTS OF WORK, AS WELL AS LIMITS OF CLEARING AND GRUBBING OPERATIONS FOR REVIEW AND APPROVAL BY THE ENGINEER. ADJUSTMENTS TO PATH ALIGNMENTS AND LIMITS OF WORK MAY BE REQUIRED TO CONSERVE TREES, SHRUBS OR OTHER NATURAL RESOURCES IDENTIFIED WITHIN INITIALLY MARKED LIMIT OF WORK. MARK TREES IDENTIFIED FOR REMOVAL. MAKE ADJUSTMENTS AS DIRECTED. NO WORK SHALL BEGIN WITHOUT AUTHORIZATION TO PROCEED.
7. PRUNE AND THIN VEGETATION TO REMAIN, AS DIRECTED BY THE ENGINEER.
8. REFER TO REQUIREMENTS OF PERMITS, WHICH INCLUDE TIME OF YEAR RESTRICTIONS. REMOVE MATERIALS AND EQUIPMENT FROM ALL MARSH AREAS DAILY.
9. WORK OPERATIONS MAY BE PHASED. EROSION CONTROL MEASURES SHALL BE MAINTAINED THROUGHOUT THE ENTIRETY OF THE CONSTRUCTION
10. REFER TO C.7.13 FOR EROSION CONTROL DETAILS.



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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

SITE PREPARATION & EROSION CONTROL PLAN - 2

BID DOCUMENTS

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SCALE

50 0 50 100

SCALE IN FEET: 1"=50'

SHEET NO.

C.1.5

G:\PLANNING LANDSCAPE\10000S\10056 - YARMOUTH, MA RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLAN SET\CONSTRUCTION DOCUMENTS - PHASE 1\10056_SITE_PREP_PLAN.DWG

CONSTRUCTION SEQUENCING NOTES

STAGE 1 CONSTRUCTION - PARK SITE:

1. SET ALL PERIMETER EROSION CONTROL MEASURES FOR THE SITE.
2. STAKE LIMIT OF WORK LINE AT REGULAR INTERVALS REVIEW WITH OWNER'S REPRESENTATIVE FOR FINAL APPROVAL. SET VEGETATION PROTECTION MEASURES.
3. ESTABLISH LAY-DOWN, WASH-OUT, CLEANING, FUELING & STAGING AREA FOR EQUIPMENT AND EMPLOYEE PARKING.
4. INSTALL CONSTRUCTION ENTRANCE TRACKING PAD, CONSTRUCTION GATE AND FENCING
5. PROVIDE ACCESS DRIVEWAY AND STAGING AREA FOR BOARDWALK CONSTRUCTION.
6. CLEAR VEGETATION TO LIMITS SHOWN IN THE PLANS AND AS APPROVED IN THE FIELD.
7. PRUNE AND THIN TREES AND SHRUBS AS DIRECTED.
8. IMPLEMENT STAGED INVASIVE PLANT MANAGEMENT PROGRAM.
9. GRUB AREAS WITHIN THE PRIMARY LIMITS OF STAGE I AREA AS INDICATED.
10. GRUB FOR WOODLAND PATHWAY AREAS UNDER STAGE 2.
11. REMOVE EXISTING EXPOSED ASPHALT AND CONCRETE PAVEMENT. REMOVE MISC. DEBRIS & RUBBISH.
12. STRIP ALL AREAS IN STAGE 1 OF UPPER SOIL STRATA AS INDICATED. (ORDINARY FILL FOR RE-USE).
13. CRUSH/PULVERIZE & PROCESS REMNANT PAVEMENT LAYER WITH EXISTING SAND AND FILL SOIL.
14. COORDINATE WITH ENGINEER FOR PLACEMENT OF MIXED PULVERIZED REMNANT PAVEMENT.
15. CONSTRUCT TEMPORARY SEDIMENT CONTROL BASINS.
16. INSTALL PRIMARY ELECTRICAL SERVICE AND XMRF PAD.
17. INSTALL FORCE MAIN SEWER LINE
18. ROUGH GRADE FILL SLOPES, PARK DRIVEWAY AND PARKING LOT AREAS. INSTALL CURBING.
19. INSTALL SITE LIGHTING CONDUITS AND SITE LIGHT FOUNDATIONS.
20. CONSTRUCT DRAINAGE INFILTRATION SYSTEM 1. AFTER PARK DRIVEWAY HAS BEEN PAVED AND CONTRIBUTING WATERSHED AREA HAS BEEN STABILIZED.
21. PLACE PULVERIZED ON-SITE FILL/GRAVEL BASE FOR PARK DRIVEWAY TO PARKING AREA.
22. COMPLETE INSTALLATION OF ALL DRAINAGE PIPING IN THE ENTRANCE DRIVEWAY.
23. INSTALL BASE LAYERS FOR POROUS PAVEMENT. RESTRICT VEHICLE PASSAGE TO MAINTAIN CLEAN STONE RESERVOIR COURSE.
24. INSTALL BASE COURSE PAVEMENT AT ENTRANCE DRIVEWAY.
25. PROVIDE VEGETATIVE COVER ON ALL EXPOSED SLOPES ALONG THE ENTRANCE DRIVEWAY OR PERMANENTLY LOAM & SEED .
26. PROVIDE SEDIMENT PROTECTION AT ALL INLETS INTO INFILTRATION SYSTEMS. PERMIT FLOW INTO SYSTEMS AS COMPLETED.

MATCH LINE

EQUIPMENT STORAGE AREA AND PARKING. CLEANING & FUELING OF VEHICLES AND MACHINERY SHALL BE LIMITED TO THIS AREA

PROVIDE SPACE & UTILITIES FOR PHASE 2 CONSTRUCTION TRAILER (BY OTHERS)

CONSTRUCTION TRAILERS - FINAL LOCATION TO BE DETERMINED BY CONTRACTOR

LIMIT OF CLEARING (TYP.)

WETLAND AREA "3"

ROUGH GRADE TO WITHIN 1' OF FINISH GRADE

8" DISCHARGE PIPE (TEMPORARY)

TEMPORARY SEDIMENT CONTROL BASIN NO. 1

MIN. 20' WIDE CONSTRUCTION ACCESS ROAD (ON-GRADE)

MIN. 20' WIDE CONSTRUCTION ACCESS ROAD (ON-GRADE)

INSTALL OUTLET FLARED END

INSTALL 12" HDPE

INSTALL AREA DRAIN 2 & 8" DI PIPE PROTECT WITH HAY BALES DURING STAGE 2

LIMIT OF CLEARING (TYP.)

INSTALL INFILTRATION SYSTEM NO. 1

INSTALL HMA PATHWAY

INSTALL PARK ACCESS DRIVE

STAGING AREA FOR BOARDWALK

UTILIZE TRACKING PADS TO REDUCE IMPACT OF CONSTRUCTION

PHASE 2 ACCESS

8" DISCHARGE PIPE (TEMPORARY)

PHASE 2 WORK IN THIS AREA UNDER SEPARATE CONTRACT

INSTALL 8" DI PIPE

GRADE & SEED STORMWATER SWALE

APPROXIMATE LIMITS OF TOWN WASTEWATER PUMP STATION PROJECT

CONTRACTOR SHALL COORDINATE WORK WITH TOWN'S PROJECT

INSTALL 12" HDPE

INFILTRATION BASIN NO. 1 - CONSTRUCTION STAGE 2

TEMPORARY SEDIMENT CONTROL BASIN NO. 2

INSTALL OUTLET CONTROL STRUCTURE 1

INSTALL FLARED END

GRADE & SEED BERM

INSTALL TIDEGATES EACH PIPE (TYP)

INSTALL STONE AT PIPE ENDS, FLARED ENDS, 8" HDPE PIPE

LAND & WATER CONSERVATION FUND GRANT LIMITS*

MA ROUTE 28

INSTALL STONES AT PIPE ENDS (TYP)

INSTALL RESERVOIR COURSE AND ROUGH GRADE TO WITHIN 1' OF FINISH GRADE

ROUGH GRADE TO WITHIN 1' OF FINISH GRADE (TYP.)

PARC GRANT LIMITS*

INSTALL PLAYGROUND, PATHS AND SITE FURNISHINGS

STAGING AREA FOR KAYAK LAUNCH FLOAT AND BOARDWALK

BOTTOM OF BANK PROPERTY LINE

M.H.W. = ELEV. 2.05'

M.L.W. = ELEV. -0.7'

EBB

FLOOD

PARKERS RIVER

MATCH LINE

*** NOTE: LIMITS OF THE WORK ASSOCIATED WITH GRANTS ARE SHOWN ON THIS PLAN AS APPROXIMATE. REFER TO THE SPECIFICATIONS FOR WORK TO BE COMPLETED AS PART OF THE PARKLAND ACQUISITION AND RENOVATIONS FOR COMMUNITIES (PARC) GRANT AND LAND & WATER CONSERVATION FUND GRANT, AS WELL AS THE REQUIRED SEQUENCING AND MILESTONES.**

STAGE 2 CONSTRUCTION - PARK SITE

1. INSTALL PILINGS AND BENTS FOR KAYAK LAUNCH. OBSERVE TIME OF YEAR RESTRICTIONS.
2. INSTALL RIVER BOTTOM MOORINGS FOR KAYAK LAUNCH. OBSERVE TIME OF YEAR RESTRICTIONS.
3. INSTALL FRAMING, DECKING AND RAILINGS FOR KAYAK LAUNCH.
4. INSTALL GANGWAYS AND KAYAK LAUNCH FLOAT SYSTEM.
5. CLEAR ALL REMAINING AREAS. REMOVE RUBBISH AND DEBRIS.
6. STRIP ALL AREAS OF UPPER SOIL STRATA AS INDICATED. (ORDINARY FILL FOR RE-USE).
7. CRUSH/PULVERIZE & PROCESS REMNANT PAVEMENT LAYER WITH EXISTING SOIL STRATA.
8. COORDINATE PLACEMENT OF MATERIAL WITH ASPHALT WITH ENGINEER. LOCATE UNDER PATHWAYS.
9. REGRADE AND USE ON-SITE FILL TO SHAPE INFIELD AREA & PERIMETER PATHWAY.
10. ROUGH GRADE ALL INFIELD AND WALKWAY AREAS.
11. INSTALL INFILTRATION BASIN 1 COMPLETE, INCLUDING LOAM & SEED.
12. INSTALL ALL UTILITIES TO SERVICE LANDSCAPED AREAS AND EVENT SPACE.
13. INSTALL GRAVEL BASE FOR PERIMETER PATHWAY WEST OF THE ACCESS DRIVEWAY.
14. INSTALL GRAVEL BASE FOR ALL WALKWAYS.
15. INSTALL POROUS PAVEMENT AND SET ALL VERTICAL GRANITE CURBING.
16. PAVE PERIMETER PATHWAY AROUND THE INFIELD AREA.
17. INSTALL REINFORCED TURFGRASS SYSTEM.
18. COMPLETE ALL WALKWAYS, SIDEWALKS, AND CONCRETE PADS/SHANTY SLABS.
19. INSTALL LIGHT POLES, LUMINARIES AND ELECTRICAL ENCLOSURES.
20. FINE GRADE, INSTALL FOOTINGS, INSTALL PLAYGROUND EQUIPMENT, INSTALL SURFACING.
21. FINISH PAVE ENTRANCE DRIVEWAY AND INSTALL BITUMINOUS CURB.
23. LOAM & SEED ALL EXPOSED AREAS. COMPLETE AREAS AS THEY BECOME AVAILABLE.
24. INSTALL LANDSCAPE PLANTINGS ALONG THE ENTRANCE DRIVEWAY.
25. INSTALL REMAINING LANDSCAPE PLANTINGS.
26. INSTALL SIGNAGE AND SITE FURNITURE
27. CONTINUE INVASIVE PLANT MANAGEMENT OPERATIONS

G:\PLANNING LANDSCAPE\10000S\10056 - YARMOUTH, MA RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLAN SET\CONSTRUCTION DOCUMENTS - PHASE 1\10056_PHASING PLAN - PH 1.DWG

PREPARED BY

BETA
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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

CONSTRUCTION SEQUENCING PLAN - STAGE 1 - PARK SITE

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

50 0 50 100

SCALE IN FEET: 1"=50'

Bid Documents

SHEET NO.

C.2.1

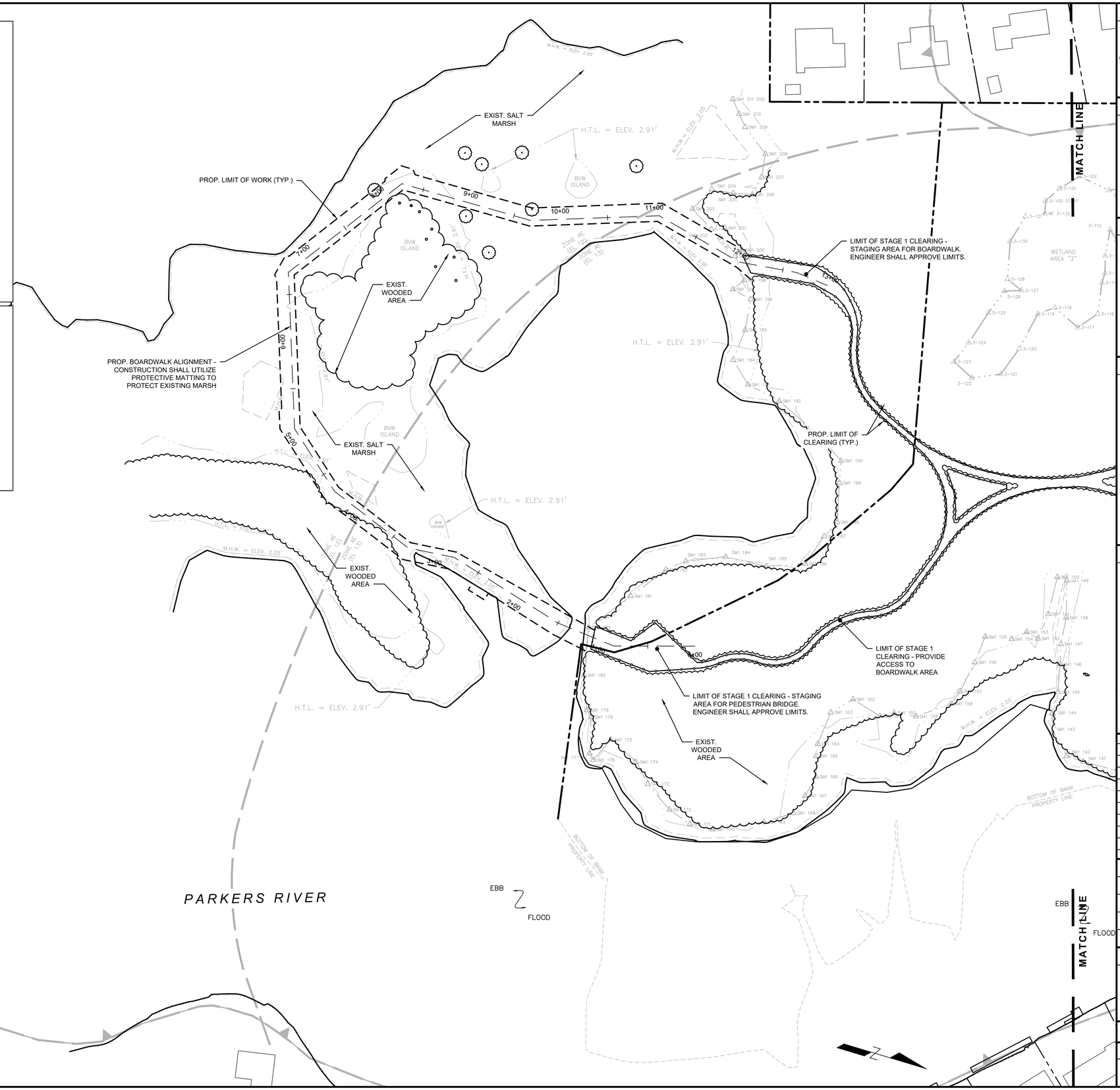
CONSTRUCTION SEQUENCING NOTES:

STAGE 1 CONSTRUCTION - BOARDWALK & WOODLAND PATHS

1. COORDINATE EROSION CONTROL AND ACCESS WITH THE OPEN PARK SITE.
2. ESTABLISH LAY DOWN AND STAGING AREAS FOR MATERIALS AND EQUIPMENT.
3. STAKE LIMIT OF CLEARING, INCLUDING ANY TREES FOR REMOVAL FOR OWNER APPROVAL.
4. ROOT PRUNE, PRUNE AND LIMB TREES SHOWN TO REMAIN WITHIN LIMIT OF WORK.
5. SET VEGETATION PROTECTION MEASURES ALONG PERIMETER OF DEVELOPMENT AREA.
6. CLEAR WOODLAND PATHWAY AREAS TO APPROVED LIMITS.
7. INSTALL EROSION CONTROLS. MAINTAIN EROSION CONTROLS THROUGHOUT PROJECT.
8. GRUB PATHWAYS AND INSTALL GRAVEL PATH BASE.
9. ROUGH GRADE WOODLAND PATHWAYS AND EDGES.
10. PLACE WOOD CHIP MULCH SURFACE TO PROTECT FOREST FLOOR & PATH EDGES.
11. PROVIDE VEGETATIVE COVER ON ANY EXPOSED SOIL.
12. UTILIZE LIGHTWEIGHT MARSH MATS TO PROTECT THE SALT MARSH. REMOVE DAILY.
13. STAKE OUT BOARDWALK ALIGNMENT FOR APPROVAL BY THE OWNER.
14. HAND CUT AND REMOVE CONFLICTING PLANT MATERIAL IDENTIFIED BY OWNER.
15. OBSERVE TIME OF YEAR RESTRICTIONS.
16. UTILIZE RUBBER TRACKED EQUIPMENT AND MARSH MATTING. REMOVE DAILY.
17. INSTALL HELICAL PILES AND PILE BENT FRAMING.
18. INSTALL WOODEN BEAMS FOR PEDESTRIAN BRIDGE.
19. NO OVERNIGHT STORAGE OF EQUIPMENT ON THE SALT MARSH.
20. NO FUELING OF EQUIPMENT ON THE SALT MARSH.
21. NO STORAGE OF MATERIAL ON THE SURFACE OF THE SALT MARSH.

STAGE 2 CONSTRUCTION - BOARDWALK & WOODLAND PATHS

1. INSTALL ALL BOARDWALK FRAMING ON BENTS.
2. INSTALL BOARDWALK RAILING POSTS AND DECKING.
3. INSTALL PEDESTRIAN BRIDGE WOOD DECKING.
4. INSTALL BOARDWALK RAILINGS, BENCHES, INTERPRETIVE PANELS.
5. UTILIZE LIGHTWEIGHT MARSH MATS TO PROTECT THE SALT MARSH.
6. NO OVERNIGHT STORAGE OF EQUIPMENT ON THE SALT MARSH
7. NO FUELING OF EQUIPMENT ON THE SALT MARSH
8. NO STORAGE OF MATERIAL ON THE SURFACE OF THE SALT MARSH.
9. INSTALL ALL LANDSCAPE PLANTINGS.
10. LOAM AND SEE ALL DISTURBED AREAS.
11. INSTALL STABILIZED AGGREGATE PATHWAYS.
12. INSTALL SIGNAGE AND BENCHES.
13. COMPLETE REMAINING LANDSCAPE PLANTINGS.
14. CONTINUE INVASIVE PLANT MANAGEMENT OPERATIONS.



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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

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TITLE

CONSTRUCTION SEQUENCING PLAN - STAGE 1 - BOARDWALK

BID DOCUMENTS

NO.	REVISIONS	DATE

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BETA JOB NO.:	10056

SCALE

50 0 50 100

SCALE IN FEET: 1"=50'

Bid Documents

SHEET NO.

C.2.2

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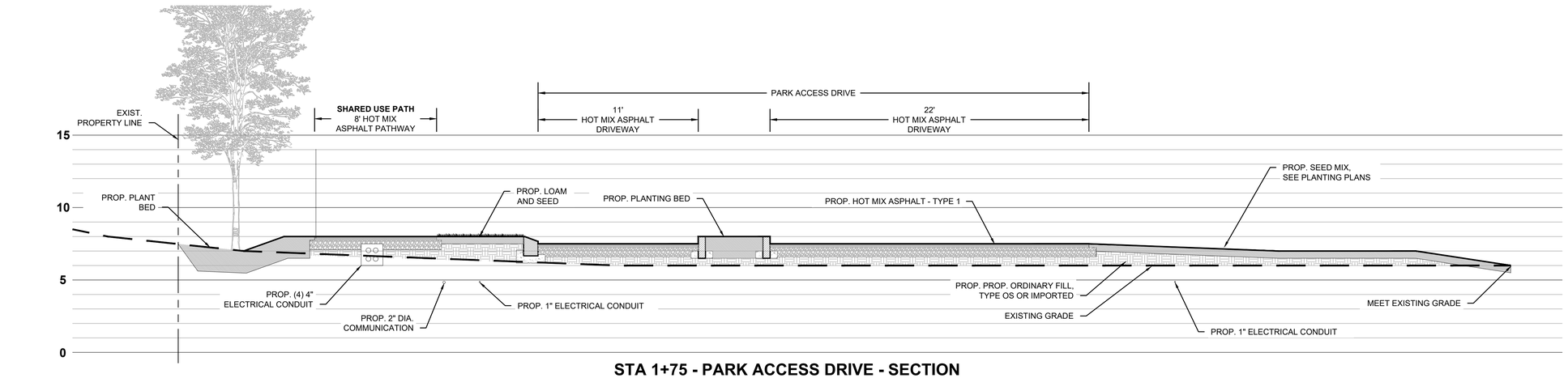
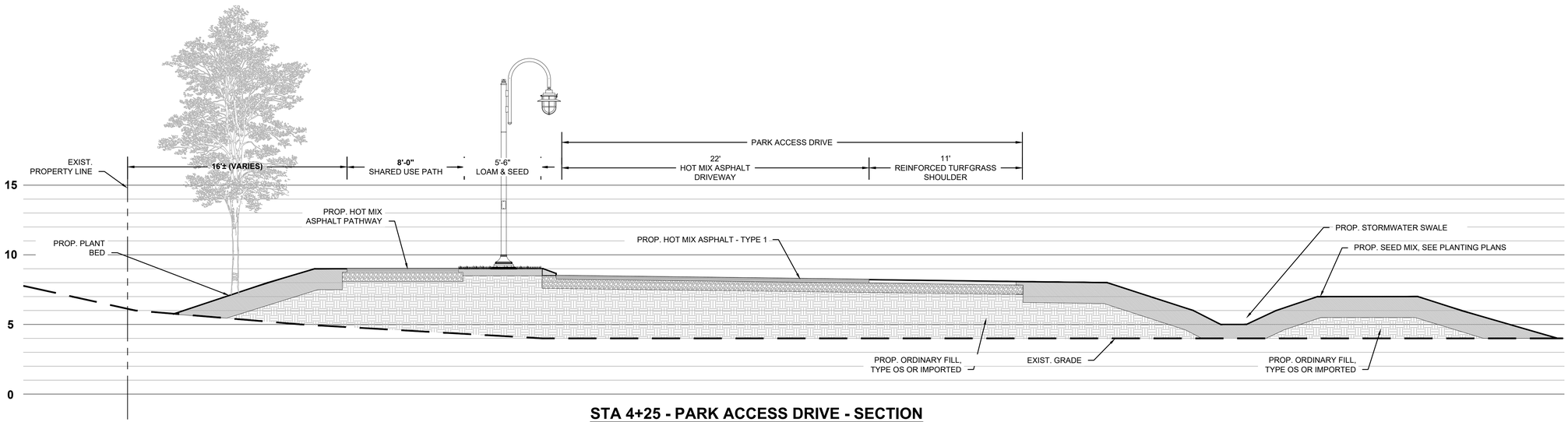


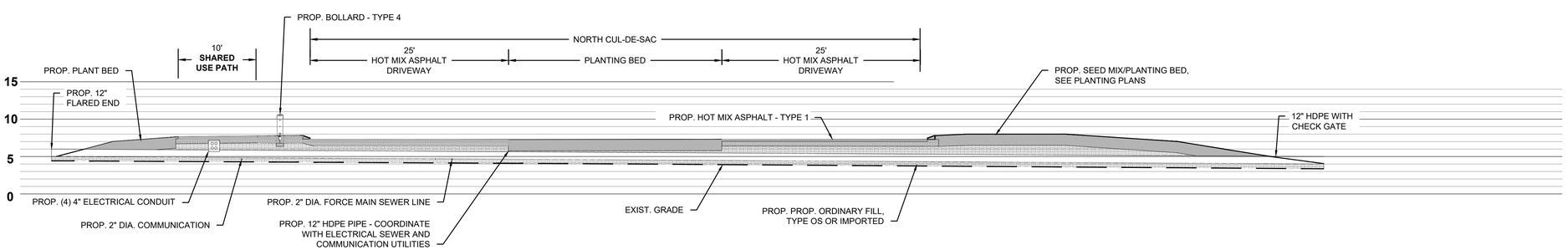
STA 1+75 - PARK ACCESS DRIVE - SECTION

SCALE: 1/4" = 1'-0"



STA 4+25 - PARK ACCESS DRIVE - SECTION

SCALE: 1/4" = 1'-0"



STA 6+55 - NORTH CULDESAC - SECTION

SCALE: 1/8" = 1'-0"

NOTE:
UTILITIES SHOWN FOR REFERENCE ONLY.

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

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TITLE

SITE SECTIONS - 1

BID DOCUMENTS

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BETA JOB NO.:	10056

SCALE

AS SHOWN

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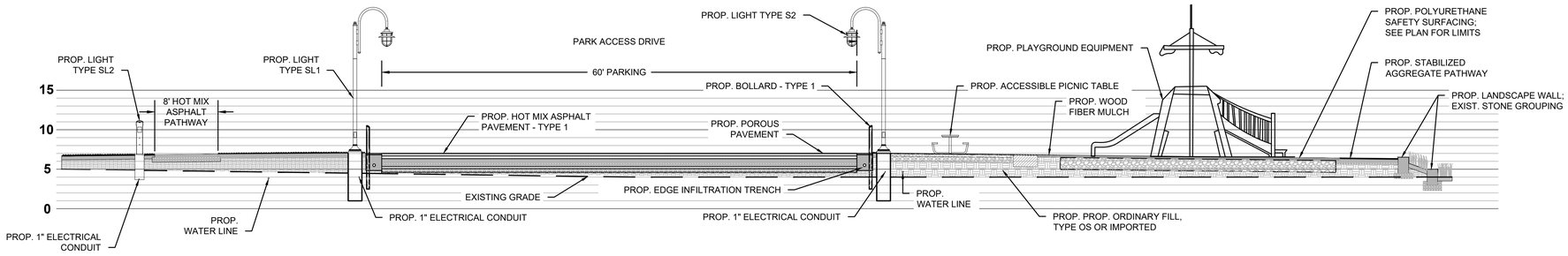
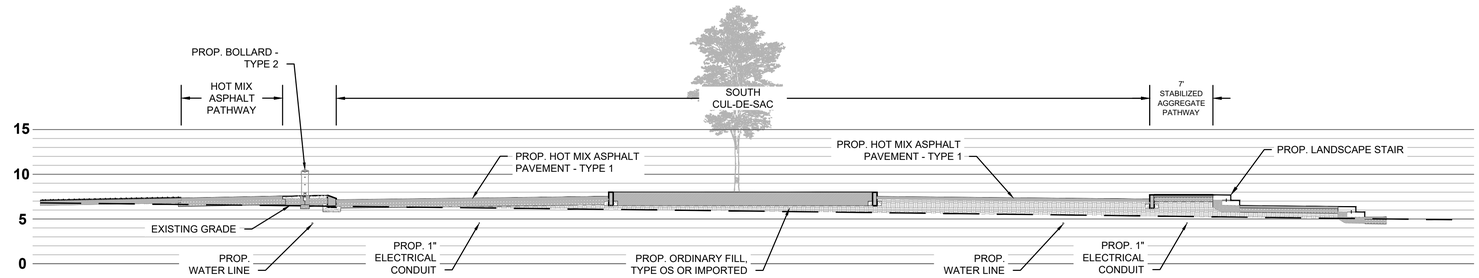
SHEET NO.

C.3.1



STA 10+25 - PARKING & PLAYGROUND - SECTION

SCALE: 1/8" = 1'-0"



STA 13+00 - SOUTH CULDESAC - SECTION

SCALE: 1/8" = 1'-0"

NOTE:
UTILITIES SHOWN FOR REFERENCE ONLY.

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

SITE SECTIONS - 2

BID DOCUMENTS

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SCALE

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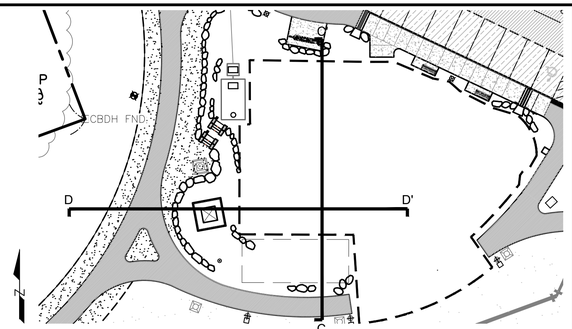
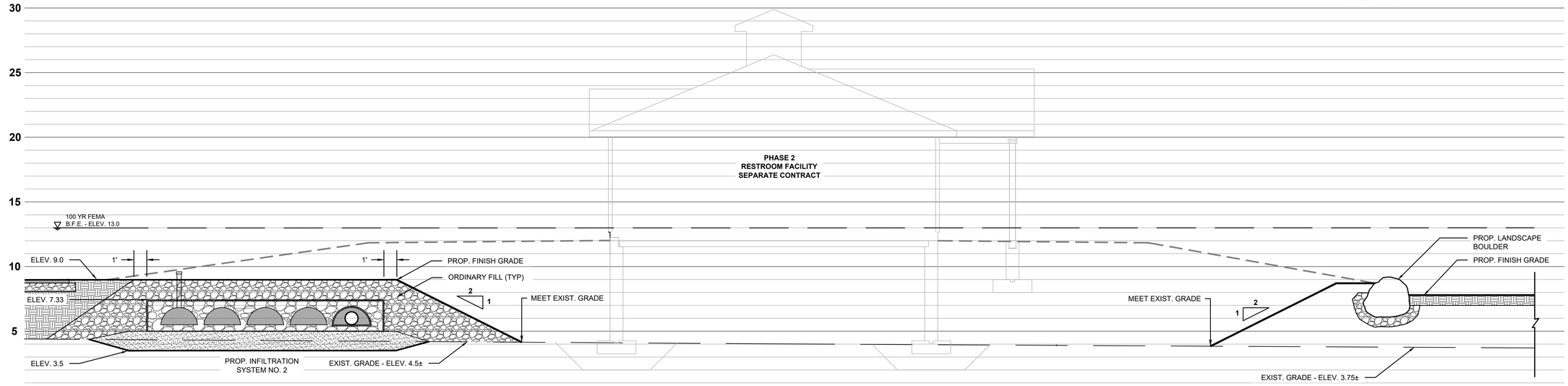
C.3.2



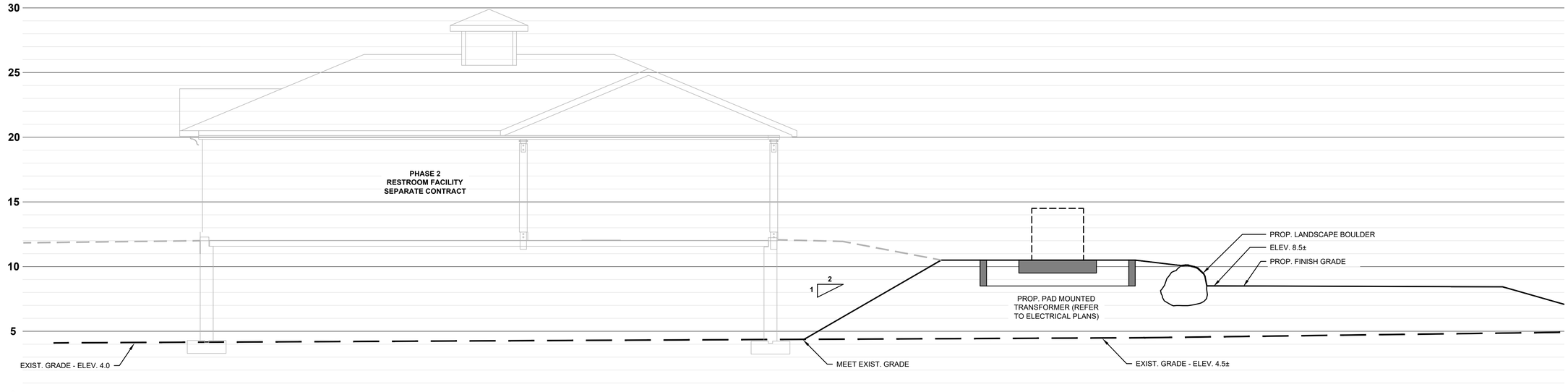
RESTROOM FACILITY - REFERENCE PLAN

SCALE: 1" = 30'



RESTROOM FACILITY - SECTION C-C'

SCALE: $\frac{1}{4}$" = 1'-0"



RESTROOM FACILITY - SECTION D-D'

SCALE: $\frac{1}{4}$" = 1'-0"

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

SITE SECTIONS - 3

BID DOCUMENTS

NO.	REVISIONS	DATE

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CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

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Bid Documents

SHEET NO.

C.3.3

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MATCH LINE

(IVW 2)

PINEWOOD RD

COURTLAND WAY

CBDH FND

4
MAG SET
N: 2699012.35
E: 1004645.15
EL: 6.17

BENCHMARK #1
N=2698908.60
E=1004753.00

N=2698832.85 E=1004689.78
N=2698990.48 E=1004644.45
N=2698733.12 E=1004725.54
N=2698648.23 E=1004802.52
N=2698875.42 E=1004687.39
N=2698928.59 E=1004734.40
N=2698944.80 E=1004786.56
N=2698992.91 E=1004858.47
N=2699050.10 E=1004889.60
N=2699104.29 E=1004895.93
N=2698995.58 E=1004915.74
N=2699009.27 E=1004925.75
N=2699157.26 E=1004883.58
N=2699202.53 E=1004864.94
N=2699235.53 E=1004845.67
N=2699317.07 E=1004819.88
N=2699400.65 E=1004752.12
N=2699408.38 E=1004775.16
N=2699534.15 E=1004699.50
N=2699659.32 E=1004647.39
N=2698545.75 E=1005046.19
N=2698522.66 E=1005085.18
N=2698411.12 E=1005175.12
N=2698536.78 E=1005089.37

INFILTRATION SYSTEM NO. 1 CENTERLINE

INFILTRATION SYSTEM NO. 2 CENTERLINE

ALIGNMENT P-1 START - STA 0+00
N=2699758.71
E=1004665.76

CB P&P FND

0+00 1+00 2+00 3+00 4+00 5+00 6+00 7+00

PC 3+68.0
PI 4+48.4
PT 1+41.9
PC 1+01.6
PCC 5+63.3
PT 7+16.3
PC 8+06.1
PT 9+59.3

N=2699009.17 E=1004970.47
N=2699012.78 E=1005024.92
N=2699135.44 E=1004966.55
N=2699170.37 E=1004987.07
N=2699160.48 E=1005075.31
N=2699133.37 E=1005107.93
N=2699153.97 E=1005134.86
N=2699119.57 E=1005144.04
N=2699064.73 E=1005188.68
N=2699168.95 E=1005221.16
N=2699194.69 E=1005226.69
N=2699011.26 E=1005188.78
N=2699033.65 E=1005195.51
N=2699017.28 E=1005224.59
N=2699135.82 E=1005232.69
N=2699004.17 E=1005253.42
N=2698933.52 E=1005292.71
N=2698908.20 E=1005326.01
N=2698895.87 E=1005254.72
N=2698885.09 E=1005251.42
N=2698854.82 E=1005292.35
N=2698873.18 E=1005351.47
N=2698830.01 E=1005370.22
N=2698746.23 E=1005315.56
N=2698740.26 E=1005332.01
N=2698721.60 E=1005342.45
N=2698743.16 E=1005378.64
N=2698751.69 E=1005368.95
N=2698783.25 E=1005364.95
N=2698619.08 E=1005512.65
N=2698645.94 E=1005429.41
N=2698663.87 E=1005373.02
N=2698647.95 E=1005327.83

ALIGNMENT P-1 END - STA 14+00
N=2698583.60
E=1005324.76

14+00 13+00 12+00 11+00 10+00 9+00

60' 24'

N=2698569.70 E=1005221.86
N=2698590.80 E=1005274.03
N=2698628.96 E=1005284.09
N=2698621.26 E=1005291.17
N=2698588.91 E=1005206.09
N=2698713.61 E=1005231.25
N=2698745.96 E=1005213.58
N=2698828.46 E=1005180.00
N=2698958.53 E=1005130.05
N=2698880.41 E=1005160.03
N=2698973.19 E=1005128.07

INFILTRATION BASIN NO. 1 CENTERLINE

CENTER OF CUL-DE-SAC STA. 13+00

CENTER OF NORTH CUL-DE-SAC STA. 6+50

N=2699427.08 E=1004804.02
N=2699522.13 E=1004768.70
N=2699253.22 E=1004904.32
N=2699314.15 E=1004869.62
N=2699343.87 E=1004855.17
N=2699360.94 E=1004839.80

STORMWATER SWALE CENTERLINE

APPROXIMATE LIMITS OF TOWN OWNED PARCEL FOR STATION PROJECT
CONTRACTOR SHALL COORDINATE WORK WITH TOWN PROJECT

BRASS DISK

MA ROUTE 28

MHB P&P

PK FND

SPK / PUNCH
N: 2699717.86
E: 1004954.30
EL: 5.21

SPK SET
N: 2699302.11
E: 1005018.48
EL: 7.93

3
REBAR
N: 2699
E: 10045
EL: 1.78

CB/DH FND

BENCHMARK
BRASS PIN
EL: 6.11

BENCHMARK
CHISSELED SQ.
EL: 6.18

L=292.86' R=2800.00'

BOTTOM OF BANK
PROPERTY LINE

EBB
FLOOD

M.L.W. = ELEV. −0.7'

PARKERS RIVER

MATCH LINE

PREPARED BY

BETA
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REGISTERED PROFESSIONAL

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

LAYOUT PLAN - 1

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

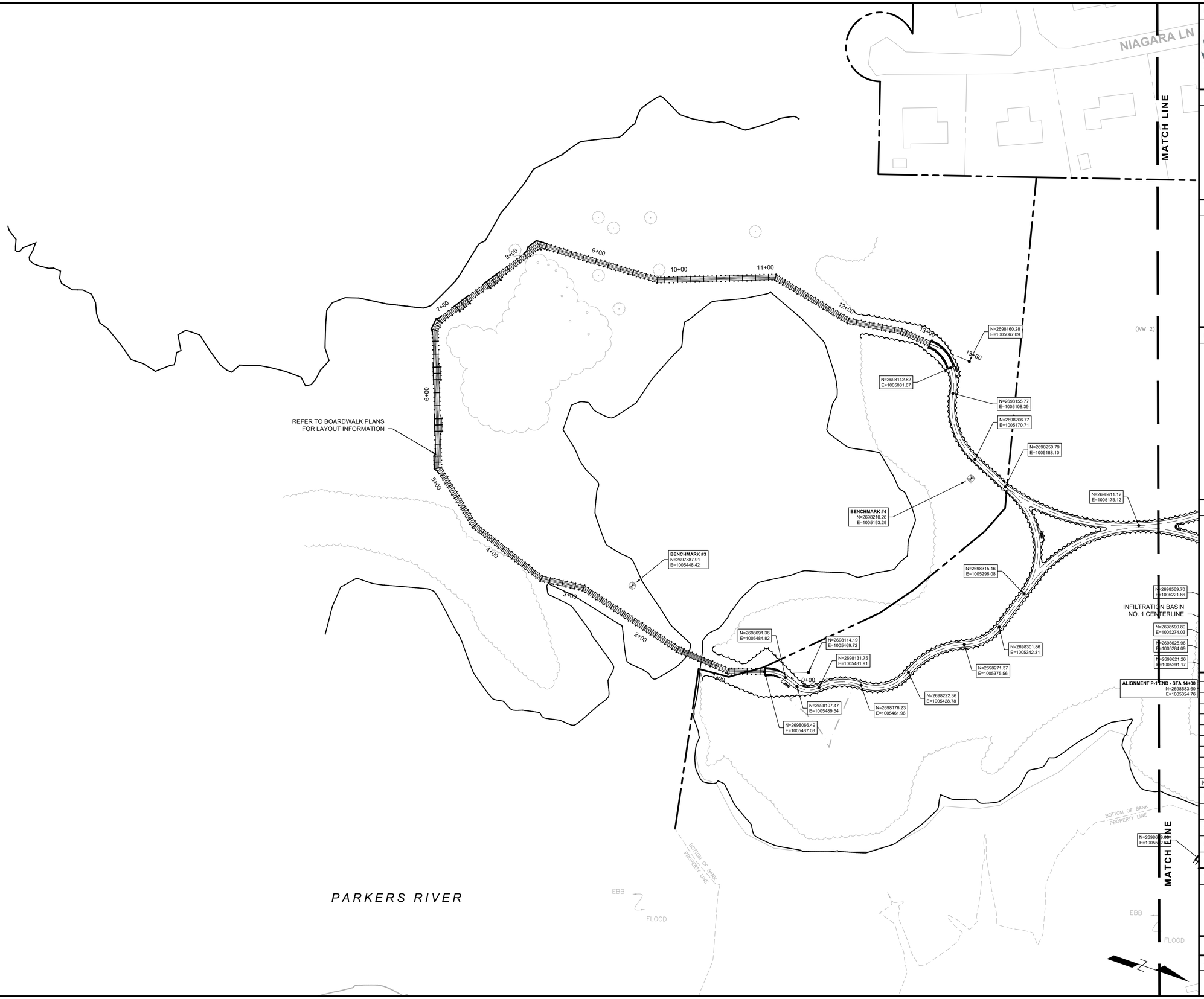
SCALE

50 0 50 100
SCALE IN FEET: 1"=50'

Bid Documents

SHEET NO.

C.4.1



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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

LAYOUT PLAN - 2

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

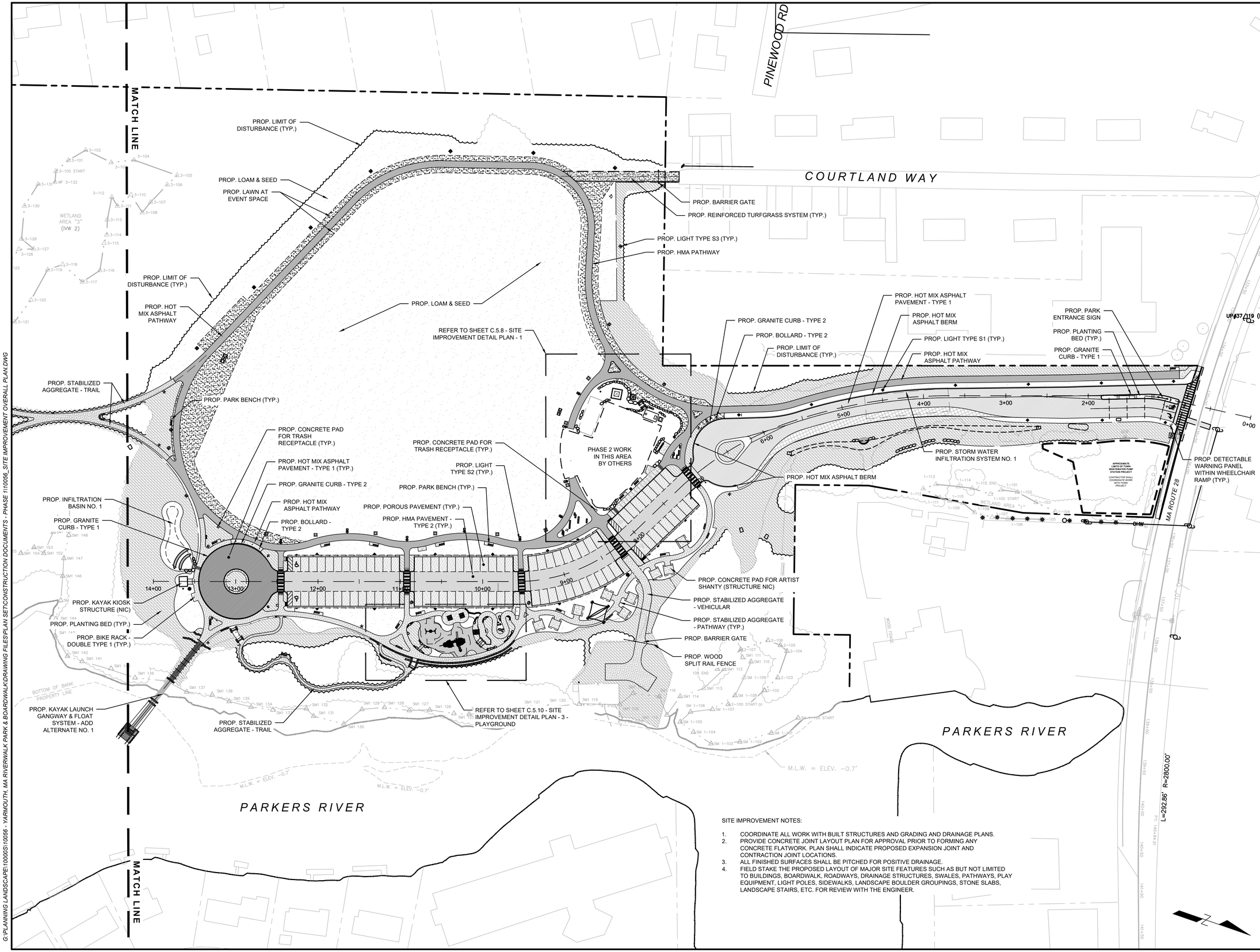
50 0 50 100

SCALE IN FEET: 1"=50'

Bid Documents

SHEET NO.

C.4.2



SITE IMPROVEMENT NOTES:

1. COORDINATE ALL WORK WITH BUILT STRUCTURES AND GRADING AND DRAINAGE PLANS.
2. PROVIDE CONCRETE JOINT LAYOUT PLAN FOR APPROVAL PRIOR TO FORMING ANY CONCRETE FLATWORK. PLAN SHALL INDICATE PROPOSED EXPANSION JOINT AND CONTRACTION JOINT LOCATIONS.
3. ALL FINISHED SURFACES SHALL BE PITCHED FOR POSITIVE DRAINAGE.
4. FIELD STAKE THE PROPOSED LAYOUT OF MAJOR SITE FEATURES SUCH AS BUT NOT LIMITED TO BUILDINGS, BOARDWALK, ROADWAYS, DRAINAGE STRUCTURES, SWALES, PATHWAYS, PLAY EQUIPMENT, LIGHT POLES, SIDEWALKS, LANDSCAPE BOULDER GROUPINGS, STONE SLABS, LANDSCAPE STAIRS, ETC. FOR REVIEW WITH THE ENGINEER.

PREPARED BY

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

SITE IMPROVEMENT OVERALL PLAN - 1

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
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BETA JOB NO.:	10056

SCALE

50 0 50 100

SCALE IN FEET: 1"=50'

Bid Documents

SHEET NO.

C.5.1

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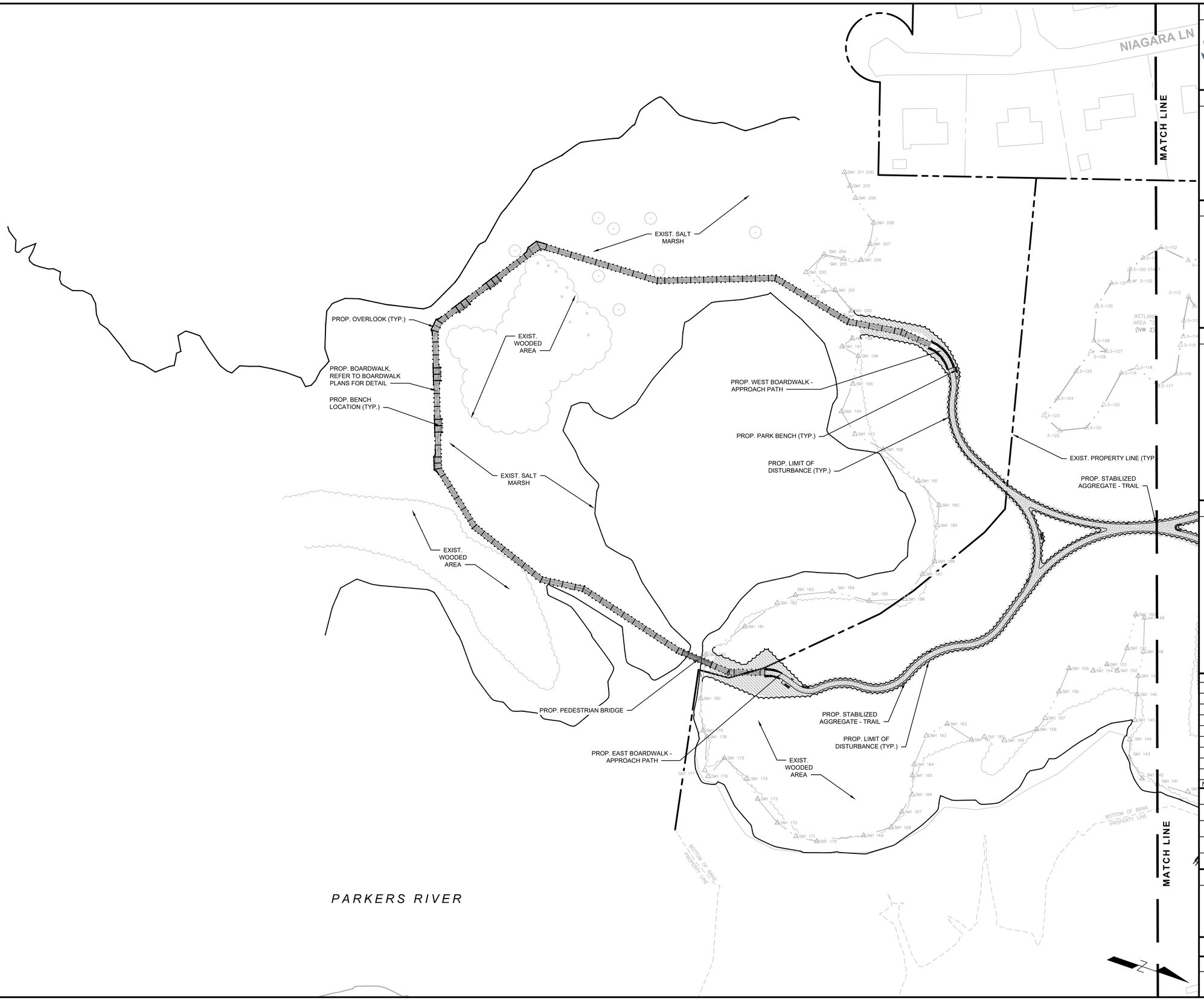

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

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SITE IMPROVEMENT OVERALL PLAN - 2

BID DOCUMENTS

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DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

50 0 50 100

SCALE IN FEET: 1"=50'

Bid Documents

SHEET NO.

C.5.2

PROP. LIMIT OF DISTURBANCE (TYP.)
PROP. INFILTRATION SYSTEM NO. 1
PROP. LIGHT TYPE S1 (TYP.)
EXIST. PROPERTY LINE (TYP.)
PROP. HOT MIX ASPHALT PAVEMENT - TYPE 1
PROP. HOT MIX ASPHALT BERM
PROP. HOT MIX ASPHALT PATHWAY
PROP. PARK BENCH (TYP.)
PROP. GRANITE CURB - TYPE 1
PROP. COBBLE PAVEMENT (TYP.)
PROP. PLANTING BED (TYP.)
PROP. CONCRETE PAVEMENT - TYPE A
PROP. DETECTABLE WARNING PANEL (TYP.)
PROP. PARK ENTRANCE SIGN
PROP. SIGN R3-7L
PROP. SIGN R1-1
PROP. CROSSWALK - TYPE 1
PROP. HMA PATCH, REFER TO UTILITY PLANS FOR LOCATION
PROP. REINFORCED TURFGRASS (TYP.)
PROP. 2" SPARE CONDUIT (TYP.)
PROP. SIGN R3-7R, SIGN R1-1
PROP. DETECTABLE WARNING PANEL (TYP.)
PROP. CONCRETE PAVEMENT - TYPE A
PROP. STONE AT PIPE ENDS
PROP. STORM WATER SWALE
PROP. CHECK DAM
LB GROUP - 1
LB GROUP - 2
LB GROUP - 3
LB GROUP - 4
LB GROUP - 5
MATCH LINE
DYL
SYL
SWL
OHW
GUY
UP#37/119 (L/R)
UP#37/120
UP#37/121
UP#1218
WETLAND AREA "1"
APPROXIMATE LIMITS OF TOWN WASTEWATER PUMP STATION PROJECT
CONTRACTOR SHALL COORDINATE WORK WITH TOWN PROJECT
0+00
1+00
2+00
3+00
4+00
5+00
133+00
133+50
134+00
134+50
136+00
136+50
137+00

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

SITE IMPROVEMENT PLAN - 1

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

20 0 20 40
SCALE IN FEET: 1"=20'

Bid Documents

SHEET NO.

C.5.3

MATCH LINE

UP

REFER TO SHEET C.5.8 - SITE IMPROVEMENT DETAIL PLAN - 1

EXIST. PROPERTY LINE (TYP.)

PROP. SITE LIGHT S3 (TYP.)

PROP. LAWN AT EVENT SPACE

PROP. SITE LIGHT S1 (TYP.)

PROP. SIGN R8-3

MATCH LINE

5+00

PROP. BOLLARD - TYPE 2

PROP. GRANITE CURB - TYPE 2

PROP. HOT MIX ASPHALT BERM

6+00

PHASE 2
WORK IN THIS AREA
SEPARATE CONTRACT

PROP. BOLLARD - TYPE 1

PROP. CHAIN

PROP. CROSSWALK - TYPE 2

PROP. BOLLARD - TYPE 1

PROP. STONE AT PIPE ENDS

PROP. REINFORCED TURFGRASS

PROP. HOT MIX ASPHALT BERM

PROP. STABILIZED AGGREGATE - PATHWAY (TYP.)

PROP. BOLLARD - TYPE 1 (TYP.)

ES GROUP - 7

PROP. STONE AT PIPE ENDS

PROP. POWER PANEL (TYP.)

PROP. SITE LIGHT S2 (TYP.)

PROP. PARK BENCH (TYP.)

PROP. HOT MIX ASPHALT PATHWAY

PROP. EDGE INFILTRATION TRENCH (TYP.)

PROP. BIKE RACK - TYPE 2

PROP. HOT MIX ASPHALT PAVEMENT - TYPE 2

PROP. SITE LIGHT S1 (TYP.)

8+00

PROP. PARK BENCH (TYP.)

PROP. ACCESSIBLE PARKING STALL

PROP. SIGN R7-8

PROP. CONCRETE PAD FOR ARTIST SHANTY (STRUCTURE NIC) (TYP.)

MATCH LINE

9+00

PROP. POROUS PAVEMENT (TYP.)

11+00

PROP. DETECTABLE WARNING PANEL (TYP.)

PROP. PERIMETER DRAIN AT ARTIST SHANTY

PROP. CONCRETE PAD FOR TRASH RECEPTACLE

WOOD FENCE (REMAINS)

PROP. STABILIZED AGGREGATE - VEHICULAR (TYP.)

PROP. SHADE STRUCTURE

ES GROUP - 8

PROP. BARRIER GATE A

PROP. WOOD SPLIT RAIL FENCE

REFER TO SHEET C.5.10 - SITE IMPROVEMENT DETAIL PLAN - 3 - PLAYGROUND

PROP. STABILIZED AGGREGATE - TRAIL

SM1 128 SM1 127 SM1 126 SM1 125 SM1 124 SM1 123 SM1 122 SM1 121 SM1 120 SM1 119 SM1 118 SM1 117 SM1 116 SM1 115 SM1 114 SM1 113 SM1 112 SM1 111 SM1 110 SM 1–109 SM 1–108 SM 1–107 SM 1–106 SM 1–105 2–100 START 2–101 2–102 2–103 2–104 2–105 2–106 2–107 108 END

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PREPARED BY

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

SITE IMPROVEMENT PLAN - 2

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

20 0 20 40

SCALE IN FEET: 1"=20'

Bid Documents

SHEET NO.

C.5.4

PROP. LIGHT TYPE S3 (TYP.)
PROP. TACTILE TRAIL SIGN AND MOUNT
PROP. LIMIT OF DISTURBANCE
PROP. INTERPRETIVE GRAPHIC PANEL
ES GROUP - 29
MATCH LINE
PROP. STONE AT PIPE ENDS
PROP. STABILIZED AGGREGATE - TRAIL
PROP. INTERPRETIVE GRAPHIC PANEL
PROP. TACTILE TRAIL SIGN AND MOUNT
PROP. LOAM AND SEED (TYP.)
PROP. LAWN AT EVENT SPACE
PROP. LAWN AT EVENT SPACE
PROP. CONCRETE PAD FOR TRASH RECEPTACLE (TYP.)
PROP. SIGN R8-3
PROP. HOT MIX ASPHALT PAVEMENT - TYPE 1 (TYP.)
PROP. BOLLARD - TYPE 2
PROP. GRANITE CURB - TYPE 2
ES GROUP - 28
PROP. INFILTRATION BASIN NO. 1
PROP. CHECK DAM
PROP. TRANSITION CURB - TYPE 2
PROP. GRANITE CURB - TYPE 1
LB GROUP - 34
LB GROUP - 33
14+00
13+00
PROP. KAYAK KIOSK STRUCTURE (NIC)
PROP. BIKE RACK - TYPE 2
PROP. CONCRETE PAD FOR TRASH RECEPTACLE
PROP. SIGN R8-3
ES GROUP - 27
ES GROUP - 26
ES GROUP - 25
ES GROUP - 24
ES GROUP - 19
PROP. LANDSCAPE STAIR LS-3
ES GROUP - 20
ES GROUP - 22
ES GROUP - 21
PROP. LANDSCAPE STAIR LS-4
PROP. TACTILE TRAIL SIGN AND MOUNT
PROP. INTERPRETIVE GRAPHIC PANEL
ES GROUP - 23
PROP. ADD ALTERNATE NO. 1
KAYAK LAUNCH & FLOAT SYSTEM
PROP. TACTILE TRAIL SIGN AND MOUNT
ES GROUP - 18
PROP. PARK BENCH (TYP.)
PROP. HOT MIX ASPHALT PATHWAY
PROP. SITE LIGHT S2 (TYP.)
PROP. BOLLARD - TYPE 1 (TYP.)
PROP. SIGN R7-8
PROP. ACCESSIBLE PARKING STALL (TYP.)
12+00
PROP. SIGN R7-8
PROP. EDGE INFILTRATION TRENCH (TYP.)
PROP. DETECTABLE WARNING PANEL (TYP.)
PROP. STABILIZED AGGREGATE - PATHWAY (TYP.)
PROP. INTERPRETIVE GRAPHIC PANEL
PROP. STABILIZED AGGREGATE - TRAIL
PROP. LIMIT OF DISTURBANCE
PROP. LIGHT TYPE S1 (TYP.)
PROP. HOT MIX ASPHALT PAVEMENT - TYPE 2 (TYP.)
PROP. PLANTING BED (TYP.)
MATCH LINE
11+00
PROP. POROUS PAVEMENT (TYP.)
9+00
PROP. PERIMETER DRAIN AT ARTIST SHANTY
PROP. CONCRETE PAD FOR ARTIST SHANTY (STRUCTURE NIC)
ES GROUP - 17
MATCH LINE
REFER TO SHEET C.5.10 - SITE IMPROVEMENT DETAIL PLAN - 3 - PLAYGROUND
MARSH DEBRIS
SM1 141
SM1 140
SM1 139
SM1 137
SM1 136
SM1 135
SM1 134
SM1 133
SM1 132
SM1 131
SM1 129
SM1 128
SM1 127
SM1 126
SM1 125
SM1 124
SM1 123
SM1 122
SM1 121
SM1 120
UP#

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

SITE IMPROVEMENT PLAN - 3

BID DOCUMENTS

NO.	REVISIONS	DATE

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DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

20 0 20 40

SCALE IN FEET: 1"=20'

Bid Documents

SHEET NO.

C.5.5

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

SITE IMPROVEMENT PLAN - 4

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

20 0 20 40

SCALE IN FEET: 1"=20'

Bid Documents

SHEET NO.

C.5.6

PROP. BOARDWALK - WEST APPROACH PATH
LB GROUP - 37
13+60
LB GROUP - 38
PROP. PARK BENCH (TYP.)
PROP. TACTILE TRAIL SIGN AND MOUNT
EXIST. PROPERTY LINE (TYP.)
PROP. TACTILE TRAIL SIGN AND MOUNT
PROP. STABILIZED AGGREGATE - TRAIL (TYP.)
PROP. LIMIT OF DISTURBANCE
PROP. BENCH WITH COMPANION SEATING (TYP.)
PROP. TACTILE TRAIL SIGN AND MOUNT
PROP. INTERPRETIVE GRAPHIC PANEL
ES GROUP - 38
MATCH LINE
PROP. STONE AT PIPE ENDS
PROP. SITE LIGHT S3 (TYP.)
PROP. INTERPRETIVE GRAPHIC PANEL
PROP. TACTILE TRAIL SIGN AND MOUNT
PROP. TACTILE TRAIL SIGN AND MOUNT
PROP. BOARDWALK - EAST APPROACH PATH
LB GROUP - 35
PROP. TACTILE TRAIL SIGN AND MOUNT
ES GROUP - 30
0+00
LB GROUP - 36
PROP. PARK BENCH (TYP.)
UP#
14+00

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

SITE IMPROVEMENT PLAN - 5

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

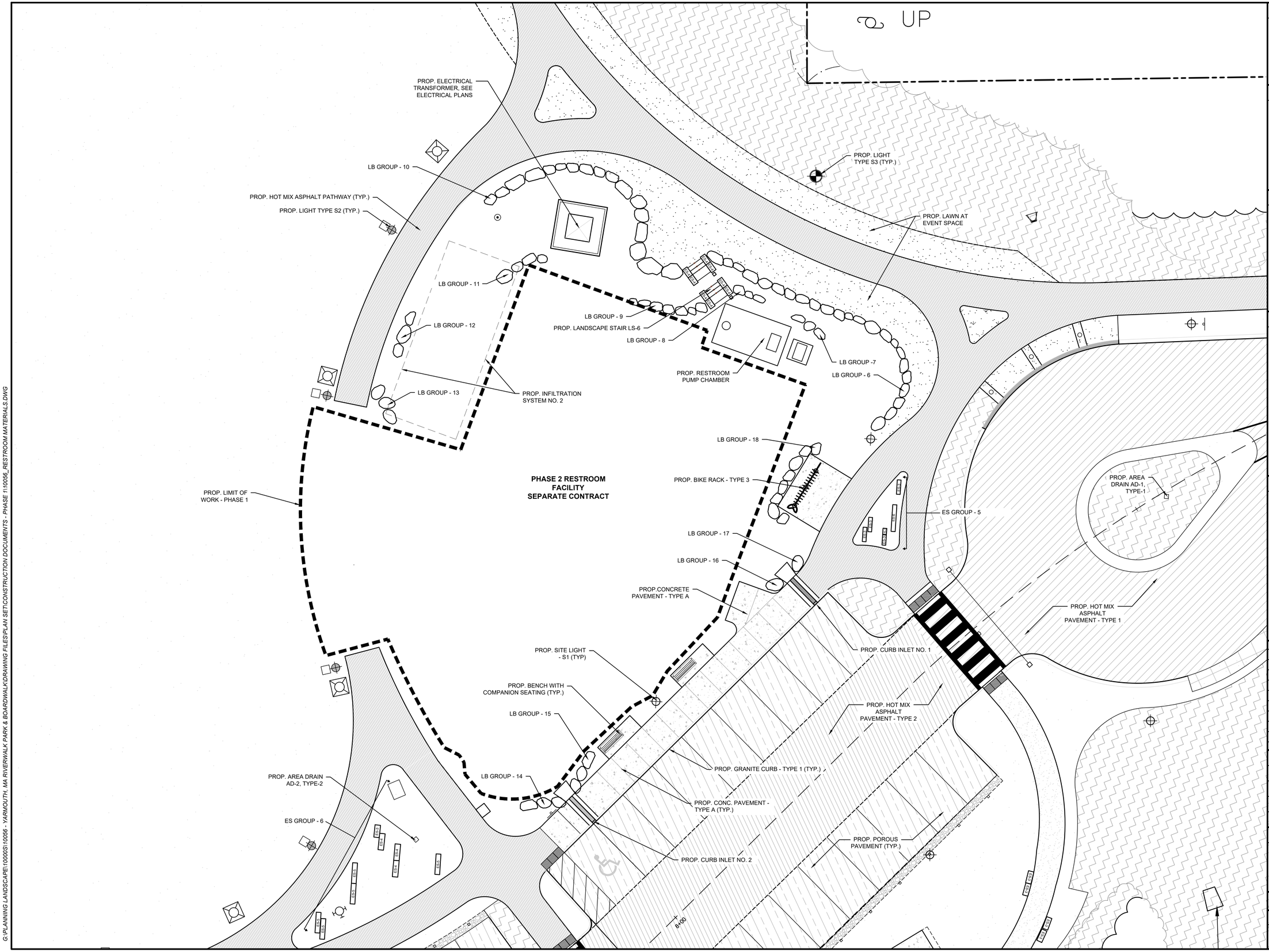
SCALE

20 0 20 40
SCALE IN FEET: 1"=20'

Bid Documents

SHEET NO.

C.5.7



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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

SITE IMPROVEMENT DETAIL PLAN - 1

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

10 0 10 20

SCALE IN FEET: 1"=10'

Bid Documents

SHEET NO.

C.5.8

UP

7'-9"

7'-4"

8"

8'-10"

N=2699057.91
E=1004910.44

N=2699065.45
E=1004915.36

8'

11'-10"

15'

8'

6'

6'-3"

R2'

10'

R2'

8'-6"

13.83

23.74

8'

8'

6.00

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

SITE IMPROVEMENT DETAIL PLAN - 2

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

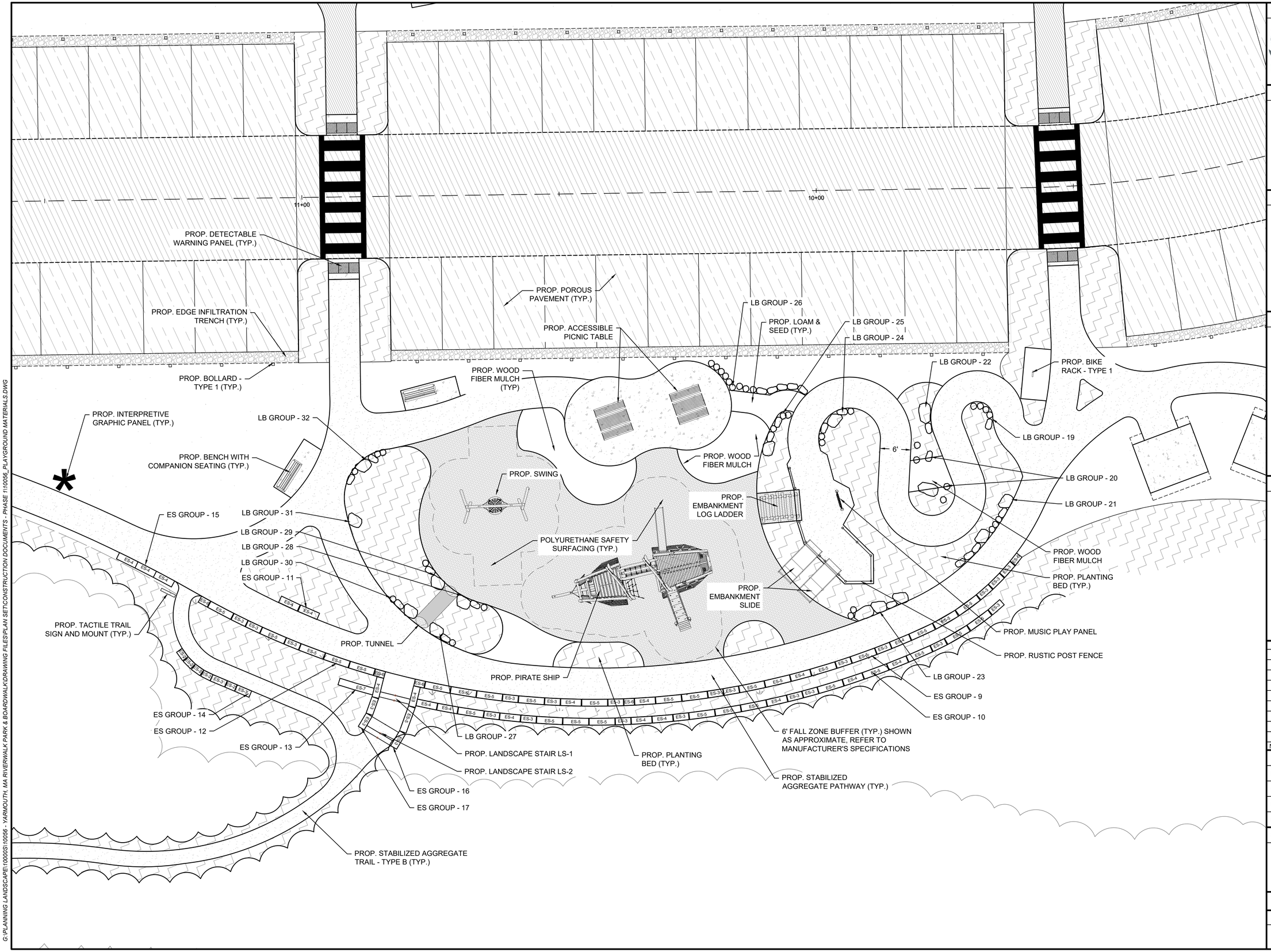
10 0 10 20

SCALE IN FEET: 1"=10'

Bid Documents

SHEET NO.

C.5.9



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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

SITE IMPROVEMENT DETAIL PLAN - 3 - PLAYGROUND

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

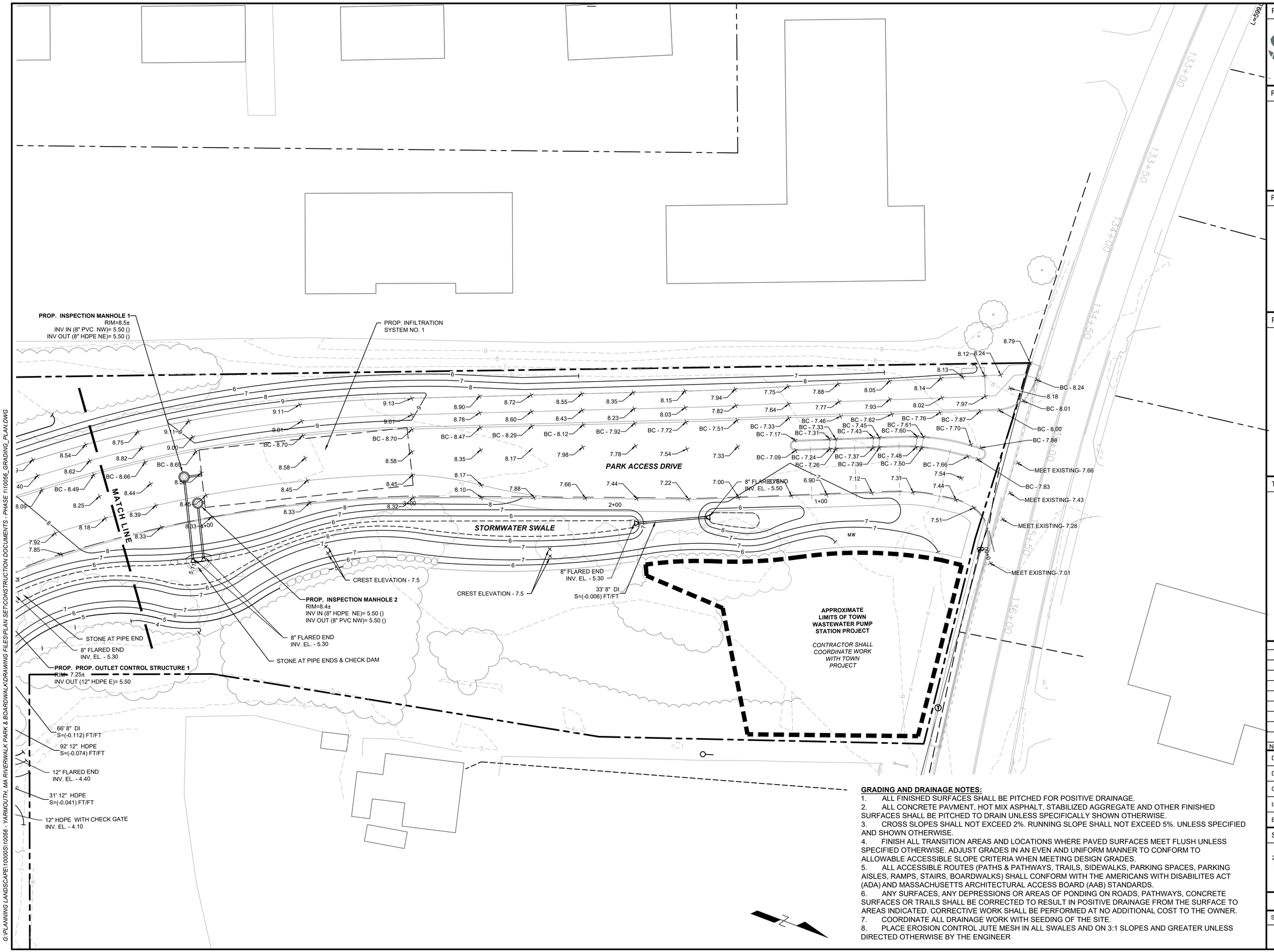
8 0 8 16

SCALE IN FEET: 1"=8'

Bid Documents

SHEET NO.

C.5.10



GRADING AND DRAINAGE NOTES:

1. ALL FINISHED SURFACES SHALL BE PITCHED FOR POSITIVE DRAINAGE.
2. ALL CONCRETE PAVMENT, HOT MIX ASPHALT, STABILIZED AGGREGATE AND OTHER FINISHED SURFACES SHALL BE PITCHED TO DRAIN UNLESS SPECIFICALLY SHOWN OTHERWISE.
3. CROSS SLOPES SHALL NOT EXCEED 2%. RUNNING SLOPE SHALL NOT EXCEED 5%. UNLESS SPECIFIED AND SHOWN OTHERWISE.
4. FINISH ALL TRANSITION AREAS AND LOCATIONS WHERE PAVED SURFACES MEET FLUSH UNLESS SPECIFIED OTHERWISE. ADJUST GRADES IN AN EVEN AND UNIFORM MANNER TO CONFORM TO ALLOWABLE ACCESSIBLE SLOPE CRITERIA WHEN MEETING DESIGN GRADES.
5. ALL ACCESSIBLE ROUTES (PATHS & PATHWAYS, TRAILS, SIDEWALKS, PARKING SPACES, PARKING AISLES, RAMPS, STAIRS, BOARDWALKS) SHALL CONFORM WITH THE AMERICANS WITH DISABILITES ACT (ADA) AND MASSACHUSETTS ARCHITECTURAL ACCESS BOARD (AAB) STANDARDS.
6. ANY SURFACES, ANY DEPRESSIONS OR AREAS OF PONDING ON ROADS, PATHWAYS, CONCRETE SURFACES OR TRAILS SHALL BE CORRECTED TO RESULT IN POSITIVE DRAINAGE FROM THE SURFACE TO AREAS INDICATED. CORRECTIVE WORK SHALL BE PERFORMED AT NO ADDITIONAL COST TO THE OWNER.
7. COORDINATE ALL DRAINAGE WORK WITH SEEDING OF THE SITE.
8. PLACE EROSION CONTROL JUTE MESH IN ALL SWALES AND ON 3:1 SLOPES AND GREATER UNLESS DIRECTED OTHERWISE BY THE ENGINEER

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

GRADING PLAN - 1

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
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BETA JOB NO.:	10056

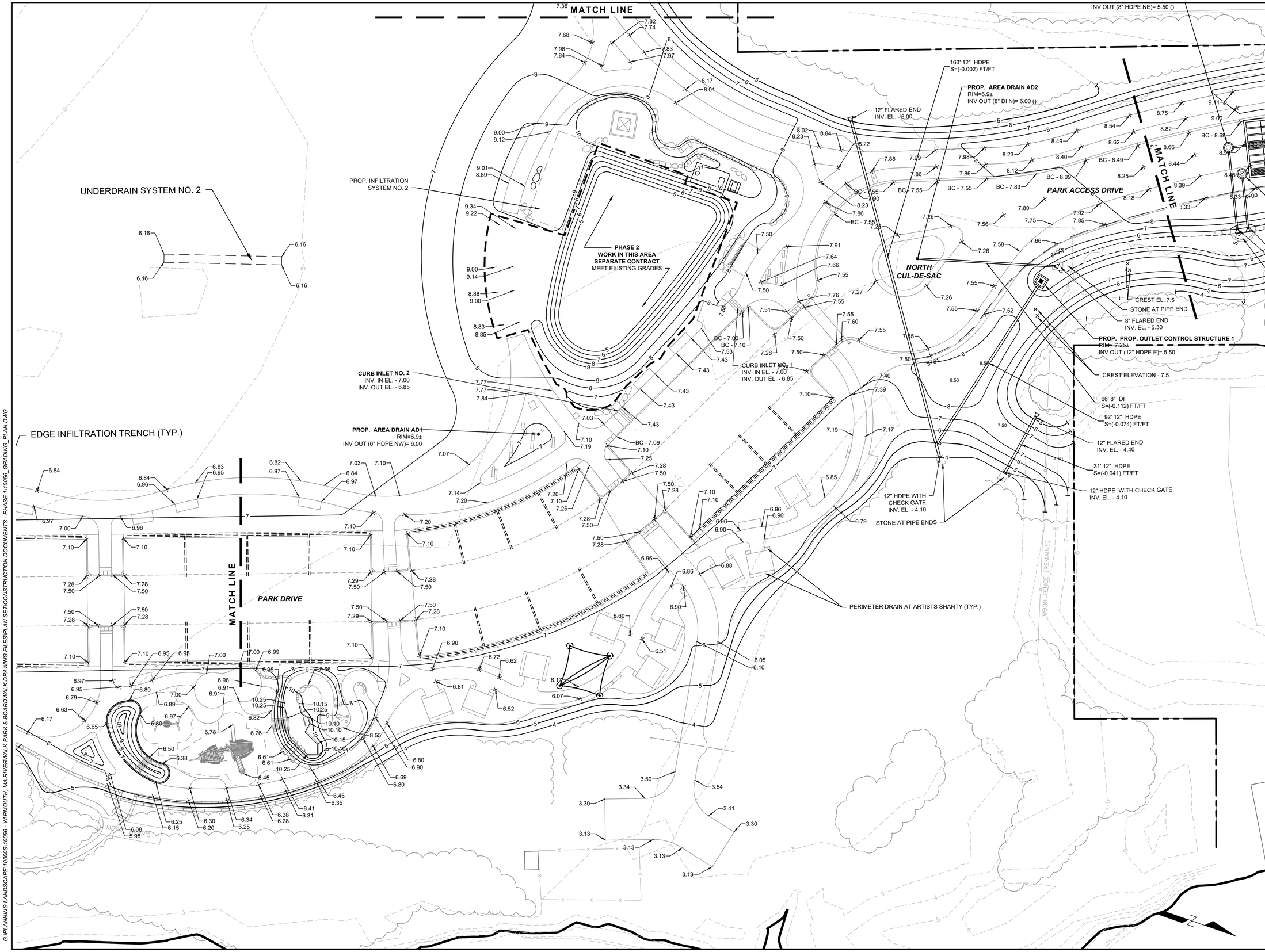
SCALE

20 0 20 40
SCALE IN FEET: 1"=20'

Bid Documents

SHEET NO.

C.6.1



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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

GRADING PLAN - 2

BID DOCUMENTS

NO.	REVISIONS	DATE

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SCALE

20 0 20 40

SCALE IN FEET: 1"=20'

Bid Documents

SHEET NO.

C.6.2

MATCH LINE

MATCH LINE

MATCH LINE

ONE AT PIPE ENDS
12" FLARED END
INV. EL. - 4.00

86' 12" HDPE
S=(-0.008) FT/FT

PROP. OUTLET CONTROL STRUCTURE 2
RIM=7.0±
INV OUT (12" HDPE SW)=4.65 ()

INFILTRATION BASIN NO. 1

CURB INLET NO. 3
INV. IN EL. - 6.75
INV. OUT EL. - 6.50

6" INV. OUT EL. - 5.25

24' 6" HDPE
S=(-0.010) FT/FT

PROP. AREA DRAIN AD3
RIM=7.2±
INV OUT (6" HDPE SW)=5.50

SOUTH CUL-DE-SAC

PROP. EDGE INFILTRATION TRENCH (TYP.)

PARK DRIVE

PLAYGROUND AREA

CURB INLET NO. 2
INV. IN EL. - 7.00
INV. OUT EL. - 6.85

PROP. AREA DRAIN AD1
RIM=6.9±
INV OUT (6" HDPE NW)= 6.00

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

GRADING PLAN - 3

BID DOCUMENTS

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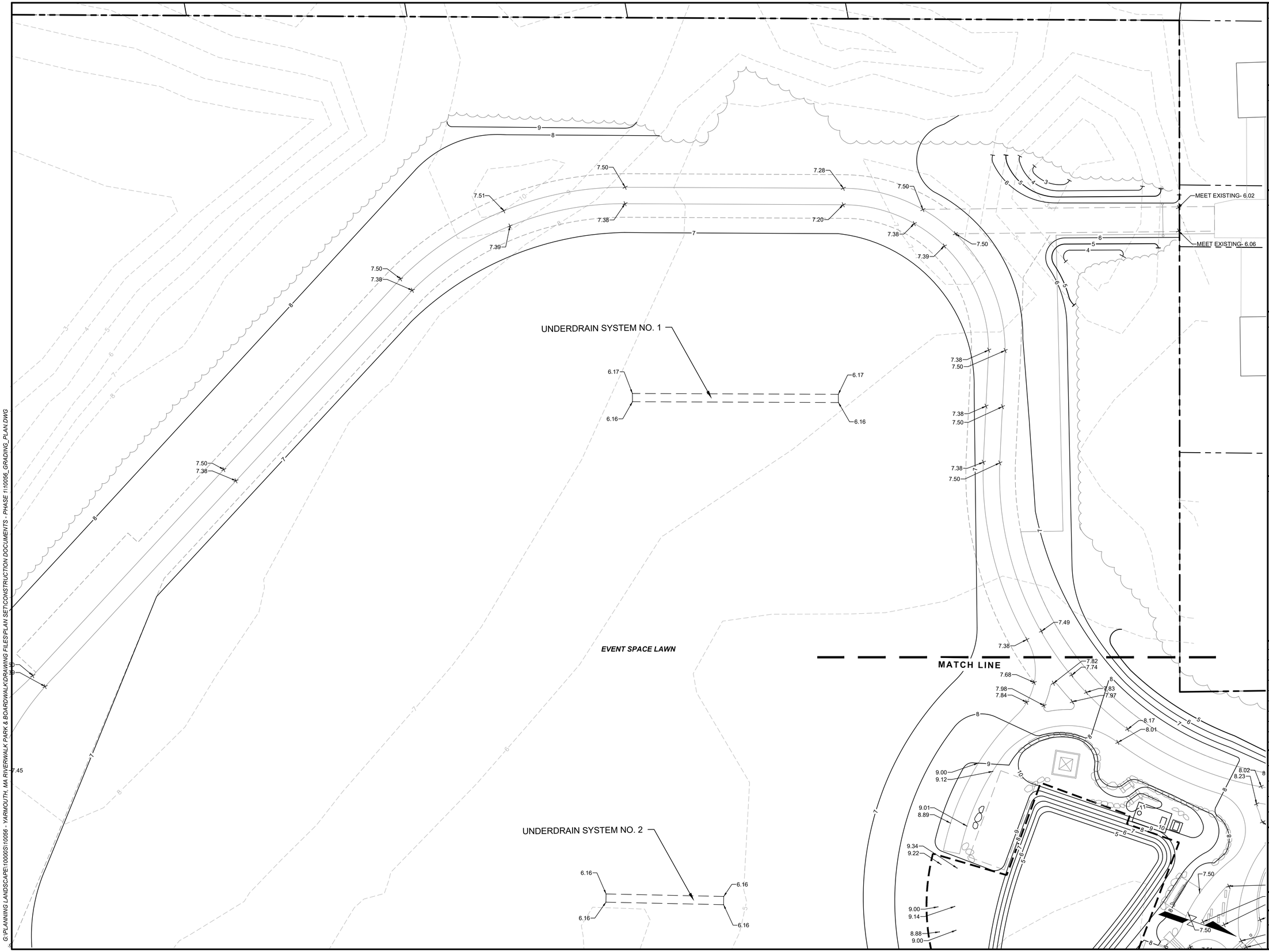
SCALE

20 0 20 40
SCALE IN FEET: 1"=20'

Bid Documents

SHEET NO.

C.6.3



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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

GRADING PLAN - 4

BID DOCUMENTS

NO.	REVISIONS	DATE

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ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

20 0 20 40

SCALE IN FEET: 1"=20'

Bid Documents

SHEET NO.

C.6.4

(IVW 2)

13+00

13+60

5.22
5.14
5.12
5.04
4.87
4.93
5.05
4.99
5.25
5.19
5.48
5.42
5.34
5.40
5.34
5.28
5.34
5.40
5.53
5.47
5.09
5.05
4.99
4.96
4.90
5.02
4.27
4.21
5.47
5.41
4.94
5.00
4.61
4.67
4.67
4.61
4.65
4.59
4.73
4.67
4.83
4.76
4.09
4.03
4.09
4.03
5.52
5.52
5.52
5.52
5.52
4.91
4.50
5.46
5.42
5.46
5.42
5.46
5.46
5.46
4.85
4.44

MATCH LINE

4.26
4.32
4.32
4.26
6.70
6.70
7.47
7.37
7.36
6.85
6.85
7.48
7.42
7.60

STONE AT PIPE ENDS

12" FLARED END
INV. EL. - 4.00

86' 12" HDPE
S=(-0.008) FT/FT

PROP. OUTLET CONTROL STRUCTURE 2
RIM=7.0±
INV OUT (12" HDPE SW)=4.65 ()

CURB INLET NO. 3
INV. IN EL. - 6.75
INV. OUT EL. - 6.50

6" INV. OUT EL. - 5.25

24' 6" HDPE
S=(-0.[illegible]) FT/FT

PROP. AREA DRAIN AD3
RIM=7.2±

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

GRADING PLAN - 5

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
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SCALE

20 0 20 40
SCALE IN FEET: 1"=20'

Bid Documents

SHEET NO.

C.6.5

PROP. INFILTRATION SYSTEM NO. 2

PROP. TRANSFORMER PAD EL. 10.5

PROP. RESTROOM FACILITY PUMP CHAMBER

BS - 9.00
TS - 10.00

BS - 10.00
TS - 11.00

LIMIT OF WORK PHASE 1

MEET AND MATCH EXISTING GRADES

PROP. AREA DRAIN AD1
RIM=6.9±
INV OUT (6" HDPE NW)= 6.00

BC - 7.55

BC - 7.00

BC - 7.10

BC - 7.09

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

GRADING DETAIL PLAN - RESTROOM FACILITY

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
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ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

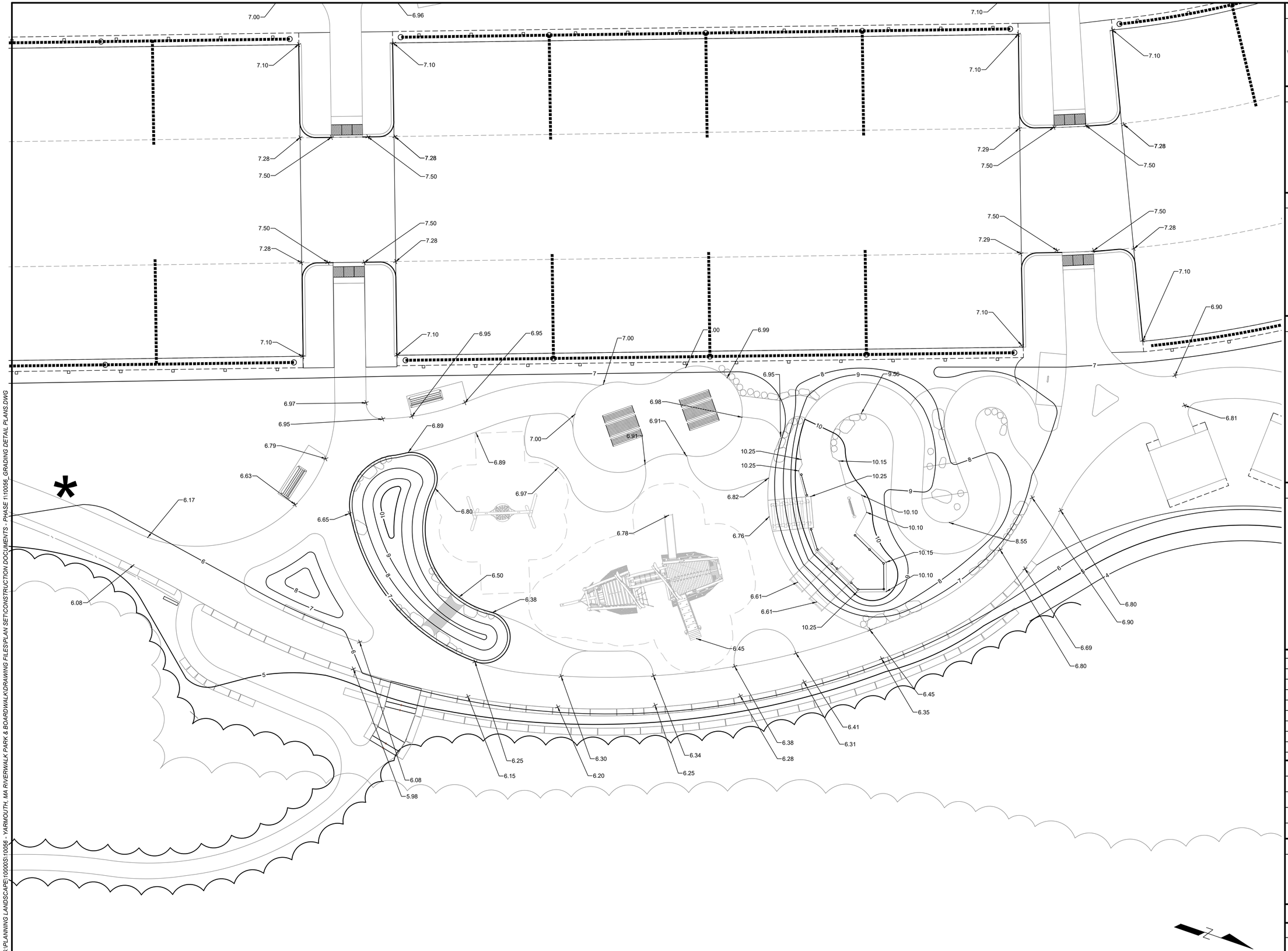
SCALE

10 0 10 20
SCALE IN FEET: 1"=10'

Bid Documents

SHEET NO.

C.6.6



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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

GRADING DETAIL PLAN - PLAYGROUND

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

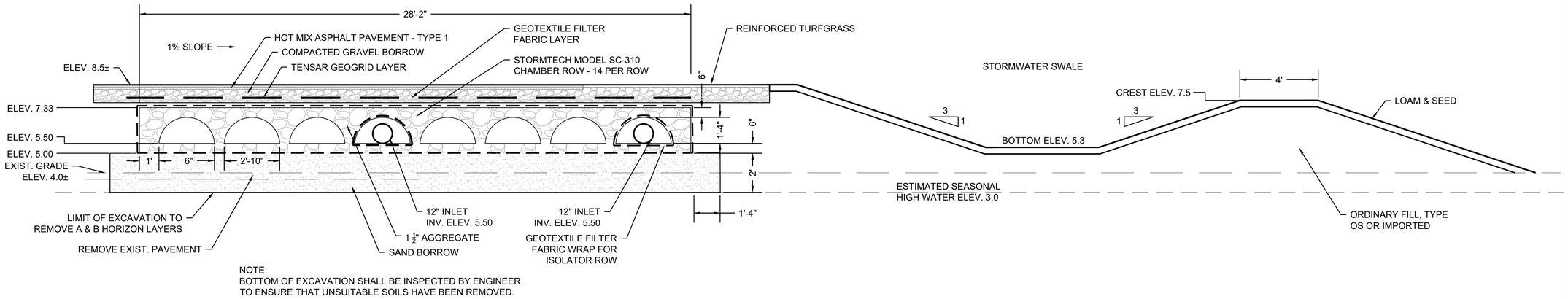
5 0 5 10 20

SCALE IN FEET: 1/8"=1'-0"

Bid Documents

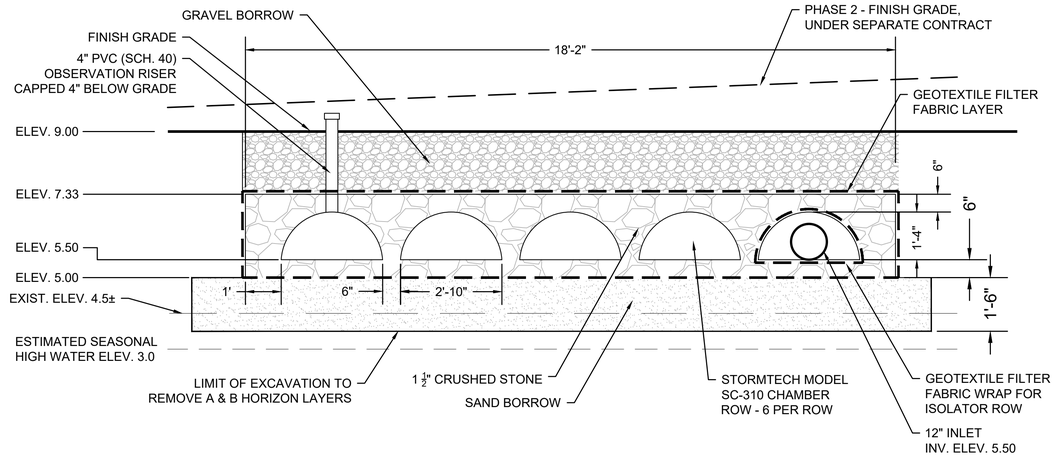
SHEET NO.

C.6.7

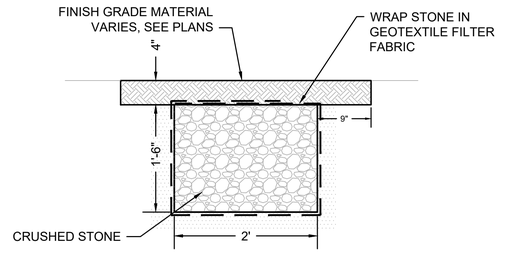


NOTE:
BOTTOM OF EXCAVATION SHALL BE INSPECTED BY ENGINEER TO ENSURE THAT UNSUITABLE SOILS HAVE BEEN REMOVED.

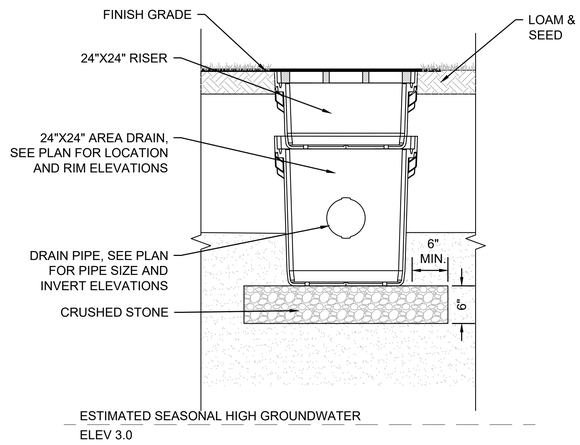
INFILTRATION SYSTEM NO. 1 - ACCESS DRIVEWAY
SCALE: 3/8"=1'–0"



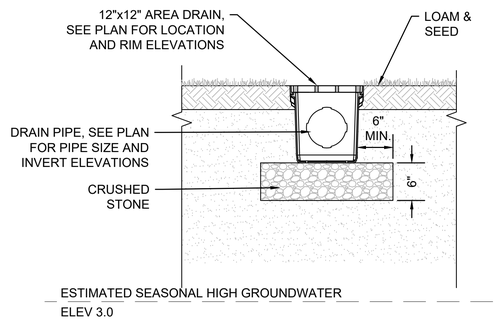
INFILTRATION SYSTEM NO. 2 - RESTROOM FACILITY
SCALE: ½"=1'–0"



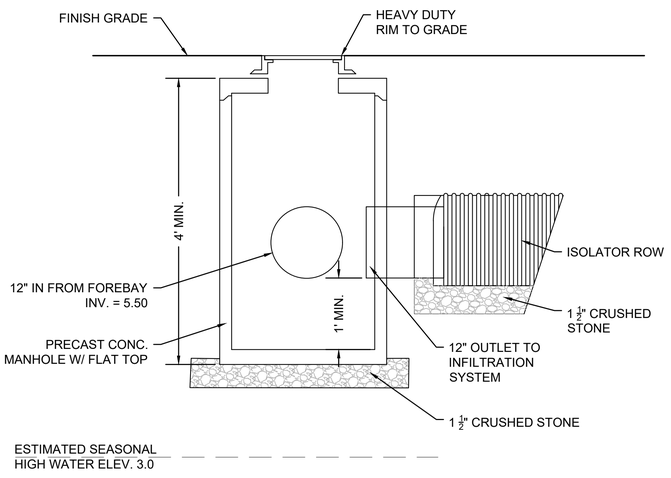
UNDERDRAIN SYSTEM
SCALE: 1"=1'–0"



AREA DRAIN - TYPE I
SCALE: 1"=1'–0"



AREA DRAIN - TYPE II
SCALE: 1"=1'–0"



INSPECTION MANHOLE
SCALE: 1"=1'–0"

G:\PLANNING LANDSCAPE\10000S\10056 - YARMOUTH, MA RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLAN SET\CONSTRUCTION DOCUMENTS - PHASE 1\10056_DRAINAGE DETAILS.DWG

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

DRAINAGE DETAILS - 1

BID DOCUMENTS

NO.	REVISIONS	DATE

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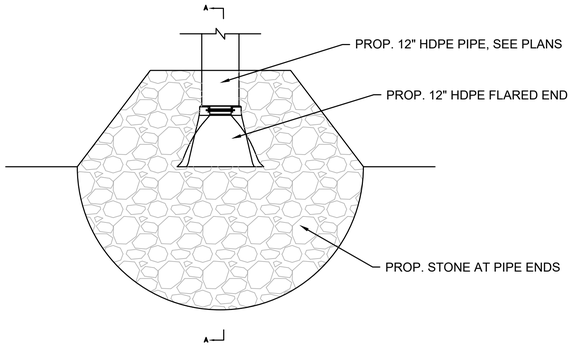
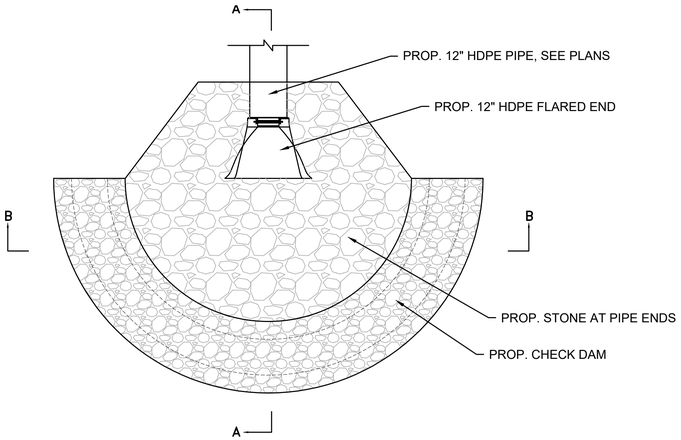
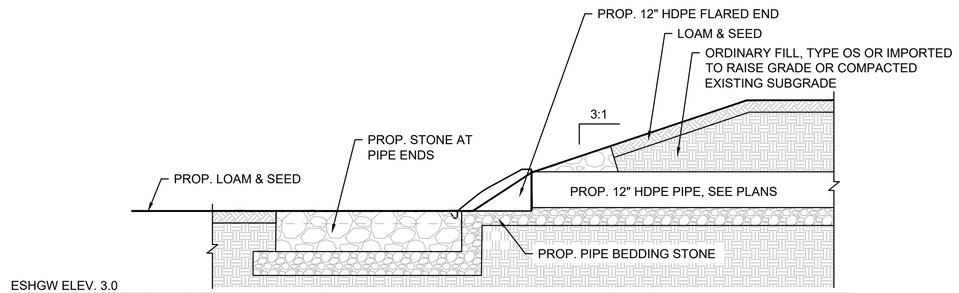


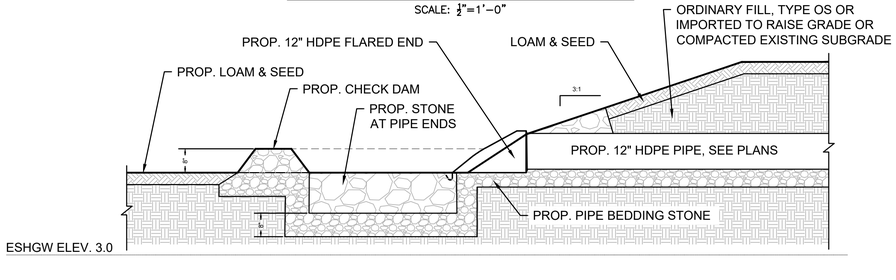
STONE AT PIPE ENDS - PLAN
SCALE: ½"=1'–0"



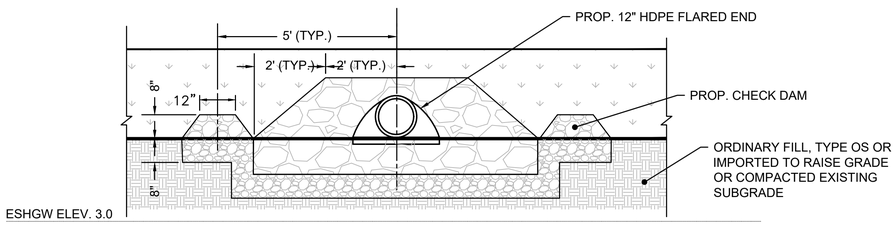
STONE AT PIPE ENDS AND CHECK DAM - PLAN
SCALE: ½"=1'–0"



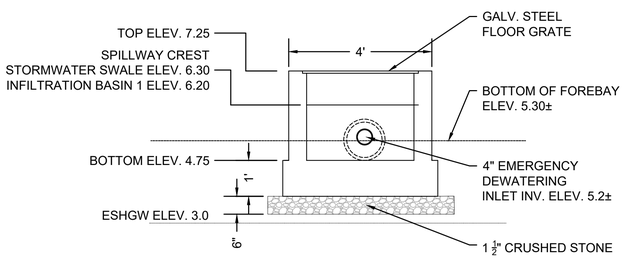
STONE AT PIPE ENDS - SECTION A - A
SCALE: ½"=1'–0"



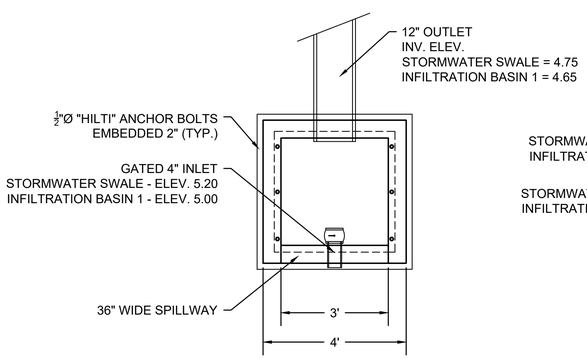
STONE AT PIPE ENDS AND CHECK DAM - SECTION A - A
SCALE: ½"=1'–0"



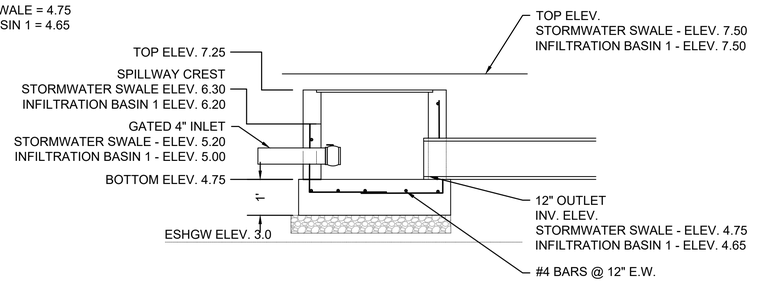
STONE AT PIPE ENDS AND CHECK DAM - ELEVATION B - B
SCALE: ½"=1'–0"



OUTLET CONTROL STRUCTURE - ELEVATION
SCALE: ½"=1'–0"



OUTLET CONTROL STRUCTURE - PLAN
SCALE: ½"=1'–0"



OUTLET CONTROL STRUCTURE - SECTION
SCALE: ½"=1'–0"

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

DRAINAGE DETAILS - 2

BID DOCUMENTS

NO.	REVISIONS	DATE

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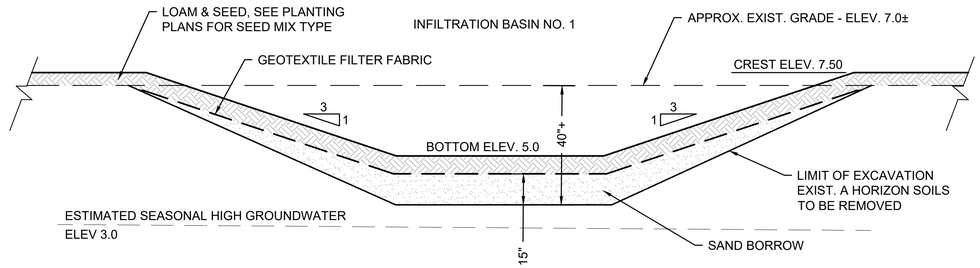
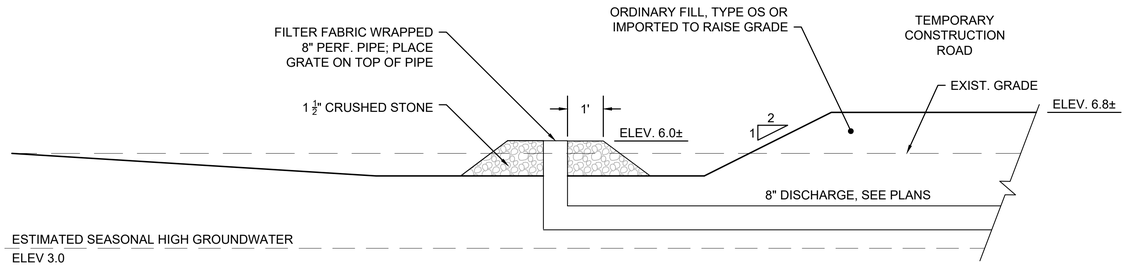


INFILTRATION BASIN NO. 1
SCALE: 1"=1'-0"



TEMPORARY SEDIMENT BASIN
SCALE: 1"=1'-0"

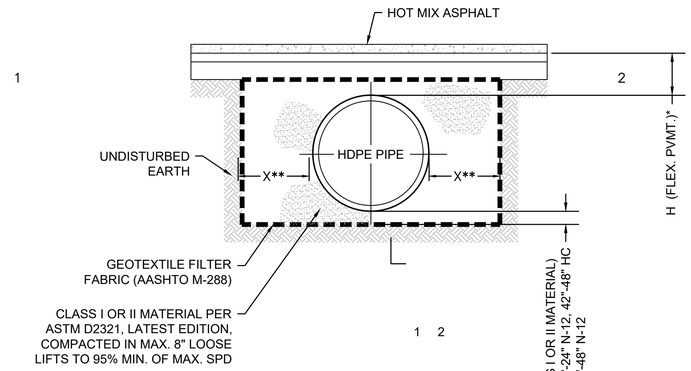


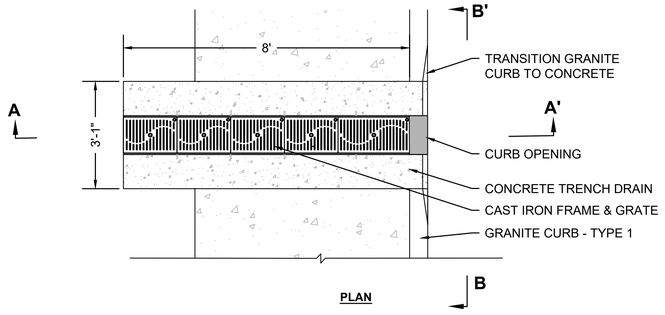
TABLE 1	
NOMINAL DIAMETER, IN (MM)	X (MIN.), FT (M)
12 (300)	0.69 (0.21)
15 (375)	0.68 (0.21)
18 (450)	0.74 (0.23)
24 (600)	0.84 (0.26)
30 (750)	1.5 (0.46)
36 (900)	1.5 (0.46)
42 (1050)	1.5 (0.46)
48 (1200)	1.5 (0.46)

*H , H = 12" FOR UP TO AND INCLUDING 36" N-12

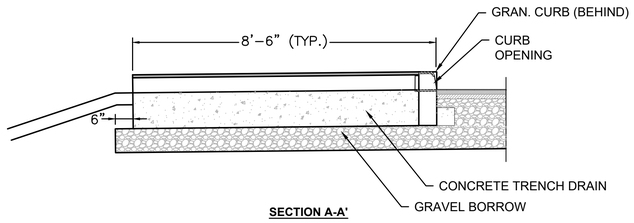
=24" FOR 42"-48" N-12

**SEE TABLE 1

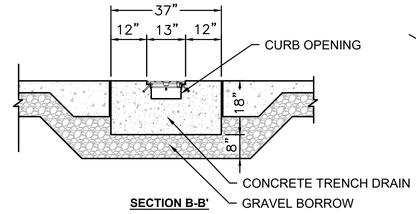
TYPICAL SUB-SURFACE TRENCH DETAIL
NOT TO SCALE



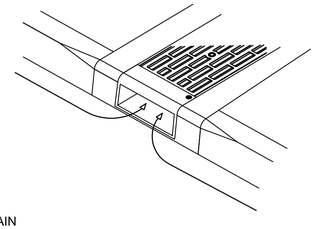
PLAN



SECTION A-A'

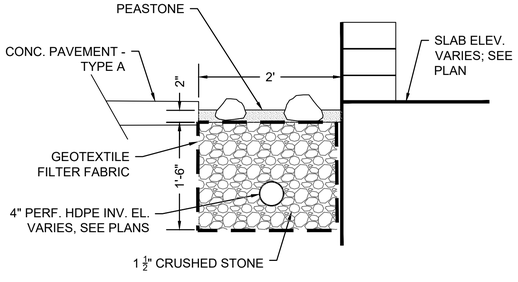


SECTION B-B'

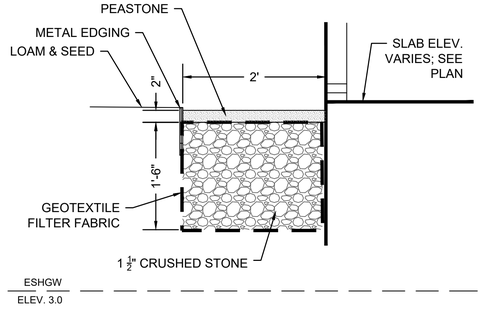


AXON

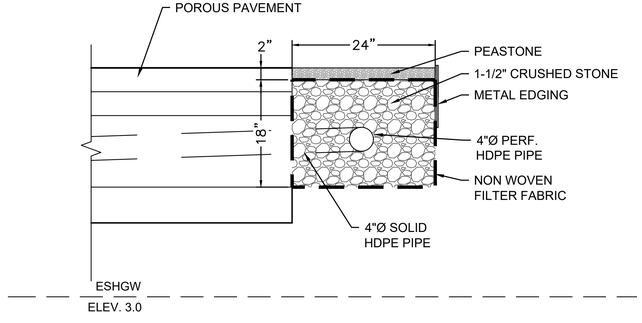
CURB INLET
SCALE: 1"=1'-0"



PERIMETER DRAIN AT RESTROOM
SCALE: 1"=1'-0"



PERIMETER DRAIN AT ARTIST/KAYAK SHANTY
SCALE: 1"=1'-0"



EDGE INFILTRATION TRENCH
SCALE: 1"=1'-0"

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

DRAINAGE DETAILS - 3

BID DOCUMENTS

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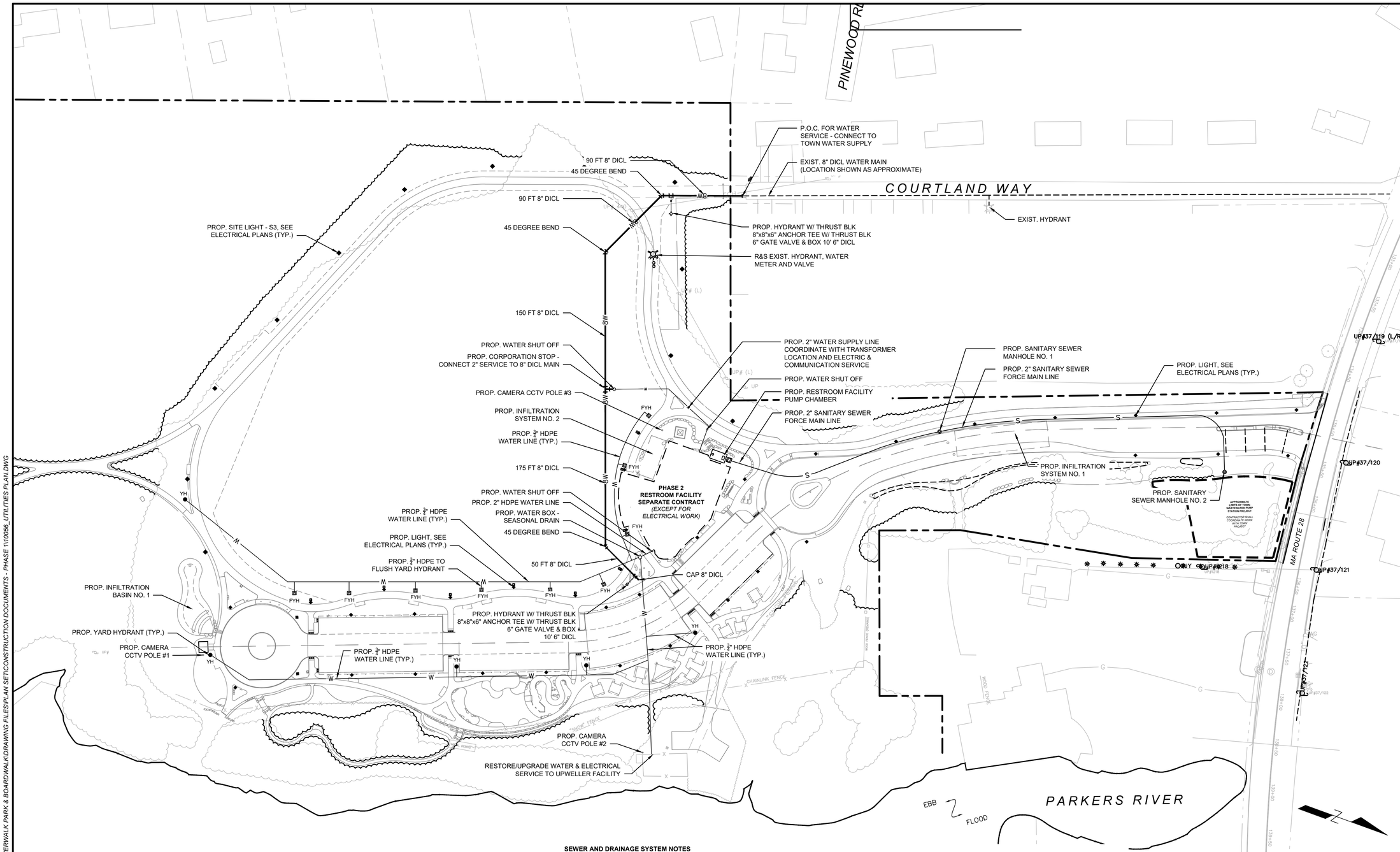

SEWER AND DRAINAGE SYSTEM NOTES

1. THE TERM "PROPOSED" (PROP) MEANS WORK TO BE CONSTRUCTED USING NEW MATERIALS OR WHERE APPLICABLE, RE-USING EXISTING MATERIALS IDENTIFIED AS "REMOVE AND RESET" (R&R).
2. WHERE EXISTING MATERIALS ARE ENCOUNTERED THAT, IN THE OPINION OF THE OWNER/ENGINEER ARE UNSUITABLE FOR BEDDING, BACK FILLING OR OTHER INTENDED USE, SUCH MATERIALS SHALL BE REMOVED AS DIRECTED AND REPLACED WITH SUITABLE GRAVEL BORROW, CRUSHED STONE AND/OR SELECTED BORROW, AS DIRECTED BY THE OWNER/ENGINEER AND PAID FOR UNDER THE APPROPRIATE BID ITEMS.
3. INVERTS AND DIRECTIONS OF PIPES AND CONDUITS ARE SHOWN FOR THE PURPOSE OF INDICATING THE BASIC PARAMETERS USED DURING THE HOWEVER, MINOR CHANGES IN HORIZONTAL AND VERTICAL LOCATIONS MAY BE REQUIRED DURING CONSTRUCTION AS FIELD CONDITIONS WARRANT. FINAL LOCATIONS OF OTHER PIPES AND/OR CONDUITS SHALL BE DETERMINED IN THE FIELD. ANY CHANGES SHALL BE APPROVED BY THE ENGINEER.
4. SEWER AND DRAIN SERVICE CONNECTIONS ARE GENERALLY LOCATED FOR EXACT LOCATIONS SHALL BE COORDINATED WITH OTHER UTILITIES IN THE FIELD.
5. UNLESS OTHERWISE STIPULATED, ALL DRAINAGE PIPE SHALL BE AS INDICATED ON THE DRAWINGS, AND UNLESS SPECIFICALLY APPROVED BY THE ENGINEER, MANHOLES OR CATCH BASINS SHALL BE PRECAST CONCRETE STRUCTURES

WATER SYSTEM NOTES:

1. MINIMUM WATER PIPE COVER SHALL BE 5'-0" EXCEPT AS OTHERWISE INDICATED ON THE DRAWINGS OR APPROVED BY THE ENGINEER.
2. EXCEPT WHERE OTHERWISE NOTED, 18" MINIMUM VERTICAL CLEARANCE SHALL BE PROVIDED BETWEEN THE EXTERIOR OF WATER MAINS AND OTHER UTILITIES.
3. ALL WATER UTILITY IMPROVEMENTS SHALL COMPLY WITH THE APPLICABLE AMERICAN WATER WORKS ASSOCIATION (AWWA) STANDARDS AND TOWN OF YARMOUTH WATER DEPARTMENT RULES AND REGULATIONS, INCLUDING ALL ERRATA. IN CASE OF CONFLICT, THE MORE STRINGENT REQUIREMENTS SHALL GOVERN.
4. PIPE TAPPING SLEEVES AND REPAIR CLAMPS SHALL BE MADE OF STAINLESS STEEL AND PROVIDED WITH TYPE 304 STAINLESS STEEL BOLTS AND NUTS.
5. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT ANY DWELLINGS/BUILDINGS WITH WATER SERVICES AFFECTED BY THE PROPOSED WORK BE PROVIDED WITH TEMPORARY WATER SERVICE, INCLUDING BUT NOT LIMITED TO THE OWNER'S UPWELLER FACILITY.

LEGEND

- DICL WATER LINE
- 2" WATER LINE, REFER TO PLAN FOR TYPE
- W — ¾" HDPE WATER LINE
- S — SANITARY SEWER FORCE MAIN LINE
- YH — YARD HYDRANT
- FYH — FLUSH MOUNT YARD HYDRANT

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

SITE UTILITY PLAN

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
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ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

50 0 50 100

SCALE IN FEET: 1"=50'

Bid Documents

SHEET NO.

U.1.1

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PROP. CAMERA CCTV POLE #3

FYH

PROP. 2" WATER SUPPLY LINE
COORDINATE WITH TRANSFORMER LOCATION AND ELECTRIC & COMMUNICATION SERVICE

PROP. WATER SHUT OFF

PROP. RESTROOM
FACILITY PUMP CHAMBER

PROP. $\frac{3}{4}$" HDPE
WATER LINE (TYP.)

PROP. INFILTRATION
SYSTEM NO. 2

PHASE 2 BOUNDARY

PROP. 2" SANITARY SEWER
FORCE MAIN LINE

175 FT 8" DICL

RESTROOM FACILITY

PHASE 2 BOUNDARY

PHASE 2 BOUNDARY

PHASE 2
RESTROOM FACILITY
SEPARATE CONTRACT
(EXCEPT FOR
ELECTRICAL WORK)

PROP. WATER BOX -
SEASONAL DRAIN

PROP. 2" HDPE WATER LINE

PROP. WATER SHUT OFF

45 DEGREE BEND

50 FT 8" DICL

PROP. HYDRANT W/ THRUST BLK
8"x8"x6" ANCHOR TEE W/ THRUST BLK
6" GATE VALVE & BOX
10' 6" DICL

CAP 8" DICL

FYH

LEGEND

- DICL WATER LINE
- 2" WATER LINE, REFER TO PLAN FOR TYPE
- W — $\frac{3}{4}$" HDPE WATER LINE
- S — SANITARY SEWER FORCE MAIN LINE
- YH — YARD HYDRANT
- FYH — FLUSH MOUNT YARD HYDRANT

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PROJECT

RIVERWALK PARK,
BOARDWALK LOOP
& EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

SITE UTILITY
ENLARGEMENT PLAN

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BETA JOB NO.:	10056

SCALE

20 0 20 40

SCALE IN FEET: 1"=20'

Bid Documents

SHEET NO.

U.1.2

I. PROPOSED RESTROOM FACILITY GENERAL NOTES:

1. THE PROPOSED USE OF THE SEPTIC TANK AS A 'TIGHT-TANK- SHALL BE FOR SEASONAL USE, ON A TEMPORARY BASIS UNTIL THE CONSTRUCTION OF THE TOWN'S WASTEWATER COLLECTION AND TREATMENT SYSTEM IS COMPLETED AND PUMP STATION 03 (PS-03) AT ROUTE 28 IS FUNCTIONAL.
2. ALL PROPOSED VALVES, MANHOLES AND FORCE MAIN SEWER PIPING FROM THE SEPTIC TANK TO THE LOCATION OF THE PROPOSED PS-03 SHALL BE INSTALLED AS PART OF THE RIVERWALK PARK IMPROVEMENTS.
3. THE TWO PUMPS SHOWN AND FINAL WIRING SHALL BE ADDED AS PART OF A FUTURE CONTRACT.
4. REFER TO SPECIFICATIONS FOR INFORMATION REGARDING DEWATERING AND EXCAVATION SUPPORT.

II. PROPOSED RESTROOM FACILITY PUMP CHAMBER NOTES:

NOTES:

1. ALARM & POWER SUPPLY CABLES SHALL BE CONNECTED TO SEPARATE POWER SUPPLY CIRCUITS.
2. ALARM PANEL SHALL BE EQUIPPED WITH BOTH VISIBLE AND AUDIBLE ALARMS WITH INDICATOR LIGHT WHICH ILLUMINATES TO SHOW WHEN PUMP IS OPERATING. ALARM SHALL ALSO PROVIDE A PHONE CALL OR SMS MESSAGE TO THE TOWN'S DPW OFFICE.
3. PANEL SHALL BE EQUIPPED WITH AN HOUR METER WHICH SHALL DISPLAY THE LENGTH OF OPERATION FOR EACH PUMP.
4. ALARM PANEL SHALL BE VISIBLY MOUNTED IN THE AREA OF THE STATIONS AS SHOWN ON LAYOUT SHEET A PERMANENT PLAQUE SHALL BE MOUNTED ON THE PANEL TO ADVISE THE APPLICANT WHO AND HOW TO REACH THE PERSON RESPONSIBLE FOR THE MAINTENANCE AND REPAIR OF THE PUMPS IF THE ALARM SHOULD SOUND.
5. PUMPS SHALL CYCLE AND RUN ALTERNATIVELY EACH TIME.
   OPERATING RANGE = 500 GALLONS
   TIME TO DISCHARGE = 500/30 = 16.6 MINUTES
   VOLUME IN MAIN = 106 GALLONS OK
6. EMERGENCY STORAGE PROVIDED

= 2,5 (1,000 G/VLF)
= 2,500 GALLONS

III. PROPOSED RESTROOM FACILITY STORAGE VOLUME

STORAGE VOLUME

DAILY FLOW = 160 PEOPLE/DAY @ 5 GAL./PERSON/DAY
= 800 GALLONS

STORAGE VOLUME PROVIDED TO ALARM = 9'-0" [4.75] 16.0 = 684 CU. FT.
= 5,116.3 GALLONS

EMERGENCY STORAGE ABOVE ALARM = 0.83' = 894 GALLONS OR > 1 DAY

TOTAL VOLUME = 6,000 GALLONS
= 7.5 DAYS @ 100% CAPACITY

IV. PUMP CALCULATIONS

1. FLOW RATE ASSUME 30 gpm
   FORCE MAIN 2" Ø HDPE - 650'
   VELOCITY IN MAIN = 0.067 cfs / 0.0218 sq. ft. = 3.08 ft/sec
   VELOCITY HEAD = 0.28'
   FRICTION SLOPE = 0.061

2. TOTAL LOSSES
   FRICTION 37.5'
   GATE VALVE 1.0'
   ELBOWS 0.5'
   TOTAL LIFT = 8'-2.0' = 6'
   TOTAL LOSS = 45'

3. TOTAL HEAD REQUIRED = 45'
   PUMP SHOULD DELIVER 30 GPM AT 45'

V. BUOYANCY CALCULATIONS

1. DETERMINE TOTAL WEIGHT OF TANK

Weight of Tank Walls
= 2(0.5x6)(17.0 + 9.0)150 lbs/c.f.
= 156.0 c.f. (150 lbs/ c.f.)
= 23,400.0 lbs.

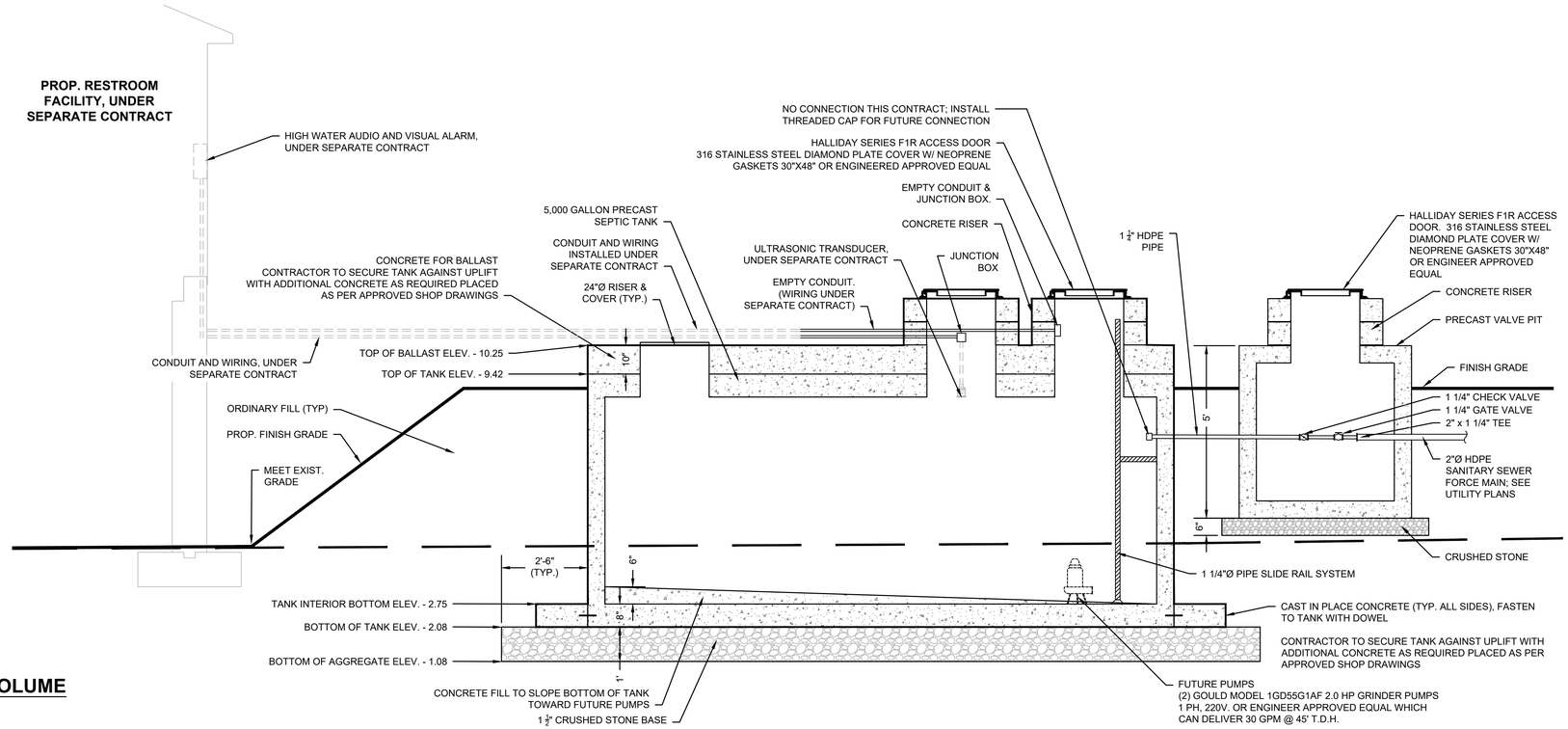
Top & Bottom Slab
= (10 x 17.0)1.42)(150 lbs/c.f.)
= 241.4 c.f. (150 lbs/c.f.)
= 36,210.0 lbs.

TOTAL WEIGHT = 59,610.0 lbs.

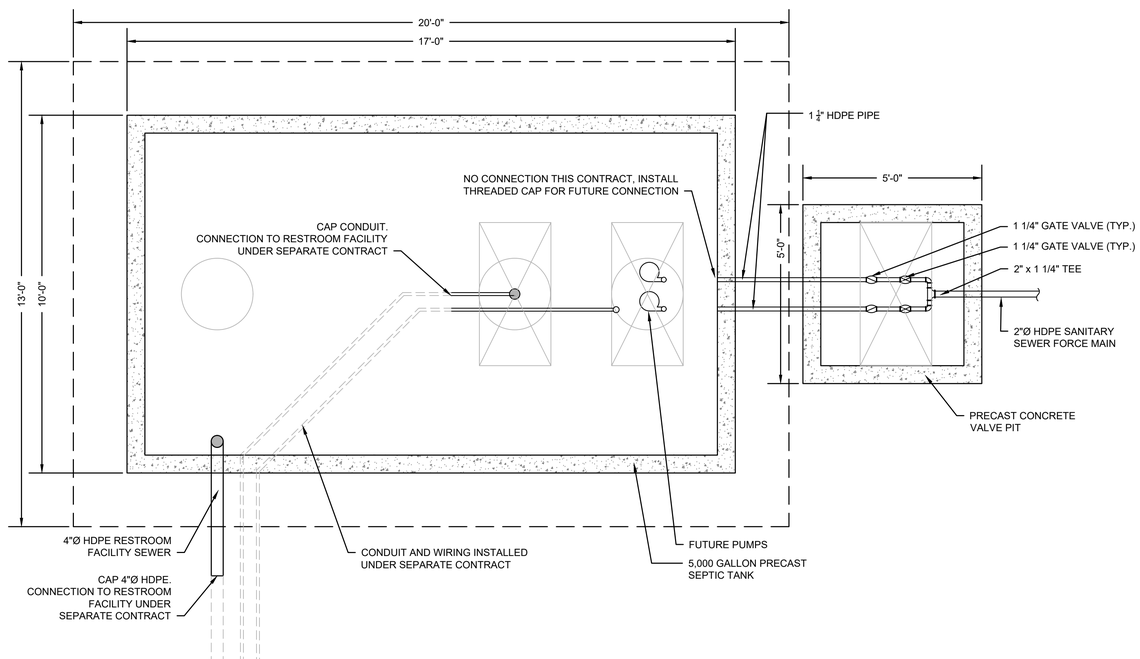
2. BUOYANCY FORCE
Assume Total Submergence depth 7.43'
Force = 10(17)7.43(62.4 lbs/c.f.)
= 78,817.4 lbs.

3. FACTOR OF SAFETY
FOR BALLAST PLACE 10" OF CONCRETE ON TOP OF TANK
WEIGHT = 10(17)0.83(150) = 21,165 lbs.
Total Weight =59,610 +21,165 = 80,775 lbs.

FACTOR OF SAFETY = WEIGHT / BUOYANCY
= 80,775 lbs. / 78,817.4 lbs
= 1.02 ok



RESTROOM FACILITY PUMP CHAMBER - SECTION
SCALE: ½" = 1'-0"



RESTROOM FACILITY PUMP CHAMBER - PLAN
SCALE: ½" = 1'-0"

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PHASE 1

West Yarmouth, MA

TITLE

SITE UTILITY DETAILS - RESTROOM FACILITY PUMP CHAMBER

BID DOCUMENTS

NO.	REVISIONS	DATE

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SCALE

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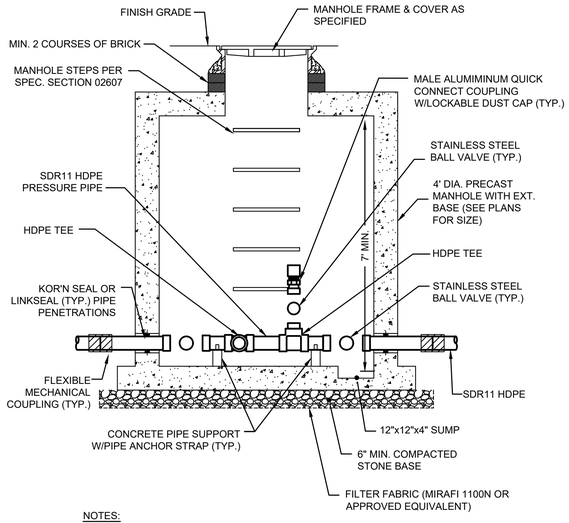
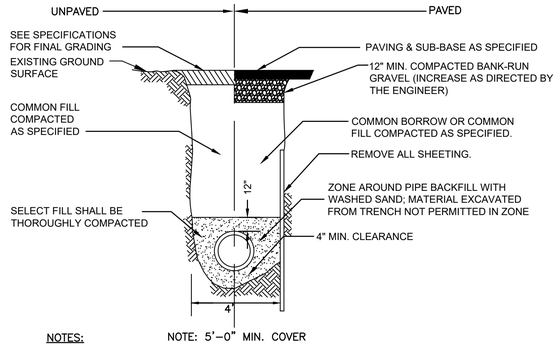


NOTES:

1. LOCATE FLUSHING QUICK CONNECT IN MANHOLE COVER OPENING.

LOW PRESSURE IN-LINE (3-WAY) CLEANOUT STRUCTURE SECTION VIEW

NOT TO SCALE



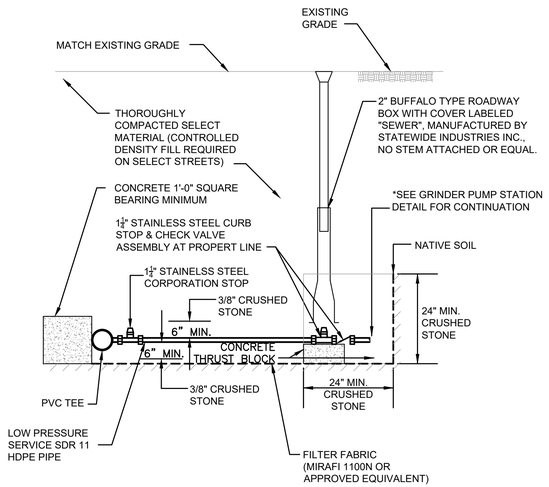
NOTES:

1. FOAM INSULATION TO BE USED IN TRENCH OVER BEDDED PIPE, IF LESS THAN 5' OF COVER TO PROTECT FROM FROST.

NOTE: 5'–0" MIN. COVER

FORCE MAIN TRENCH DETAIL

NOT TO SCALE



NOTES:

1. IF SERVICE PIPE LENGTH IS LESS THAN 5' LONG DO NOT INSTALL CORPORATION STOP

LOW PRESSURE SEWER SERVICE CONNECTION

NOT TO SCALE

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

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SITE UTILITY DETAILS - SEWER

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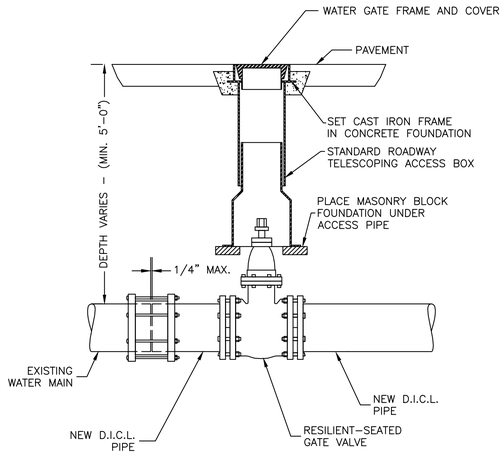
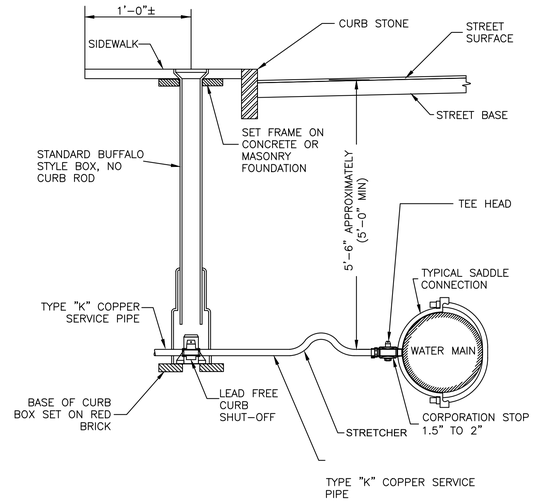
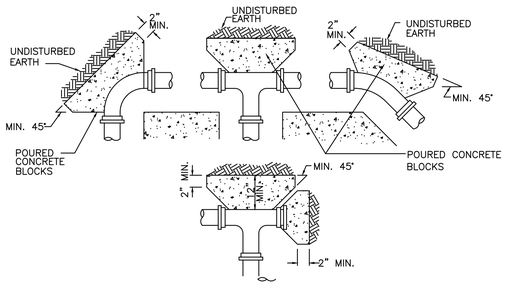


WATER GATE VALVE
NOT TO SCALE



WATER SERVICE CONNECTION
NOT TO SCALE



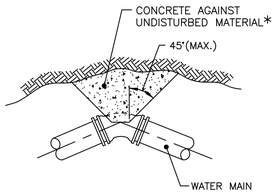
PLAN VIEWS

NOTES:

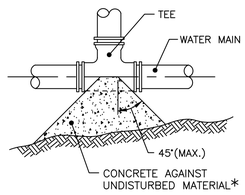
1. SPECIFIC THRUST BLOCK DESIGN SHALL CONFORM TO AWWA GUIDELINES.
2. PLACE 4 MIL. POLYETHYLENE BETWEEN CONCRETE AND FITTING (CONCRETE SHALL NOT INTERFERE WITH JOINT).
3. MINIMUM CONCRETE THICKNESS SHALL BE 12 INCHES.
4. THRUST BLOCK ORIENTATION SHALL BE SUCH THAT THE CENTER OF THE FITTING CORRESPONDS WITH THE CENTER OF THE THRUST BLOCK.
5. THE MINIMUM ALLOWABLE ANGLE (EITHER VERTICAL OR HORIZONTAL) SHALL BE 45 DEGREES.

NOMINAL PIPE SIZE (INCHES)	MAXIMUM PIPE OD (INCHES)	REQUIRED BEARING AREA (SQ FT)					
		TEES& CAPS	90 DEG	45 DEG	30 DEG	22.5 DEG	11.25 DEG
4	4.80	1.3	1.8	1	0.7	0.5	0.3
6	6.90	2.6	3.7	2	1.4	1	.5
8	9.05	5	6.4	3.5	2.3	1.8	0.9
10	11.10	7	10	5.2	3.5	2.7	1.4
12	13.20	9.5	13.4	7.3	5	4	1.9
16	17.4	15.65	22.2	12.0	8.1	6.1	3.1

THRUST BLOCK DETAIL AND BEARING FOR WATER MAIN
NOT TO SCALE



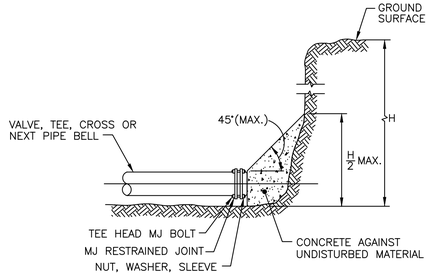
THRUST BLOCK AT BEND

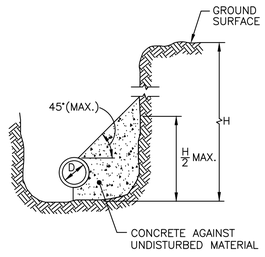


THRUST BLOCK AT TEE

NOTE
SEE TABLE ON THRUSH BLOCK BEARING AREAS FOR THE AREA OF CONCRETE REQUIRED.

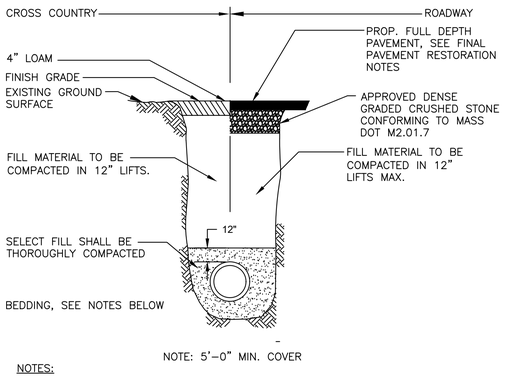
THRUST BLOCK DETAIL FOR WATER MAIN
NOT TO SCALE





NOTE
SEE TABLE ON THRUSH BLOCK BEARING AREAS FOR THE AREA OF CONCRETE REQUIRED.

THRUST BLOCK DETAIL FOR WATER MAIN
NOT TO SCALE

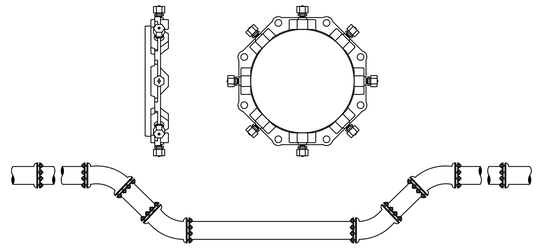


NOTE: 5'-0" MIN. COVER

NOTES:

1. FOR LOCATIONS WHERE LEDGE IS NOT ENCOUNTERED IN TRENCH, INSTALL PIPE ON UNDISTURBED EARTH, OR ON BEDDING CONSISTENT WITH AWWA GUIDELINES.
2. FOR LOCATIONS WHERE LEDGE IS ENCOUNTERED, BEDDING SHALL BE MINIMUM OF 12" THICK.
3. FILL MATERIAL SHALL BE COMPACTED TO 95% PROCTOR DENSITY.

WATER MAIN TRENCH DETAIL
NOT TO SCALE



NOTES:

1. DEVICES NEED TO BE PLACED BEYOND THE AREA OF RESTRAINTS IN ACCORDANCE WITH MANUFACTURES RECOMMENDATIONS.

TYPICAL THRUST RESTRAINT WEDGE ACTION TYPE JOINTS
NOT TO SCALE

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

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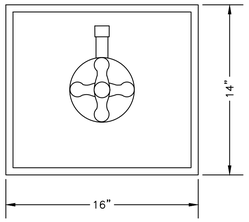
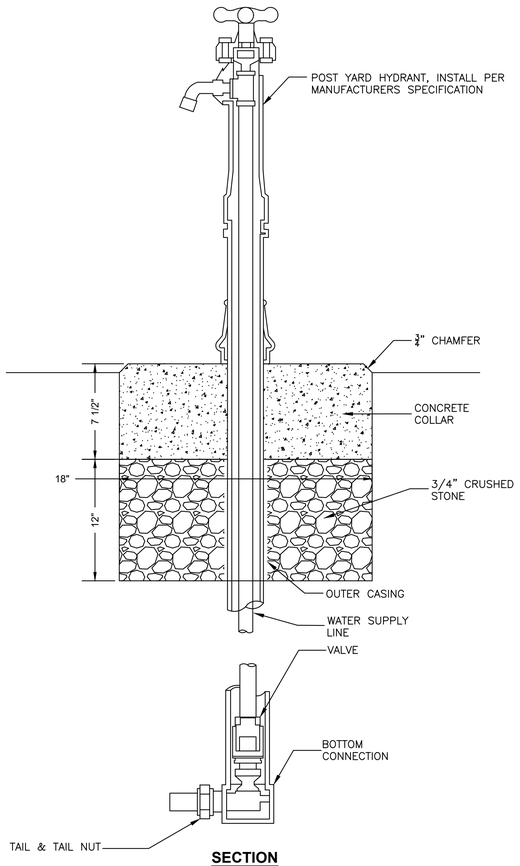
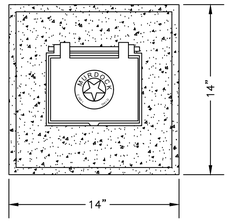


PLAN

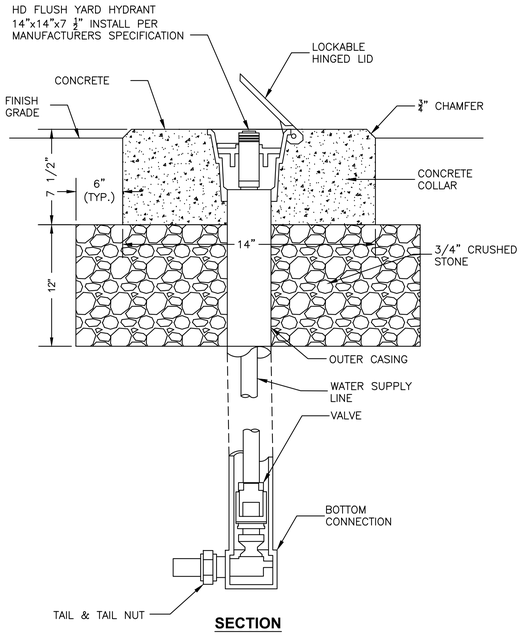


SECTION

YARD HYDRANT
NOT TO SCALE

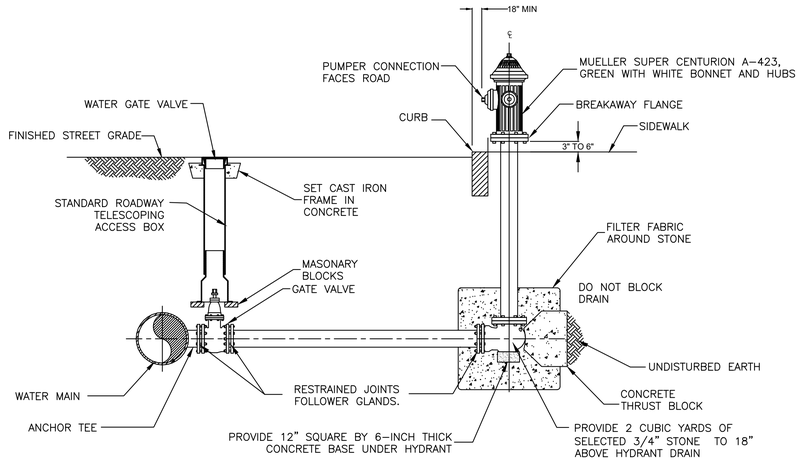


PLAN



SECTION

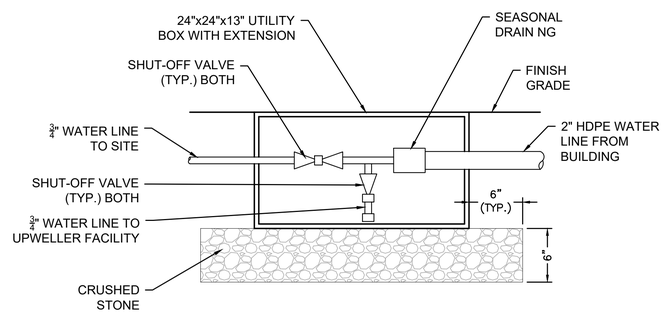
FLUSH MOUNT YARD HYDRANT
NOT TO SCALE



NOTE:

1. PROVIDE HYDRANT AND VALVE JOINTS WITH RESTRAINED MECHANICAL JOINTS.
2. ALL JOINTS BETWEEN ANCHOR TEE AND HYDRANT SHALL BE RESTRAINED.
3. SUPPORT BLOCKS TO BE CONCRETE MASONRY BLOCK.
4. VALVE OPERATION IN ACCORDANCE WITH YARMOUTH WATER DEPT. STANDARDS.
5. ALL HYDRANTS OUT OF SERVICE MUST BE BAGGED.

HYDRANT ASSEMBLY
NOT TO SCALE



WATER BOX WITH SEASONAL DRAIN VALVE
NOT TO SCALE

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LIGHTING FIXTURES

SYMBOL	DESCRIPTION	NOTES
FP 1a	WALL OR CEILING MOUNTED LIGHTING FIXTURE	UPPER CASE LETTERS INDICATE FIXTURE TYPE REFERENCE TO FIXTURE SCHEDULE SUBSCRIPT LOWER CASE LETTERS INDICATE SWITCH CONTROL ASSOCIATIONS APPLICATION OF ARROWS THUS: FP 1a FP 1a INDICATES LIGHT OUTPUT OF DIRECTIONALLY ORIENTED LIGHTING FIXTURE SHADING OF FIXTURES THUS: FPE 1a INDICATES FIXTURE IS PART OF EMERGENCY LIGHTING SYSTEM POWERED BY EMERGENCY LIGHTING PANELBOARDS
	FLOOR MOUNTED LIGHTING FIXTURE	
	POLE TYPE LIGHTING EQUIPMENT	
F 1a	CEILING MTD WALL WASHER LIGHTING FIXTURE	
DIM	HOUSE DIMMER	

EXIT SIGNS

XW WP 1	CEILING MOUNTED EXIT SIGN	APPLICATION OF SHADED QUADRANTS AND ARROWS THUS: WIRED TO CENTRAL BATTERY SYSTEM XW 1 INDICATE LETTERED FACE AND DIRECTIONAL ARROWS AS REQUIRED UPPER CASE LETTERS INDICATE REFERENCE TO LIGHTING FIXTURE SCHEDULE "WP" – INDICATES WEATHER PROOF "XW" – INDICATES FIXTURE TYPE "1" – INDICATES CIRCUIT NUMBER
XW WP 1	WALL MOUNTED EXIT SIGN	

WIRING DEVICES-SWITCHES

Sa WP	SINGLE POLE SWITCH	20A 120–277V AC "WP" – INDICATES WEATHER PROOF	SUBSCRIPT LOWER CASE LETTERS INDICATE SWITCH CONTROL ASSOCIATIONS SUBSCRIPT UPPER CASE LETTERS DENOTE SWITCH TYPE AS LISTED IN NON–STANDARD SWITCHES UNLESS NOTED OTHERWISE SWITCHES SHALL BE MOUNTED 48" TO CENTER LINE A.F.F
SPa	SINGLE POLE SWITCH WITH PILOT LIGHT		
S2	DOUBLE POLE SWITCH		
S3	THREE–WAY SWITCH		
S4	FOUR–WAY SWITCH		
Sk	KEY OPERATED SWITCH		

LIGHTING CONTROL SYSTEM

OC	CEILING MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR	
PC	CEILING MOUNTED PHOTOCELL	
D	LOW VOLTAGE DIMMER SWITCH FOR INTERFACE TO LIGHTING CONTROLS	
OC	WALL MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR	PROVIDE DUAL CIRCUIT SWITCH FOR ROOMS WITH DUAL SWITCHING
W	LOW VOLTAGE WALL STATION	
S OR	LOW VOLTAGE SWITCH FOR LIGHTING CONTROLS	"OR" INDICATES LIGHT CONTROL OVERIDE SWITCH
TC	ASTRONOMICAL TIME CLOCK SWITCH	
OC D	WALL MOUNTED OCCUPANCY SENSOR SWITCH, "D" INDICATES DIMMER COMBINATION TYPE	PROVIDE DUAL CIRCUIT SWITCH FOR ROOMS WITH DUAL SWITCHING

SITE LEGEND

HH P	NON–UTILITY HANDHOLE	"P" REPRESENTS ELECTRICAL HANDHOLE, "C" REPRESENT COMMUNICATION HANDHOLE
UH P	UTILITY CONCRETE HANDHOLE	"P" REPRESENTS ELECTRICAL HANDHOLE, "C" REPRESENT COMMUNICATION HANDHOLE
	UTILITY POLE	
S1 1	SITE LIGHTING FIXTURE	LETTER INDICATES FIXTURE TYPE REFERENCE TO FIXTURE SCHEDULE. NUMBER INDICATES CIRCUIT NUMBER
PP	POWER PEDESTAL	NUMBER INDICATES CIRCUIT NUMBER

WIRING DEVICES - RECEPTACLES

SYMBOL	DESCRIPTION	NOTES
1	WALL DUPLEX CONVENIENCE OUTLET MTD 18" AFF	20A/125V, 2P, 3W, GNDG., NEMA 5–20R "1"– INDICATES CIRCUIT NUMBER 'WP' – INDICATES WEATHER PROOF "C" – INDICATES MOUNTED ABOVE COUNTER "AV" – INDICATED ISOLATED GROUND RECEPTACLE FOR AUDIO/VISUAL PURPOSES. HVP – INDICATES RECEPTACLES FOR HIGH VIDEO PRESENTATION OUTLET LVP – INDICATES RECEPTACLES FOR LOW VIDEO PRESENTATION OUTLET SFR – INDICATES RECEPTACLES FOR SPEECH REINFORCEMENT RECIEVER S – INDICATES RECEPTACLES TO BE RAISED OFF FLOOR. R – INDICATES DEDICATED RECEPTACLE FOR REFRIGERATOR UR – INDICATED RECEPTACLE FOR UNDER COUNTER REFRIGERATOR P – INDICATES DEDICATED RECEPTACLE FOR PRINTER/COPER A – INDICATES AUTOMATIC RECEPTACLE CONTROL CS – INDICATES CHARGING STATION
	FLOOR DUPLEX CONVENIENCE OUTLET	
	FLOOR DOUBLE DUPLEX CONVENIENCE OUTLET	
	CEILING MOUNTED DUPLEX CONVENIENCE OUTLET	
SR	SPEECH REINFORCEMENT RECIEVER	
	WALL DOUBLE DUPLEX CONVENIENCE OUTLET	
	GROUND FAULT INTERRUPTING TYPE RECEPTACLE	
	GROUND FAULT INTERRUPTING TYPE DOUBLE DUPLEX RECEPTACLE	
	SPECIAL PURPOSE POWER RECEPTACLE	
	FLOOR SPECIAL PURPOSE POWER RECEPTACLE	

JUNCTION BOXES

J 1	CEILING/FLOOR MOUNTED JUNCTION BOX	'HD' – INDICATES POWER CONNECTION FOR HAND DRYERS "P" – INDICATES POWER CONNECTION "c" – INDICATES COMMUNICTION CONNECTION "EWC"– INDICATES ELECTRIC WATER COOLER PROVIDE JUNCTION BOX FOR HARD WIRED TYPE OR SIMPLEX RECEPTACLE FOR PLUG IN TYPE. "1"– INDICATES CIRCUIT NUMBER
J 1	WALL MOUNTED JUNCTION BOX	
J	JUNCTION BOX	
S G J	WALL MOUNTED JUNCTION BOX WITH FLEXIBLE CONNECTION TO EQUIPMENT	
PB	PULL BOX	
OR	WIRE TROUGH	SIZE AS N.E.C.

MOTORS AND CONTROLS

	MOTOR	COMPLETE INFO. FOR MOTOR IS INDICATED BY APPLICATION OF INDEXING SYMBOLS REFERENCE TO SCHEDULE OF MECHANICAL EQUIPMENT	
	COMINATION MAGNETIC MOTOR STARTER	SUBSCRIPT INDICATES NEMA SIZE	COMPLETE INFORMATION FOR CONTROL ITEMS IS INDICATED BY THE INDEXING SYMBOL REFERENCE APPLIED TO ASSOCIATED EQUIP.
VFD	VARIABLE FREQUECY DRIVE		
P1 (2) Sm	MANUAL MOTOR STARTER (THERMAL OVERLOAD SWITCH)	P1 INDICATES PANELBOARD (2) INDICATES CIRCUIT NUMBER	
MD	MOTORIZED DAMPER	FURNISHED AND INSTALLED BY DIV. 23	
CP	CONTROL PANEL	FURNISHED AND INSTALLED BY OTHERS. WIRED BY THE ELECTRICAL CONTRACTOR	

SECURITY SYSTEMS

CCTV	15' POLE MOUNTED CLOSED CIRCUIT TELEVISION CAMERA, CAMERA PROVIDED AND INSTALLED BY OWNER. PROVIDE 15' MOUNTING POLE, REFER TO LIGHTING FIXTURE SCHEDULE

BRANCH CIRCUITRY AND RACEWAY SYSTEM

SYMBOL	DESCRIPTION	NOTES
UC	LIGHTING AND APPLIANCE BRANCH CIRCUITRY, "UC" INDICATES UNDERGROUND CONDUIT	HOME RUNS ARE INDICATED THUS: PP1 (1) HOMERUN DESIGNATION TO PANEL PP1 CIRCUIT #1, WITH THE FOLOWING CONDUIT/WIRES UNLESS OTHERWISE NOTED: • 3/4" C WITH 2#12, 1#12GND THWN TO 20AMP SINGLE PHASE CIRCUITS. • 3/4" C WITH 2#10 (FOR 2–WIRE), 3#10 (FOR 3–WIRE), 1#10GND THWN TO 30AMP SINGLE PHASE CIRCUITS. • 3/4" C WITH 2#8 (FOR 2–WIRE), 3#8 (FOR 3–WIRE), 1#10GND THWN TO 40AMP SINGLE PHASE CIRCUITS. • 3/4" C WITH 2#8 (FOR 2–WIRE), 3#8 (FOR 3–WIRE), 1#10GND THWN TO 50AMP SINGLE PHASE CIRCUITS. • FOR 3 PHASE CIRCUITS REFER TO CONDUIT/CABLE FEEDER SCHEDULE • WHERE INDICATED AS UNDERGROUND CONDUIT CIRCUITS SHALL BE 1" C MINIMUM. • 1" C WITH 2#10, 1#10GND XHHW TO 20AMP POLE MOUNTED LIGHTING CIRCUITS. • 1" C WITH 2#10, 1#10GND XHHW TO 20AMP POLE/BOLLARD MOUNTED RECEPTACLE CIRCUITS • 1" C WITH 2#8, 1#10GND XHHW TO SHANTY LOAD CENTERS.
	INDIVIDUAL RUN TURNING UP	
	INDIVIDUAL RUN TURNING DOWN	
	INDIVIDUAL RUN TURNING UP & DOWN	
		CUH 1 P11–LP (21) EQUIPMENT CIRCUIT NUMBER DESIGNATION TO PANEL PP1–LP CIRCUIT #21,

SINGLE LINE AND SCHEMATIC DIAGRAM

100	CIRCUIT BREAKER (3 POLE UNLESS OTHERWISE NOTED) 100 REFERS TO TRIP RATING
	TRANSFORMER (AS NOTED)
5	MOTOR, NUMBER INDICATES HORSEPOWER
	GROUND
	FUSE, CURRENT LIMITING FUSE

DISTRIBUTION EQUIPMENT

	SURFACE MOUNTED PANEL	
	FLUSH MOUNTED PANEL	
SPD	SURGE PROTECTION DEVICE	
ATS	AUTOMATIC TRANSFER SWITCH	
T	TRANSFORMER	
WP	OVERCURRENT AND/OR SWITCHING DEVICE "WP" – INDICATES WEATHER PROOF	COMPLETE INFORMATION FOR DEVICES IS INDICATED BY APPLICATION OF TAG SYMBOLS 30 INDICATES UNFUSED SWITCH 30 – FRAME SIZE 15 F INDICATES FUSED SWITCH 15 – FUSE SIZE CB INDICATES ENCLOSED CIRCUIT BREAKER INDICATES COMBINATION FUSED SWITCH AND STARTER

SYMBOL LIST NOTES

1. CERTAIN SYMBOLS SHOWN IN THE SYMBOL LIST DO NOT APPEAR ELSEWHERE IN THE DRAWINGS, SUCH SYMBOLS ARE INCLUDED TO PERMIT INTERPRETATIONS TO BE MADE IN THE EVENT OF DESIGN CHANGES, FOR THIS REASON THE SCOPE OF WORK IS TO BE DETERMINED ONLY FROM DRAWINGS OTHER THAN THE SYMBOL LIST.

ABBREVIATIONS

ABBR	ABBREVIATIONS
A/AMP	AMPERE
AC	ALTERNATING CURRENT
A/C	AIR CONDITIONING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
ARCH	ARCHITECTURAL
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
BAT	BATTERY
BIS	BYPASS ISOLATOR SWITCH
BCS	BELOW CEILING STRUCTURE
C	CONDUIT
CATV	CABLE TELEVISION
CAB	CABINET
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CKT	CIRCUIT
CL	CENTERLINE
CLG	CEILING
CO	COMPANY
COL	COLUMN
C/T	CURRENT TRANSFORMER
CW	COOL WHITE
DET	DETAIL
DIA	DIAMETER
DISC	DISCONNET
DN	DOWN
DP	DISTRIBUTION PANEL
DPDT	DOUBLE POLE DOUBLE THROW
DPST	DOUBLE POLE SINGLE THROW
DT	DUST TIGHT
DWG	DRAWING
EA	EACH
EC	ELECTRICAL CONTRACTOR
EL	ELEVATION
ELEC	ELECTRIC
ELEV	ELEVATOR
ES	ENERGY SAVING
FDR	FEEDER
FLR	FLOOR
FLUOR	FLUORECENT
GEN	GENERATOR
GFI	GROUND FAULT INTERRUPER
GFP	GROUND FAULT PROTECTOR
GND	GROUND
HC	HUNG CEILING
HGT	HEIGHT
HID	HIGH INTENSITY DISCHARGE LAMP
HO	HIGH OUTPUT
HP	HORSEPOWER
HPS	HIGH PRESSURE SODIUM
HVAC	HEATING, VENTILATION AND AIR CONDITIONING
HZ	HERTZ
HV	HIGH VOLTAGE
IG	ISOLATED GROUND
IN	INCHES
INCAND	INCANDESCENT
JB	JUNCTION BOX
KV	KILOVOLT
KVA	KILOVOLT–AMPERES
KW	KILOWATT
L	LENGTH
LA	LIGHTNING ARRESTOR
LCP	LIGHTING CONTROL PANEL
LTG	LIGHTING
LV	LOW VOLTAGE
M	METER
MM	MILLIMETER
MCB	MAIN CIRCUIT BREAKER
MECH	MECHANICAL
MFR	MANUFACTURER
MLO	MAIN LUG ONLY
MISC	MISCELLANEOUS
MTD	MOUNTED
N	NEUTRAL
N/C	NORMALLY CLOSED
NEC	NATIONAL ELECTRIC CODE
NEMA	NATIONAL ELECTRICAL MANUFACTUERS ASSOCIATION
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT CIRCUIT
N/O	NORMALLY OPEN
NO	NUMBER
OC	ON CENTER
O/C	OVERCURRENT
OL	OVERLOAD
PB	PULL BOX
PH	PHASE
PNL	PANEL
PP	PUMP
PRI	PRIMARY
P/T	POTENTIAL TRANSFORMER
PVC	POLYVINYL TRANSFORMER
PWR	POWER
RECEPT	RECEPTACLE
REC	RECESSED
RGA	REMOTE GENERATOR ANNUNCIATOR
SEC	SECONDARY
SP	SPARE
SPECS	SPECIFICATIONS
SPKLR	SPRINKLER
SW	SWITCH
TB	TERMINAL BOARD
TEL	TELEPHONE
TSP	TWISTED SHIELDED PAIR
TV	TELEVISION
TYP	TYPICAL
UC	UNDERGROUND CONDUIT
U.N.O	UNLESS NOTED OTHERWISE
V	VOLTS
VA	VOLT AMPERAGE
VAC	VACUUM
VENT	VENTILATING
VT	VAPOR TIGHT
W	WATT ON WIRE
W/	WITH
WAO	WORK AREA OUTLET
WP	WEATHERPROOF
XD	EXISTING TO BE DEMOLISHED
XL	EXISTING TO BE RELOCATED
XM	EXISTING TO REMAIN
XR	EXISTING TO BE REPLACED

GENERAL NOTES

1. ALL CONDUITS, WIRE AND EQUIPMENT SHALL BE INSTALLED AND GROUNDED IN ACCORDANCE WITH THE LATEST RULES AND REGULATIONS OF THE APPLICABLE LOCAL AND NATIONAL CODES.
2. CONTRACTOR TO PROVIDE CONCRETE HOUSEKEEPING PADS ON ALL GRADE MOUNTED ELECTRICAL EQUIPMENT, EQUIPMENT INDICATED ON THE DRAWINGS IS THE MINIMUM REQUIREMENT FOR HOUSEKEEPING PADS. ADDITIONAL PADS MAYBE REQUIRED BASED ON THE CONTRACTOR'S MOUNTING METHODS.
3. PROVIDE ALL SUPPLEMENTARY STEELWORK REQUIRED FOR PROPERLY MOUNTING AND/OR SUPPORTING EQUIPMENT AND MATERIALS.
4. CONDUIT RUNS ARE SHOWN DIAGRAMATICALLY ONLY AND SHALL BE INSTALLED IN A MANNER TO PREVENT CONFLICTS WITH EQUIPMENT AND STRUCTURAL CONDITIONS. EXPOSED CONDUITS SHALL BE INSTALLED PARALLEL TO BEAMS AND WALLS. EMPTY CONDUITS SHALL HAVE NYLON PULL LINE.
5. CONDUITS SHALL BE TERMINATED SO AS TO PERMIT NEAT CONNECTIONS TO MOTORS AND OTHER EQUIPMENT.
6. NO CONDUIT SMALLER THAN 3/4", NOR WIRE SIZE SMALLER THAN NO. 12 A.W.G. FOR POWER SHALL BE USED UNLESS OTHERWISE NOTED.
7. THE WIRING DIAGRAMS, QUANTITY AND SIZE OF THE WIRES AND CONDUIT REPRESENT A SUGGESTED ARRANGEMENT BASED UPON SELECTED STANDARD COMPONENTS OF ELECTRICAL EQUIPMENT. MODIFICATIONS ACCEPTABLE TO THE CONSTRUCTION MANAGER MAY BE MADE BY THE CONTRACTOR TO ACCOMMODATE EQUIPMENT ACTUALLY PURCHASED. THE BASIC SEQUENCE AND METHOD OF CONTROL MUST BE MAINTAINED AS INDICATED ON THE DRAWINGS AND/OR SPECIFICATIONS.
8. ALL PANELBOARDS SHALL BE MOUNTED SO THAT THE DISTANCE FROM THE TOP CIRCUIT BREAKER OPERATING HANDLE TO THE FLOOR SHALL NOT EXCEED 6'–6".
9. CONDUIT AND WIRE (NOT SHOWN) FOR FIXTURES, SWITCHES AND/OR RECEPTACLES SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR AND SHALL BE:
   A. 3/4" (MIN.) CONDUIT RUN
   B. NO. 12 (MIN.) Cu, WIRE (MIN.) "THWN/THHN" NO. OF WIRES AS REQUIRED.
14. ALL 120V BRANCH CIRCUITS GREATER THAN 100 LINEAR FEET SHALL BE NO. 10AWG MIN.
15. ALL WORK SHOWN IS NEW (FURNISHED AND INSTALLED) UNLESS OTHERWISE NOTED.
16. PROVIDE ELECTRICAL OUTLET PLATE GASKET SEALS AT RECEPTACLES, SWITCHES AND OTHER ELECTRICAL BOXES WITHIN ELECTRICAL ENCLOSURES.
17. ALL TERMINATION LUGS SHALL BE SIZED ACCORDINGLY TO ACCOMMODATE INDICATED CONDUCTORS.
18. ALL 20 AMPERE, SINGLE PHASE CIRCUITS SHALL BE PROVIDED WITH A SEPARATE FULL SIZE NEUTRAL CONDUCTOR.

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

ELECTRICAL LEGEND, ABBREVIATIONS AND GENERAL NOTES

NO.	REVISIONS	DATE

DRAWN BY: RLB
DESIGNED BY: RLB
CHECKED BY: MC
ISSUE DATE: 4/5/2024
BETA JOB NO.: 10056

SCALE

NONE

Bid Documents

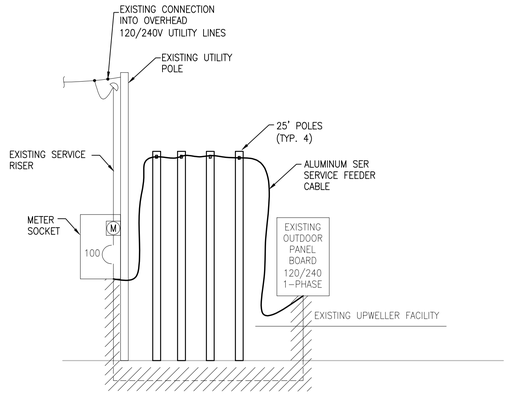
SHEET NO.

E.0.1

CONDUIT/CABLE FEEDER SCHEDULE				
UPSTREAM DEVICE	CONDUCTORS (3–PHASE, 3–WIRE) WITH GROUND	CONDUIT SIZE	CONDUCTORS (3–PHASE, 4–WIRE) WITH GROUND	CONDUIT SIZE
20A CB	3#12 & 1#12 GND	3/4"		
			4#12 & 1#12 GND	3/4"
30A CB	3#10 & 1#12 GND	3/4"		
			4#10 & 1#12 GND	3/4"
40A & 50A CB	3#8 & 1#10 GND	3/4"		
			4#8 & 1#10 GND	3/4"
60A CB	3#6 & 1#10 GND	3/4"		
			4#6 & 1#10 GND	1"
70A CB	3#4 & 1#8 GND	1"		
			4#4 & 1#8 GND	1–1/2"
90A CB	3#3 & 1#8 GND	1–1/2"		
			4#3 & 1#8 GND	1–1/2"
100A CB	3#2 & 1#8 GND	1–1/2"		
			4#2 & 1#8 GND	1–1/2"
125A CB	3#1 & 1#6 GND	2"		
			4#1 & 1#6 GND	2"
150A CB	3#1/0 & 1#6 GND	2"		
			4#1/0 & 1#6 GND	2"
175A CB	3#2/0 & 1#6 GND	2"		
			4#2/0 & 1#6 GND	2"
200A CB	3#3/0 & 1#6 GND	2–1/2"		
			4#3/0 & 1#6 GND	2–1/2"
250A CB	3#4/0 & 1#4 GND	2–1/2"		
			4#4/0 & 1#4 GND	2–1/2"
400A CB	3–500KCMIL & 1#3 GND	4"		
			4–500KCMIL & 1#3 GND	4"
600A CB			10–350KCMIL & 2#1 GND	(2) 3"

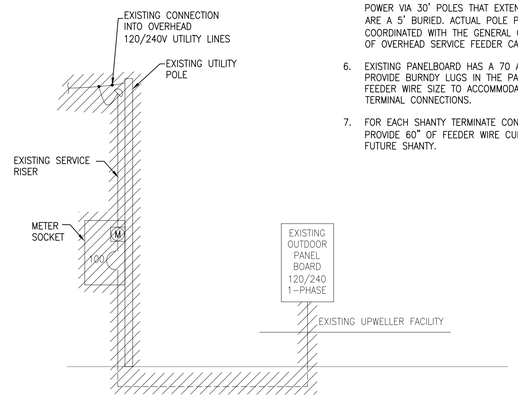
CONDUIT/CABLE FEEDER SCHEDULE NOTES:

1. UNLESS OTHERWISE INDICATED ELSEWHERE FEEDER CONDUIT AND WIRE SIZES SHALL BE PER THIS TABLE BASED ON THE UPSTREAM OVERCURRENT PROTECTION DEVICE FOR FEEDERS AND THE MAIN CIRCUIT BREAKER FOR THE SERVICE.
2. UNLESS OTHERWISE INDICATED ELSEWHERE FEEDERS TO MECHANICAL EQUIPMENT AND PUMPS SHALL BE 3–PHASE, 3–WIRE. ALL OTHER FEEDERS AND SERVICE SHALL BE 3–PHASE, 4–WIRE.



UPWELLER TEMPORARY SERVICE ONE LINE RISER DIAGRAM (NOTE 5)

N.T.S.

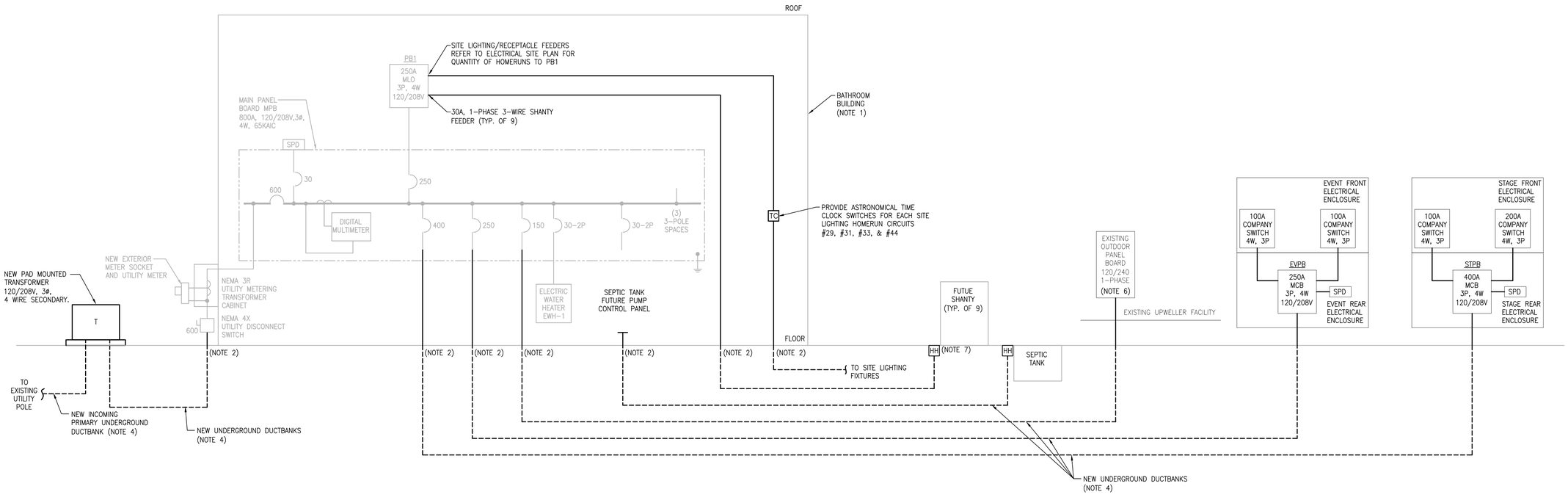


DEMOLITION ONE LINE RISER DIAGRAM

N.T.S.

NOTES:

1. BATHROOM BUILDING SHALL BE CONSTRUCTED UNDER THE PHASE 2 CONTRACT. EQUIPMENT WITHIN AND ON THE BUILDING INDICATED IN LIGHT GREY IS BEING PROVIDED IN THE PHASE 2 CONTRACT. THE PHASE 1 CONTRACTOR SHALL COORDINATE WITH THE PHASE 2 CONTRACTORS.
2. PROVIDE CONDUIT AND WIRE INTO THE BUILDING AND TO THE INDICATED EQUIPMENT, MAKE ALL CONNECTIONS. COORDINATE WITH PHASE 2 CONTRACTOR FOR THE INSTALLATION OF THE CONDUIT WITHIN THE BATHROOM BUILDING FOOTPRINT AND SURROUNDING PHASE 2 SITE AREA.
3. REFER TO CONDUIT/CABLE FEEDER SCHEDULE FOR CONDUIT/CABLE REQUIREMENTS.
4. REFER TO DUCTBANK DETAILS ON DRAWING E.2.1 FOR DUCTBANK CONDUIT/CABLE REQUIREMENTS.
5. EXISTING UNDERGROUND SERVICE FEEDER TO THE UPWELLER FACILITY IT IS TO BE DISCONNECTED AND MADE SAFE FOR DEMOLITION BY THE GENERAL CONTRACTOR TO FACILITATE THE INSTALLATION OF THE NEW BUILDING UNDER PHASE 2. ELECTRICAL CONTRACTOR TO PROVIDE TEMPORARY OVERHEAD POWER VIA 30' POLES THAT EXTEND 25' ABOVE GRADE AND ARE A 5' BURIED. ACTUAL POLE PLACEMENT SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR, PROVIDE 700' OF OVERHEAD SERVICE FEEDER CABLE RATED FOR 100 AMPS.
6. EXISTING PANELBOARD HAS A 70 AMP MAIN CIRCUIT BREAKER, PROVIDE BURNDY LUGS IN THE PANELBOARD AND REDUCE THE FEEDER WIRE SIZE TO ACCOMMODATE THE CIRCUIT BREAKER TERMINAL CONNECTIONS.
7. FOR EACH SHANTY TERMINATE CONDUIT INTO HAND HOLE, PROVIDE 60" OF FEEDER WIRE CURLED UP IN HAND HOLE FOR FUTURE SHANTY.



ONE LINE RISER DIAGRAM

N.T.S.

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

ELECTRICAL ONELINE DIAGRAM

NO.	REVISIONS	DATE

DRAWN BY:	RLB
DESIGNED BY:	RLB
CHECKED BY:	MC
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

NONE

Bid Documents

SHEET NO.

E.0.2

EXISTING UTILITY POLE TO BE DEMOLISHED

EXISTING UTILITY POLE WITH EXISTING SERVICE METER TO BE DEMOLISHED

EXISTING UTILITY POLE TO BE DEMOLISHED

DUCT "D6"

DUCT "D4"

UTILITY TRANSFORMER WITH OIL CONTAINMENT CURB

STAGE ELECTRICAL ENCLOSURES

EVENT ELECTRICAL ENCLOSURES

1"UC, 6#10 3#12GND

PB1(33,35,37)

PB1(31)

PB1(29)

1"UC, 6#10 3#12GND TO PB1 (25,27,44)

SEPTIC TANK

EXISTING UTILITY POLE

FUTURE SHANTY, REFER TO ONE LINE DIAGRAM FOR SCOPE OF WORK (TYP. OF 9)

KIOSK PROVIDE 60" OF WIRE CURLED UP IN HANDHOLE

EXISTING UPWELLER FACILITY PANELBOARD

L=232.86' R=2800.00'

PREPARED BY

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

ELECTRICAL SITE PLAN

NO.	REVISIONS	DATE

DRAWN BY:	RLB
DESIGNED BY:	RLB
CHECKED BY:	MC
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

50 0 50 100
SCALE IN FEET: 1"=50'

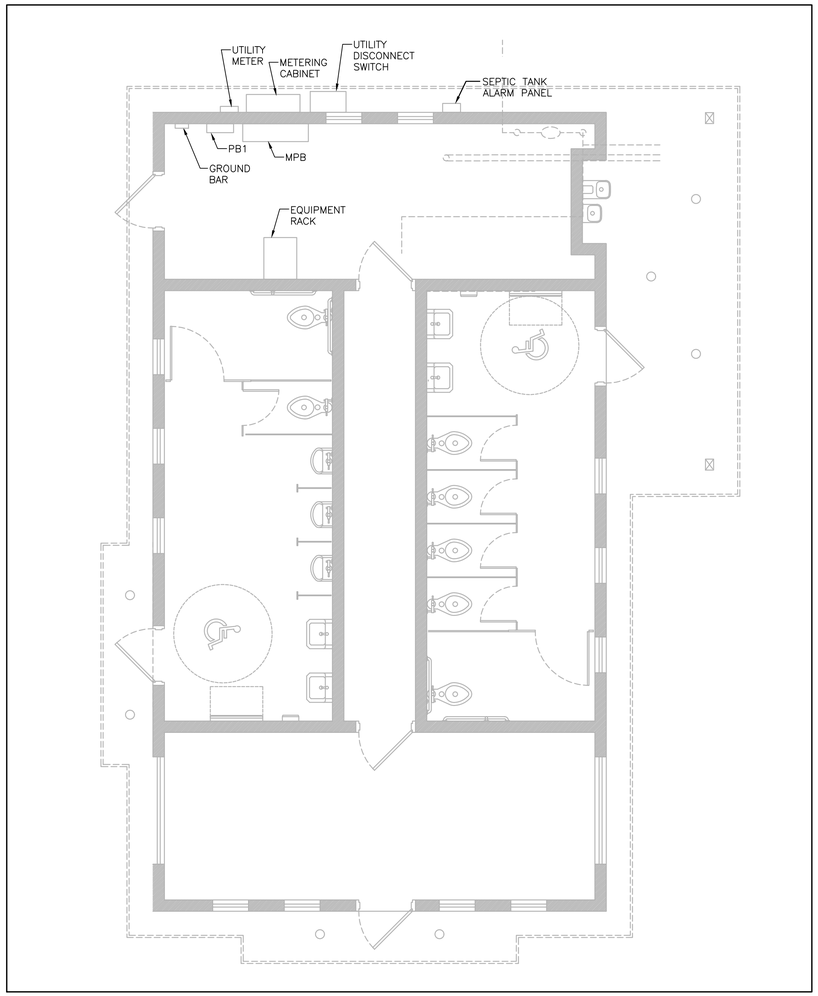
Bid Documents

SHEET NO.

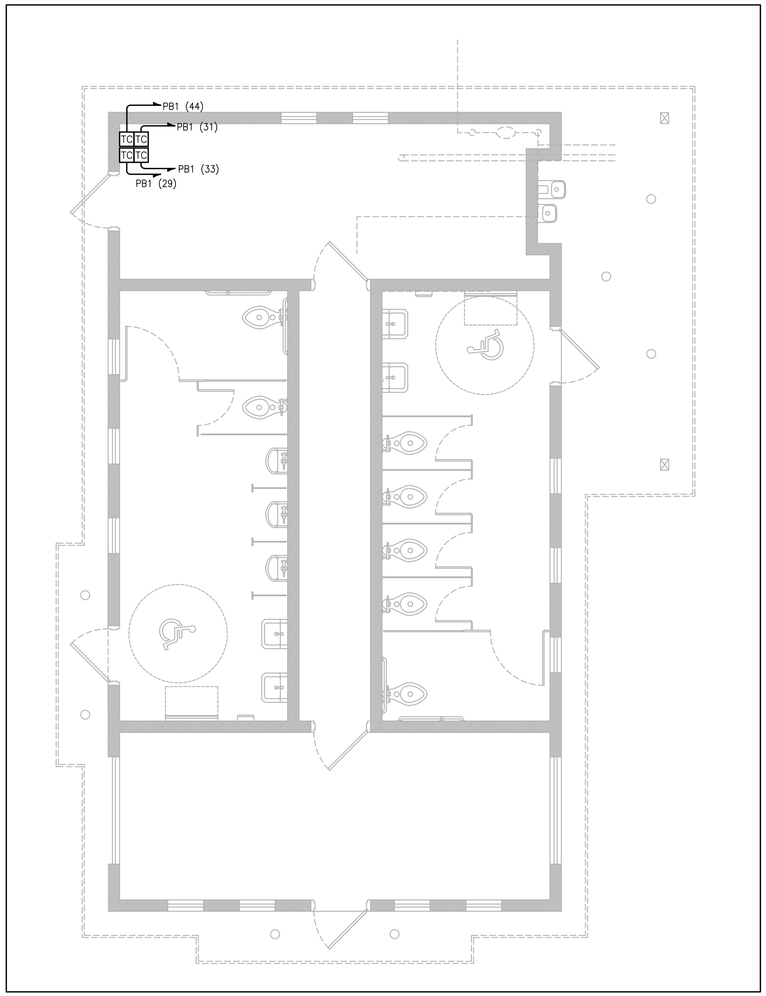
E.0.3

NOTES:

1. ELECTRICAL EQUIPMENT INDICATED ON THIS PLAN IS PROVIDED UNDER THE PHASE 2 CONTRACT AND IS SHOWN FOR REFERENCES PURPOSES ONLY.
2. SITE LIGHTING CONTROLS ARE TO BE PROVIDED AND TESTED UNDER THIS PHASE 1 CONTRACT.



1 BATHROOM BUILDING LOCATION PLAN (NOTE 1)
1/4" = 1'-0"



2 BATHROOM BUILDING SITE LIGHTING CONTROLS PLAN (NOTE 2)
1/4" = 1'-0"

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

RESTROOM FACILITY PHASE 2 (REFERENCE ONLY)

NO.	REVISIONS	DATE

DRAWN BY:	RLB
DESIGNED BY:	RLB
CHECKED BY:	MC
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

50 0 50 100
SCALE IN FEET: 1"=50'

Bid Documents

SHEET NO.

E.1.0

PANELBOARD SCHEDULE

NO. EVPB — LOCATION: EVENT REAR ELECTRICAL ENCLOSURE

208/120 V, 3 PH, 4 W, 250 A MAIN, 100% SOLID NEUTRAL; 250 A MCB

10,000 AIC AT – V FULL GROUND BUS — – A MLO SURFACE MOUNTING

CIRCUIT	DESCRIPTION OF LOAD	LOAD (KVA) A⌀	LOAD (KVA) B⌀	LOAD (KVA) C⌀	BREAKER TRIP	BREAKER POLE	BREAKER POLE	BREAKER TRIP	LOAD (KVA) A⌀	LOAD (KVA) B⌀	LOAD (KVA) C⌀	DESCRIPTION OF LOAD	CIRCUIT
1		8.0							8.0				2
3	100A COMPANY SWITCH		8.0		100A	3	3	100A		8.0		100A COMPANY SWITCH	4
5				8.0							8.0		6
7		4.0							4.0				8
9	L21–50R SIMPLEX RECEPTACLE		4.0		50A GFCI	3	3	50A GFCI		4.0		L21–50R SIMPLEX RECEPTACLE	10
11				4.0							4.0		12
13		2.0							2.0				14
15	L21–30R SIMPLEX RECEPTACLE		2.0		30A GFCI	3	3	30A GFCI		2.0		L21–30R SIMPLEX RECEPTACLE	16
17				2.0							2.0		18
19	L5–30R SIMPLEX RECEPTACLE	1.0			30A GFCI	1	1	20A GFCI	0.5			5–20R DUPLEX RECEPTACLE	20
21	L5–30R SIMPLEX RECEPTACLE		1.0		30A GFCI	1	1	20A GFCI		0.5		5–20R DUPLEX RECEPTACLE	22
23	ELECTRICAL ENCLOSURE LIGHTS			0.1	20A	1	1	20A GFCI			0.5	5–20R DUPLEX RECEPTACLE	24
25	REAR ELECTRICAL ENCLOSURE RECEPTACLE	0.2			20A GFCI	1	1	20A GFCI	0.5			5–20R DUPLEX RECEPTACLE	26
27	SPARE		–		20A	1	1	20A GFCI		0.5		5–20R DUPLEX RECEPTACLE	28
29	SPARE			–	20A	1	1	–			–	SPACE	30
31	SPARE	–			20A	1	1	–	–			SPACE	32
33	SPARE		–		20A	1	1	–		–		SPACE	34
35	SPARE			–	20A	1	1	–			–	SPACE	36
37	SPARE	–			20A	1	1	–	–			SPACE	38
39	SPARE		–		20A	1	1	–		–		SPACE	40
41	SPARE			–	20A	1	1	–			–	SPACE	42
SUB–TOTAL CONNECTED		15.1	15.0	14.1					15.0	15.0	14.5	SUB–TOTAL CONNECTED	

SUB–TOTAL CONNECTED KVA A⌀ = 30.1

SUB–TOTAL CONNECTED KVA B⌀ = 30.0

SUB–TOTAL CONNECTED KVA C⌀ = 28.6

TOTAL CONNECTED KVA = 88.70

PANELBOARD SCHEDULE

NO. STPB — LOCATION: STAGE REAR ELECTRICAL ENCLOSURE

208/120 V, 3 PH, 4 W, 400 A MAIN, 100% SOLID NEUTRAL; 400 A MCB

22,000 AIC AT – V FULL GROUND BUS — – A MLO SURFACE MOUNTING

CIRCUIT	DESCRIPTION OF LOAD	LOAD (KVA) A⌀	LOAD (KVA) B⌀	LOAD (KVA) C⌀	BREAKER TRIP	BREAKER POLE	BREAKER POLE	BREAKER TRIP	LOAD (KVA) A⌀	LOAD (KVA) B⌀	LOAD (KVA) C⌀	DESCRIPTION OF LOAD	CIRCUIT
1		15.0							8.0				2
3	200A COMPANY SWITCH		15.0		200A	3	3	100A		8.0		100A COMPANY SWITCH	4
5				15.0							8.0		6
7		4.0							4.0				8
9	L21–50R SIMPLEX RECEPTACLE		4.0		50A GFCI	3	3	50A GFCI		4.0		L21–50R SIMPLEX RECEPTACLE	10
11				4.0							4.0		12
13		2.0							2.0				14
15	L21–30R SIMPLEX RECEPTACLE		2.0		30A GFCI	3	3	30A GFCI		2.0		L21–30R SIMPLEX RECEPTACLE	16
17				2.0							2.0		18
19	L5–30R SIMPLEX RECEPTACLE	0.8			30A GFCI	1	1	20A GFCI	0.5			5–20R DUPLEX RECEPTACLE	20
21	L5–30R SIMPLEX RECEPTACLE		0.8		30A GFCI	1	1	20A GFCI		0.5		5–20R DUPLEX RECEPTACLE	22
23	ELECTRICAL ENCLOSURE LIGHTS			0.1	20A	1	1	20A GFCI			0.5	5–20R DUPLEX RECEPTACLE	24
25	REAR ELECTRICAL ENCLOSURE RECEPTACLE	0.2			20A GFCI	1	1	20A GFCI	0.5			5–20R DUPLEX RECEPTACLE	26
27	KIOSK		0.5		20A	1	1	20A GFCI		0.5		5–20R DUPLEX RECEPTACLE	28
29	SPARE			–	20A	1	1	–			–	SPACE	30
31	SPARE	–			20A	1	1	–	–			SPACE	32
33	SPARE		–		20A	1	1	–		–		SPACE	34
35	SPARE			–	20A	1	1	–			–	SPACE	36
37	SPARE	–			20A	1	1	–	–			SPACE	38
39	SPARE		–		20A	1	1	–		–		SPACE	40
41	SPARE			–	20A	1	1	–			–	SPACE	42
SUB–TOTAL CONNECTED		22.0	22.3	21.1					11.0	11.0	1.00	SUB–TOTAL CONNECTED	

SUB–TOTAL CONNECTED KVA A⌀ = 32.0

SUB–TOTAL CONNECTED KVA B⌀ = 33.3

SUB–TOTAL CONNECTED KVA C⌀ = 32.1

TOTAL CONNECTED KVA = 97.40

LIGHTING FIXTURE SCHEDULE

TYPE	DESCRIPTION	MANUFACTURER & CATALOG SERIES	LED DRIVER LUMENS	LED DRIVER COLOR TEMP	WATTS	VOLTS	MOUNTING TYPE	MOUNTING HEIGHT	ACCESSORIES	REMARKS
S1	DECORATIVE POLE LIGHT WITH 30" ARC BRACKET MOUNTED MARINA GRADE BLACK ROUND GLOBE LED LIGHT	CYCLONE CN12P1A–FGC–3MHS–P40–3K–120–PND506 - **BK - TX - MG** ***REFER TO NOTE 2**	4917	3000K	58	120	POLE	15'	BRACKET: M240–C1–T42–PTL–120–BK–TX–MG POLE: PA42–12–T42– **GFCI2 - BK - TX - MG** BASE: BD11–BK–TX–MG	PROVIDE GROUND ROD 60" FROM LIGHT POLE BASE AND CONNECT TO LIGHT POLE WITH #6 GROUND CONDUCTOR.
S2	LED SCONCE LIGHT MOUNTED TO WOOD BOLLARD	RAB SLIM–18–3000K	2600	3000K	18	120	SURFACE	–	–	PROVIDE GROUND ROD 60" FROM LIGHT POST CONNECT TO LIGHT AND POWER PEDESTAL WITH #6 GROUND CONDUCTOR.
S3	POLE LIGHT WITH 20" STRAIGHT ARM BRACKET MOUNTED MARINA GRADE BLACK ROUND LED LIGHT WITH AND GFCI RECEPTACLE	CYCLONE NEL30S - FGF - T3HS - P50 - 3K - MVOLT - PND506 - BK - TX - MG	7081	3000K	63.5	120	POLE	15'	BRACKET: M100–C1–T42–PTL–120–BK–TX–MG POLE: PA42–**15**–T42–GFCI2–BK–TX–MG BASE: BD11–BK–TX–MG	PROVIDE GROUND ROD 60" FROM LIGHT POLE BASE AND CONNECT TO LIGHT POLE WITH #6 GROUND CONDUCTOR. PROVIDE AND INSTALL RECEPTACLE WITH WEATHERPROOF COVER
CCTV CAMERA POLE	–	–	–	–	–	–	–	–	POLE: PA42–15–T42–GFCI2–BK–TX–MG BASE: BD11–BK–TX–MG	**PROVIDE GROUND ROD 60" FROM CCTV POLE BASE AND CONNECT TO CCTV POLE WITH #6 GROUND CONDUCTOR.**

NOTES:

1. THE CATALOG NUMBERS LISTED ARE GIVEN AS A GUIDE TO THE DESIGN AND QUALITY OF FIXTURE DESIRED. EQUIVALENT DESIGNS, MATERIALS, DIMENSIONS, COEFFICIENT OF UTILIZATIONS AND EQUAL QUALITY FIXTURES OF OTHER MANUFACTURERS WILL BE ACCEPTABLE.
2. **S1 LIGHT SHALL BE TYPE 3 OR TYPE 4 PER MANUFACTURER'S PHOTOMETRIC PLANS.**

PREPARED BY

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REGISTERED PROFESSIONAL

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

ELECTRICAL SCHEDULES

NO.	REVISIONS	DATE

DRAWN BY: RLB

DESIGNED BY: RLB

CHECKED BY: MC

ISSUE DATE: 4/5/2024

BETA JOB NO.: 10056

SCALE

50 0 50 100

SCALE IN FEET: 1"=50'

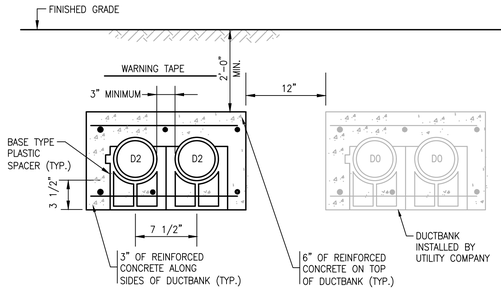
Bid Documents

SHEET NO.

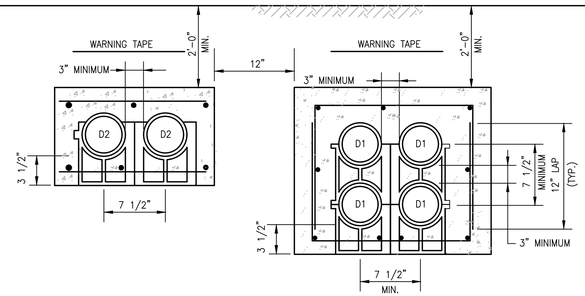
E.2.0

DUCT / CABLE SCHEDULE

DUCT NO.	SIZE	CONDUCTORS	FROM	TO
D0	–	–	ELECTRIC UTILITY POLE	UTILITY HANDHOLE
D1	4"	PULL STRING FOR PRIMARY SERVICE	UTILITY HANDHOLE	UTILITY TRANSFORMER
D2	4"	PULL STRING FOR SERVICE PROVIDER	ELECTRIC UTILITY POLE	EQUIPMENT RACK IN MECH. ROOM (NOTE 2)
D3	3"	(4) 350kcmil	UTILITY TRANSFOMER	UTILITY DISCONNECT SWITCH (NOTE 2)
D4	5"	(4) 600kcmil, #3 GND	MDP (NOTE 2)	STPB
D5	4"	(4) #4/0, #4 GND	MDP (NOTE 2)	EVPB
D6	4"	PULL STRING	STAGE FRONT ELECTRICAL ENCLOSURE	EVENT FRONT ELECTRICAL ENCLOSURE
D7	4"	PULL STRING	UTILITY HANDHOLE	HANDHOLE
D8	2 1/2"	(4) #2/0, #6 GND	MDP (NOTE 2)	EXISTING UPWELLAR PANELBOARD
D9	1 1/2"	PULL STRING	STUB UP BELOW EQUIPMENT RACK (NOTE 2)	CCTV CAMERA POLE
D10	1 1/2"	FLOAT SWITCH VENDER CABLE	SEPTIC TANK ALARM PANEL (NOTE 2)	SEPTIC TANK FLOAT SWITCHES
D11	1 1/2"	PULL STRING	STUB UP BELOW FUTURE SEPTIC TANK ALARM PANEL (NOTE2)	HAND HOLE NEXT SEPTIC TANK



SECTION A-A



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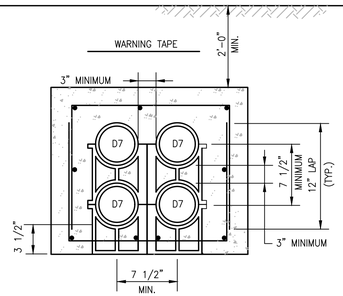

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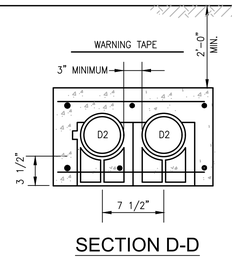

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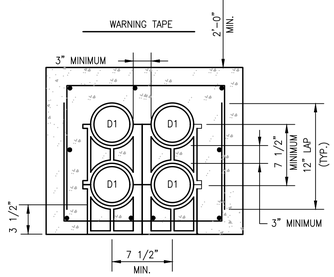

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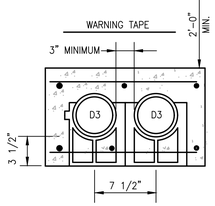

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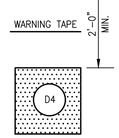
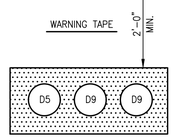


SECTION G-G



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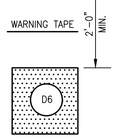
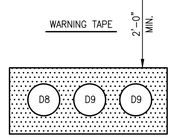
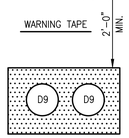


SECTION I-I



SECTION J-J



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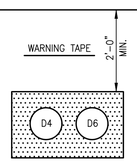
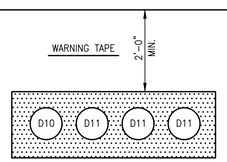
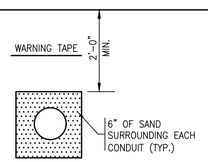


SECTION L-L



SECTION M-M



SINGLE UNDERGROUND CONDUIT SECTION
NO SCALE

NOTES:

1. BACKFILL DUCT BANK IN 4" LIFT LAYERS AND MANUALLY TAMP OR "PUDDLE" CONCRETE FILL. PROVIDE RED DUCT BANK MARKER TAPES, READING "CAUTION – ELECTRICAL LINES BELOW", OVER ENTIRE LENGTH OF POWER DUCTLINE. PROVIDE ORANGE DUCT BANK MARKER TAPES, READING "CAUTION – TELECOMMUNICATIONS LINES BELOW", OVER ENTIRE LENGTH OF COMMUNICATION DUCTLINE. LOCATE TAPES 12 INCHES BELOW GRADE. PROVIDE A TAPE FOR EVERY 12 INCHES OF WIDTH OF DUCTLINE.
2. PROVIDE CONDUIT AND WIRE INTO THE BUILDING AND TO THE INDICATED EQUIPMENT, MAKE ALL CONNECTIONS. COORDINATE WITH PHASE 2 CONTRACTOR FOR THE INSTALLATION OF THE CONDUIT WITHIN THE BATHROOM BUILDING FOOTPRINT AND SURROUNDING PHASE 2 SITE AREA.
3. UNLESS INDICATED OTHERWISE, RACEWAY BANKS SHALL BE ENCASED IN 3,000 PSI CONCRETE. CONCRETE SHALL BE REINFORCED WITH #5 ASTM A615 GRADE 60 STEEL REBAR RODS.

1

DUCT BANK SECTIONS
NO SCALE

PREPARED BY

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

ELECTRICAL DUCTBANK SECTIONS

NO.	REVISIONS	DATE

DRAWN BY: RLB
DESIGNED BY: RLB
CHECKED BY: MC
ISSUE DATE: 4/5/2024
BETA JOB NO.: 10056

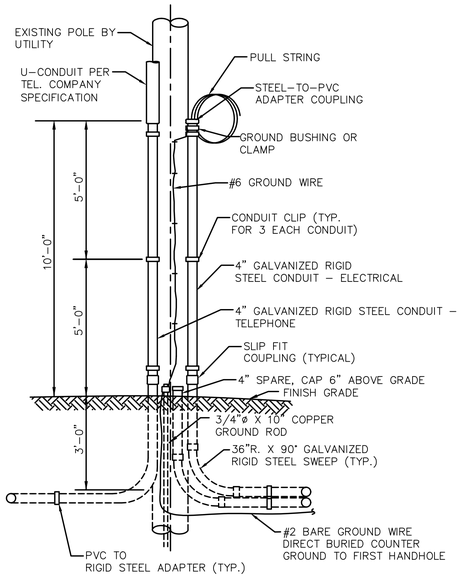
SCALE

50 0 50 100
SCALE IN FEET: 1"=50'

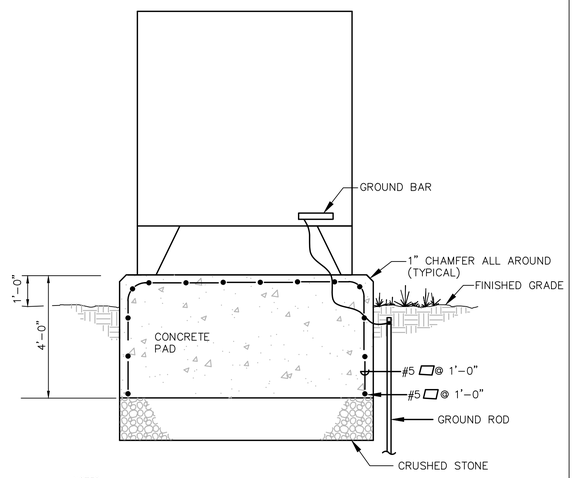
Bid Documents

SHEET NO.

E.2.1



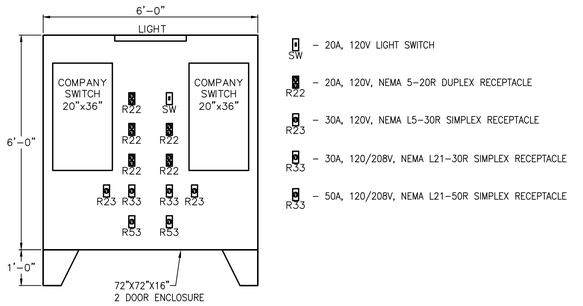
1 UTILITY POLE SERVICE RISER DETAIL
NO SCALE



NOTES:

1. CONCRETE TO BE 4000 PSI AFTER 28 DAYS, 3,000 PSI CONCRETE. CONCRETE SHALL BE REINFORCED WITH #5 ASTM A615 GRADE 60 STEEL REBAR RODS.

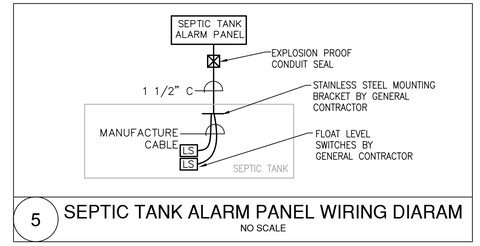
2 ELECTRICAL ENCLOSURE BASE DETAIL
SCALE: 1" = 2'-0"



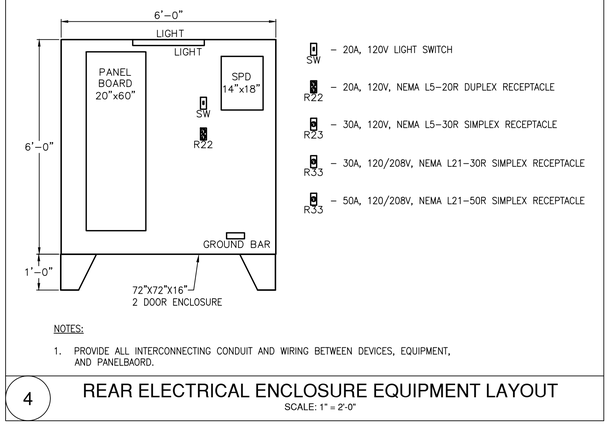
NOTES:

1. PROVIDE ALL INTERCONNECTING CONDUIT AND WIRING BETWEEN DEVICES, EQUIPMENT, AND PANELBAORD.

3 FRONT ELECTRICAL ENCLOSURE EQUIPMENT LAYOUT
SCALE: 1" = 2'-0"



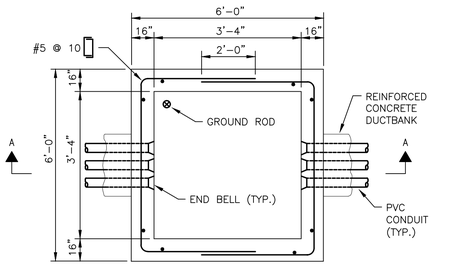
5 SEPTIC TANK ALARM PANEL WIRING DIARAM
NO SCALE



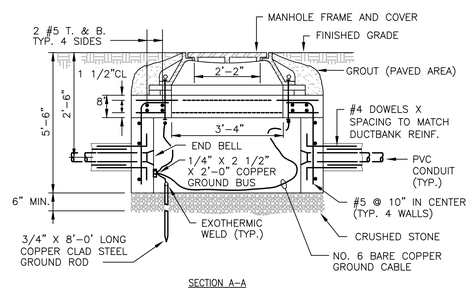
NOTES:

1. PROVIDE ALL INTERCONNECTING CONDUIT AND WIRING BETWEEN DEVICES, EQUIPMENT, AND PANELBAORD.

4 REAR ELECTRICAL ENCLOSURE EQUIPMENT LAYOUT
SCALE: 1" = 2'-0"



PLAN VIEW

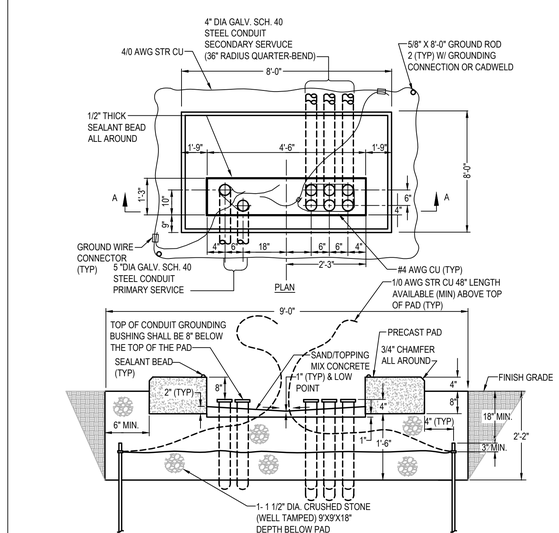


SECTION A-A

NOTES:

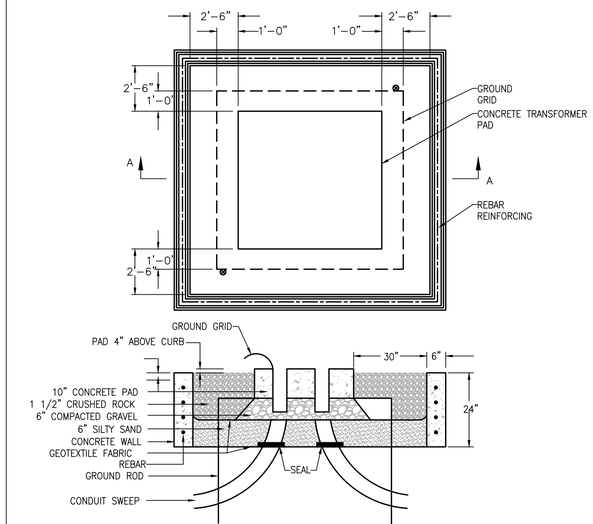
1. CHIMNEY HEIGHT IS KEPT TO MINIMUM TO FACILITATE PLACING COMPLETED SPLICES IN HANDHOLE FROM ABOVE GRADE
2. CONCRETE PER SPECIFICATIONS WITH MINIMUM STRENGTH OF 5,000 PSI AT 28 DAYS. CONCRETE SHALL BE REINFORCED WITH #5 ASTM A615 GRADE 60 STEEL REBAR RODS.
3. PROVIDE HANDHOLE FRAME, RING AND COVER.
4. REFER TO DUCTBANK SECTIONS FOR THE REQUIRED NUMBER OF CONDUIT ENTRANCES. PROVIDE CONDUIT ENTRY SPACE ON NON-USED SIDES FOR A MINIMUM (8) 4" FUTURE CONDUITS.

6 UTILITY HANDHOLE DETAIL
NO SCALE



SECTION A-A

7 PAD MOUNTED TRANSFORMER DETAIL AND GROUNDING
NO SCALE



8 TRANSFORMER OIL CONTAINMENT CURB
NO SCALE

PREPARED BY

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REGISTERED PROFESSIONAL

COMMONWEALTH OF MASSACHUSETTS
MICHAEL J. COTTER
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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

ELECTRICAL DETAILS

NO.	REVISIONS	DATE

DRAWN BY:	RLB
DESIGNED BY:	RLB
CHECKED BY:	MC
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

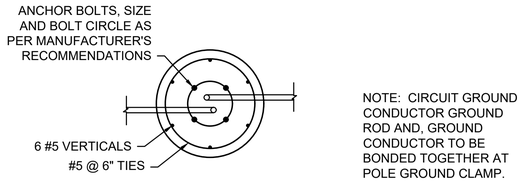
SCALE

50 0 50 100
SCALE IN FEET: 1"=50'

Bid Documents

SHEET NO.

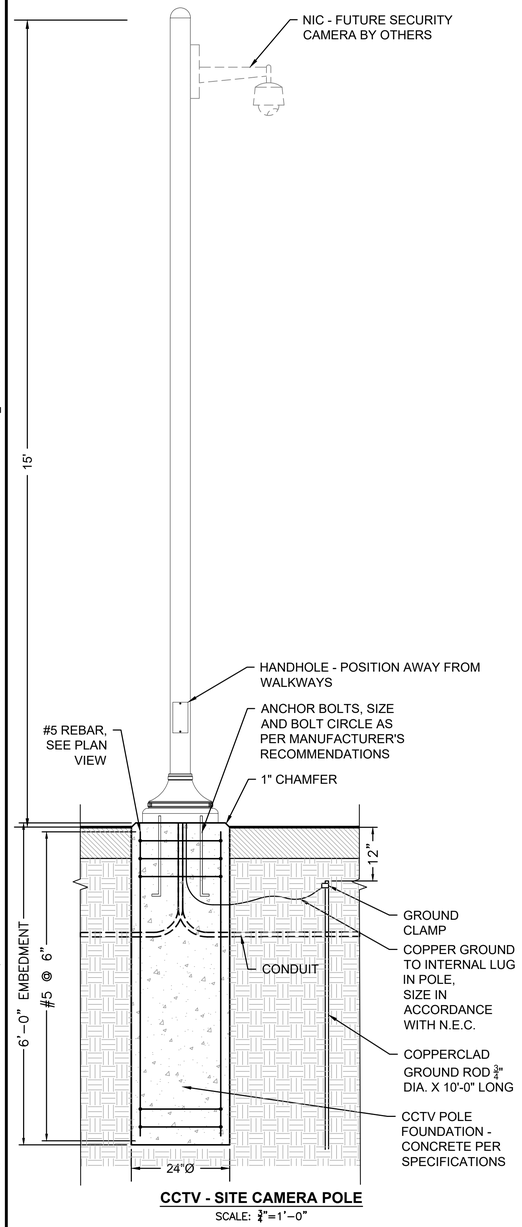
E.2.2



NOTE: CIRCUIT GROUND CONDUCTOR GROUND ROD AND, GROUND CONDUCTOR TO BE BONDED TOGETHER AT POLE GROUND CLAMP.

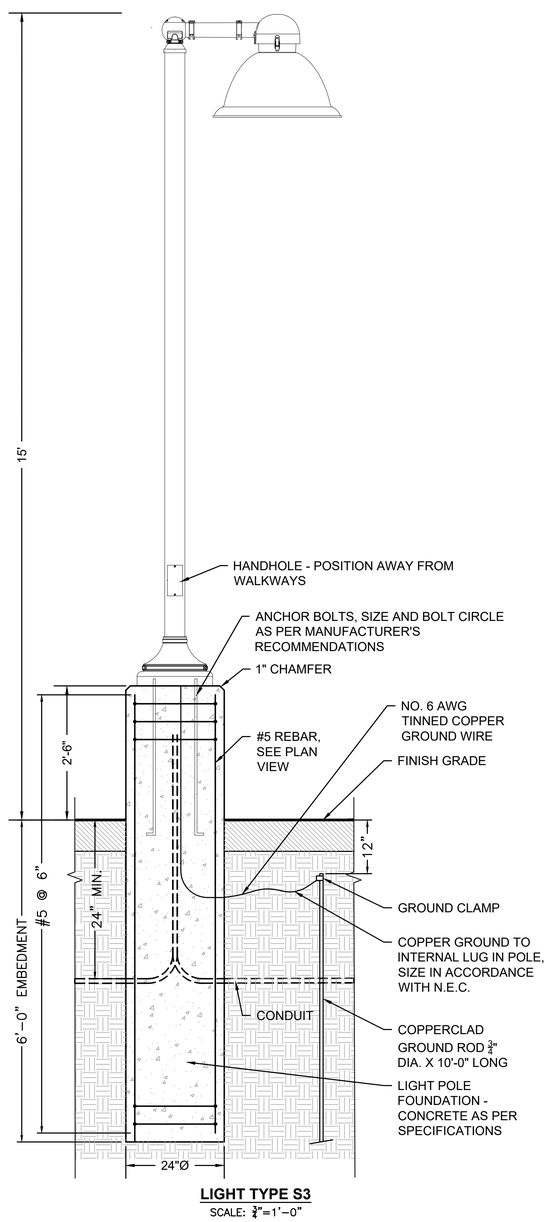
LIGHT & CCTV POLE FOUNDATION - PLAN

SCALE: $\frac{3}{4}$"=1'–0"



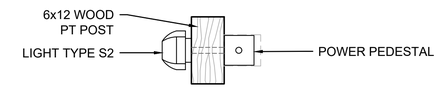
CCTV - SITE CAMERA POLE

SCALE: $\frac{3}{4}$"=1'–0"



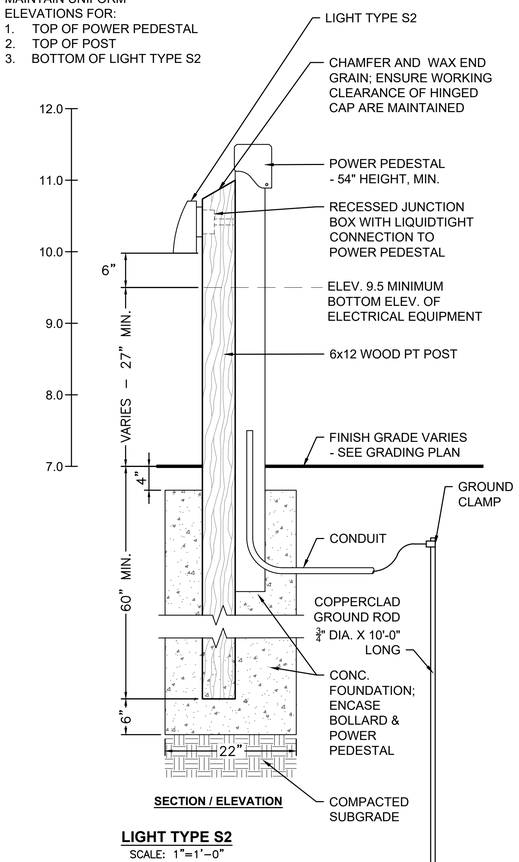
LIGHT TYPE S3

SCALE: $\frac{3}{4}$"=1'–0"



PLAN VIEW

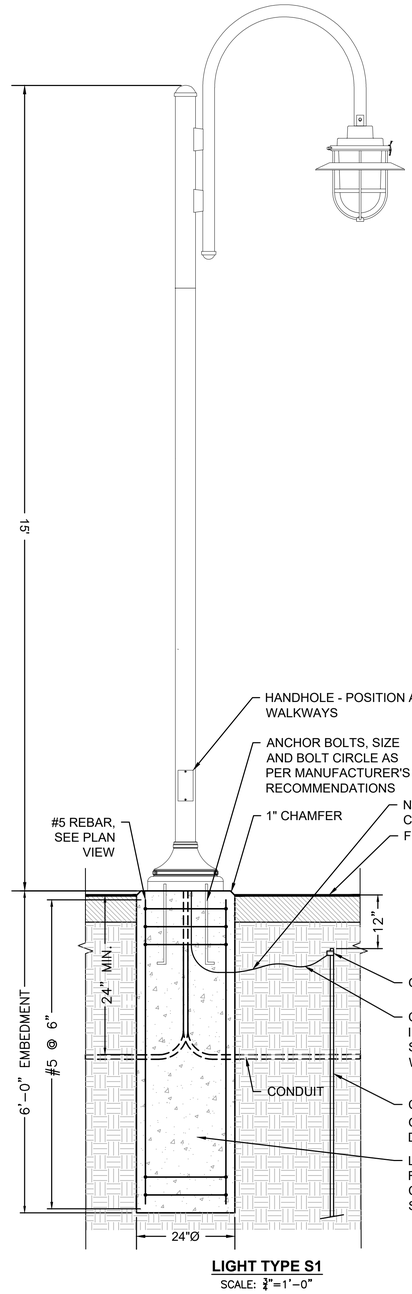
FOR ALL LOCATIONS, MAINTAIN UNIFORM ELEVATIONS FOR:
1. TOP OF POWER PEDESTAL
2. TOP OF POST
3. BOTTOM OF LIGHT TYPE S2



SECTION / ELEVATION

LIGHT TYPE S2

SCALE: 1"=1'–0"



LIGHT TYPE S1

SCALE: $\frac{3}{4}$"=1'–0"

PREPARED BY

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REGISTERED PROFESSIONAL

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

SITE LIGHTING DETAILS - 1

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

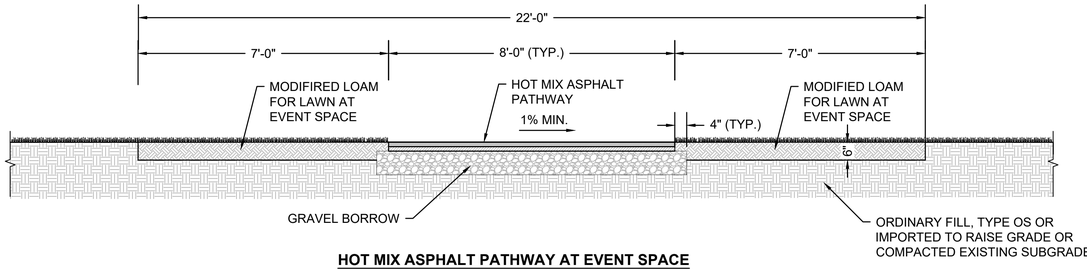
AS SHOWN

Bid Documents

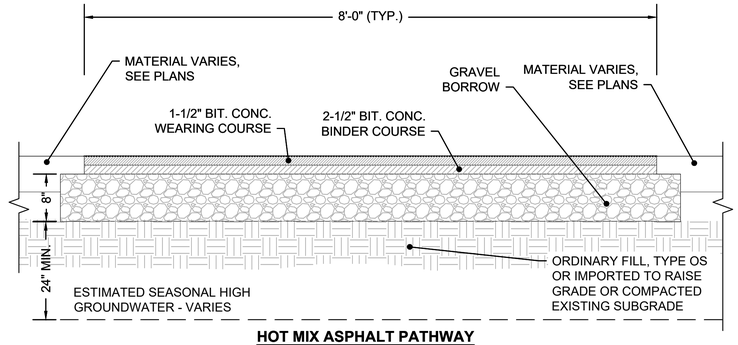
SHEET NO.

C.7.4

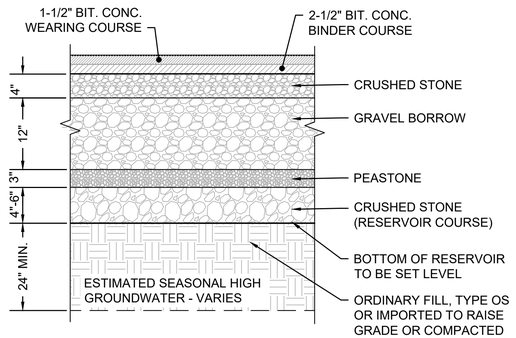
G:\PLANNING LANDSCAPE\10000S\10056 - YARMOUTH, MA RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLAN SET\CONSTRUCTION DOCUMENTS - PHASE 1\10056_ELECTRICAL DETAILS.DWG



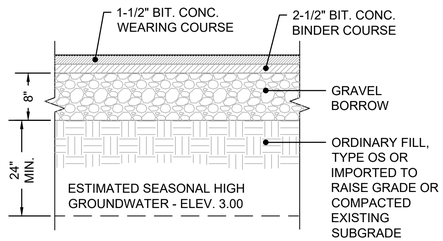
HOT MIX ASPHALT PATHWAY AT EVENT SPACE
SCALE: 1"=1'-0"



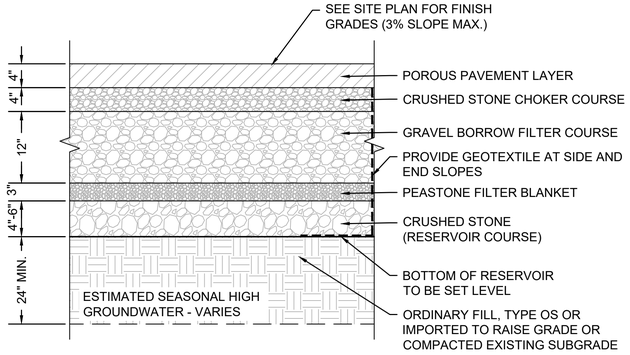
HOT MIX ASPHALT PATHWAY
SCALE: 1"=1'-0"



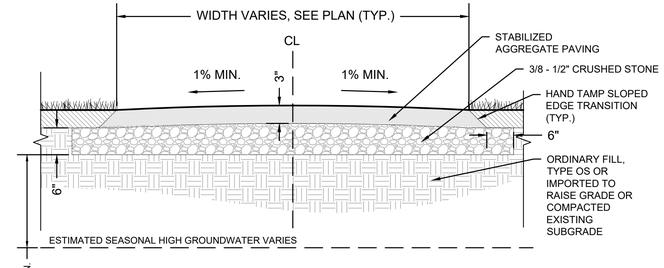
HOT MIX ASPHALT PAVEMENT - TYPE 2
SCALE: 1"=1'-0"



HOT MIX ASPHALT PAVEMENT - TYPE 1
SCALE: 1"=1'-0"

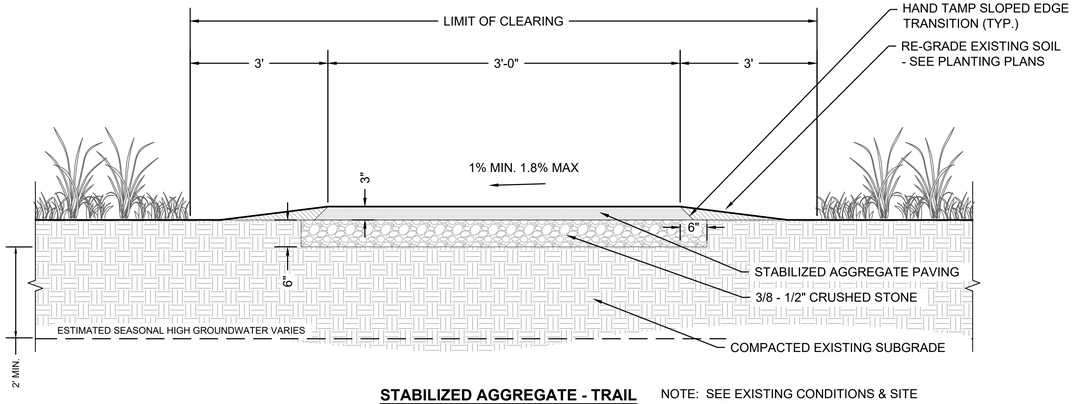


POROUS FLEXIBLE PAVEMENT
SCALE: 1"=1'-0"



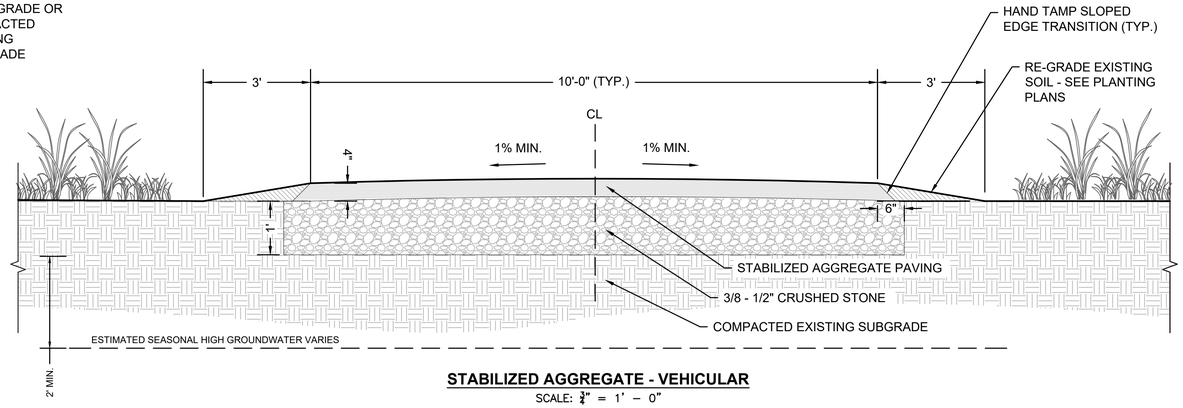
STABILIZED AGGREGATE - PATHWAY
SCALE: 3/4" = 1' - 0"

NOTE:
1. ALL PATHS SHALL COMPLY WITH ALL ADA REGULATIONS. SLOPE OF PATHS SHALL NOT EXCEED 4.8%. CROSS SLOPE OF PATHS SHALL NOT EXCEED 1.8%



STABILIZED AGGREGATE - TRAIL
SCALE: 3/4" = 1' - 0"

NOTE: SEE EXISTING CONDITIONS & SITE PREPARATION PLANS FOR LOCATION OF CLEARING, SEDIMENT CONTROL BARRIER AND PROTECTIVE FENCING FOR EXISTING VEGETATION.



STABILIZED AGGREGATE - VEHICULAR
SCALE: 3/4" = 1' - 0"

NOTES:
1. STABILIZED AGGREGATE PATHWAY MUST ALWAYS BE PRE-WET FOR INSTALLATION. PRE-WETTED STABILIZED AGGREGATE BLEND IS THE PREFERRED METHOD OF INSTALLATION. ENSURE THAT BINDER IS HOMOGENEOUSLY ACTIVATED BY WATER. IF PRE-WETTING IS NOT DONE AT THE QUARRY, THE USE OF A FRONT-LOADING TRACTOR AND A WATER SOURCE CAN PRE-WET PATHWAY AGGREGATE ON THE JOB SITE. SLOWLY ADD WATER TO THE ORGANIC-LOCK PATHWAY AGGREGATE AND TURN IT OVER UNTIL ~10% MOISTURE CONTENT (24 GALLONS PER IMPERIAL TON) IS ACHIEVED
2. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
3. ALL DIMENSIONS ARE CONSIDERED TRUE AND REFLECT MANUFACTURER'S SPECIFICATIONS.
4. ALL PAVEMENT AND WALKWAY SYSTEMS SHALL BE ADA COMPLIANT. NO CROSS SLOPES SHALL EXCEED 1.8% RUNNING SLOPE SHALL NOT EXCEED 4.8%.

PREPARED BY
BETA
www.BETA-Inc.com

REGISTERED PROFESSIONAL

REGISTERED PROFESSIONAL

PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

SITE DETAILS - 1 - PAVEMENT & WALKWAY SYSTEMS

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

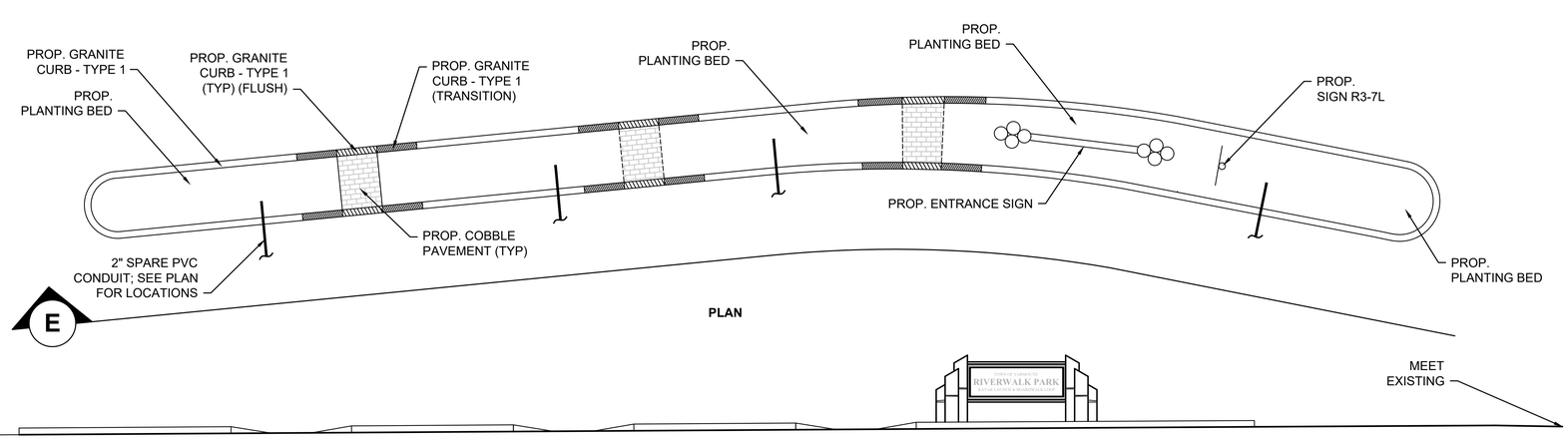
AS SHOWN

Bid Documents

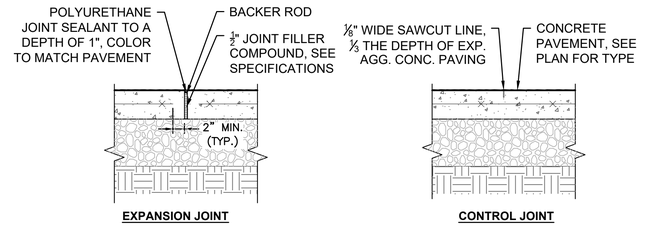
SHEET NO.

C.7.5

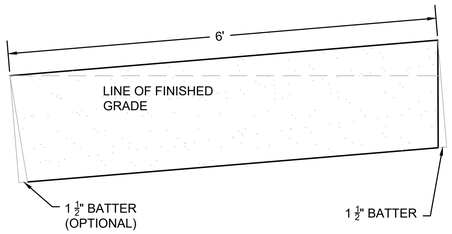
G:\PLANNING LANDSCAPE\10000S\10056 - YARMOUTH, MA RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLAN SET\CONSTRUCTION DOCUMENTS - PHASE 1\10056_SITE_DETAILS.DWG



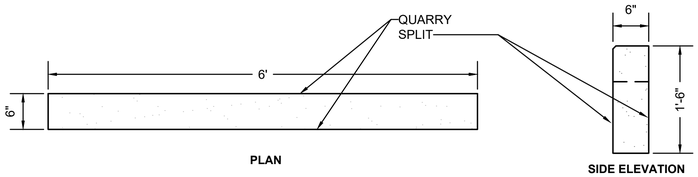
ENTRY DRIVE - RAISED ISLAND
SCALE: 3/16"=1'–0"

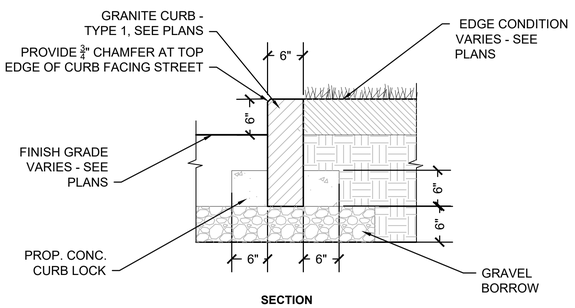


EXPANSION & CONTROL JOINTS
SCALE: 1"=1'–0"



TRANSITION CURB

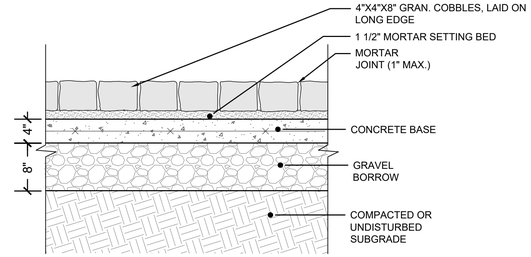




NOTES:

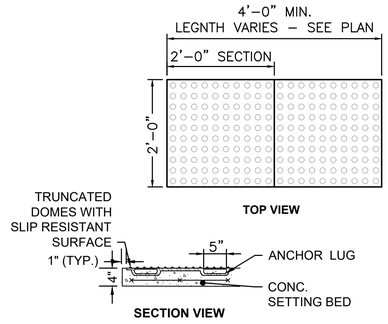
1. TOP SURFACE TO BE DRESSED BY SAW OR TOOL.
2. ALL REQUIRED CUTTING OF CURB PIECE TO BE PAID FOR UNDER COST OF CURB.
3. THE CONTRACTOR MAY CUT EXISTING CURB SECTIONS AS REQUIRED TO MEET THIS DETAIL AND SPECIFICATIONS, WHERE OLD CURBING IS BEING REUSED. PAYMENT TO BE UNDER THIS ITEM ONLY
4. CONTRACTOR SHALL QUANTIFY EXISTING CURB TO BE RESET. PIECES SHALL BE MIN. 4'0" IN LENGTH IN ORDER TO BE RESET. QUALITY AND QUANTITY OF EXISTING CURB SHALL BE REVIEWED WITH OWNER/ OWNER'S REPRESENTATIVE PRIOR TO FINALIZING

GRANITE CURB - TYPE 1
SCALE: 1"=1'–0"



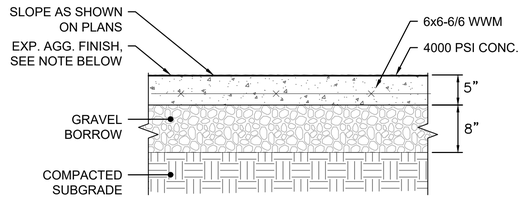
NOTES:
1. SEE PLAN FOR PATTERN AND LIMITS.
2. SLOPE PAVEMENT PER GRADING PLANS.

COBBLE PAVEMENT
SCALE: 1"=1'–0"



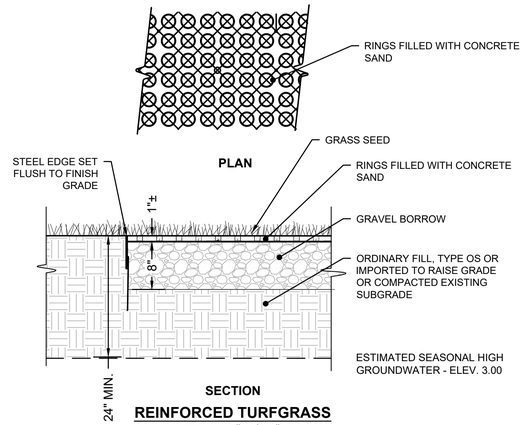
NOTES:
1. LOCATE AT ALL WHEELCHAIR RAMPS AS SHOWN ON THE PLANS.
2. ADA COMPLIANT TACTILE WARNING PLATE FABRICATED FROM GRAY IRON.

DETECTABLE WARNING PANEL
SCALE: ¾"=1'–0"

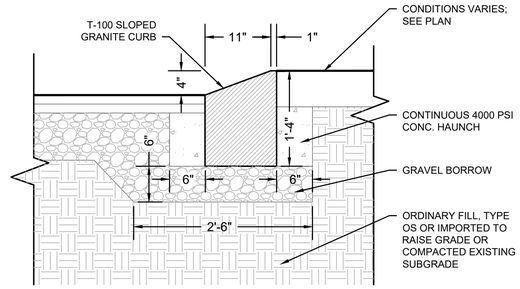


CONCRETE PAVEMENT - TYPE A
SCALE: 1"=1'–0"

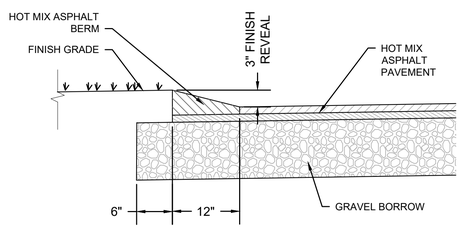
NOTES:
1. SEE SPECIFICATIONS FOR AGGREGATE SIZE, COLOR, SHAPE AND SAMPLE REQUIREMENTS.
2. EXPANSION JOINTS SHALL BE 20' O.C. UNLESS OTHERWISE NOTED ON THE PLANS.
3. THOROUGHLY WASH AND CLEAN ALL SURFACES AND REMOVE ALL DEBRIS AFTER SAWCUTTING.
4. SAWCUT CONTROL JOINTS SHALL BE 5' O.C. UNLESS OTHERWISE NOTED ON THE PLANS.



REINFORCED TURFGRASS
SCALE: 1"=1'–0"



GRANITE CURB - TYPE 2
SCALE: 1" = 1' – 0 "



NOTE:
HMA BERM CAN BE PLACED AT THE SAME TIME THAT THE SURFACE COURSE LAYER IS PLACED ON THE BITUMINOUS ASPHALT DRIVEWAY OR IT CAN BE INSTALLED IN A SEPARATE OPERATION ON THE BINDER COURSE.

HOT MIX ASPHALT BERM
NOT TO SCALE

PREPARED BY
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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

SITE DETAILS - 2 - PAVEMENT & WALKWAY SYSTEMS

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

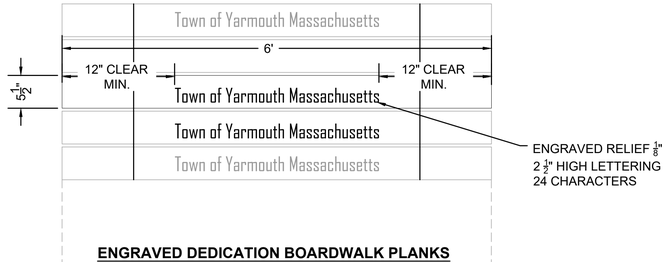
AS SHOWN

Bid Documents

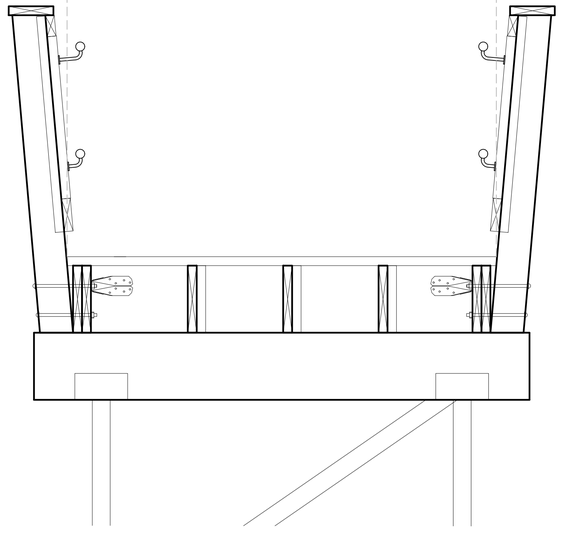
SHEET NO.

C.7.6

GRAPHIC PANEL LEGEND			
KEY	THEME	SIZE	QUANTITY
GP-S-1	SITE MAP	24"x36"	2
GP-S-2	HISTORY	24"x36"	1
GP-S-3	WATER	24"x36"	1
GP-BW-1	ECOLOGY SALT MARSH	53"x14"	1
GP-BW-2	ABOVE THE SALT MARSH	53"x14"	1
GP-BW-3	IN THE SALT MARSH	53"x14"	1
S = SITE LOCATION			
BW = BOARDWALK LOCATION			

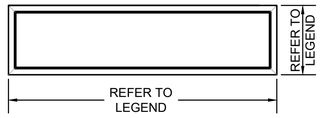


ENGRAVED DEDICATION BOARDWALK PLANKS
SCALE: 1"=1'-0"

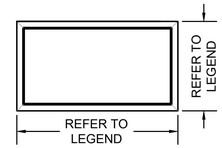


BOARDWALK SECTION (TYP.)
SCALE: 1"=1'-0"

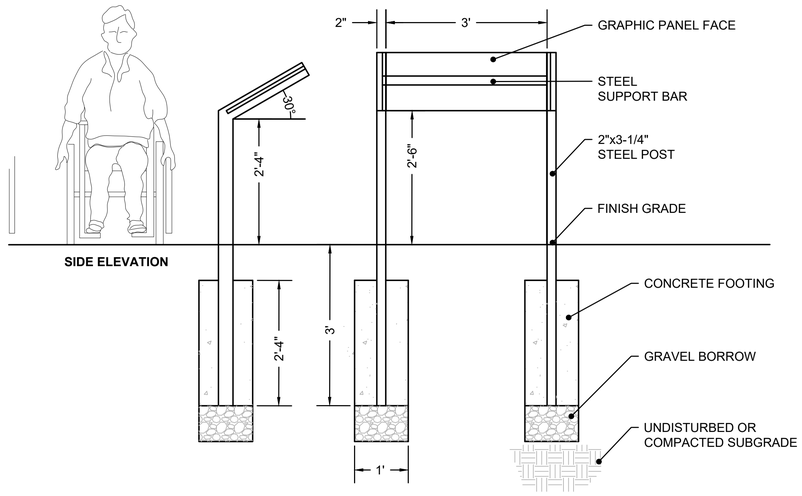
NOTE:
SECTION SHOWN FOR REFERENCE ONLY.



GP-BW GRAPHIC PANEL FACE
SEE BOARDWALK PLANS FOR DETAILS



GP-S GRAPHIC PANEL FACE



SIDE ELEVATION

FRONT ELEVATION / SECTION

INTERPRETIVE GRAPHIC PANEL
SCALE: ¾" = 1' - 0"

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

SITE DETAILS - 3 - GRAPHIC PANELS & DEDICATION PLANKS

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

AS SHOWN

Bid Documents

SHEET NO.

C.7.7

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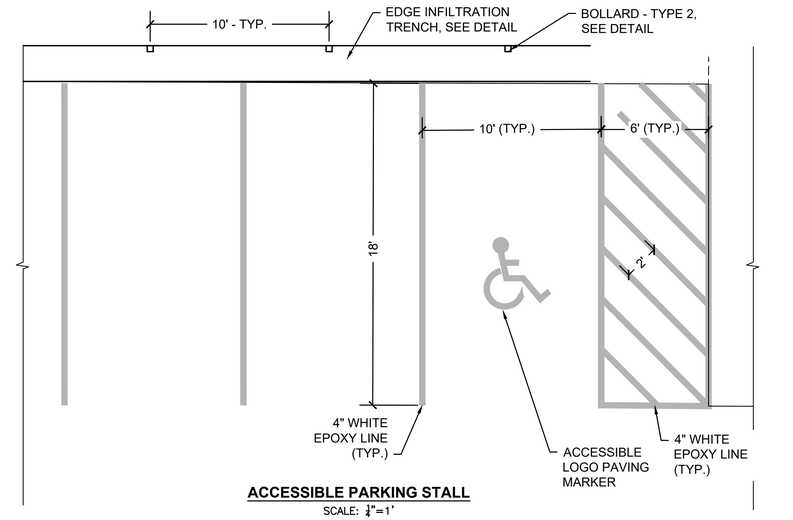
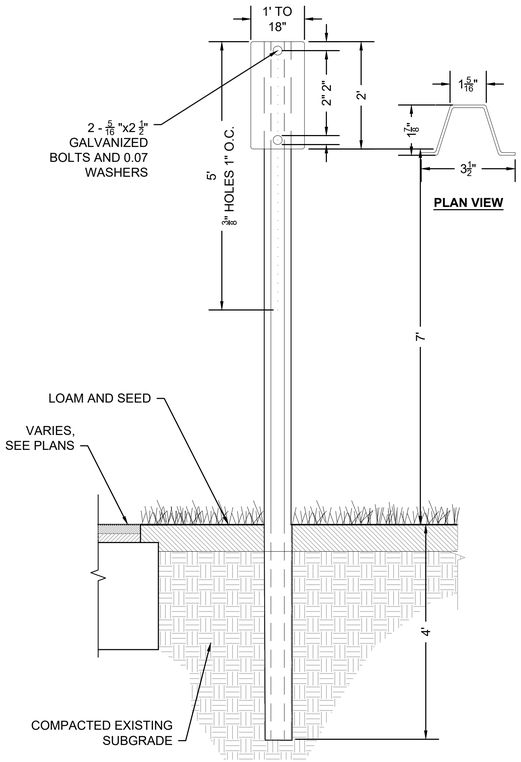


ACCESSIBLE PARKING STALL
SCALE: ¼"=1'

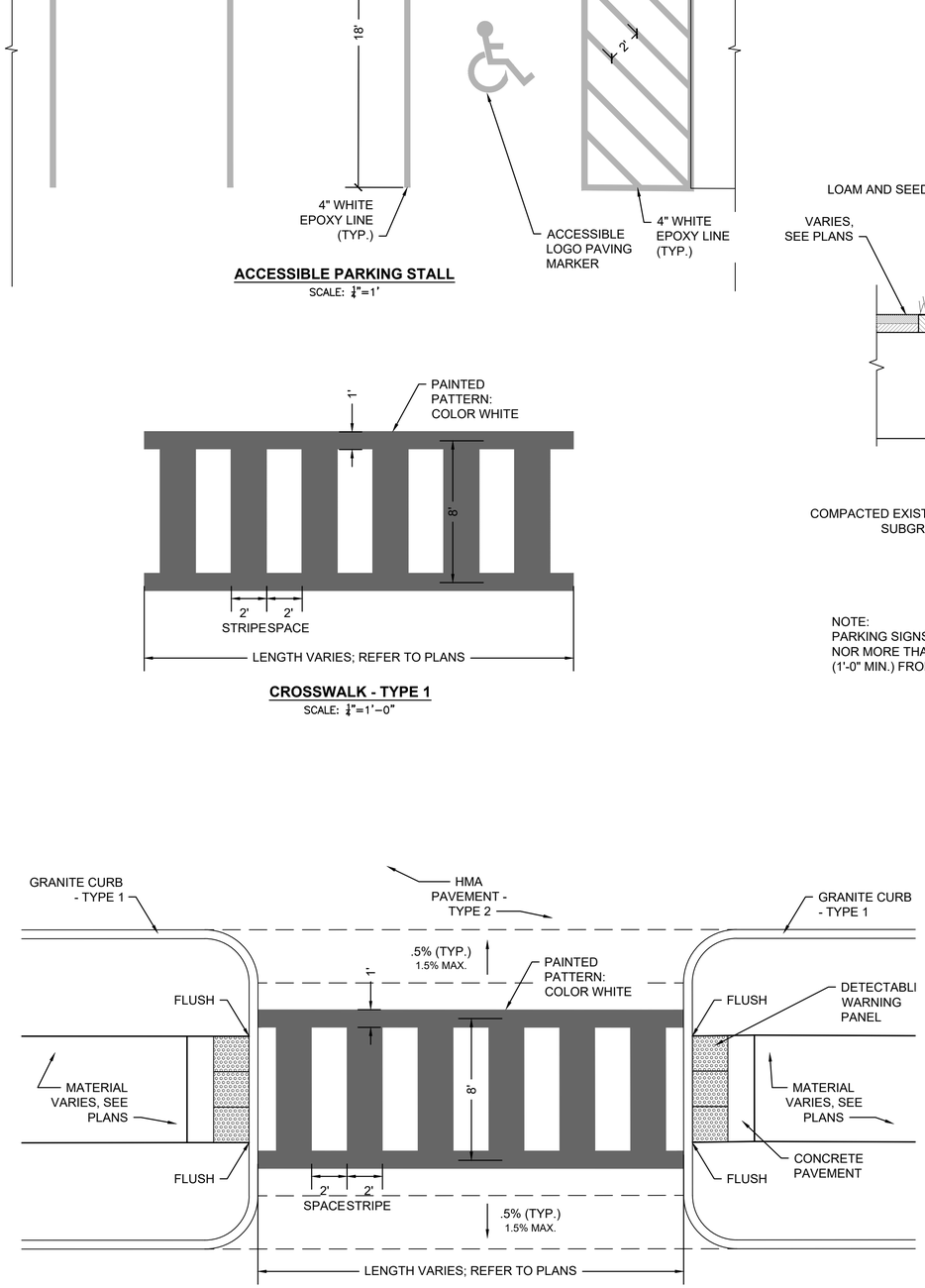
CROSSWALK - TYPE 1
SCALE: ¼"=1'–0"



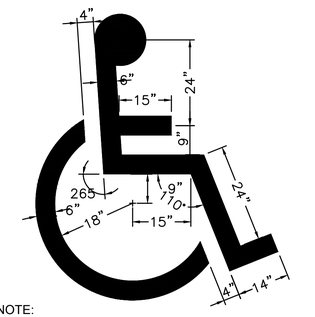
ELEVATION

NOTE:
PARKING SIGNS SHALL BE SET AT AN ANGLE OF NOT LESS THAN 30° NOR MORE THAN 45° WITH A LINE PARALLEL TO FLOW OF TRAFFIC, 1'-6" (1'-0" MIN.) FROM EDGE OF PAVEMENT.

REGULATORY SIGN
SCALE: ¾"=1'



CROSSWALK - TYPE 2
SCALE: ¼"=1'–0"



NOTE:
1. HANDICAP SYMBOLS SHALL BE WHITE EPOXY.
2. HANDICAP SYMBOLS SHALL BE INSTALLED, ORIENTED AS SHOWN IN EACH LOCATION AND CENTERED IN THE PARKING STALL.

ACCESSIBLE LOGO PAVING MARKER
NOT TO SCALE

TOWN TO PROVIDE GRAPHIC

SIGN PS-1
SCALE: N.T.S.
QTY. 4

SIGN PS-2
SCALE: N.T.S.
QTY. 2

SIGN PS-3
SCALE: N.T.S.
QTY. 2

SIGN PS-4
SCALE: N.T.S.
QTY. 6

SIGN PS-5
SCALE: N.T.S.
QTY. 4

PARK SIGN LEGEND

SIGN R1-1
SCALE: N.T.S.

SIGN R3-7L
SCALE: N.T.S.

SIGN R3-7R
SCALE: N.T.S.

SIGN R8-3
SCALE: N.T.S.

SIGN R7-8
SCALE: N.T.S.

REGULATORY SIGN LEGEND

SIGN & PAVEMENT MARKING NOTES

1. ALL EXISTING SIGNS AND SIGN POSTS WITHIN THE PROJECT LIMITS SHALL BE RETAINED UNLESS OTHERWISE NOTED ON PLANS.
2. ALL PROPOSED PAVEMENT MARKINGS SHALL BE THERMOPLASTIC. ALL EXISTING PAVEMENT MARKINGS THAT CONFLICT WITH THE PROPOSED PAVEMENT MARKINGS SHALL BE REMOVED BY AN APPROVED METHOD.
3. ALL PROPOSED SIGN POSTS SHALL BE P-5 TYPE (TELESCOPIC POST).
4. ALL R7 PARKING SIGNS SHALL BE MOUNTED AT AN ANGLE OF NOT LESS THAN 30° NOR MORE THAN 45° TO THE CURB AND FACING THE FLOW OF TRAFFIC. ALL OTHER SIGNS SHALL BE 90° TO THE CURB AND FACING THE FLOW OF TRAFFIC.
5. SIGNS TO BE MOUNTED NEAR THE CURB LINE SHALL BE SET BACK 6" FROM THE EDGE OF THE SIGN PANEL TO THE CURB LINE. NO SIGN SHALL OVERHANG THE CURB LINE.
6. ALL SIGNS SHALL BE MOUNTED TO PROVIDE A 7' MINIMUM CLEARANCE BETWEEN THE BOTTOM OF THE SIGN AND FINISHED GRADE.

PREPARED BY

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REGISTERED PROFESSIONAL

REGISTERED PROFESSIONAL

PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

SITE DETAILS - 4 - REGULATORY SIGNAGE

BID DOCUMENTS

NO.	REVISIONS	DATE
1		

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

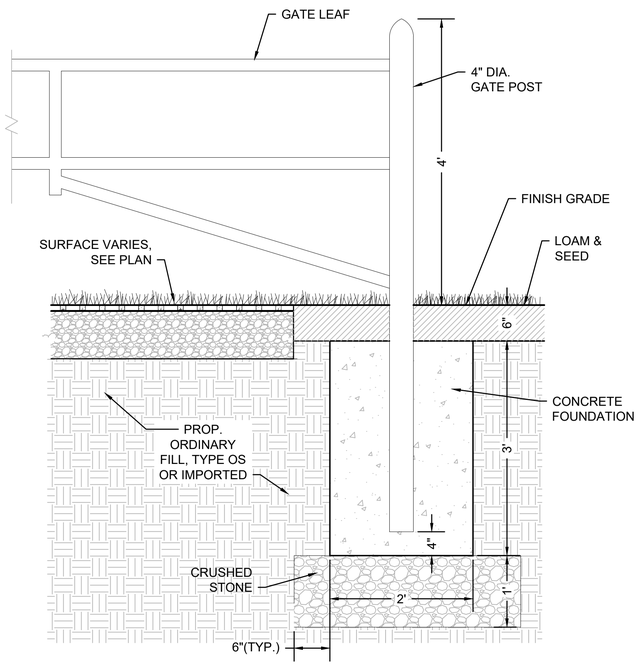
SCALE

AS SHOWN

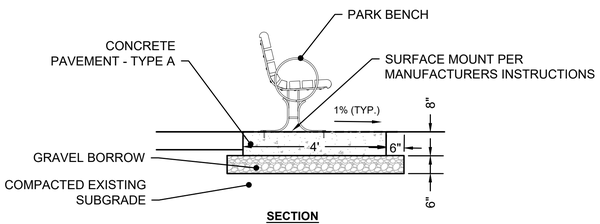
Bid Documents

SHEET NO.

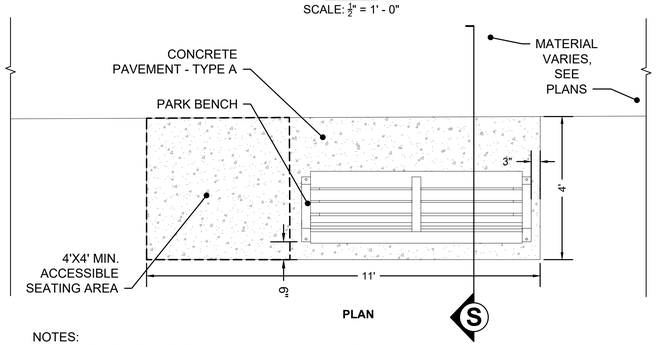
C.7.8



BARRIER GATE
SCALE: 1"=1'–0"



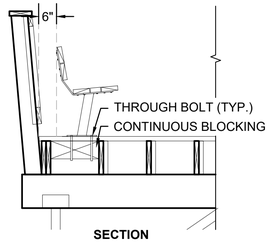
SECTION
SCALE: ½" = 1' - 0"



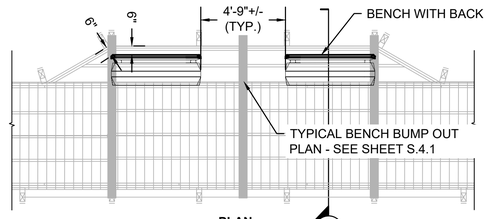
PLAN

NOTES:
1. SEE SPECIFICATIONS FOR MANUFACTURER, MODEL, & FINISH.
2. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
3. CONCRETE PAVEMENT SHALL BE INSTALLED AS PART OF THE BASE BID OF THE CONTRACT. FURNISH & INSTALL OF BENCH IS CAPTURED AS PART OF THE ADD ALTERNATE NO. 2.

PARK BENCH
SCALE: ½" = 1'



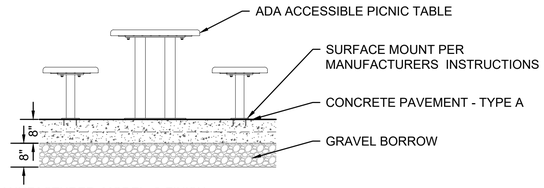
SECTION



PLAN
SCALE : ¼" = 1' - 0"

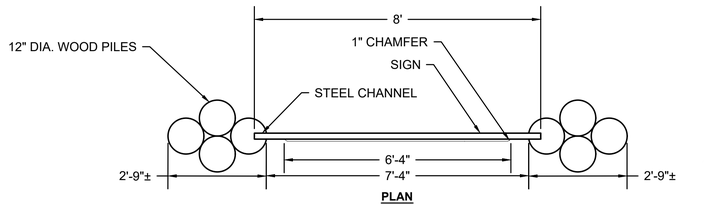
NOTES:
1. SEE SPECIFICATIONS FOR MANUFACTURER, MODEL, & FINISH.
2. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

BOARDWALK BENCH
SCALE: ½" = 1'

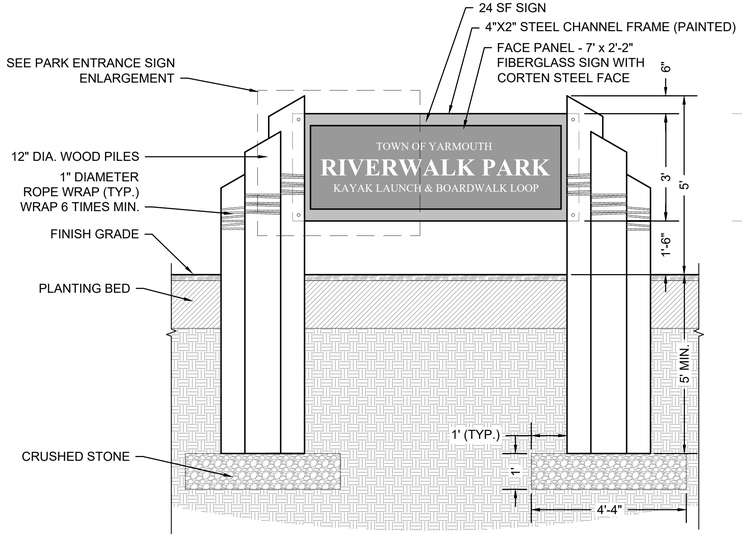


NOTES:
1. SEE SPECIFICATIONS FOR MANUFACTURER, MODEL, & FINISH.
2. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
3. CONCRETE PAVEMENT SHALL BE INSTALLED AS PART OF THE BASE BID OF THE CONTRACT. FURNISH & INSTALL OF ACCESSIBLE PICNIC TABLE IS CAPTURED AS PART OF THE ADD ALTERNATE NO. 2.

ACCESSIBLE PICNIC TABLE
SCALE: ½" = 1' – 0"

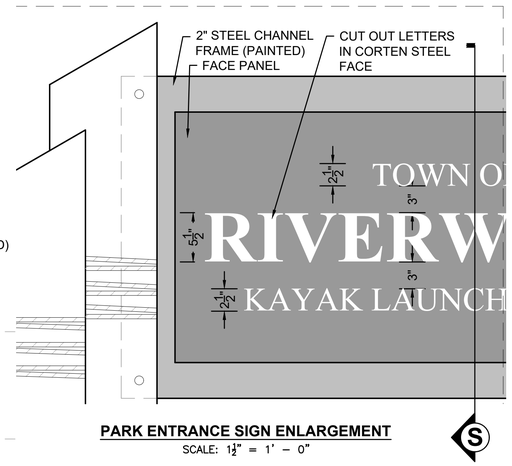


PLAN

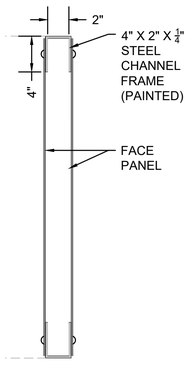


ELEVATION

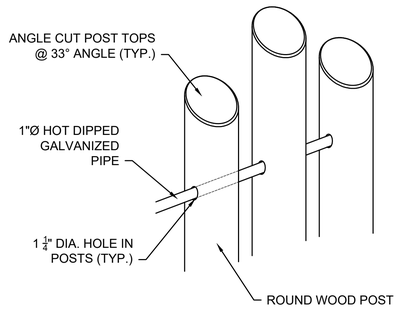
PARK ENTRANCE SIGN
SCALE: ½"=1'–0"



PARK ENTRANCE SIGN ENLARGEMENT
SCALE: 1½" = 1' – 0"

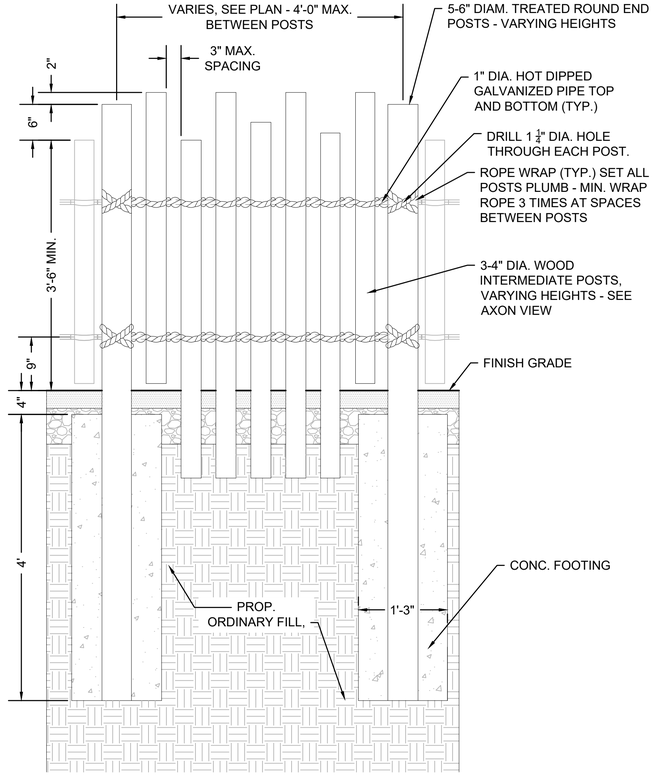


SECTION
SCALE: 1½" = 1' – 0"



RUSTIC POST FENCE - AXON
SCALE: N.T.S.

RUSTIC POST FENCE -
REFERENCE IMAGE
SCALE: N.T.S.



NOTE: EMBED INTERMEDIATE POSTS 18" BELOW FINISH GRADE

RUSTIC POST FENCE - SECTION
SCALE: 1"=1'–0"

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

SITE DETAILS - 5 - SITE AMENITIES

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

AS SHOWN

Bid Documents

SHEET NO.

C.7.9

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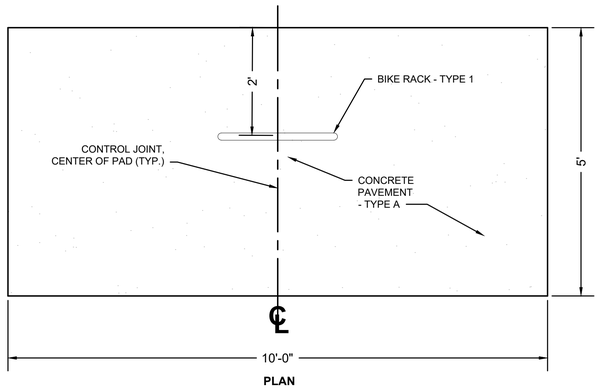
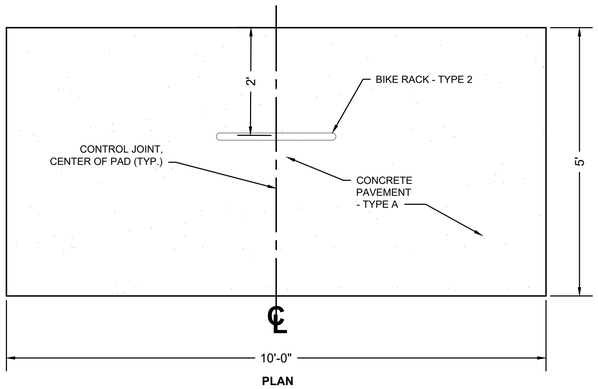
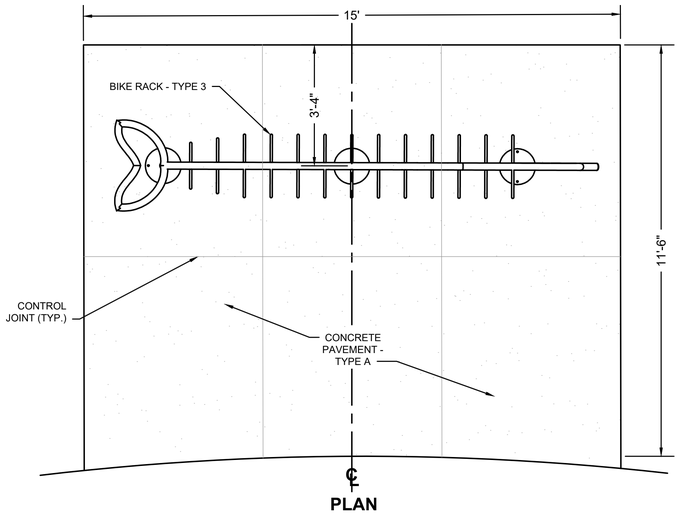


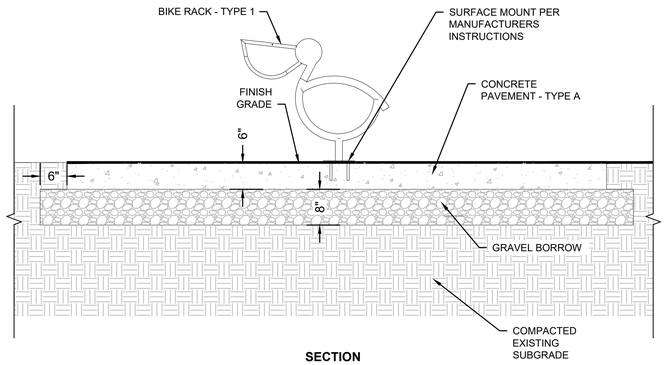
PLAN



PLAN

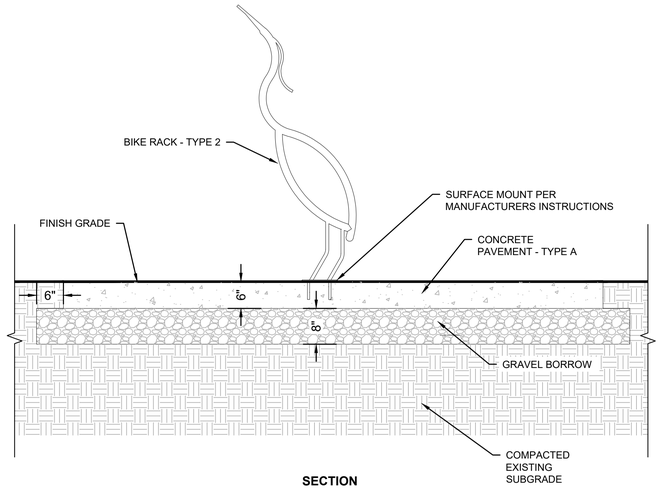


PLAN



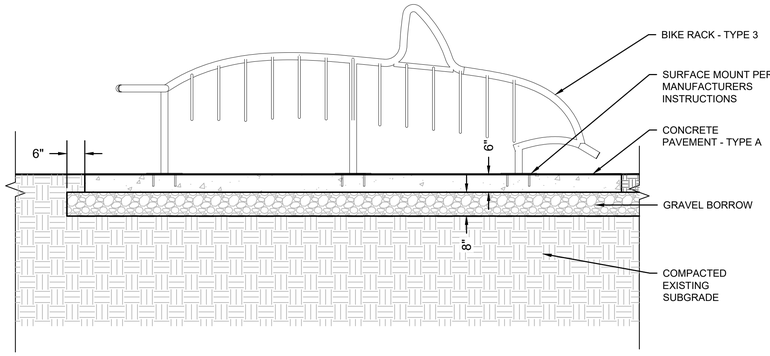
SECTION

BIKE RACK - TYPE 1
SCALE: 3/4"=1'-0"



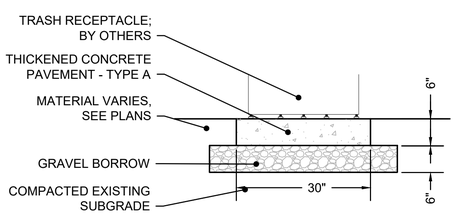
SECTION

BIKE RACK - TYPE 2
SCALE: 3/4"=1'-0"

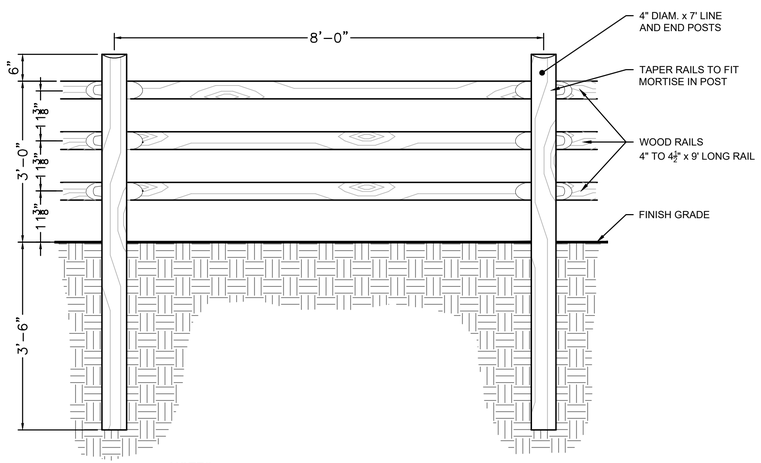


SECTION

BIKE RACK - TYPE 3
SCALE: 1/2"=1'



CONCRETE PAD FOR TRASH RECEPTACLE
SCALE: 3/4" = 1'



NOTES:
1. ALL WOOD SHALL BE WHITE CEDAR NATURAL FINISH.
2. AFTER SETTING POSTS, TAMP BACKFILL FIRMLY IN PLACE.
3. DO NOT BACKFILL WITH CONCRETE.

WOOD SPLIT RAIL FENCE
SCALE: 3/4"=1'

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

SITE DETAILS - 6 - SITE AMENITIES

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
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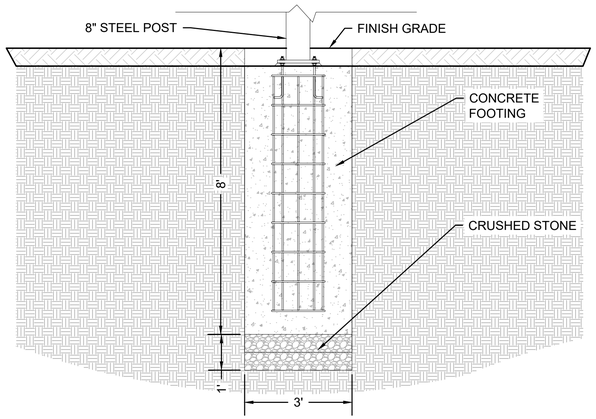
SCALE

AS SHOWN

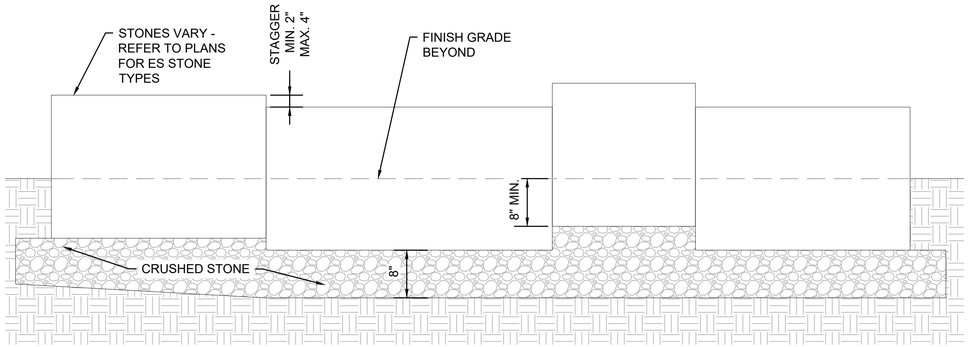
Bid Documents

SHEET NO.

C.7.10



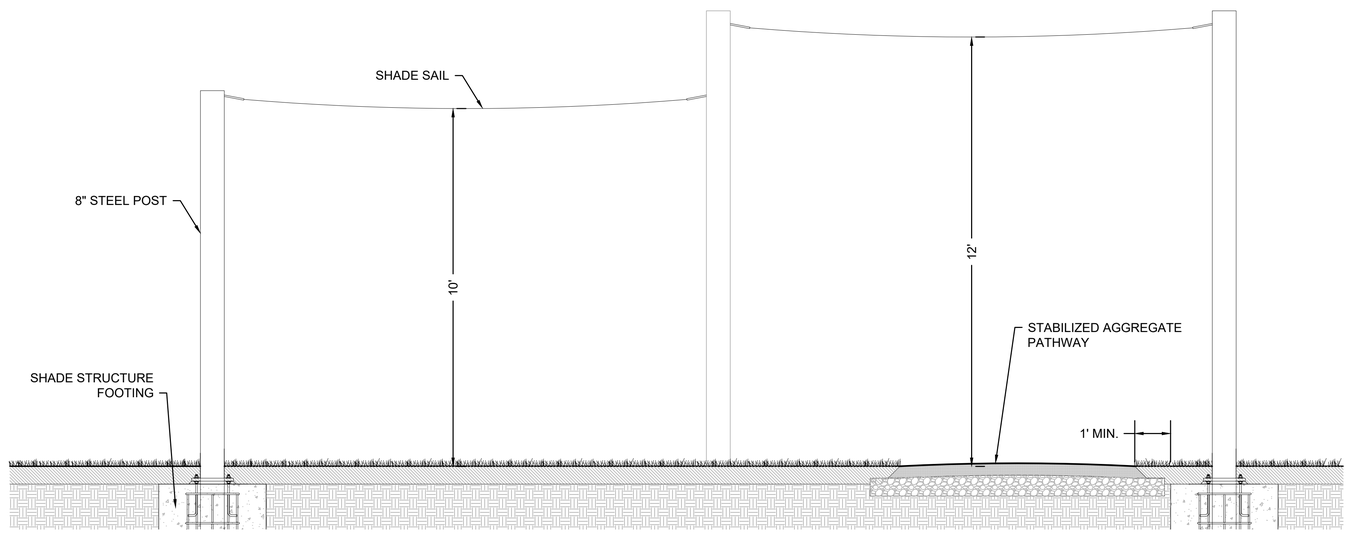
SHADE STRUCTURE FOOTING
SCALE: ½" = 1'



EXISTING STONE SLAB (ES) - SECTION (ES GROUPS)
SCALE: 1"=1'-0"

ES GROUPS LEGEND	
ES GROUP - 1	(2) ES4
ES GROUP - 2	(2) ES4
ES GROUP - 3	(2) ES4
ES GROUP - 4	(2) ES4
ES GROUP - 5	(1) ES2 (4) ES3 (1) ES6
ES GROUP - 6	(1) ES3 (3) ES4 (5) ES5
ES GROUP - 7	(4) ES3
ES GROUP - 8	(2) ES5
ES GROUP - 9	(10) ES3 (4) ES4 (14) ES5 (3) ES6
ES GROUP - 10	(8) ES3 (8) ES4 (12) ES5
ES GROUP - 11	(2) ES4
ES GROUP - 12	(3) ES3 (5) ES5 (2) ES6
ES GROUP - 13	(1) ES7
ES GROUP - 14	(5) ES2 (2) ES3
ES GROUP - 15	(3) ES4
ES GROUP - 16	(1) ES3 (1) ES4 (1) ES5
ES GROUP - 17	(2) ES3 (1) ES4
ES GROUP - 18	(1) ES6
ES GROUP - 19	(2) ES4
ES GROUP - 20	(2) ES4
ES GROUP - 21	(2) ES4
ES GROUP - 22	(2) ES4
ES GROUP - 23	(1) ES2 (1) ES4 (1) ES5
ES GROUP - 24	(1) ES2 (5) ES3
ES GROUP - 25	(1) ES2 (1) ES3 (1) ES4
ES GROUP - 26	(4) ES2 (1) ES6
ES GROUP - 27	(3) ES2
ES GROUP - 28	(2) ES2
ES GROUP - 29	(3) ES4
ES GROUP - 30	(2) ES2 (1) ES4

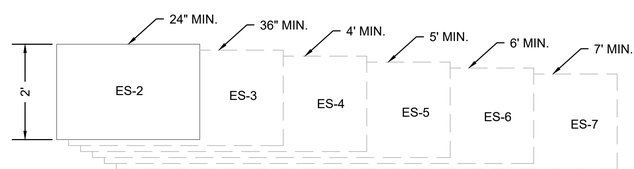
PROPOSED EXISTING STONE GROUPINGS (ES GROUPS) - TABLE
SCALE: NTS



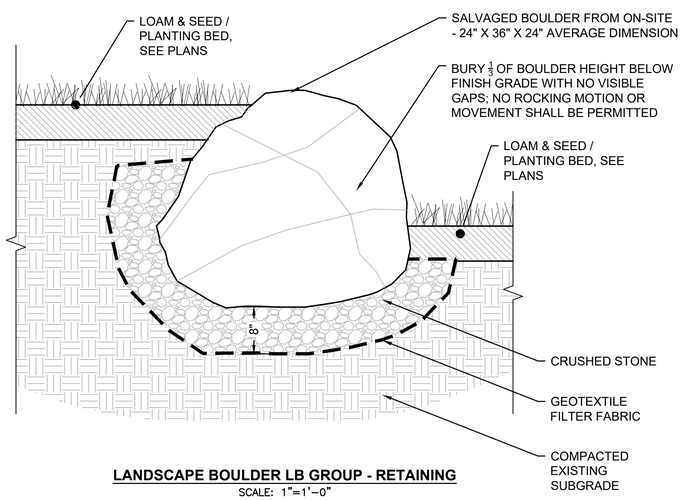
FABRIC SAIL SHADE STRUCTURE - ADD ALTERNATE NO. 2
SCALE: ½" = 1'

NAME	LENGTH	QTY.
ES-2	24 - 36"	60
ES-3	36 - 48"	64
ES-4	48 - 60"	53
ES-5	60 - 72"	44
ES-6	72 - 84"	10
ES-7	84 - 96"	1
	Total	232

EXISTING STONE SLABS (ES) - TABLE
SCALE: NTS



EXISTING STONE SLABS (ES) FROM ON-SITE STOCK PILE
SCALE: 1"=1'-0"



LANDSCAPE BOULDER LB GROUP - RETAINING
SCALE: 1"=1'-0"

NAME	LENGTH (LF)
LB GROUP - 1	20
LB GROUP - 2	18
LB GROUP - 3	27
LB GROUP - 4	8
LB GROUP - 5	8
LB GROUP - 6	78
LB GROUP - 7	11
LB GROUP - 8	9
LB GROUP - 9	23
LB GROUP - 10	60
LB GROUP - 11	16
LB GROUP - 12	13
LB GROUP - 13	12
LB GROUP - 14	12
LB GROUP - 15	11
LB GROUP - 16	5
LB GROUP - 17	5
LB GROUP - 18	27
LB GROUP - 19	6
LB GROUP - 20	5
LB GROUP - 21	22
LB GROUP - 22	8
LB GROUP - 23	16
LB GROUP - 24	10
LB GROUP - 25	10
LB GROUP - 26	22
LB GROUP - 27	6
LB GROUP - 28	6
LB GROUP - 29	6
LB GROUP - 30	6
LB GROUP - 31	5
LB GROUP - 32	10
LB GROUP - 33	12
LB GROUP - 34	12
LB GROUP - 35	22
LB GROUP - 36	22
LB GROUP - 37	40
LB GROUP - 38	40

LANDSCAPE BOULDER (LB GROUP) - TABLE
SCALE: NTS

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

SITE DETAILS - 7 - SITE AMENITIES

BID DOCUMENTS

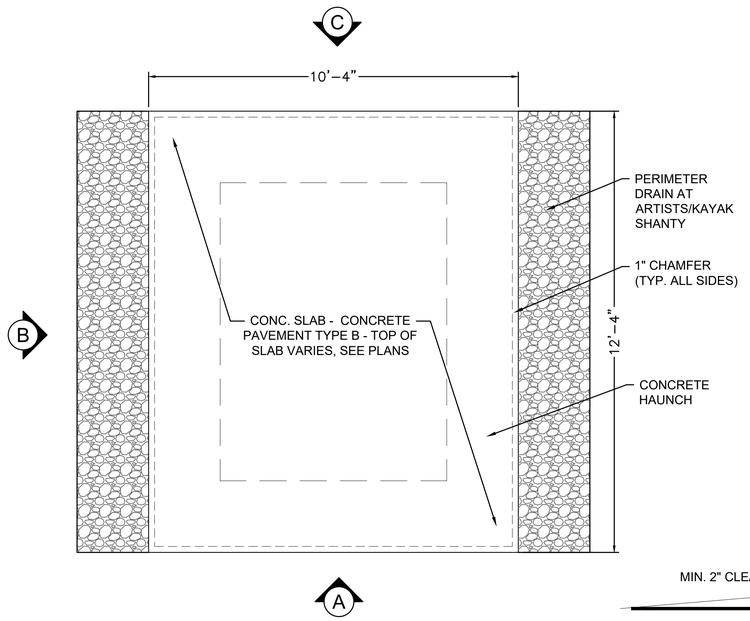
NO.	REVISIONS	DATE

DRAWN BY: AKP
DESIGNED BY: AWG
CHECKED BY: AWG
ISSUE DATE: 4/5/2024
BETA JOB NO.: 10056

SCALE
NONE

Bid Documents

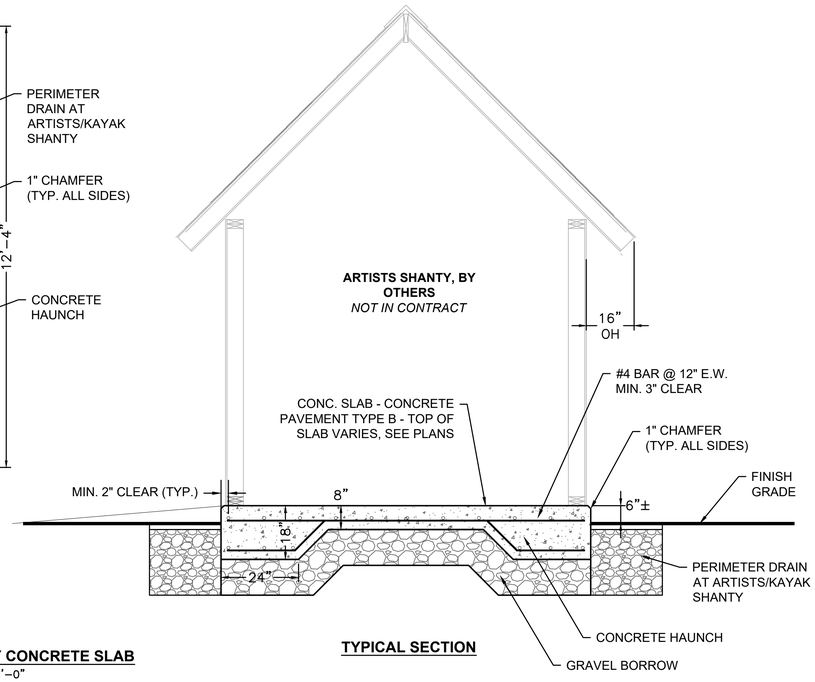
SHEET NO.
C.7.11



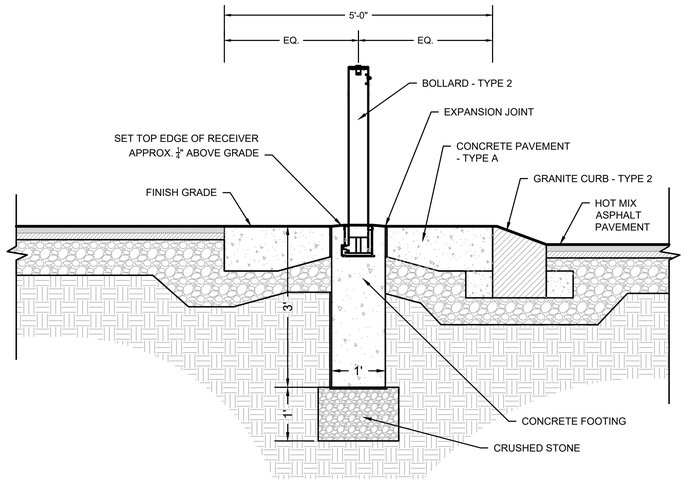
PLAN VIEW

NOTES:
1. ARTIST/KAYAK SHANTY CONCRETE SLAB SHALL BE INSTALLED AS PART OF THIS CONTRACT, SEE PLANS FOR LOCATION.
2. ARTIST/KAYAK SHANTY NOT IN CONTRACT, SHOWN FOR REFERENCE ONLY.

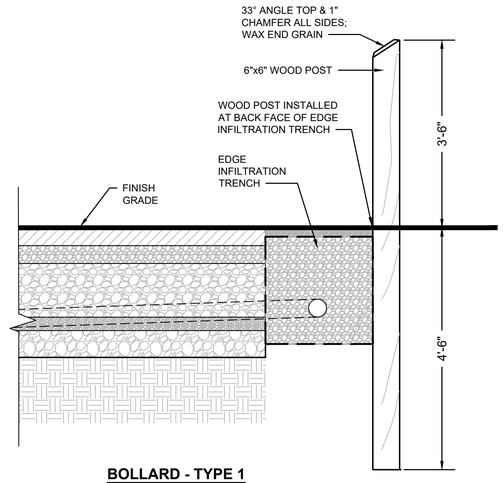
ARTIST/KAYAK SHANTY CONCRETE SLAB
SCALE: 1/2"=1'–0"



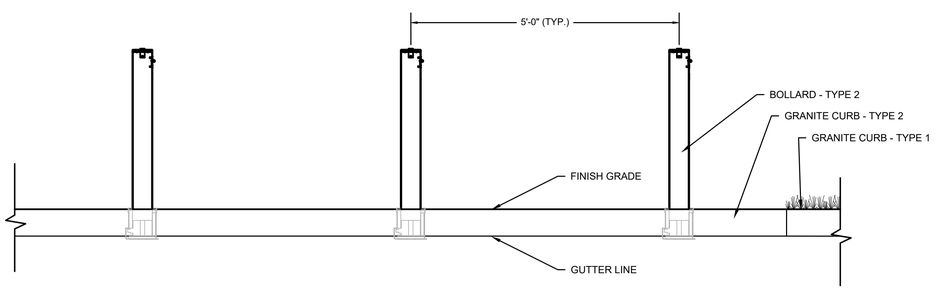
TYPICAL SECTION



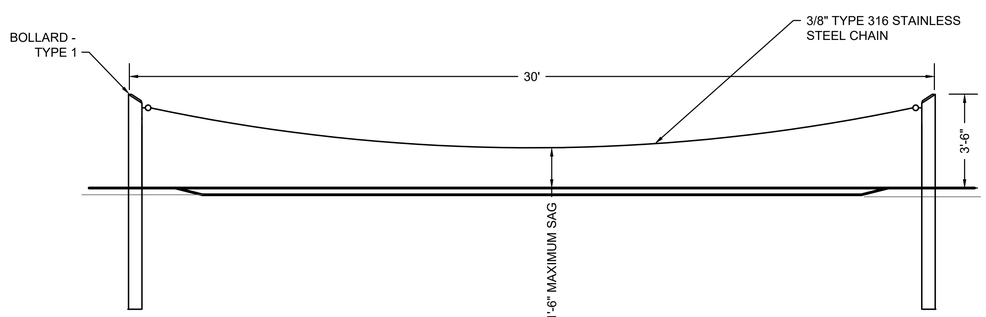
BOLLARD - TYPE 2 - SECTION
SCALE: 3/4"=1'–0"



BOLLARD - TYPE 1
SCALE: 3/4"=1'–0"



BOLLARD - TYPE 2 - ELEVATION
SCALE: 3/4"=1'–0"



BOLLARD - TYPE 1 WITH CHAIN - ELEVATION
SCALE: 3/4"=1'–0"

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

SITE DETAILS - 8 - SITE AMENITIES

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
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ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

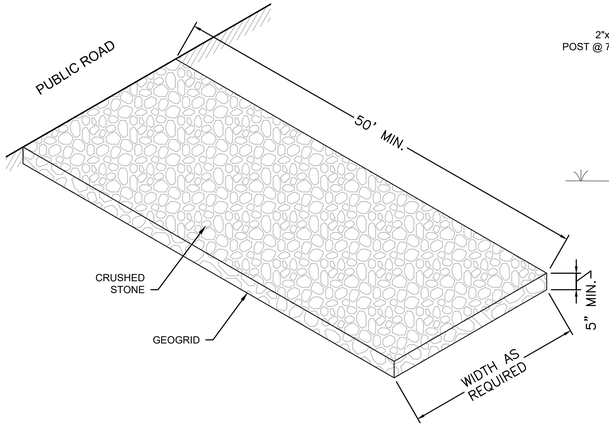
SCALE

NONE

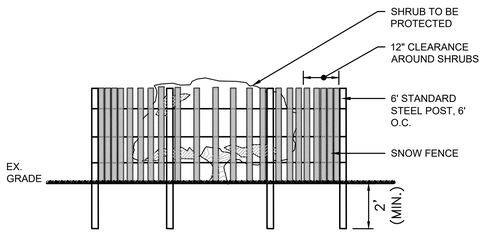
Bid Documents

SHEET NO.

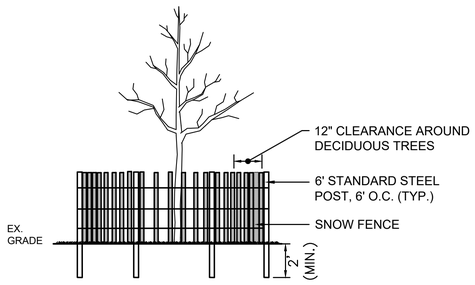
C.7.12



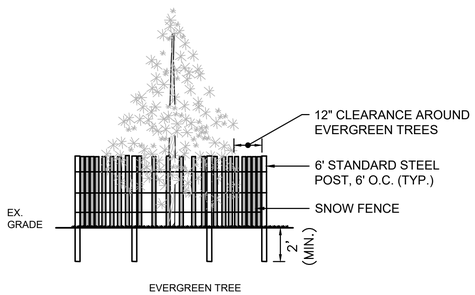
CONSTRUCTION ENTRANCE
NOT TO SCALE



SHRUB PROTECTION DEVICE
NOT TO SCALE

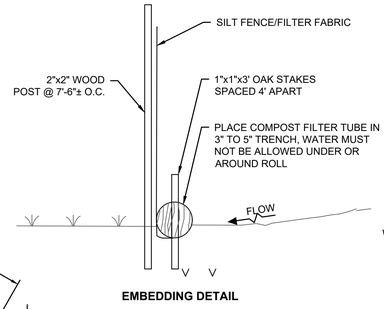


DECIDUOUS TREE

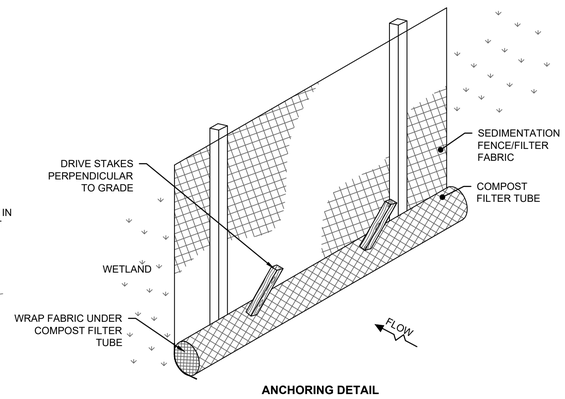


EVERGREEN TREE

PROTECTIVE FENCING FOR EXISTING VEGETATION
NOT TO SCALE



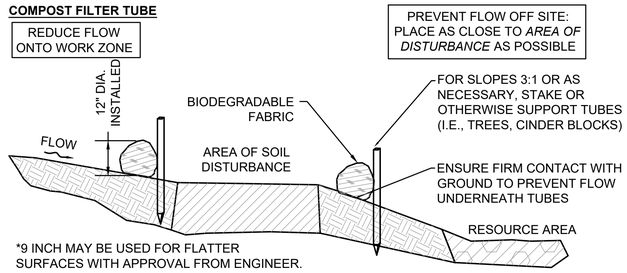
EMBEDDING DETAIL



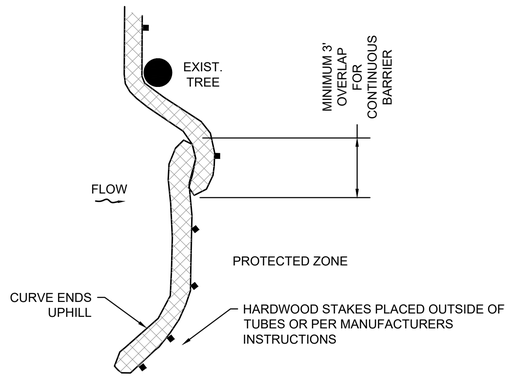
ANCHORING DETAIL

EROSION CONTROL DEVICE - TYPE 1
SCALE: ½" = 1' – 0"

COMPOST FILTER TUBE



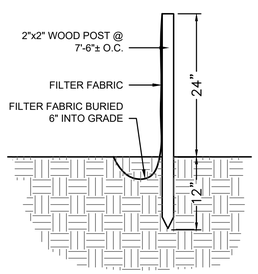
*9 INCH MAY BE USED FOR FLATTER SURFACES WITH APPROVAL FROM ENGINEER.



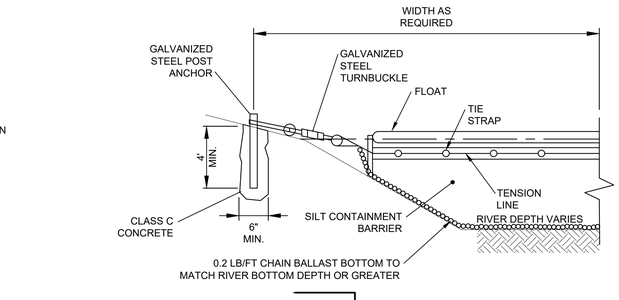
PLAN VIEW

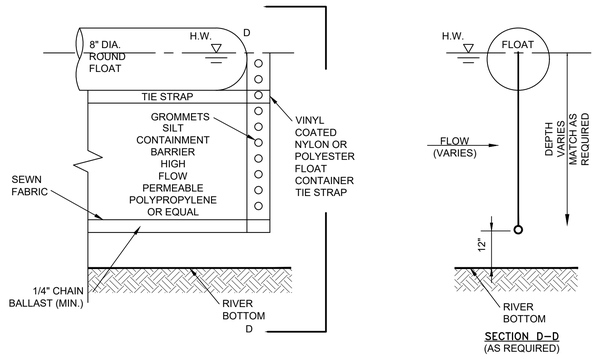
NOTES:
1. PLACE TUBE ALONG CONTOURS AND PERPENDICULAR TO FLOW.
2. ADJUST LOCATION AS REQUIRED FOR OPTIMUM EFFECTIVENESS. DO NOT INSTALL IN WATERWAYS.
3. PLACE STAKES AS NEEDED TO SECURE TUBES IN PLACE.

EROSION CONTROL DEVICE - TYPE 2
½"=1' – 0"



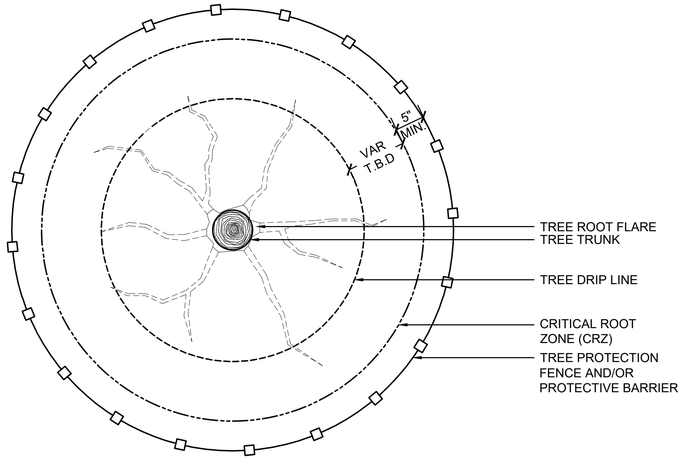
EROSION CONTROL DEVICE - TYPE 3
SCALE: 1"=1'

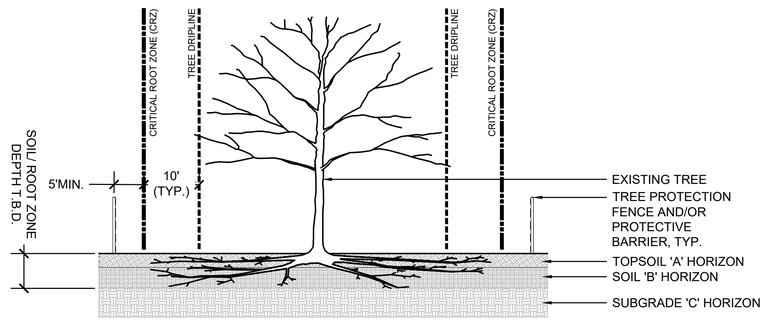




SECTION D–D
(AS REQUIRED)

FLOATING SILT FENCE
SCALE: ½" = 1' – 0"





EXISTING TREE PRESERVATION WITH AIRSPADE
SCALE: NO TO SCALE

G:\PLANNING LANDSCAPE\10000S\10056 - YARMOUTH, MA RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLAN SET\CONSTRUCTION DOCUMENTS - PHASE 1\10056_SITE_DETAILS.DWG

PREPARED BY

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

SITE DETAILS - 9 - SITE PREPARATION

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

AS SHOWN

Bid Documents

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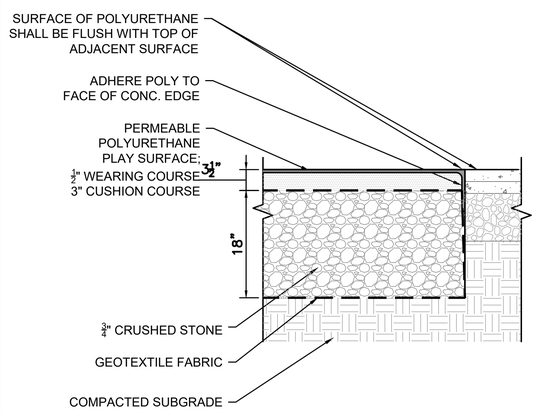
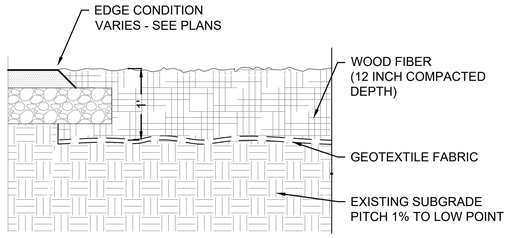
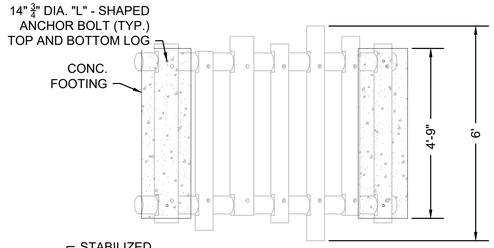


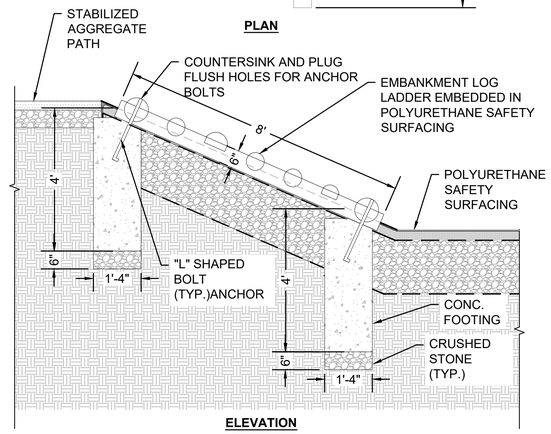
POLYURETHANE SAFETY SURFACING
SCALE: 1"=1'



WOOD FIBER MULCH
NOT TO SCALE

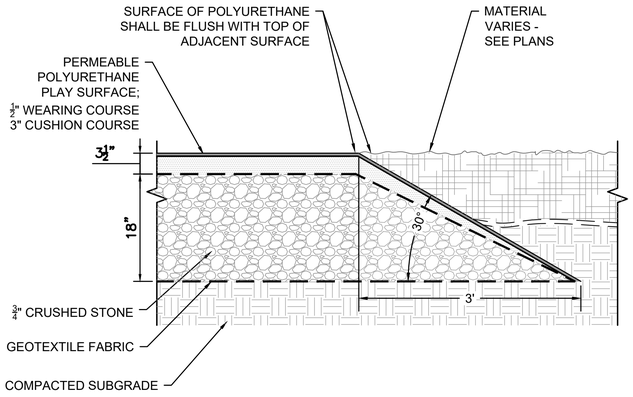


PLAN

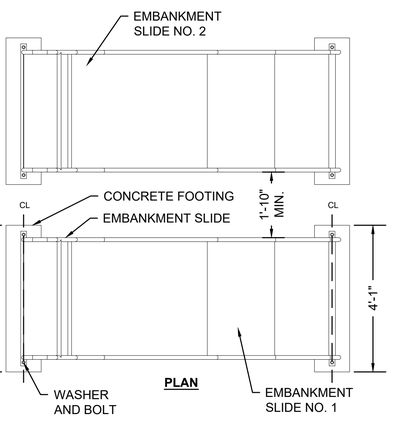


ELEVATION

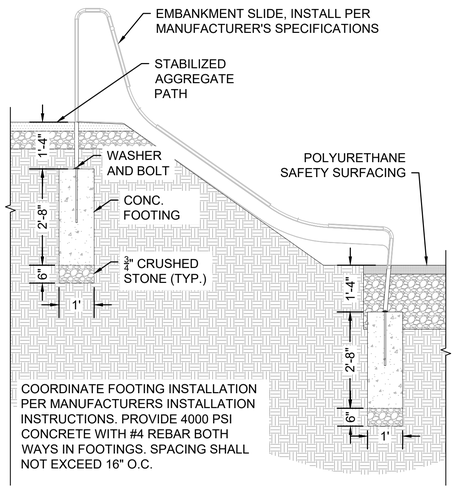
EMBANKMENT LOG LADDER
SCALE: ½"=1'



POLYURETHANE SAFETY SURFACING EDGE
SCALE: 1"=1'

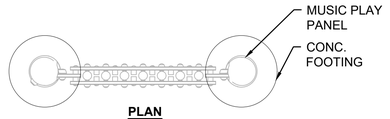


PLAN

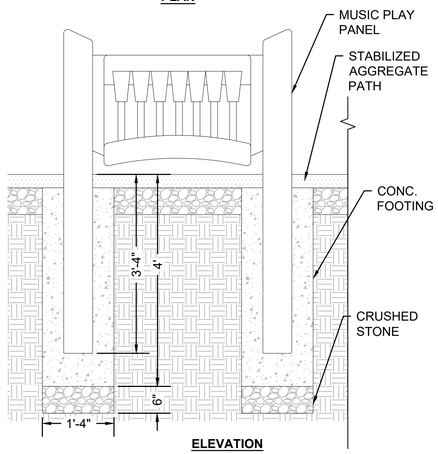


ELEVATION

EMBANKMENT SLIDE
SCALE: ½"=1'



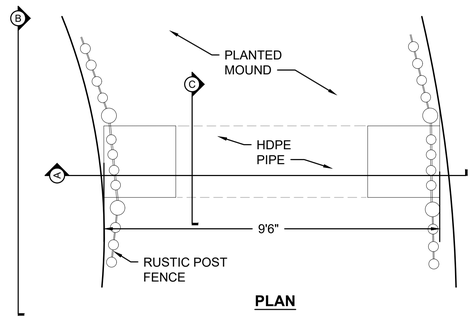
PLAN



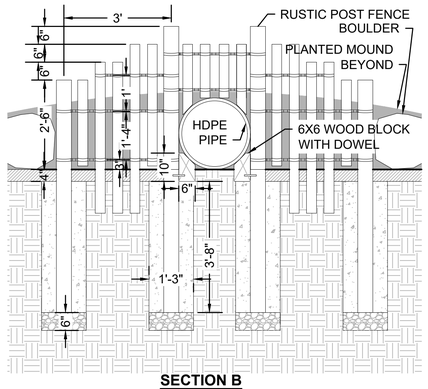
ELEVATION

COORDINATE FOOTING INSTALLATION PER MANUFACTURERS INSTALLATION INSTRUCTIONS. PROVIDE 4000 PSI CONCRETE WITH #4 REBAR BOTH WAYS IN FOOTINGS. SPACING SHALL NOT EXCEED 16" O.C.

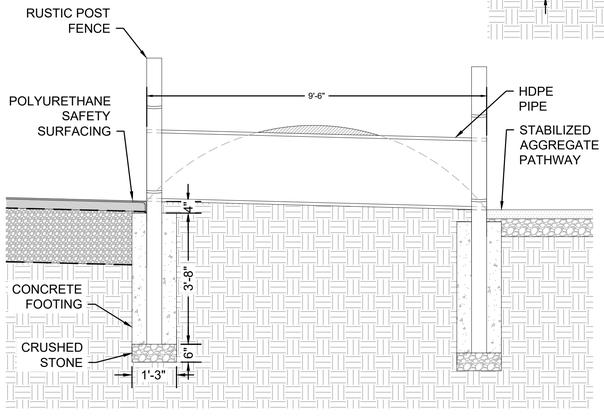
MUSIC PLAY PANEL
SCALE: ¾"=1'



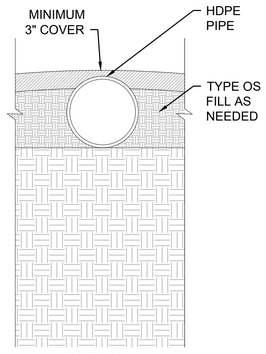
PLAN



SECTION B



SECTION A



SECTION C

TUNNEL
SCALE: ½"=1'

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PREPARED BY

BETA
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REGISTERED PROFESSIONAL

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

SITE DETAILS - PLAYGROUND - 1

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

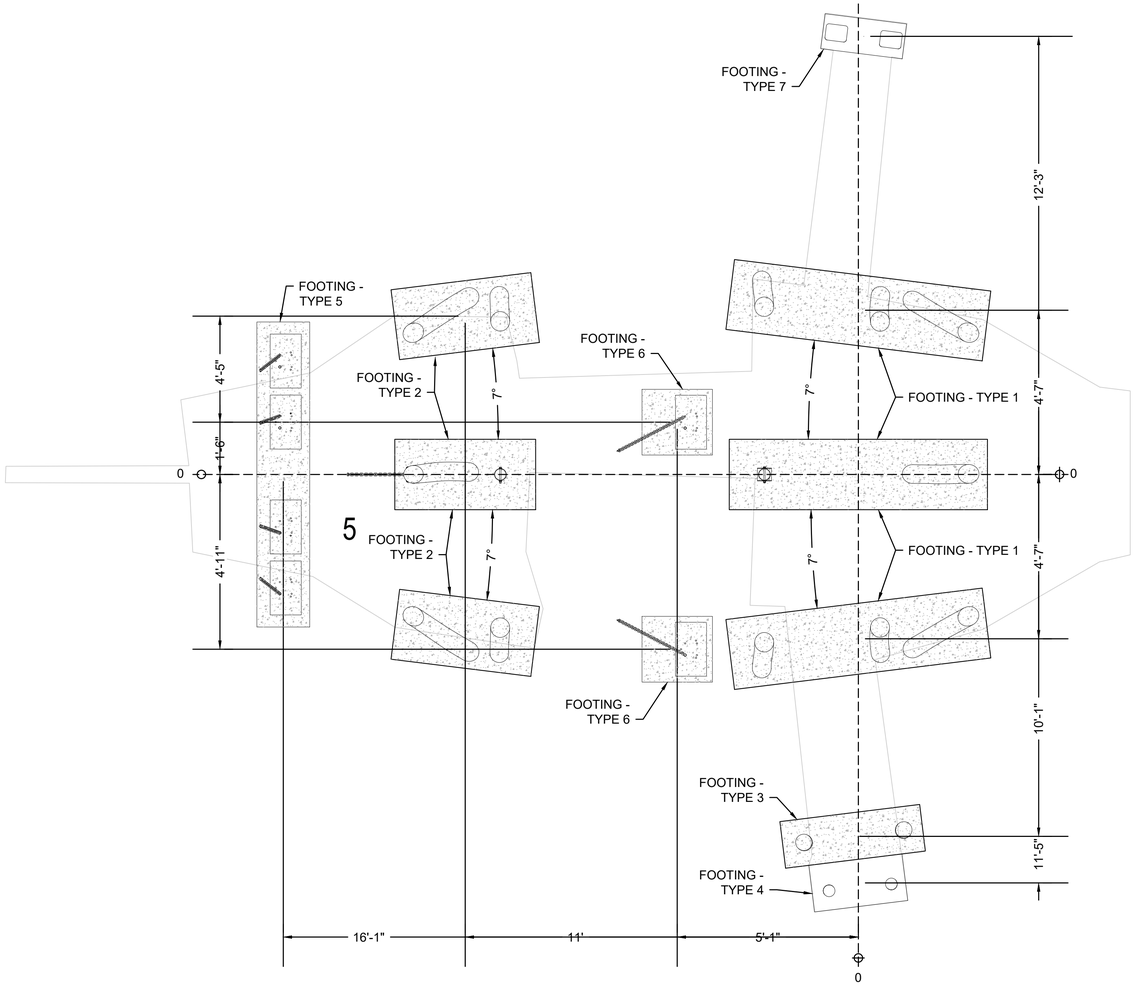
SCALE

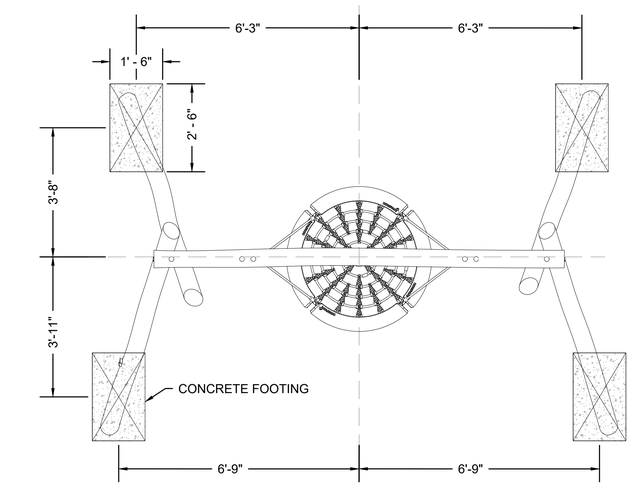
AS SHOWN

Bid Documents

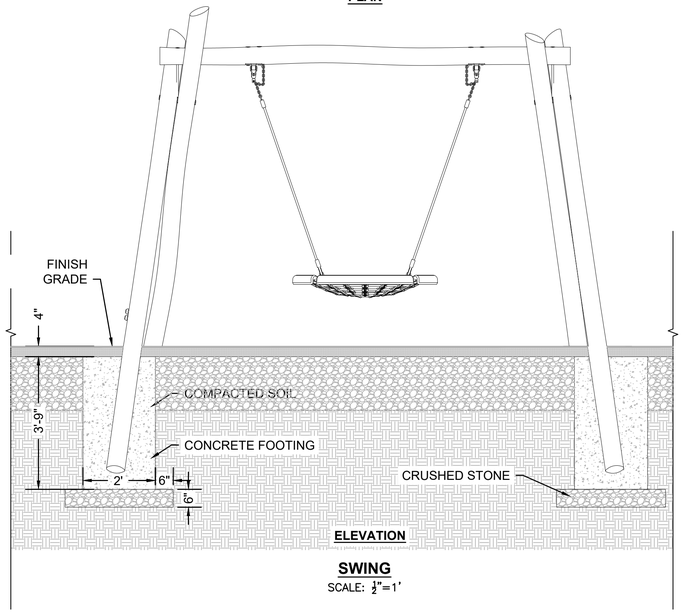
SHEET NO.

C.7.14





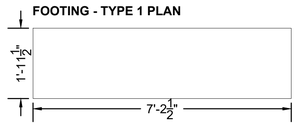
PLAN



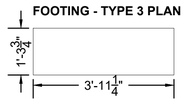
ELEVATION

SWING
SCALE: $\frac{1}{2}$"=1'

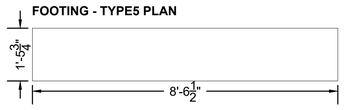
FOOTING - TYPE 1 PLAN



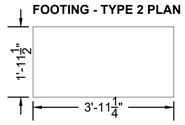
FOOTING - TYPE 3 PLAN



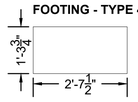
FOOTING - TYPE5 PLAN



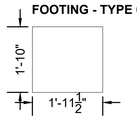
FOOTING - TYPE 2 PLAN



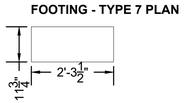
FOOTING - TYPE 4 PLAN

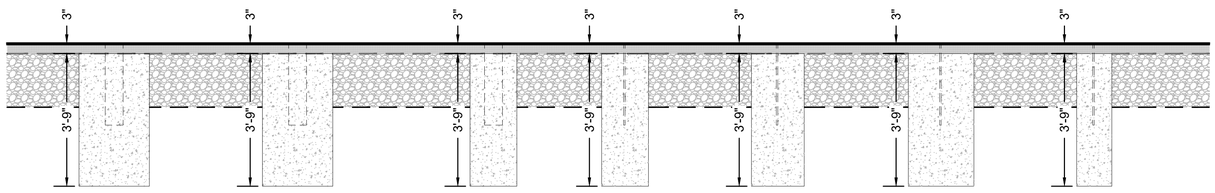


FOOTING - TYPE 6 PLAN



FOOTING - TYPE 7 PLAN





FOOTING - TYPE 1 | FOOTING - TYPE 2 | FOOTING - TYPE 3 | FOOTING - TYPE 4 | FOOTING - TYPE 5 | FOOTING - TYPE 6 | FOOTING - TYPE 7

NOTE: ALL CONCRETE FOOTINGS SHALL REACH A MINIMUM DEPTH OF 4' BELOW FINISH GRADE

PIRATE SHIP
SCALE: $\frac{1}{2}$"=1'

G:\PLANNING LANDSCAPE\10000S\10056 - YARMOUTH, MA RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLAN SET\CONSTRUCTION DOCUMENTS - PHASE 1\10056_PLAYGROUND_DETAILS.DWG

PREPARED BY

BETA
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REGISTERED PROFESSIONAL

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

SITE DETAILS - PLAYGROUND - 2

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

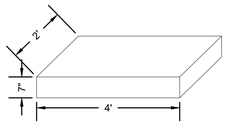
AS SHOWN

Bid Documents

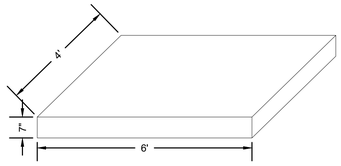
SHEET NO.

C.7.15

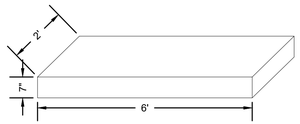
GRANITE CUT STONES					
			FINISHES		
GRANITE ID	QTY.	GRANITE TYPE	FRONT FACE	T0P FACE	SIDES/ BACK
CS-1	7	TYPE 1	SPLIT FACE	THERMAL	SAWN
CS-2	1	TYPE 1	SPLIT FACE	THERMAL	SAWN
CS-3	5	TYPE 1	SPLIT FACE	THERMAL	SAWN



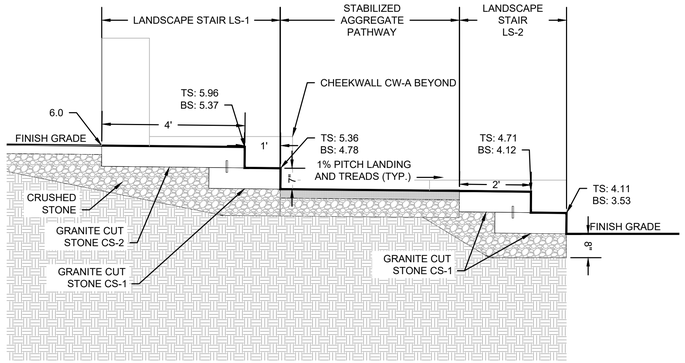
GRANITE CUT STONE CS-3
SCALE: 1" = 2' - 0"



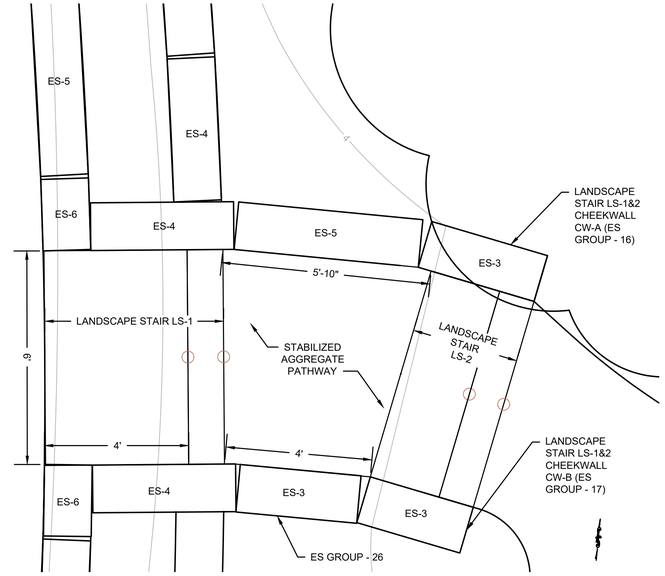
GRANITE CUT STONE CS-2
SCALE: 1" = 2' - 0"



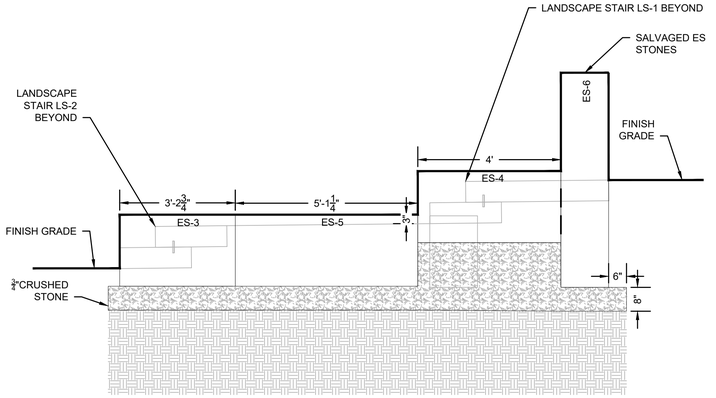
GRANITE CUT STONE CS-1
SCALE: 1" = 2' - 0"



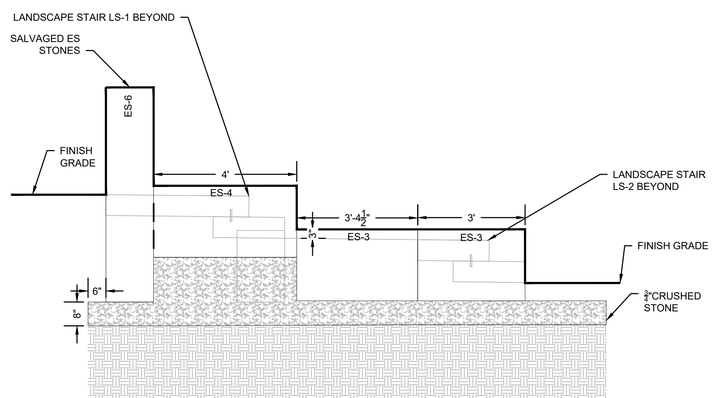
LANDSCAPE STAIR LS-1&2
SCALE: 1" = 2' - 0"



LANDSCAPE STAIR LS-1&2 - KEY PLAN
SCALE: 1" = 2' - 0"



LANDSCAPE STAIR LS-1&2 - CHEEKWALL CW-A (ES GROUP - 16)
SCALE: 1" = 2' - 0"



LANDSCAPE STAIR LS-1&2- CHEEKWALL CW-B (ES GROUP - 17)
SCALE: 1" = 2' - 0"

LANDSCAPE STAIR, EXISTING STONE SLABS AND BOULDER INSTALLATION NOTES:

1. REFER TO SHEET C.7.11. EXISTING STONE (GRANITE) IS IDENTIFIED AS TYPE ES. STONES HAVE BEEN SORTED ROUGHLY BY UNIFORM LENGTHS, THICKNESS AND WIDTH VARIES.
2. CONTRACTOR SHALL SELECT STONES FROM ON-SITE STOCKPILE WHERE ES STONES HAVE BEEN GROUPED BY LENGTH. ES-4 INDICATES A STONE APPROXIMATELY 4 FEET IN LENGTH
3. CONTRACTOR SHALL IDENTIFY THE COMBINATION OF STONES FOR BEST FIT FOR INTENDED LOCATION BASED ON STONE APPEARANCE AND SPECIFIC LAYOUT.
4. WHERE STONE WIDTH VARIES, SET SURFACE CLOSEST TO PEDESTRIAN WALKWAYS TO A UNIFORM PLANE, WITH STONE SURFACE VARIATION FACING VEGETATED AREAS.
5. LOAD, HAUL AND SET SET ACCORDING TO PLANS AND DETAILS. UTILIZE WOVEN NYLON STRAPS AND SLINGS TO HANDLE STONES. DO NOT MAR FINISHED SURFACES EXPOSED TO VIEW
6. FIELD CUT, GRIND, CHISEL TO FIT STONES TOGETHER IN FIELD AS REQUIRED. FINISHED APPEARANCE SHALL BE RUSTICATED. CONCEAL SMOOTH CUT SURFACES .
7. ES STONES SHALL BE SET GENERALLY PLUMB AND LEVEL, BASED ON OVERALL STONE APPEARANCE. COORDINATE INSTALLATION WITH THE ENGINEER.
8. SET WITH 1/2 INCH JOINT. FILL JOINTS WITH POLYMERIC JOINT MATERIAL CALIBRATED FOR JOINT SIZE. CHINK WIDE VOIDS AS DIRECTED BY THE ENGINEER.
9. CUT STONES FABRICATED FROM A QUARRY ARE IDENTIFIED AS CS STONES. CS STONES ARE UTILIZED FOR STAIR TREADS.
10. SET ALL TREADS TO PITCH TO DRAIN. DRILL AND PIN CS TREAD STONES IN PLACE.UTILIZE TWO, 4" SS. DOWELS, 1/2" DIA. PER CS AS INDICATED. EPOXY SET PINS IN PLACE.
11. CRUSHED STONE BASE PAY LIMIT SHALL EXTEND 6" BEYOND EDGE OF STONE WHEN SET.
12. CRUSHED STONE BASE SHALL NOT EXCEED PAY LIMITS SHOWN VERTICALLY. MINIMUM DEPTHS SHALL BE MAXIMUM PAY LIMIT.

PREPARED BY
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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

SITE DETAILS - WALLS & STAIRS - 1

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

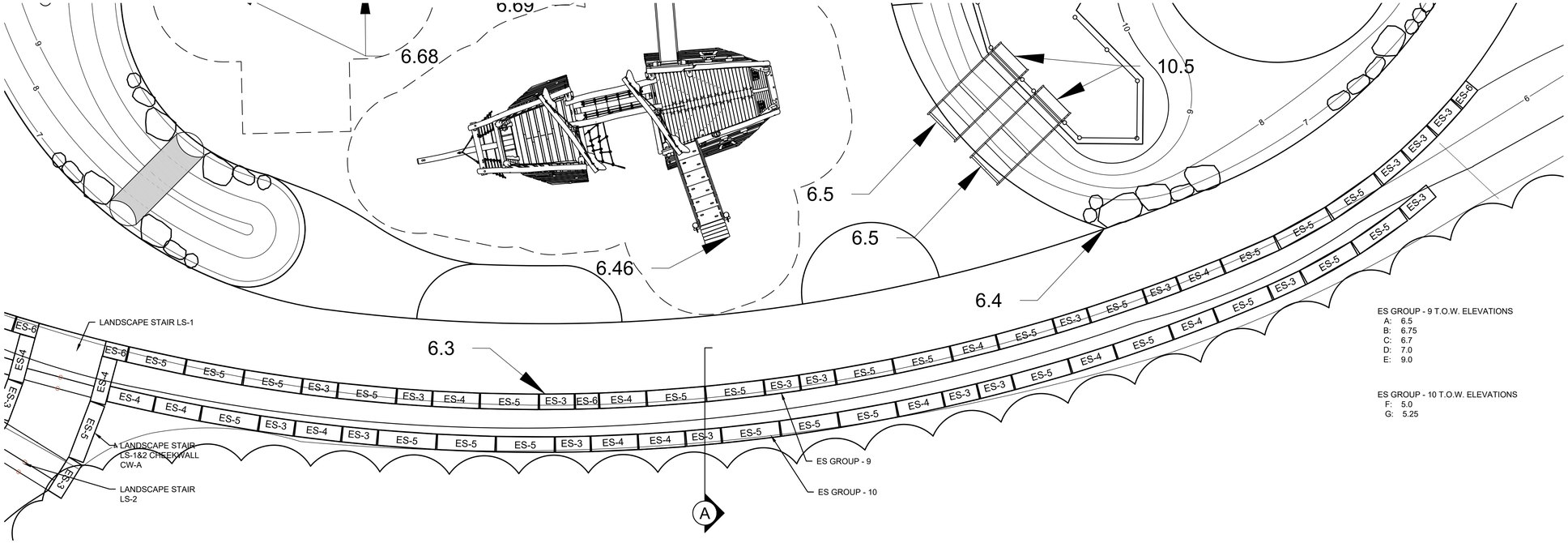
SCALE

AS SHOWN

Bid Documents

SHEET NO.

C.7.16

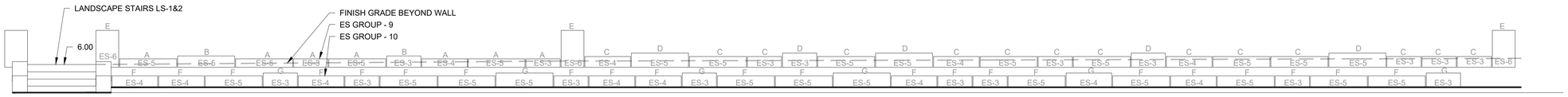


ES GROUP - 9 T.O.W. ELEVATIONS
A: 6.5
B: 6.75
C: 6.7
D: 7.0
E: 9.0

ES GROUP - 10 T.O.W. ELEVATIONS
F: 5.0
G: 5.25

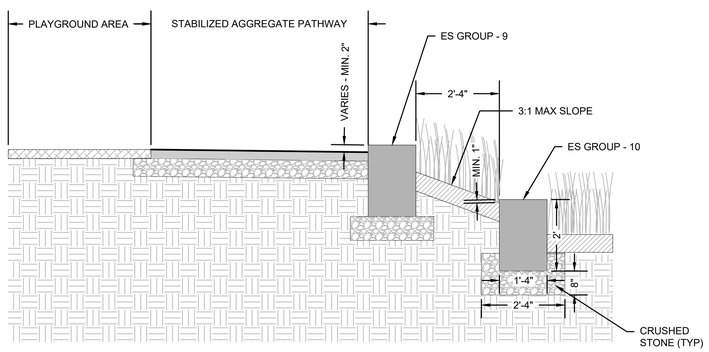
ES GROUP 9 & 10 - PLAN

SCALE: 1"= 5' - 0"



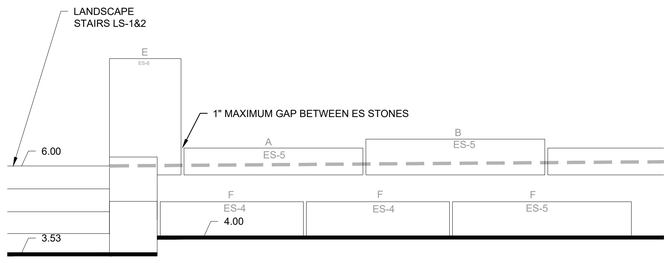
ES GROUP 9 & 10 - ELEVATION

SCALE: 1" = 5' - 0"



ES GROUP - 9 & 10 - SECTION A

SCALE: ¾" = 1' - 0"



ES GROUP - 9 & 10 - ELEVATION ENLARGEMENT

SCALE: ¾" = 1' - 0"

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

SITE DETAILS - WALLS & STAIRS - 2

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

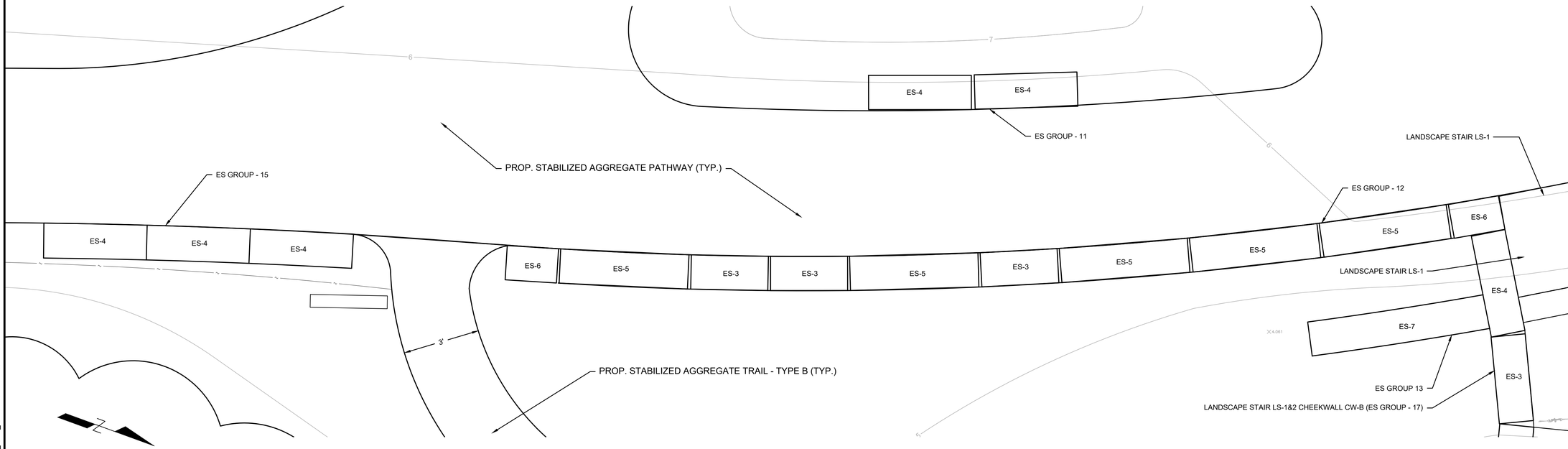
SCALE

AS SHOWN

Bid Documents

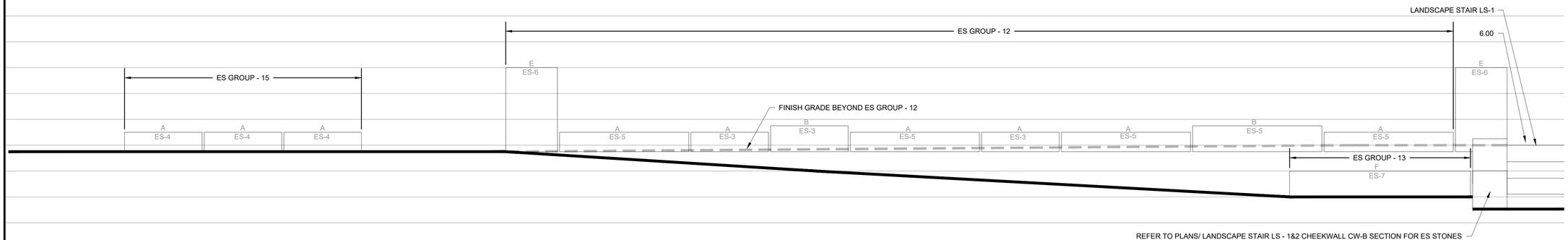
SHEET NO.

C.7.17



ES GROUPS 12, 13, & 15 KEY PLAN

SCALE: 1/2" = 1' - 0"



ES GROUPS 12, 13, & 15 - ELEVATION

SCALE: 1/2" = 1' - 0"

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

SITE DETAILS - WALLS & STAIRS - 3

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

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SHEET NO.

C.7.18

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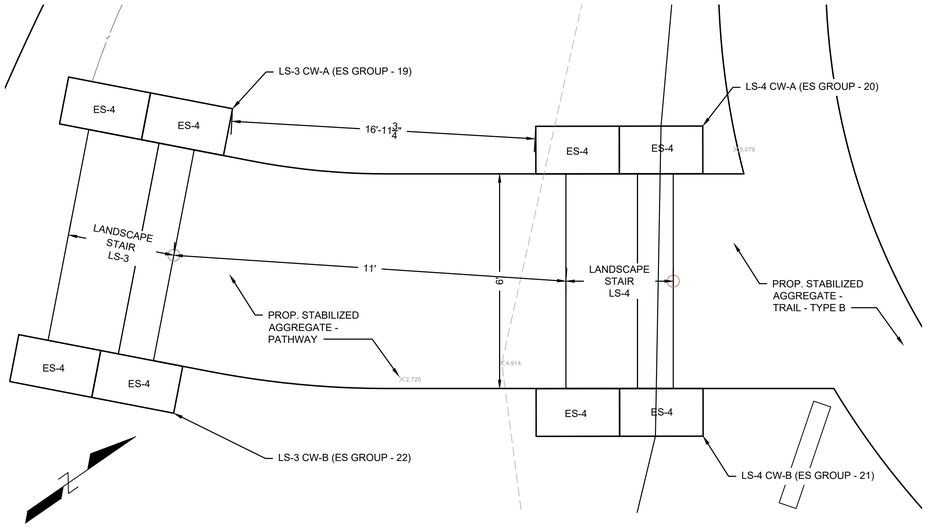
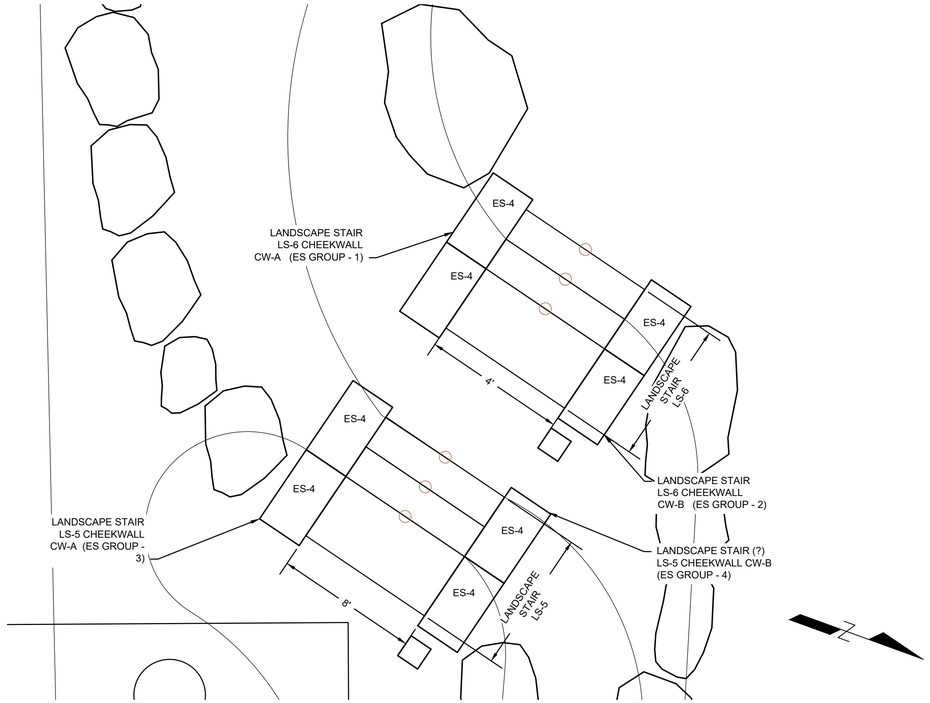


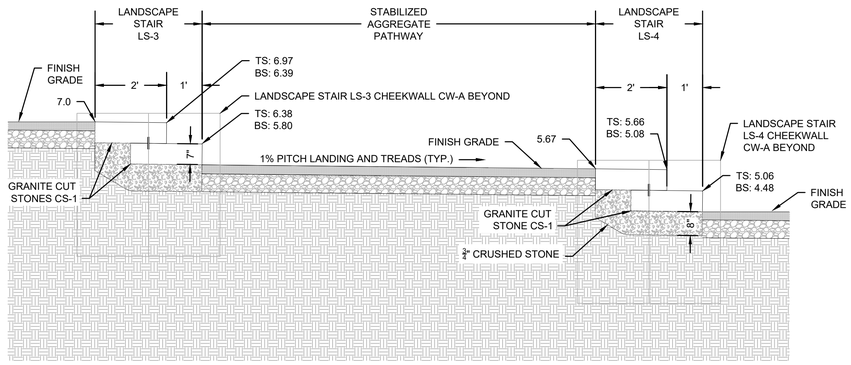
LANDSCAPE STAIR LS-3&4 - KEY PLAN

SCALE: 1"= 2' - 0"



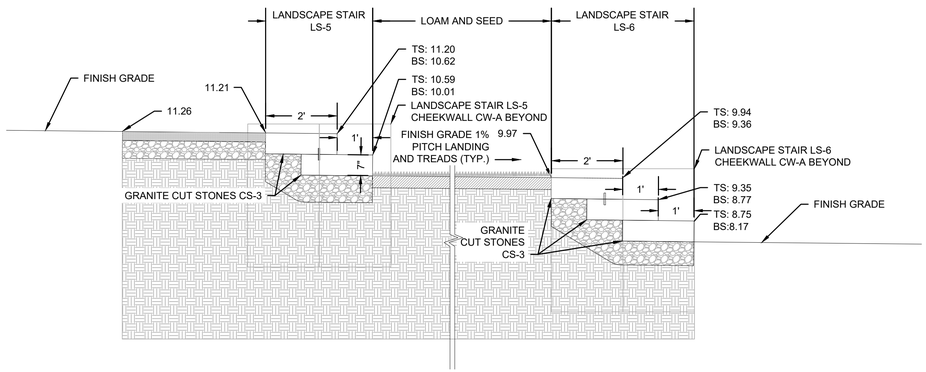
LANDSCAPE STAIR LS-5&6 - KEY PLAN

SCALE: 1/2" = 1'-0"



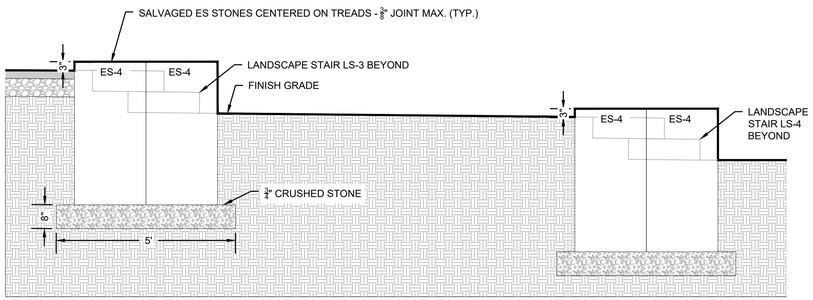
LANDSCAPE STAIR LS-3&4 - SECTION

SCALE: 1" =2' - 0"



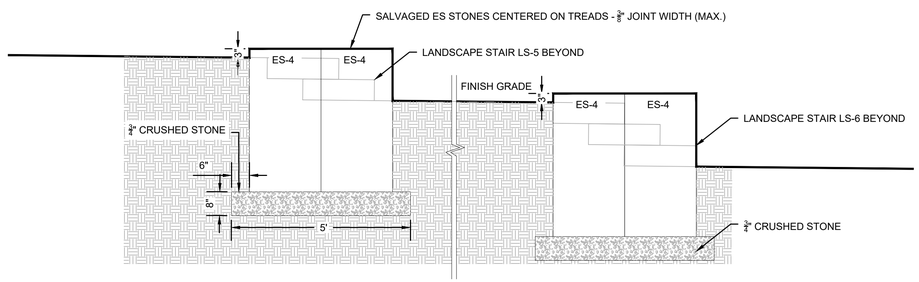
LANDSCAPE STAIR LS-5&6 - SECTION

SCALE: 1/2" = 1'-0"



LANDSCAPE STAIR LS-3&4 CHEEK WALL CW-A & CW-B - SECTION

SCALE: 1" =2' - 0"



LANDSCAPE STAIR LS-5&6 CHEEKWALL CW-A AND CW-B - SECTION

SCALE: 1/2" = 0' - 0"

PREPARED BY

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REGISTERED PROFESSIONAL

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

SITE DETAILS - WALLS & STAIRS - 4

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

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Bid Documents

SHEET NO.

C.7.19

1. ALL TEMPORARY TRAFFIC CONTROL WORK SHALL CONFORM TO THE 2009 EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND ALL REVISIONS.
2. ALL SIGN LEGENDS, BORDERS AND MOUNTING SHALL BE IN ACCORDANCE WITH THE MUTCD.
3. TEMPORARY CONSTRUCTION SIGNING AND ALL OTHER TRAFFIC CONTROL DEVICES SHALL BE IN PLACE PRIOR TO THE START OF ANY WORK.
4. TEMPORARY CONSTRUCTION SIGNING, BARRICADES AND ALL OTHER UNNECESSARY WORK ZONE TRAFFIC CONTROL DEVICES SHALL BE REMOVED FROM THE HIGHWAY OR COVERED WHEN THEY ARE NOT REQUIRED FOR CONTROL OF TRAFFIC.
5. SIGNS AND SIGN SUPPORTS LOCATED ON OR NEAR THE TRAVELED WAY, CHANNELIZING DEVICES, BARRIERS, AND CRASH ATTENUATORS MUST PASS THE CRITERIA SET FORTH IN NCHRP REPORT 350, 'RECOMMENDED PROCEDURES FOR THE SAFETY PERFORMANCE EVALUATION OF HIGHWAY FEATURES" AND/OR "MANUAL FOR ASSESSING SAFETY HARDWARE" (MASH).
6. CONTRACTORS SHALL NOTIFY EACH ABUTTER AT LEAST 24 HOURS IN ADVANCE OF THE START OF ANY WORK THAT WILL REQUIRE THE TEMPORARY CLOSURE OF ACCESS, SUCH AS CONDUIT INSTALLATION, EXISTING PAVEMENT EXCAVATION, TEMPORARY DRIVEWAY PAVEMENT PLACEMENT AND SIMILAR OPERATIONS.
7. THE FIRST TEN PLASTIC DRUMS OF A TAPER SHALL BE MOUNTED WITH SEQUENTIAL FLASHING LIGHTS.
8. THE ADVISORY SPEED LIMIT, IF REQUIRED, SHALL BE DETERMINED BY THE ENGINEER.
9. DISTANCES ARE A GUIDE AND MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER.
10. MAXIMUM SPACING OF TRAFFIC DEVICES IN A TAPER (DRUMS OR CONES) IS EQUAL IN FEET TO THE SPEED LIMIT IN MPH.
11. MINIMUM LANE WIDTH IS TO BE 11 FEET UNLESS OTHERWISE SHOWN. MINIMUM LANE WIDTH TO BE MEASURED FROM THE EDGE OF DRUMS OR MEDIAN BARRIER.
12. ALL SIGNS SHALL BE MOUNTED ON THEIR OWN STANDARD SIGN SUPPORTS.
13. TEMPORARY CONSTRUCTION SIGNING AND ALL OTHER NECESSARY WORK ZONE TRAFFIC CONTROL NOT COVERED IN THE PLAN SHALL REFER TO MASS HIGHWAY "STANDARD DETAILS AND DRAWINGS FOR THE DEVELOPMENT OF TRAFFIC MANAGEMENT PLANS".
14. EXISTING SIGNS THAT CONFLICT WITH TEMPORARY TRAFFIC CONTROL (TTC) SHALL BE COVERED OR REMOVED WHILE THE TTC ZONE IS IN EFFECT, AND SHALL BE UNCOVERED OR REPLACED WHEN EXISTING TRAFFIC PATTERNS ARE RESTORED.
15. CONTRACTOR IS RESPONSIBLE FOR FURNISHING, INSTALLING, MAINTAINING AND REMOVING ALL TRAFFIC MANAGEMENT DEVICES REQUIRED FOR MAINTENANCE OF TRAFFIC.
16. THESE DETAILS ARE INTENDED TO BE USED ON PUBLIC ROADWAYS WHENEVER CONSTRUCTION ACTIVITIES IMPACT TRAFFIC. FURNISHING, INSTALLING, RELOCATING AND REMOVING TEMPORARY TRAFFIC CONTROL DEVICES IS CONSIDERED INCIDENTAL TO OTHER ITEMS OF WORK IN THE CONTRACT AND NO SEPARATE PAYMENT WILL BE MADE.

LEGEND:

- REFLECTORIZED PLASTIC DRUM
- POLICE DETAIL
- TYPE III BARRICADE
- FLASHING ARROW PANEL
- FLASHING ARROW PANEL
- WORK ZONE
- DIRECTION OF TRAFFIC
- IMPACT ATTENUATOR
- MEDIAN BARRIER
- MEDIAN BARRIER WITH WARNING LIGHTS
- WORK VEHICLE
- TRUCK MOUNTED ATTENUATOR
- TRAFFIC OR PEDESTRIAN SIGNAL
- SIGN
- PORTABLE CHANGEABLE MESSAGE SIGN

SUGGESTED WORK ZONE WARNING SIGN SPACING

ROAD TYPE	DISTANCE BETWEEN SIGNS**		
	A	B	C
LOCAL OR LOW VOLUME ROADWAYS*	350	350	350
MOST OTHER ROADWAYS*	500	500	500
FREEWAYS AND EXPRESSWAYS*	1,000	1,500	2,640

* SPEED CATEGORY TO BE DETERMINED BY HIGHWAY AGENCY

** DISTANCES ARE SHOWN IN FEET. THE COLUMN HEADINGS A, B, AND C ARE THE DIMENSIONS SHOWN IN THE DETAIL/ TYPICAL SETUP FIGURES. THE A DIMENSION IS THE DISTANCE FROM THE TRANSITION OR POINT OF RESTRICTION TO THE FIRST SIGN. THE B DIMENSION IS THE DISTANCE BETWEEN THE FIRST AND SECOND SIGNS. THE C DIMENSION IS THE DISTANCE BETWEEN THE SECOND AND THIRD SIGNS. (THE "THIRD" SIGN IS THE FIRST ONE TYPICALLY ENCOUNTERED BY A DRIVER APPROACHING A TEMPORARY TRAFFIC CONTROL (TTC) ZONE.)

THE "THIRD" SIGN ABOVE IS TYPICALLY REFERRED TO AS AN "ADVANCE WARNING" SIGN ON THE TMP SETUPS. IT IS THE ONE WHICH MAY OFTEN HAVE THE "STANDARD RED OR RED—ORANGE FLAGS (16 in. X 16 in.)" MOUNTED ON IT. THESE ADVANCE WARNING SIGNS ARE LOCATED AT THE PROJECT LIMITS ON ALL APPROACHES (i.e. THE W20-1 SERIES (ROAD WORK XX FT) SIGNS), AND USUALLY REMAIN FOR THE DURATION OF THE PROJECT.

THE FIRST AND SECOND WARNING SIGNS ABOVE ARE REFERRED TO AS THE OPERATIONAL (DAY-TO-DAY) WORK ZONE SIGNS AND MAY BE MOVED DEPENDING ON WHERE THE SPECIFIC ROADWAY WORK FOR THAT DAY IS LOCATED.

MA-R2-10a SIGNS SHALL BE PLACED BETWEEN THE SECOND AND THIRD SIGNS AS DESCRIBED ABOVE.

MA-R2-10a, MA-R2-10e, AND W20-1 SERIES SIGNS ARE TO BE INCLUDED ON ALL DETAILS/TYPICAL SETUPS.

BASED ON: TABLE 6C-1 2009 MUTCD

FORMULAS FOR DETERMINING TAPER LENGTHS

SPEED LIMIT (S)	TAPER LENGTH (L) FEET
40 MPH OR LESS	$L = \frac{WS^2}{60}$
45 MPH OR MORE	L = WS

WHERE: L = TAPER LENGTH IN FEET

W = WIDTH OF OFFSET IN FEET

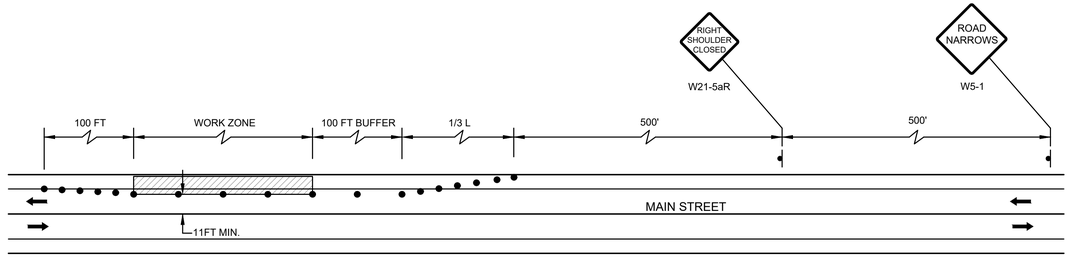
S = POSTED SPEED LIMIT, OR OFF-PEAK 85TH-PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED IN MPH

BASED ON: TABLE 6C-4 2009 MUTCD

TAPER LENGTH CRITERIA FOR TEMPORARY TRAFFIC CONTROL ZONES

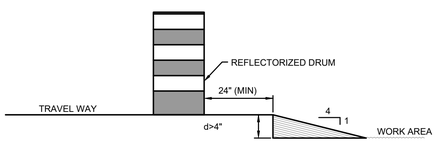
TYPE OF TAPER	TAPER LENGTH (L)*
MERGING TAPER	AT LEAST L
SHIFTING TAPER	AT LEAST 0.5L
SHOULDER TAPER	AT LEAST 0.33L
ONE-LANE, TWO-WAY TRAFFIC TAPER	50 FT MINIMUM, 100 FT MAXIMUM
DOWNSTREAM TAPER	50 FT MINIMUM, 100 FT MAXIMUM

BASED ON: TABLE 6C-3 2009 MUTCD



TWO LANE ROAD SHOULDER CLOSED

NOT TO SCALE



LATERAL DROP-OFF DETAIL

NOT TO SCALE

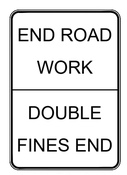
Ⓐ

W20-1B
36" x 36"

Ⓑ

MA-R2-10a
48" x 36"

Ⓒ



MA-R2-10e
36" x 48"

TYPICAL MAINLINE ADVANCED SIGN SETUP

NOT TO SCALE

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

TEMPORARY TRAFFIC CONTROL DETAILS

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
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SCALE

AS SHOWN

Bid Documents

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C.7.20

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EXIST. SALT MARSH

BOARDWALK - WESTERN SEGMENT

OVERLOOK 3

ANGLE POINT 8

8+00

9+00

ANGLE POINT 9

10+00

ANGLE POINT 10

11+00

EXIST. WOODED AREA

OVERLOOK 2

EXIST. SALT MARSH

BENCH BUMP OUT 4

ANGLE POINT 7

7+00

BENCH BUMP OUT 3

BENCH BUMP OUT 2

EXIST. WOODED AREA

BOARDWALK - CENTRAL SEGMENT

6+00

BENCH BUMP OUT 1

OVERLOOK 1

ANGLE POINT 6

5+00

ANGLE POINT 5

4+00

ANGLE POINT 4

ANGLE POINT 3

3+00

EXIST. WOODED AREA

MEAN HIGH WATER (M.H.W.) - ELEV. 2.05

PARKERS RIVER

BOARDWALK - EASTERN SEGMENT

ANGLE POINT 2

2+00

PEDESTRIAN BRIDGE

ANGLE POINT 1

1+00

0+00

WOODED

WOODED

EAST APPROACH END BENT

BP 0+00.00
2698114.1853
1005469.7147

SBDH FND

8
SPK SET
N: 2697887.91
E: 1005548.42
EL: 2.54

SM1 211 END
SM1 210
SM1 209
SM1 208
SM1 207
SM1 206
SM1 205
SM1 204
SM1 203
SM1 201
SM1 200
SM1 199
SM1 198
SM1 197
SM1 196
SM1 195
SM1 194
SM1 193
SM1 192
SM1 191
SM1 190
SM1 189
SM1 188
SM1 187
SM1 186
SM1 185
SM1 184
SM1 183
SM1 182
SM1 181
SM1 180

ANGLE POINT 11

ANGLE POINT 12

12+00

WEST APPROACH END BENT

13+00

13+58

EP 13+57.92
2698160.1717
1005067.0952

BOARDWALK APPROACH PATH - WEST

LIMIT OF CLEARING

3–130
3–128
3–126
3–125
3–124
3–123
3–122
3–121

EXIST. WOODED AREA

BENCH WITH COMPANION SEATING

LIMIT OF SALT MARSH (TYP.)

STABILIZED AGGREGATE - TRAIL

7
SPK SET
N: 2698210.26
E: 1005193.29
EL: 3.84

EPIPE FND

EXISTING "TRAIL"

SALT MARSH FLAG (TYP.)

SBDH FND

STABILIZED AGGREGATE - TRAIL

SM1 155
SM1 154
SM1 156
SM1 157
SM1 158
SM1 162

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

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OVERALL BOARDWALK PLAN

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SCALE

30 0 30 60

SCALE IN FEET: 1"=30'

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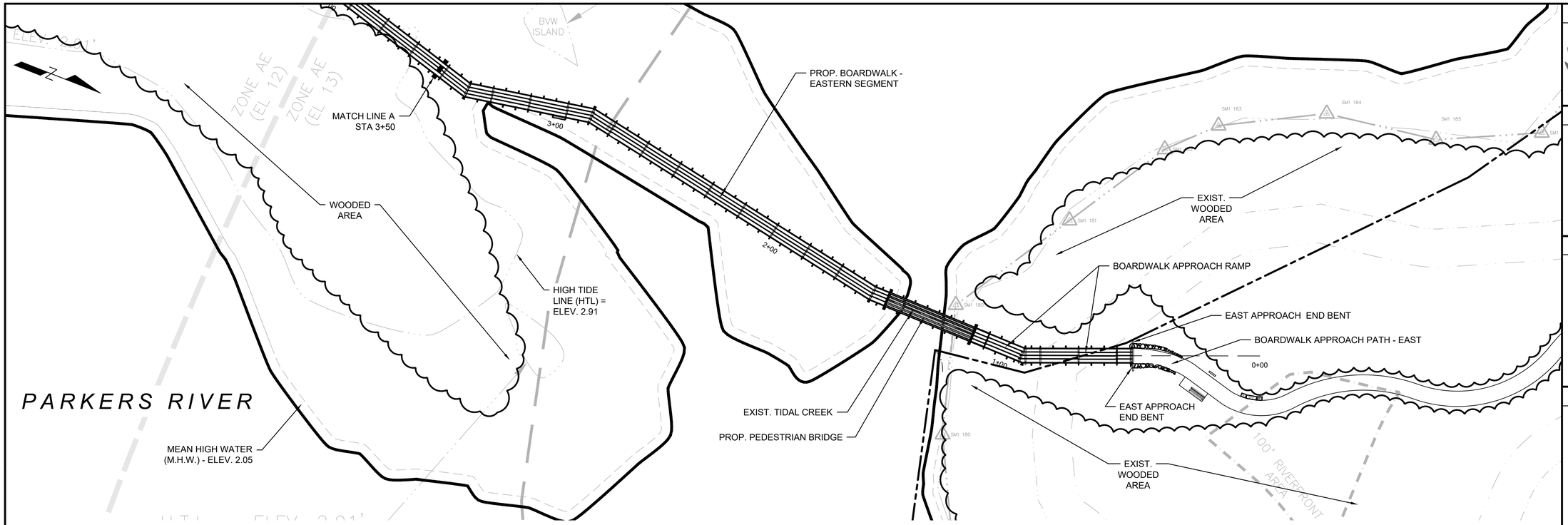
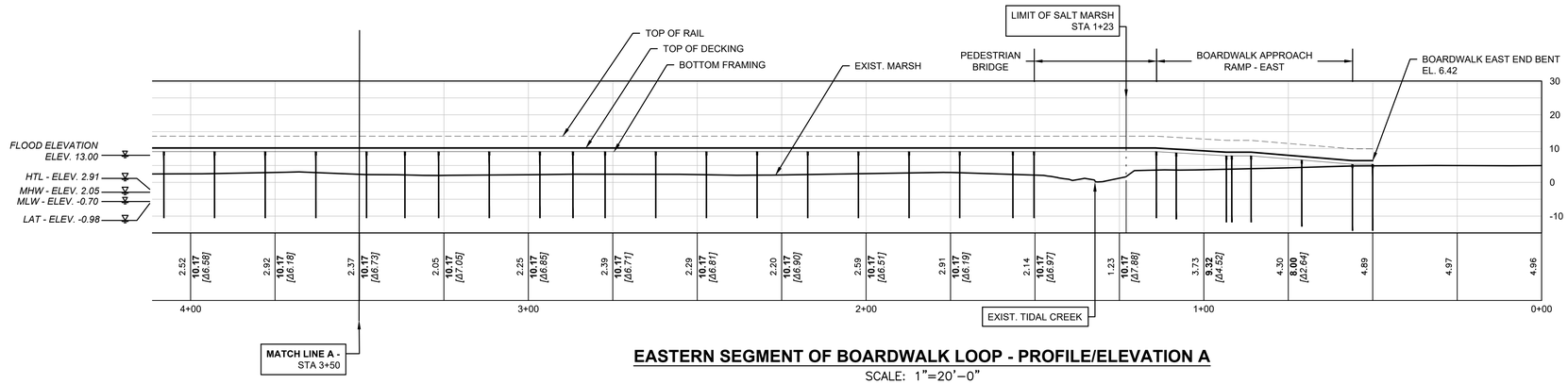


EASTERN SEGMENT OF BOARDWALK LOOP - PLAN

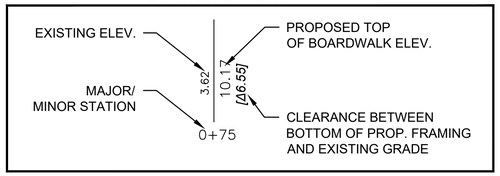
SCALE: 1"=20'–0"



EASTERN SEGMENT OF BOARDWALK LOOP - PROFILE/ELEVATION A

SCALE: 1"=20'–0"

STATION LEGEND



MINIMUM 1:1 CLEARANCE

DATUM:
HORIZONTAL: NAD83, VERTICAL: NAVD88

CRITICAL ELEVATIONS

HIGH TIDE LINE (HTL) = ELEV. 2.91

MEAN HIGH WATER (MHW) = ELEV. 2.05

MEAN LOW WATER (MLW) = ELEV. -0.70

LOWEST ASTRONOMICAL TIDE (LAT) = ELEV. -0.98

Station ID: 8447605
Hyannis Port , Hyannis Harbor, VM 2063, PID AR7934

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

BOARDWALK - PROFILE - 1

BID DOCUMENTS

NO.	REVISIONS	DATE

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SCALE

20 0 20 40
SCALE IN FEET: 1"=20'

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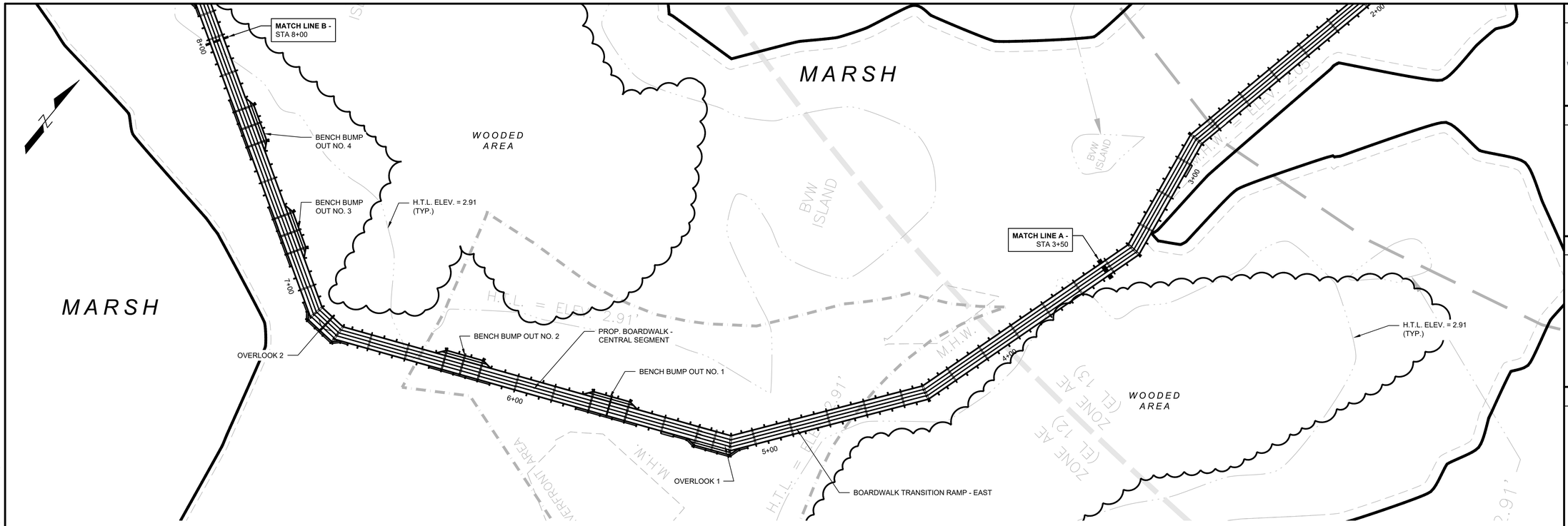
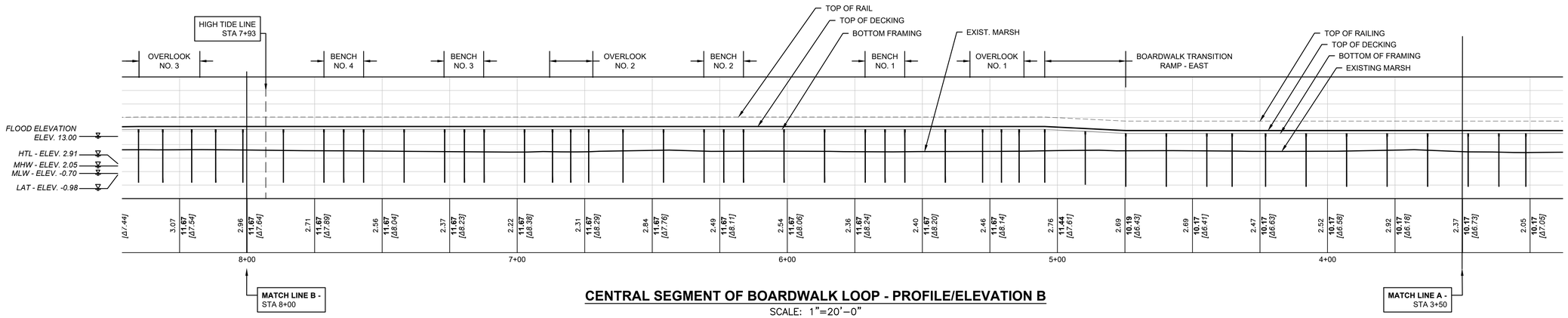


CENTRAL SEGMENT OF BOARDWALK LOOP - PLAN

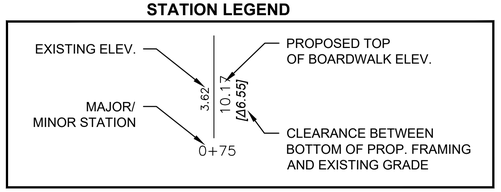
SCALE: 1"=20'–0"



CENTRAL SEGMENT OF BOARDWALK LOOP - PROFILE/ELEVATION B

SCALE: 1"=20'–0"

STATION LEGEND



MINIMUM 1:1 CLEARANCE

DATUM:
HORIZONTAL: NAD83, VERTICAL: NAVD88

CRITICAL ELEVATIONS

HIGH TIDE LINE (HTL) = ELEV. 2.91
MEAN HIGH WATER (MHW) = ELEV. 2.05
MEAN LOW WATER (MLW) = ELEV. -0.70
LOWEST ASTRONOMICAL TIDE (LAT) = ELEV. -0.98

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Hyannis Port , Hyannis Harbor, VM 2063, PID AR7934

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

BOARDWALK - PROFILE - 2

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SCALE

20 0 20 40
SCALE IN FEET: 1"=20'

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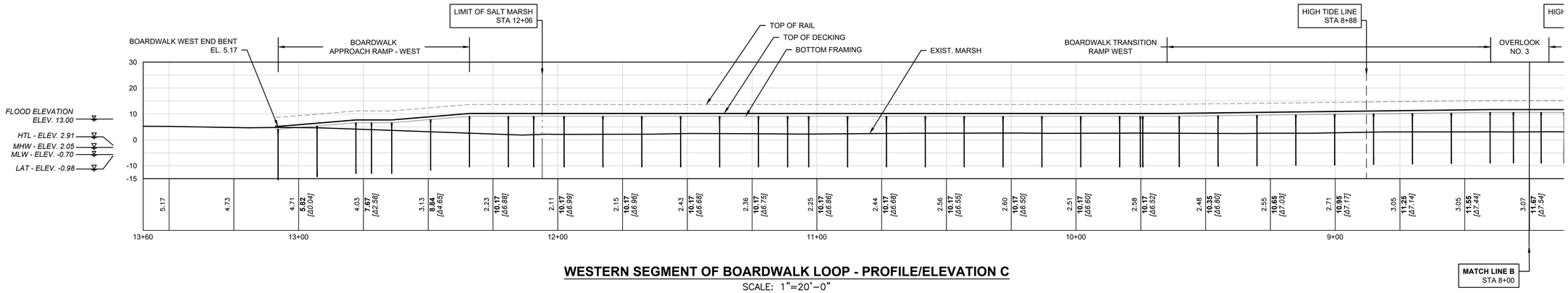
WESTERN SEGMENT OF BOARDWALK LOOP - PLAN

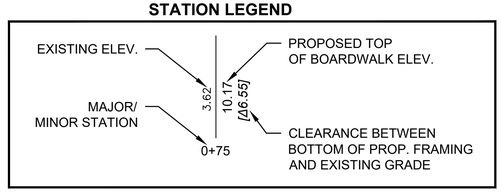
SCALE: 1"=20'-0"



WESTERN SEGMENT OF BOARDWALK LOOP - PROFILE/ELEVATION C

SCALE: 1"=20'-0"

STATION LEGEND



MINIMUM 1:1 CLEARANCE

DATUM:
HORIZONTAL: NAD83, VERTICAL: NAVD88

CRITICAL ELEVATIONS

HIGH TIDE LINE (HTL) = ELEV. 2.91
MEAN HIGH WATER (MHW) = ELEV. 2.05
MEAN LOW WATER (MLW) = ELEV. -0.70
LOWEST ASTRONOMICAL TIDE (LAT) = ELEV. -0.98

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

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BOARDWALK - PROFILE - 3

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SCALE

20 0 20 40
SCALE IN FEET: 1"=20'

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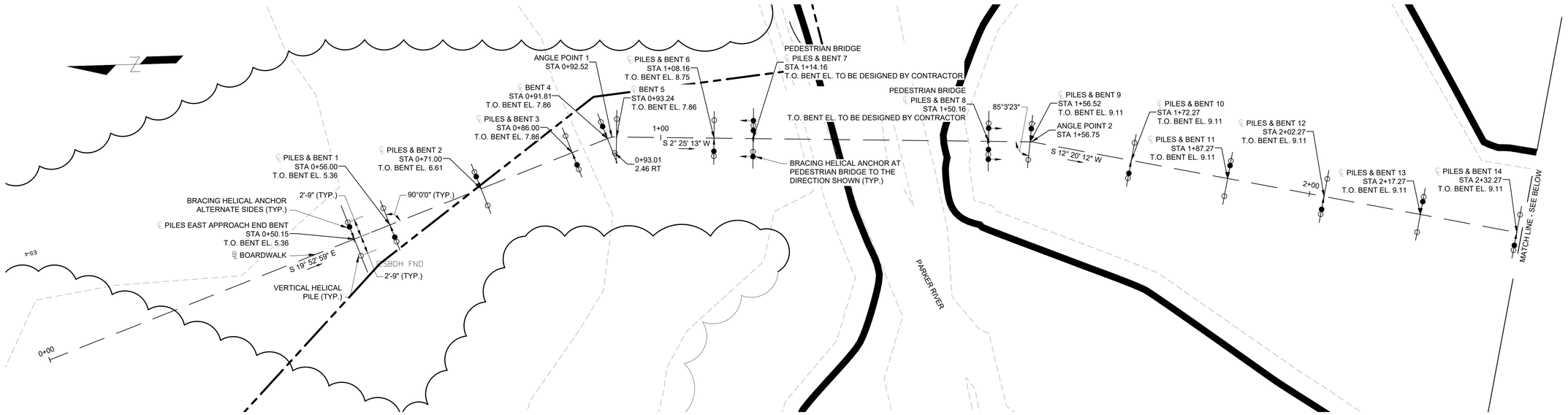
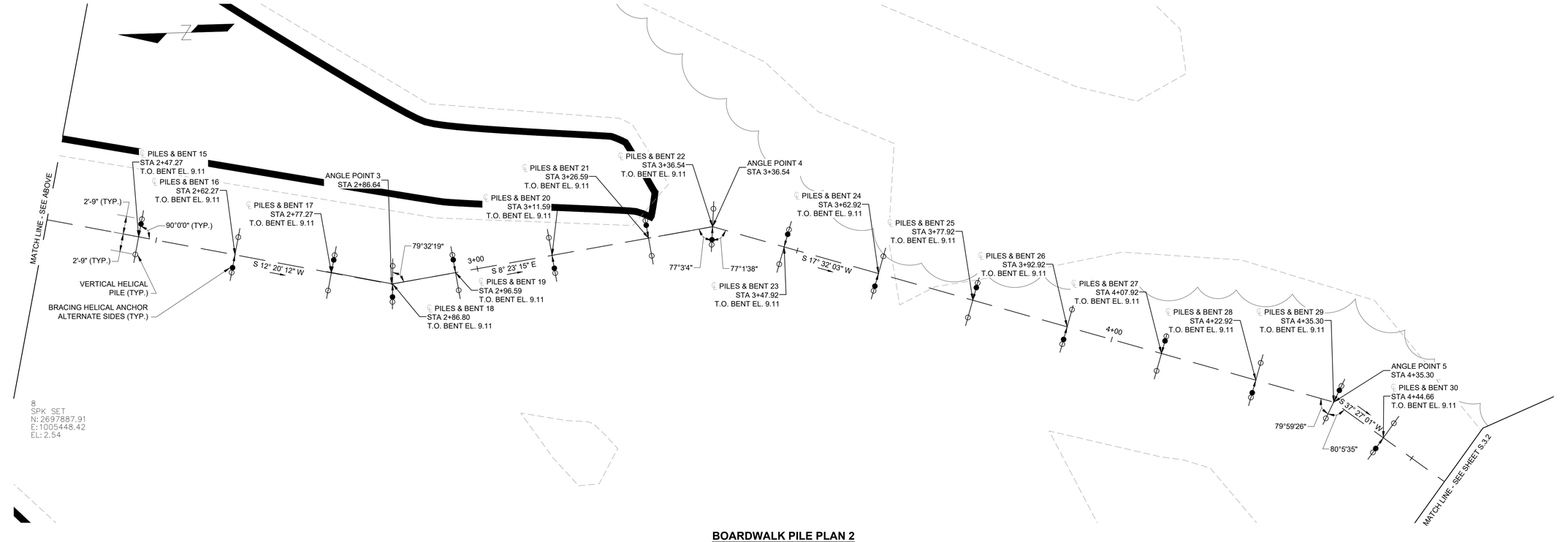


BOARDWALK PILE PLAN 1
SCALE: 1/8"=1'-0"



BOARDWALK PILE PLAN 2
SCALE: 1/8"=1'-0"

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

BOARDWALK PILE PLAN - 1

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SCALE

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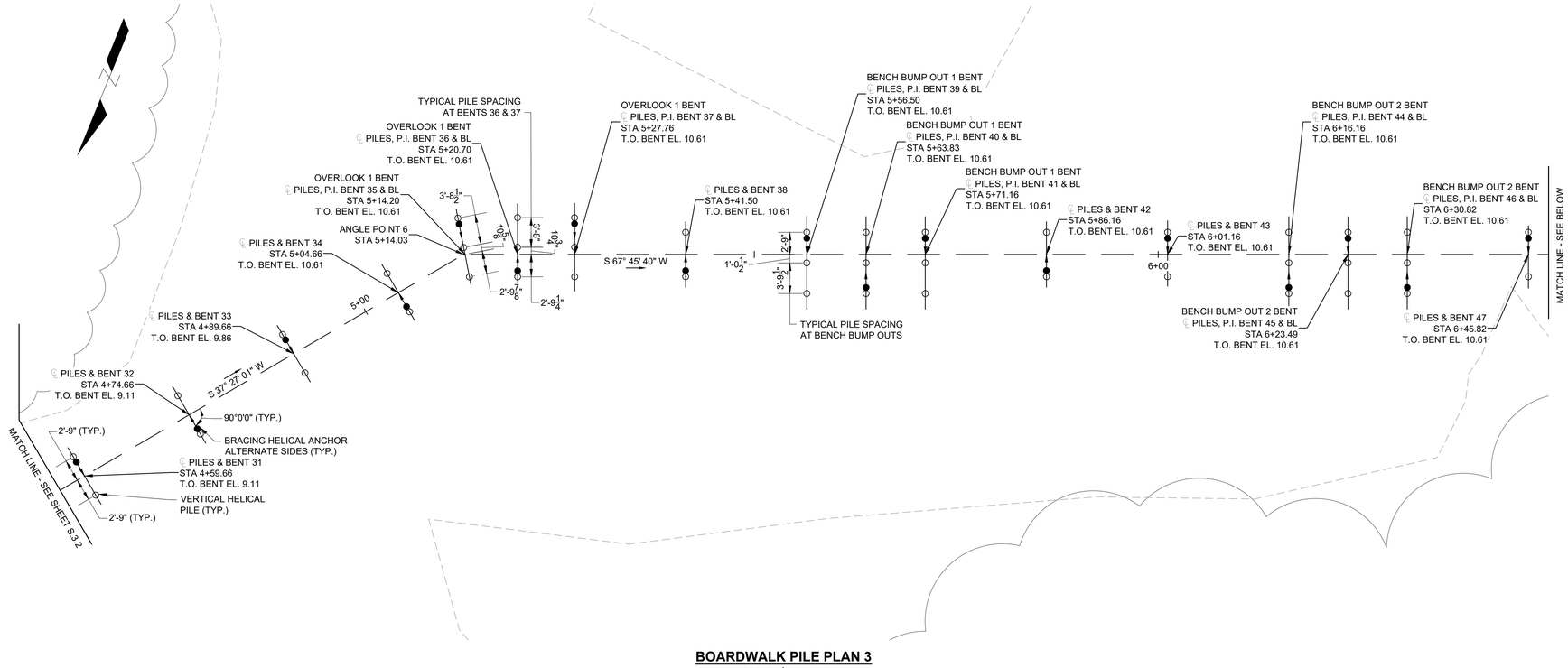
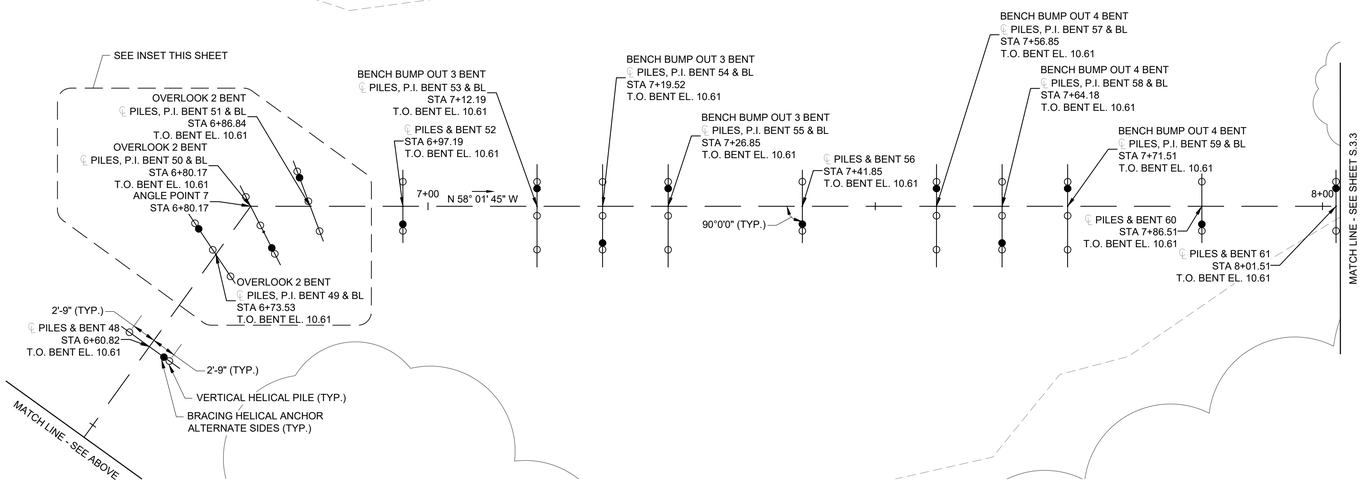
SHEET NO.

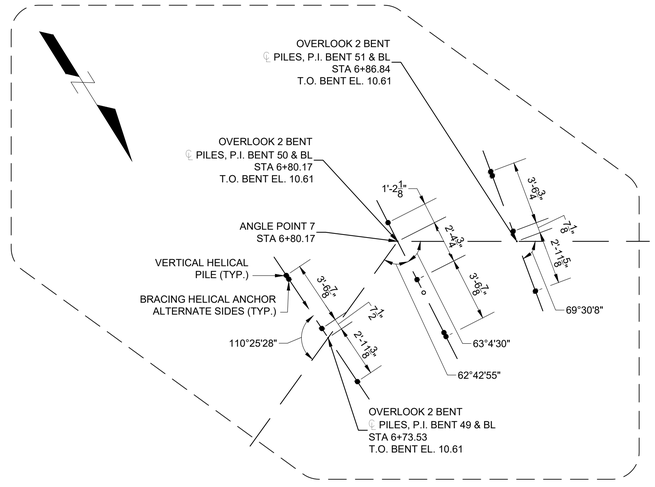
S.2.1



BOARDWALK PILE PLAN 3
SCALE: ⅛"=1'–0"



BOARDWALK PILE PLAN 4
SCALE: ⅛"=1'–0"



INSET PLAN
SCALE: ¼"=1'–0"

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

BOARDWALK PILE PLAN - 2

BID DOCUMENTS

NO.	REVISIONS	DATE

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SCALE

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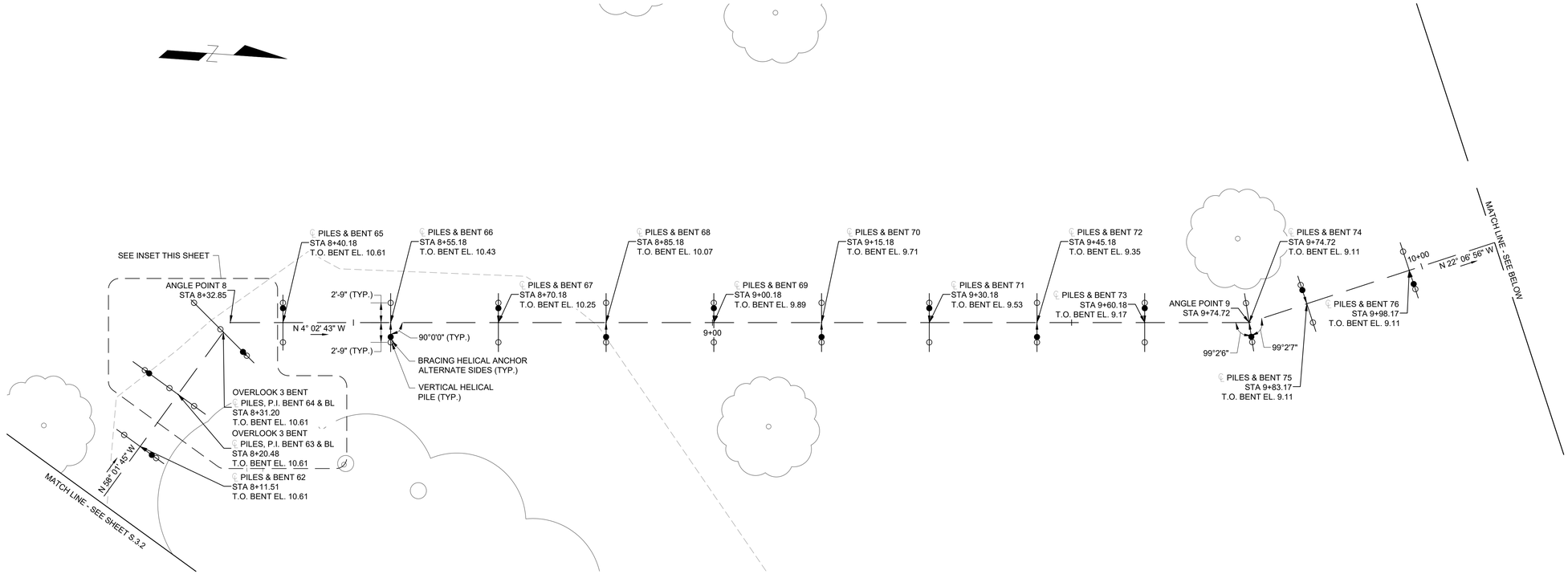
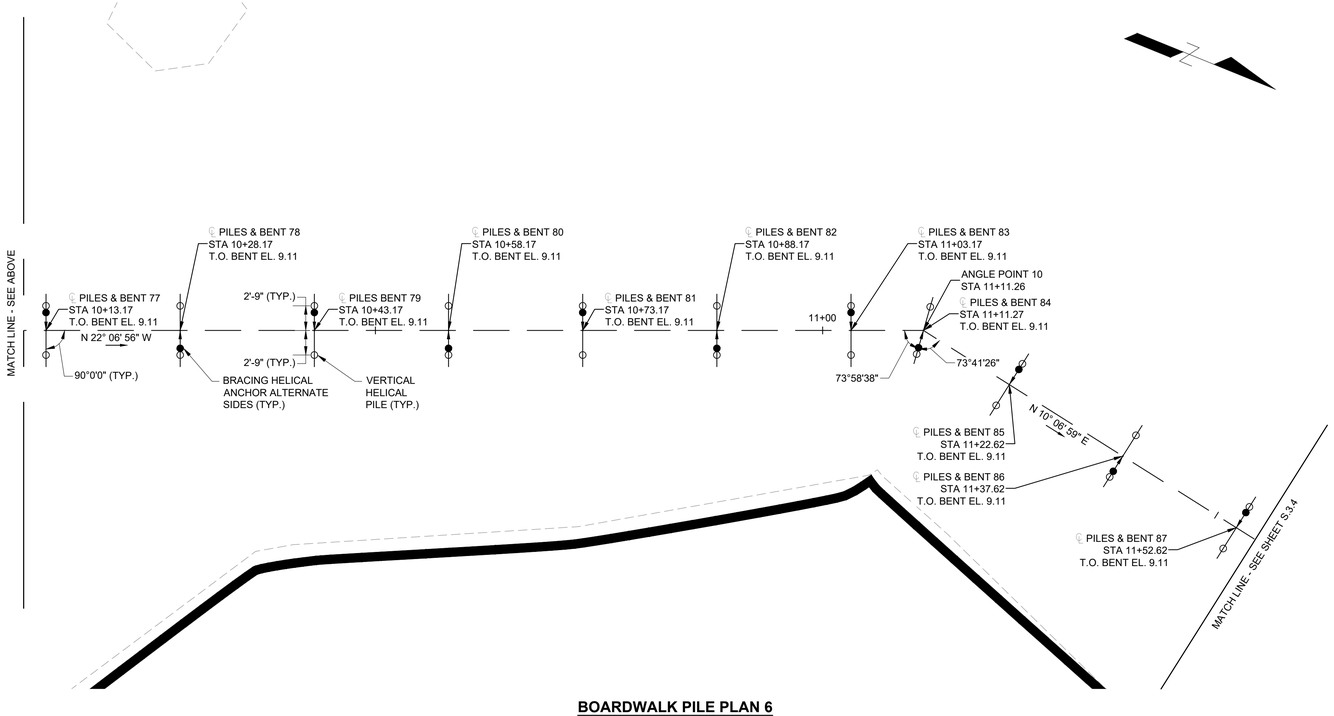
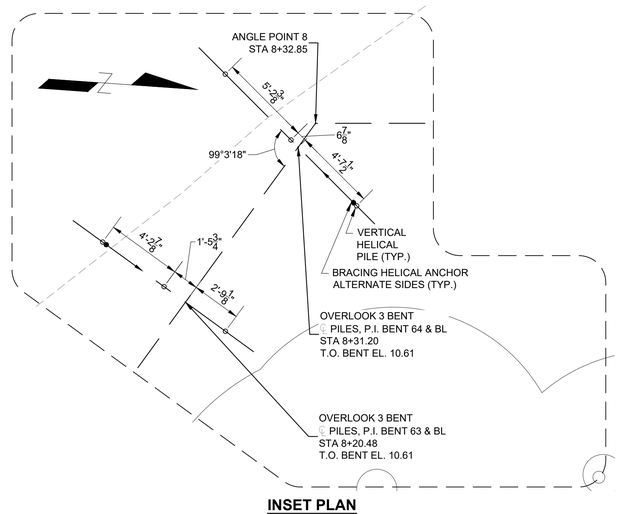


BOARDWALK PILE PLAN 5
SCALE: $\frac{1}{8}$"=1'–0"



BOARDWALK PILE PLAN 6
SCALE: $\frac{1}{8}$"=1'–0"



INSET PLAN
SCALE: $\frac{1}{4}$"=1'–0"

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

BOARDWALK
PILE PLAN - 3

BID DOCUMENTS

NO.	REVISIONS	DATE

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SCALE

AS SHOWN

Bid Documents

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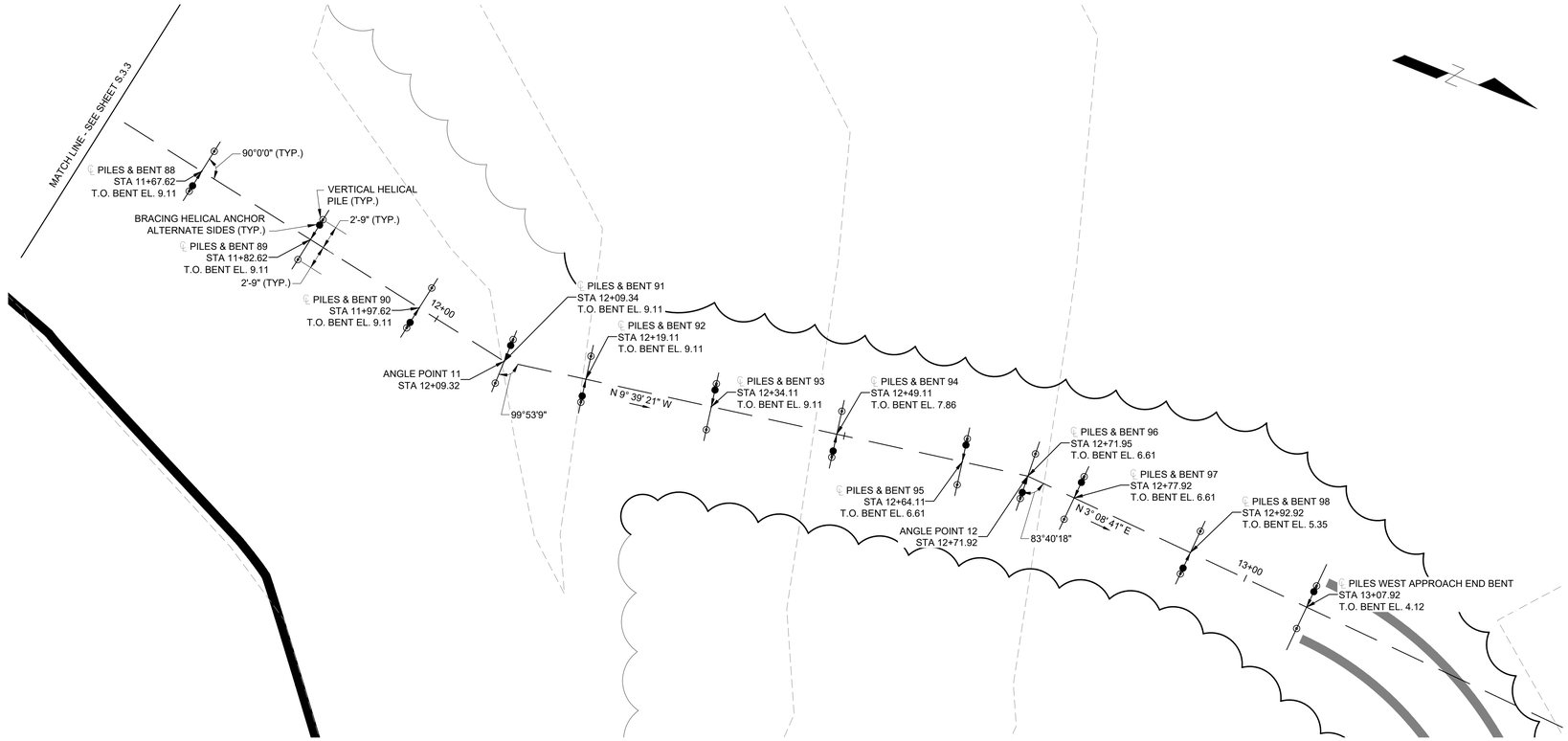

BOARDWALK PILE PLAN 7

SCALE: $\frac{1}{8}$"=1'–0"

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

BOARDWALK
PILE PLAN - 4

BID DOCUMENTS

NO.	REVISIONS	DATE

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CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

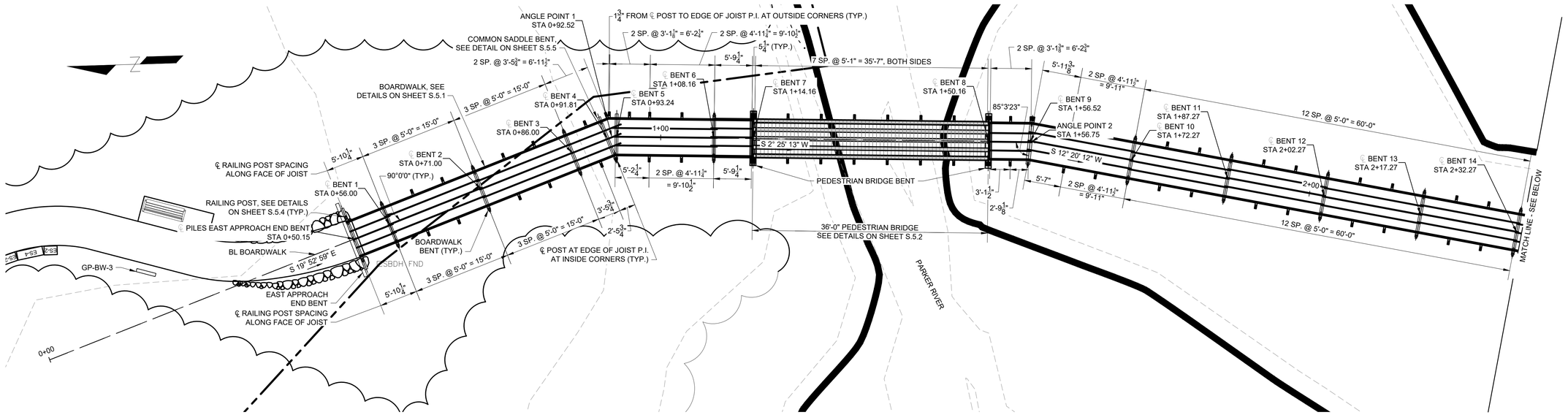
SCALE

AS SHOWN

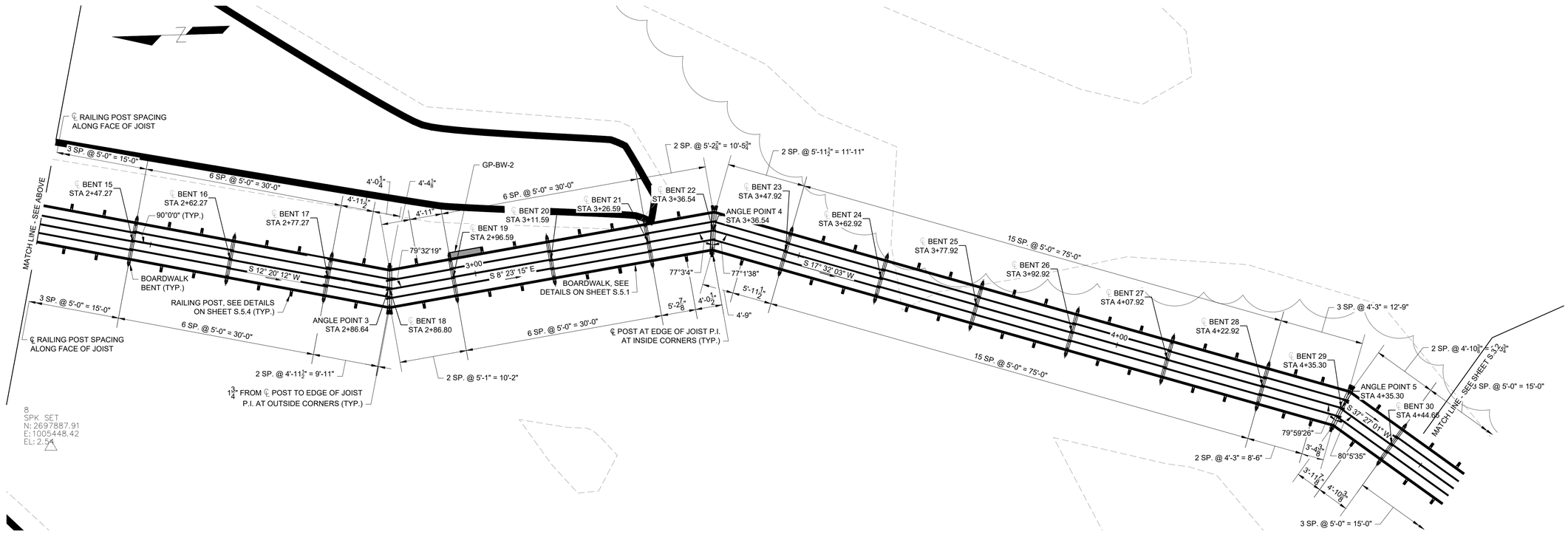
Bid Documents

SHEET NO.

S.2.4



BOARDWALK PLAN 1
SCALE: ⅛"=1'–0"



BOARDWALK PLAN 2
SCALE: ⅛"=1'–0"

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

BOARDWALK PLAN - 1

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ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

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Bid Documents

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S.3.1

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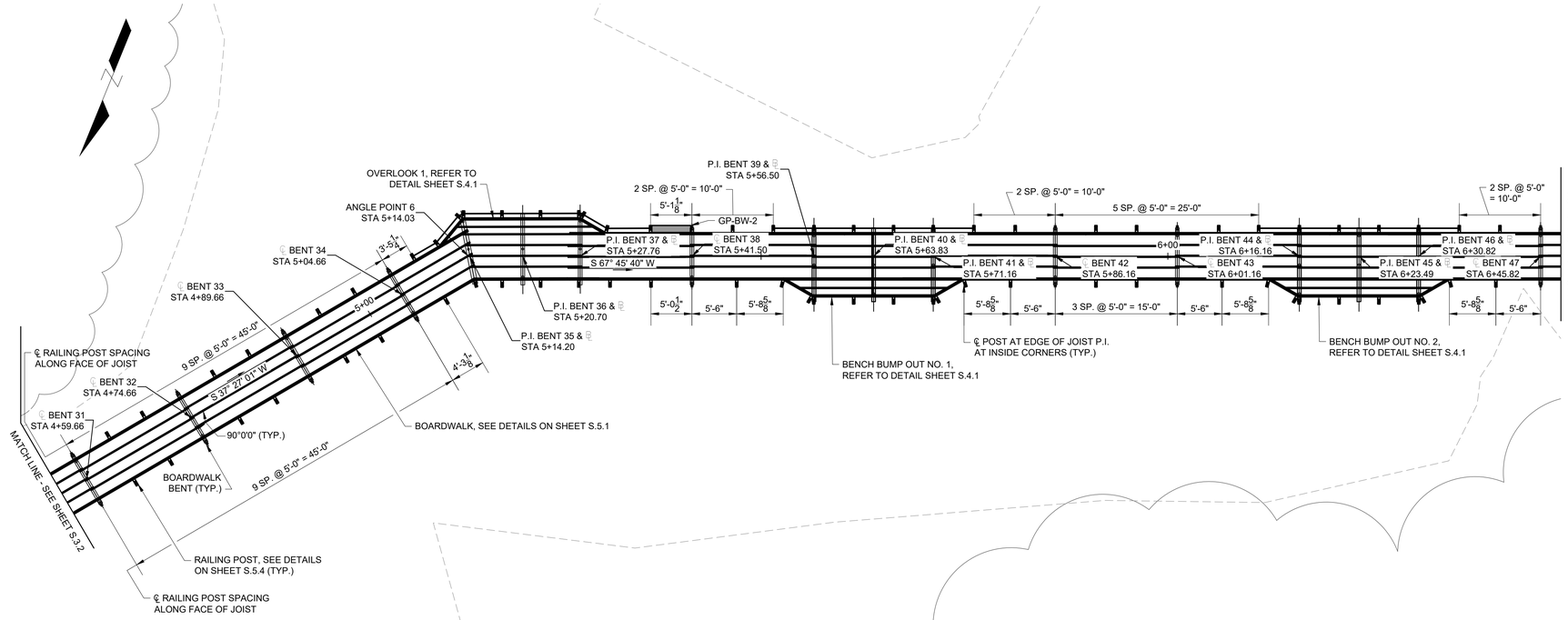
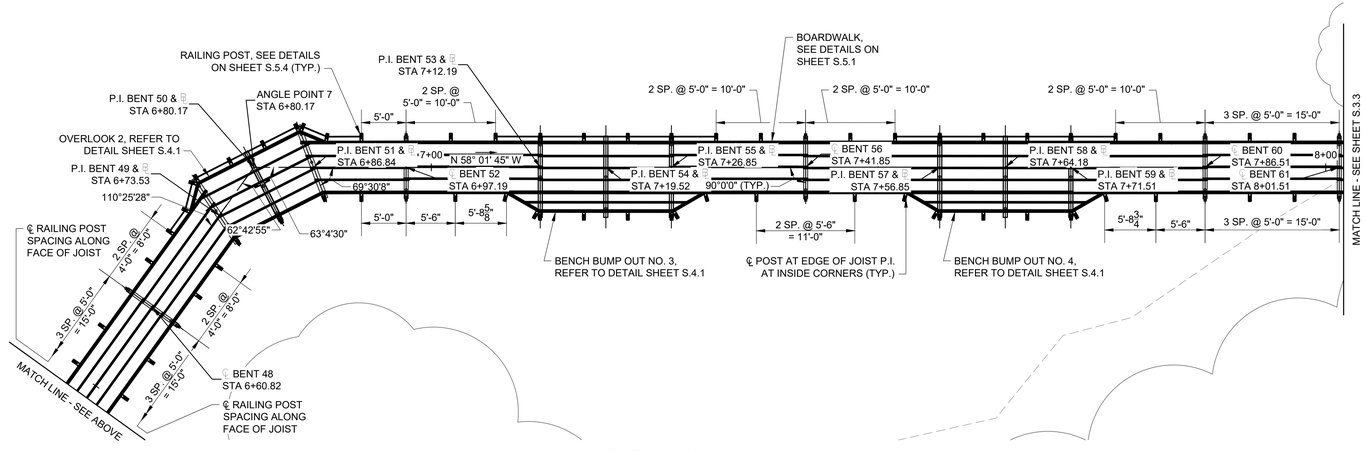


BOARDWALK PLAN 3
SCALE: 1/8"=1'-0"



BOARDWALK PLAN 4
SCALE: 1/8"=1'-0"

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

BOARDWALK PLAN - 2

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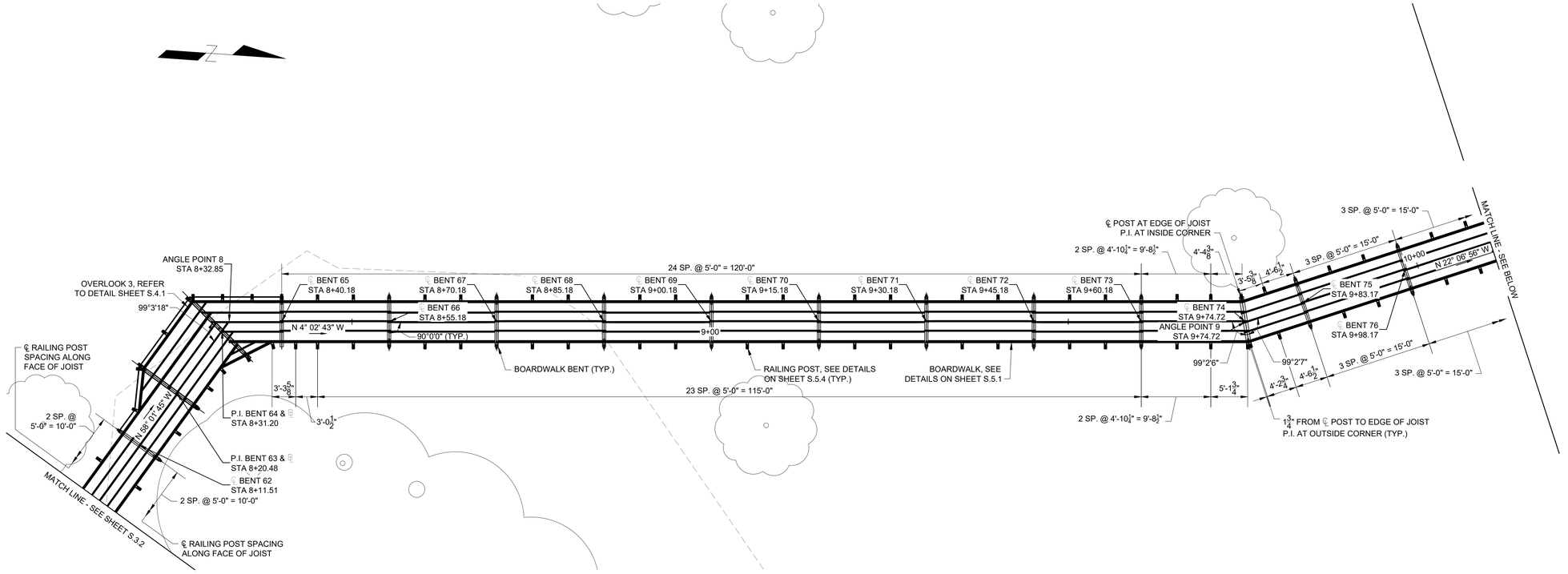
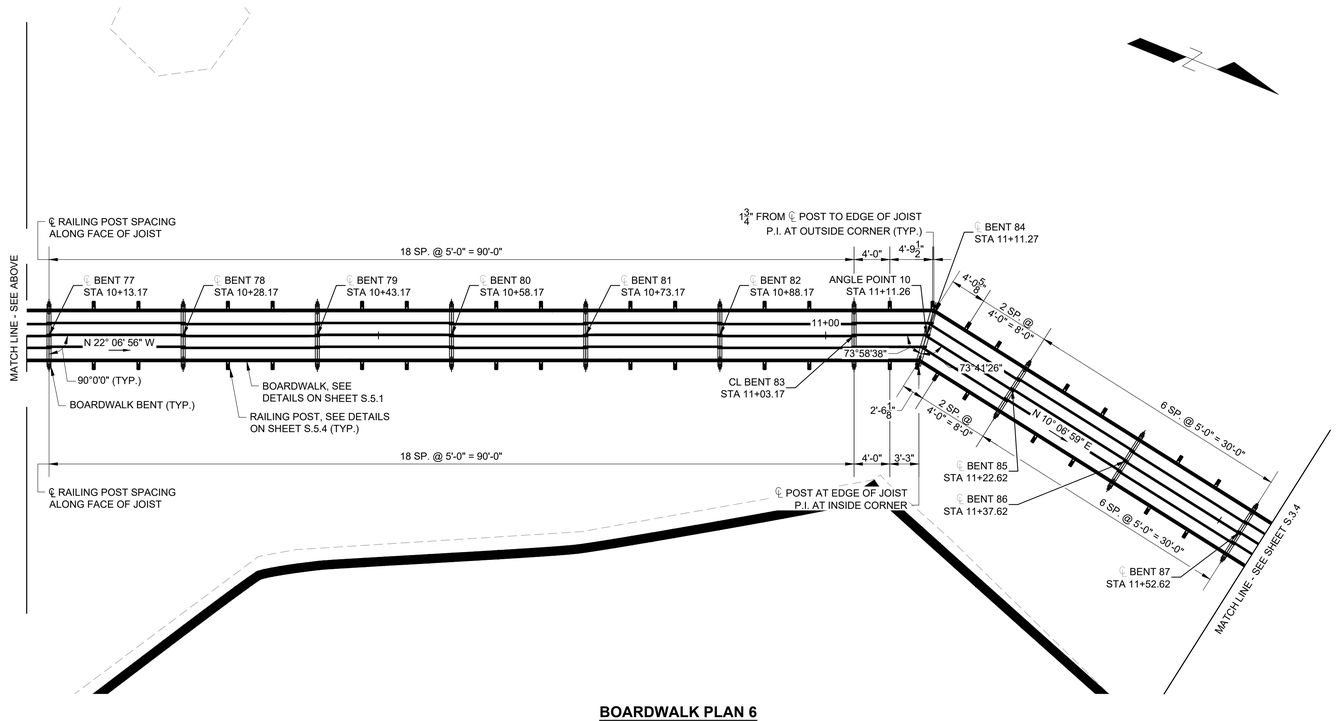


BOARDWALK PLAN 5
SCALE: 1/8"=1'-0"



BOARDWALK PLAN 6
SCALE: 1/8"=1'-0"

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

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BOARDWALK PLAN - 3

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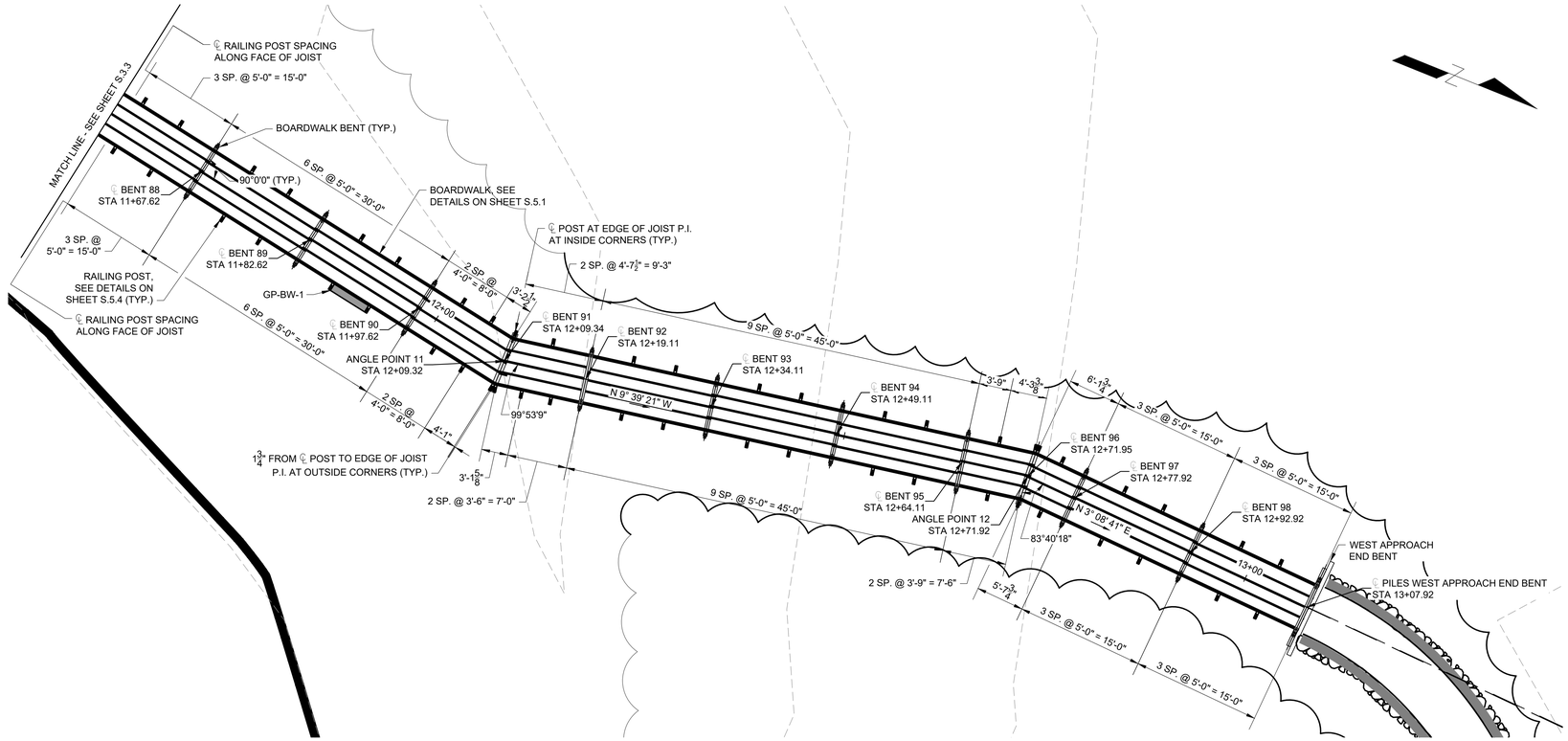

BOARDWALK PLAN 7
SCALE: $\frac{1}{8}$"=1'–0"

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

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BOARDWALK PLAN - 4

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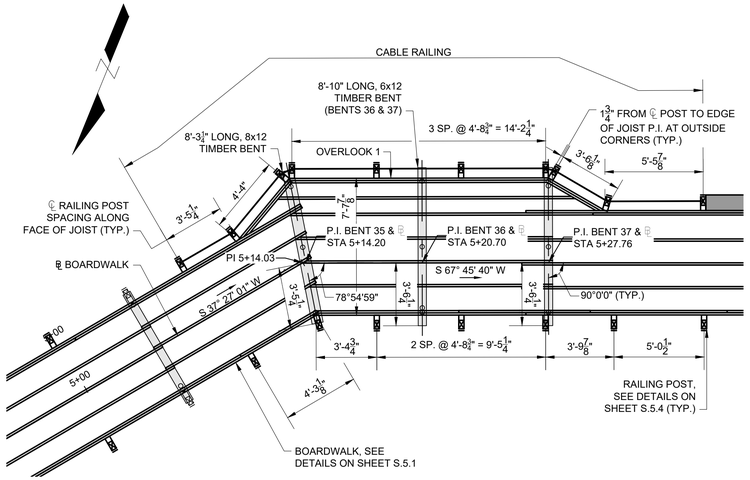
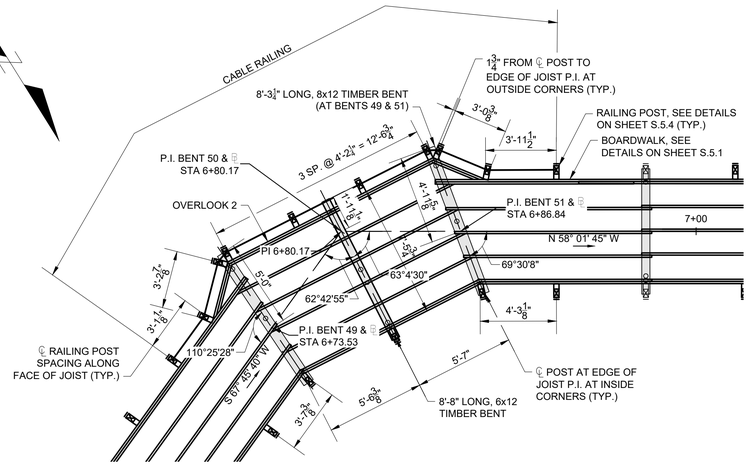


OVERLOOK 1 PLAN

SCALE: ¼"=1'–0"



OVERLOOK 2 PLAN

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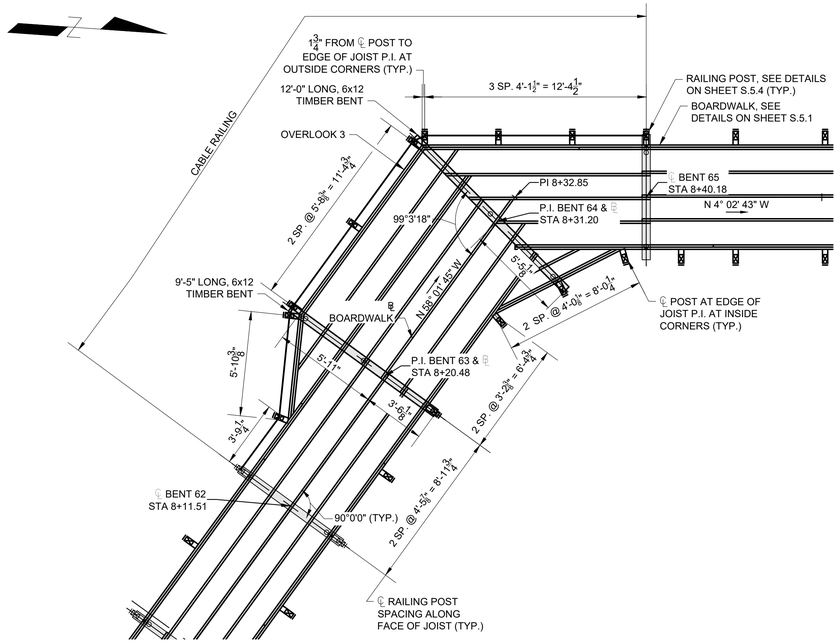
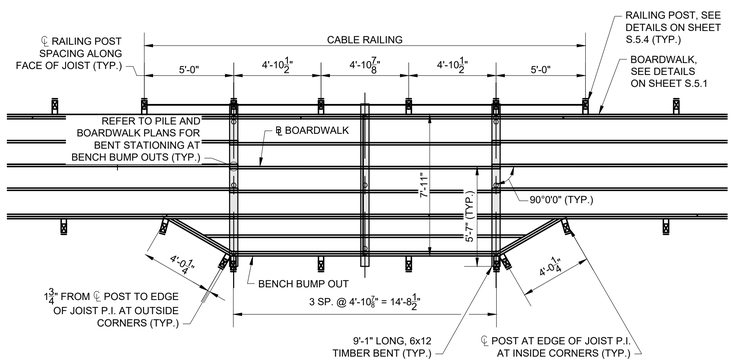


OVERLOOK 3 PLAN

SCALE: ¼"=1'–0"



TYPICAL BENCH BUMP OUT PLAN

SCALE: ¼"=1'–0"

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

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BOARDWALK OVERLOOK PLANS

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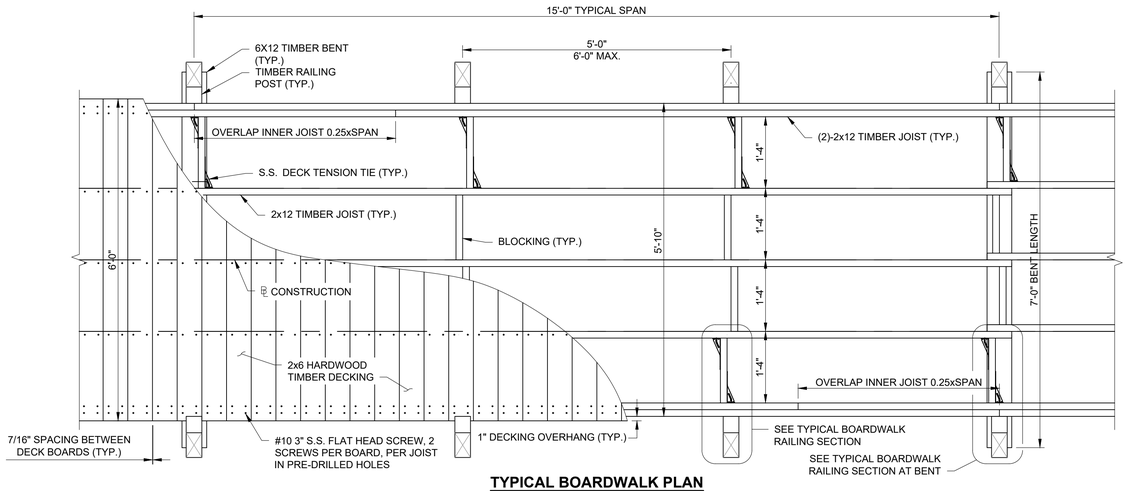
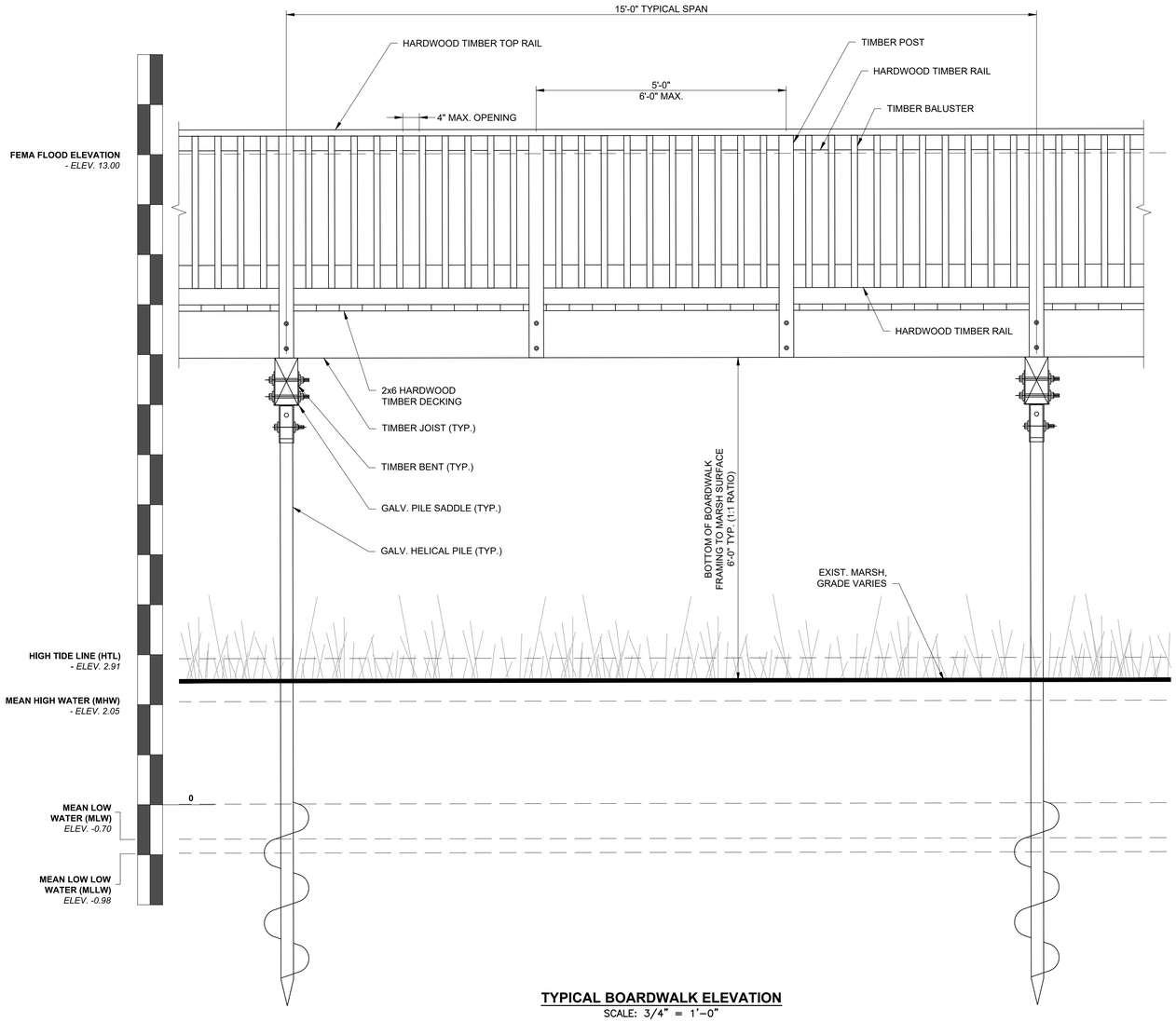


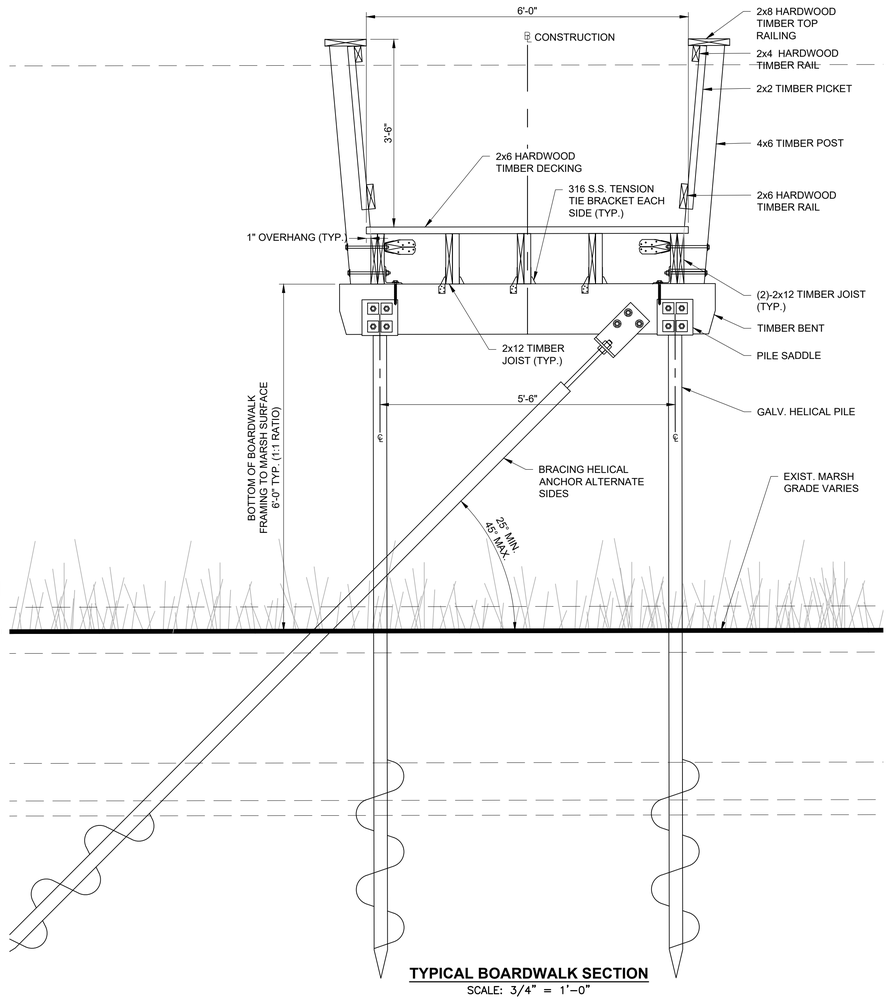
TYPICAL BOARDWALK PLAN
SCALE: 3/4" = 1'-0"

GENERAL NOTES:

1. DESIGN IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, AASHTO GUIDE SPECIFICATIONS FOR PEDESTRIAN BRIDGES, MASSACHUSETTS STATE BUILDING CODE, AND NATIONAL DESIGN SPECIFICATIONS FOR WOOD CONSTRUCTION, 2018.
2. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION.
3. DESIGN LOADS:
   LIVE LOAD = 90 PSF
   WIND LOAD STRENGTH III = 75 PSF
   WIND LOAD STRENGTH V = 21 PSF
   WIND LOAD SERVICE I = 16 PSF
   25-YR STORM EVENT= WAVE CREST EL. 7.17
4. ALL TIMBER SHALL BE SAWN LUMBER, SURFACED FOUR SIDES (S4S) UNLESS OTHERWISE NOTED, AND SHALL COMPLY WITH THE REQUIREMENTS OF ASSHTO M168.
5. SOFTWOOD SAWN LUMBER OTHER THAN JOISTS AND BENT CAPS SHALL BE PRESSURE TREATED WITH ACQ CONFORMING TO AWPA STANDARD U1 USE CATEGORY 3B. SOFTWOOD SAWN LUMBER JOISTS AND BENT CAPS SHALL BE PRESSURE TREATED WITH ACZA CONFORMING TO AWPA STANDARD U1 USE CATEGORY 5A. ALL MEMBERS SHALL BE FABRICATED BEFORE TREATMENT AND DRIED TO A MOISTURE CONTENT OF 19 PERCENT OR LESS AFTER TREATMENT.
6. ALL TIMBER SHALL BE PREDRILLED PRIOR TO TREATMENT.
7. ALL SOFTWOOD TIMBER/LUMBER, INCLUDING BENT CAPS, JOISTS, BLOCKING, SPACERS, AND ALL STRUCTURAL MEMBERS SHALL BE SOUTHERN PINE, GRADE NO. 1 OR BETTER.
8. ALL TIMBER SHALL BE PRECISION END TRIMMED TO LENGTH WITH $\frac{1}{4}$" UNDER LENGTH AND NO OVER LENGTH TOLERANCE PERMITTED.
9. ALL TREATED TIMBER THAT IS FIELD CUT, BORED THRU, DRILLED INTO OR DAMAGED SHALL BE TREATED AS OUTLINED IN AWPA STANDARD M4 WHICH REQUIRES THAT ALL CUTS, HOLES, OR INJURIES TO TREATED WOOD BE PROTECTED BY BRUSHING, SPRAYING, DIPPING, OR SOAKING IN APPROVED PRESERVATIVE.
10. ALL BOLTS, LAG SCREWS AND WASHERS SHALL BE STAINLESS STEEL ASTM F593 GRADE 316, UNLESS OTHERWISE NOTED.
11. ALL HARDWARE, BRACKETS, AND SCREWS ABOVE THE TIMBER BENTS SHALL BE STAINLESS STEEL GRADE 316 UNLESS OTHERWISE NOTED.
12. ALL PLATES, ANGLES, AND STRUCTURAL SHAPES SHALL BE GALVANZIED PER ASTM A123 GRADE 100 (3.9 mils MINIMUM).
13. ALL STEEL CHANNELS, ANGLES, AND PLATES SHALL BE ASTM A36.
14. CONSTRUCTION REQUIREMENTS SHALL CONFORM TO STATE SPECIFICATIONS. ALL TIMBER SHALL BE CUT TO LENGTH AND DRESSED TO SIZE REQUIRED PRIOR TO TREATMENT.
15. TIMBER WHICH AT THE DISCRETION OF THE ENGINEER IS SEVERELY WARPED, BOWED, SPLIT, OR SPLINTERED SHALL NOT BE INCORPORATED IN THE WORK.
16. TIMBER RAIL POSTS SHALL BE SET VERTICAL ALONG THE ELEVATION OF THE BOARDWALK IN THE FIELD.
17. HORIZONTAL TIMBER RAILS SHALL BE ATTACHED PARALLEL TO THE ACTUAL SLOPE OF DECK.
18. RAILS SHALL BE CONTINUOUS OVER TWO POSTS SPACING (MINIMUM).
19. ALL DOUBLE JOISTS SHALL BE FULLY GLUED AND NAILED WITH STAINLESS STEEL GRADE 316 (3) 8d NAILS @ 12" PITCH ALTERNATING SIDES.
20. DECKING, SIDE RAILS, AND TOP RAIL TIMBER SHALL BE HARDWOOD
21. 1:1 SHALL REFER TO THE CLEARANCES REQUIRED OVER THE JURISDICTIONAL SALT MARSH AREAS TO ELEVATION 2.91 (HIGH TIDE LINE).



TYPICAL BOARDWALK ELEVATION
SCALE: 3/4" = 1'-0"



TYPICAL BOARDWALK SECTION
SCALE: 3/4" = 1'-0"

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

BOARDWALK DETAILS - 1

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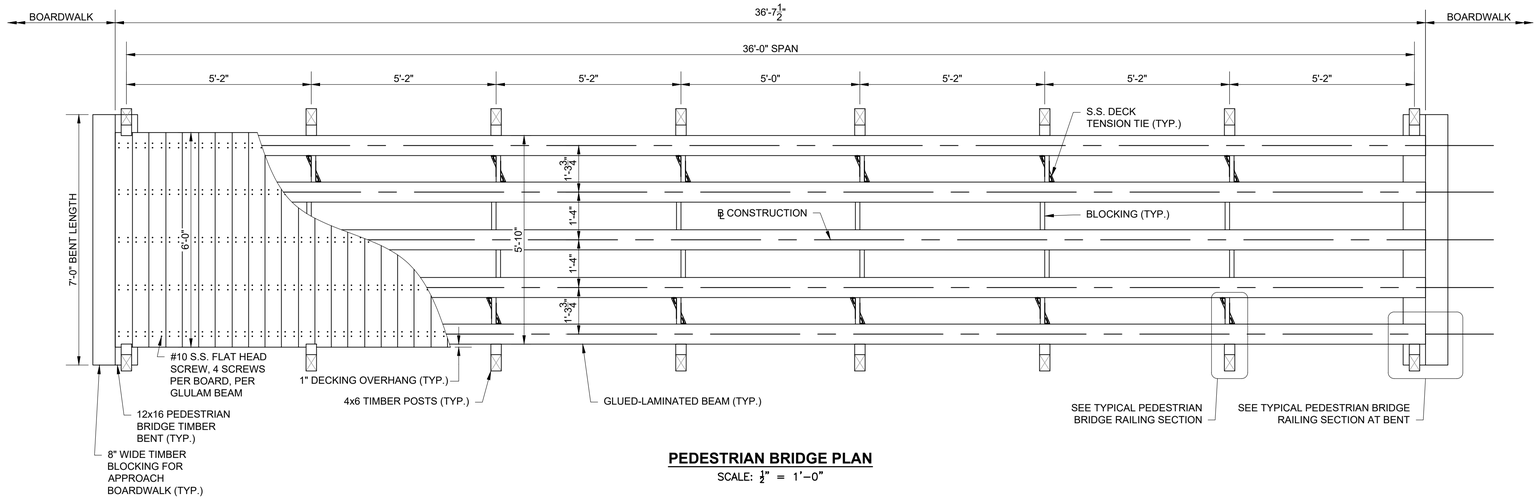
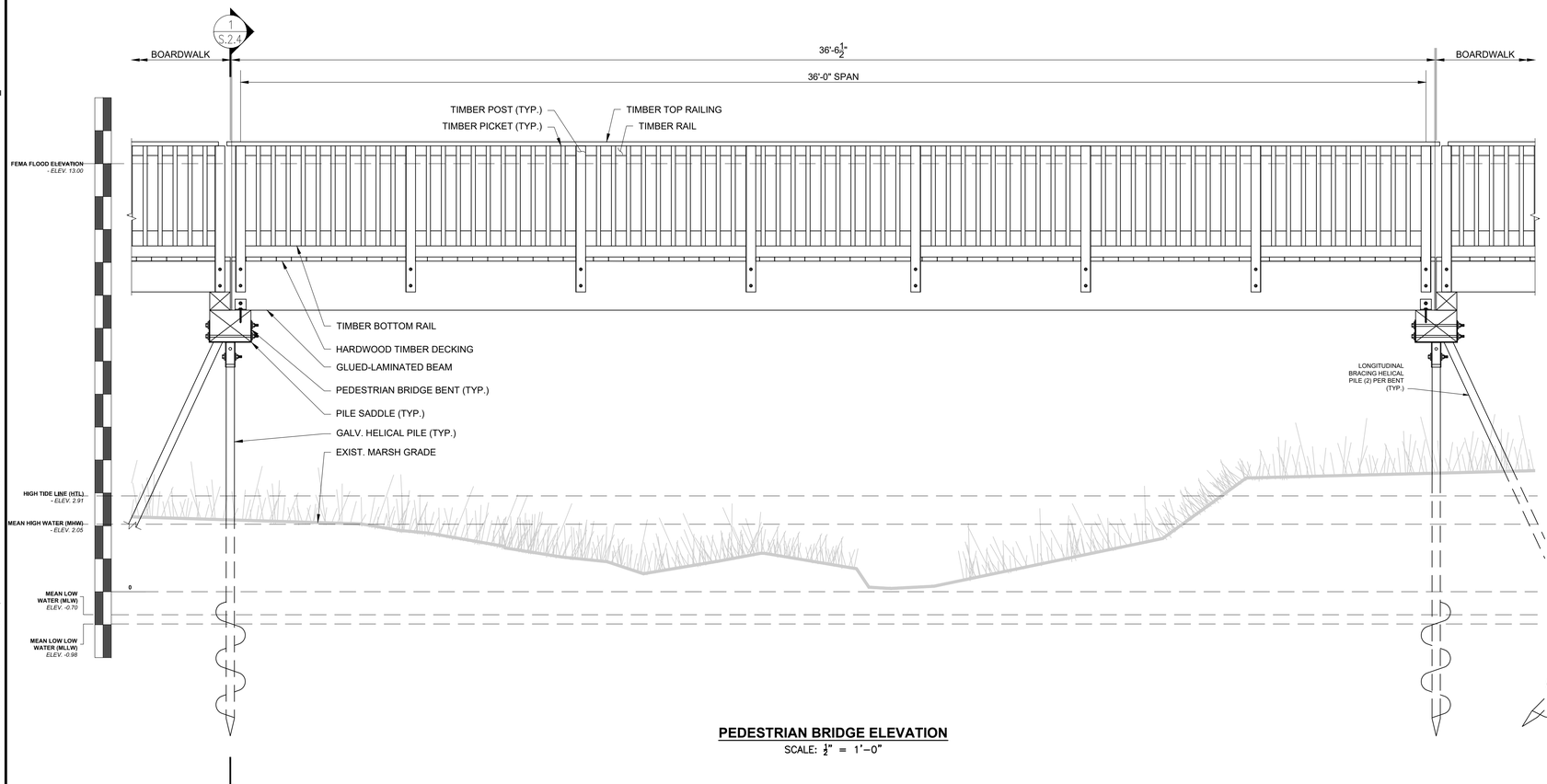


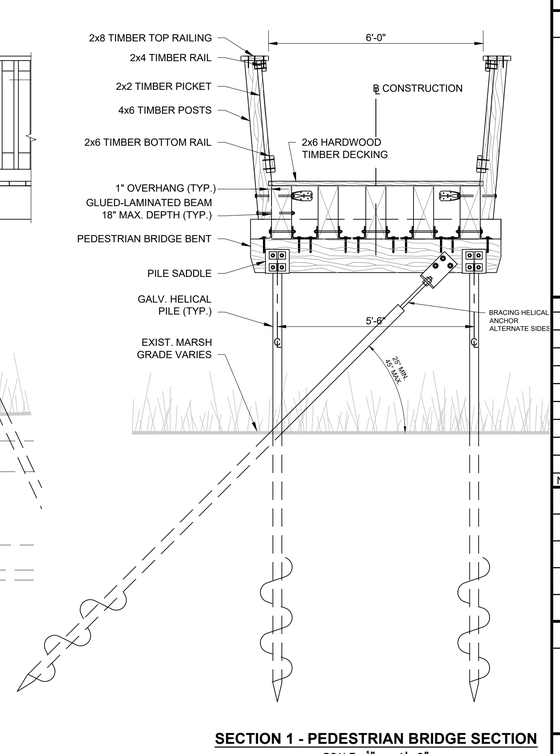
PEDESTRIAN BRIDGE PLAN
SCALE: ½" = 1'–0"

GLULAM NOTES:

1. STRUCTURAL GLUED LAMINATED TIMBER SHALL BE FURNISHED AS SHOWN ON THE PLANS AND IN ACCORDANCE WITH THE SPECIFICATIONS.
2. STRUCTURAL GLUED LAMINATED TIMBER OF SOFTWOOD SPECIES SHALL BE IN CONFORMANCE WITH ANSI A190.1, AMERICAN NATIONAL STANDARD FOR STRUCTURAL GLUED LAMINATED TIMBER, OR OTHER CODE-APPROVED DESIGN, MANUFACTURING AND/OR QUALITY ASSURANCE PROCEDURES.
3. GLULAM SHALL BE SOUTHERN PINE IN ACCORDANCE WITH ANSI A190.1
4. GLULAM SHALL BE PRESSURE TREATED BEFORE MANUFACTURE IN ACCORDANCE WITH AMERICAN WOOD PROTECTION ASSOCIATION (AWPA) STANDARD U1 WITH ACZA ABOVE GROUND EXPOSURE.
5. UNLESS OTHERWISE SPECIFIED, SEALER SHALL BE APPLIED TO THE ENDS OF ALL MEMBERS. SURFACES OF MEMBERS SHALL BE SEALED WITH PENETRATING SEALER.
6. ADHESIVES USED IN THE MANUFACTURE OF STRUCTURAL GLUED LAMINATED TIMBER SHALL MEET REQUIREMENTS FOR WET-USE SERVICE CONDITIONS.
7. STRUCTURAL GLUED LAMINATED TIMBER SHALL BE MANUFACTURED WITH A BUILT-IN CAMBER. THE BUILT-IN CAMBER SHALL BE SET SUCH THAT THE STRUCTURE EXHIBITS NO CAMBER WHEN FULLY LOADED UNDER THE SERVICE CONDITION.
8. LIVE LOAD DEFLECTIONS UNDER THE SERVICE LOAD COMBINATION SHALL NOT EXCEED L/360. DEAD LOAD + LIVE LOAD DEFLECTIONS SHALL NOT EXCEED L/240.
9. THE GLUED LAMINATED TIMBERS SHALL BE DESIGNED BY THE CONTRACTOR FOR A LIVE LOAD OF 90 PSF.
10. MEMBERS SHALL BE MARKED WITH THE APA TRADEMARK INDICATING CONFORMANCE WITH THE MANUFACTURING, QUALITY ASSURANCE, AND MARKING PROVISIONS OF ANSI A190.1
11. CONTRACTOR RESPONSIBLE FOR COORDINATING BENT ELEVATIONS, RAILING ATTACHMENT, AND GEOMETRY BASED ON THE GLUED-LAMINATED BEAM SIZE.



PEDESTRIAN BRIDGE ELEVATION
SCALE: ½" = 1'–0"



SECTION 1 - PEDESTRIAN BRIDGE SECTION
SCALE: ½" = 1'–0"

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

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BOARDWALK DETAILS - 2

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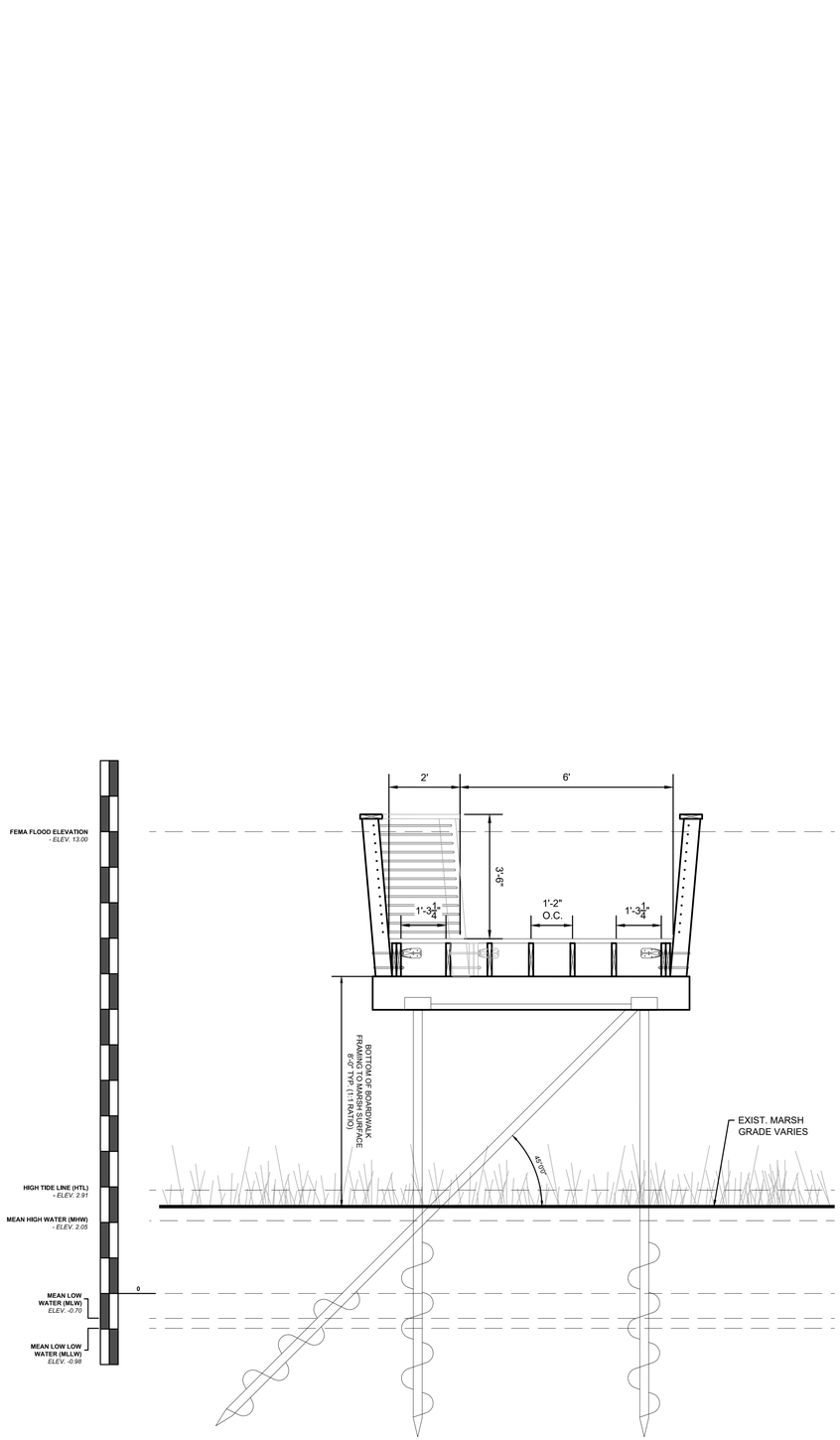
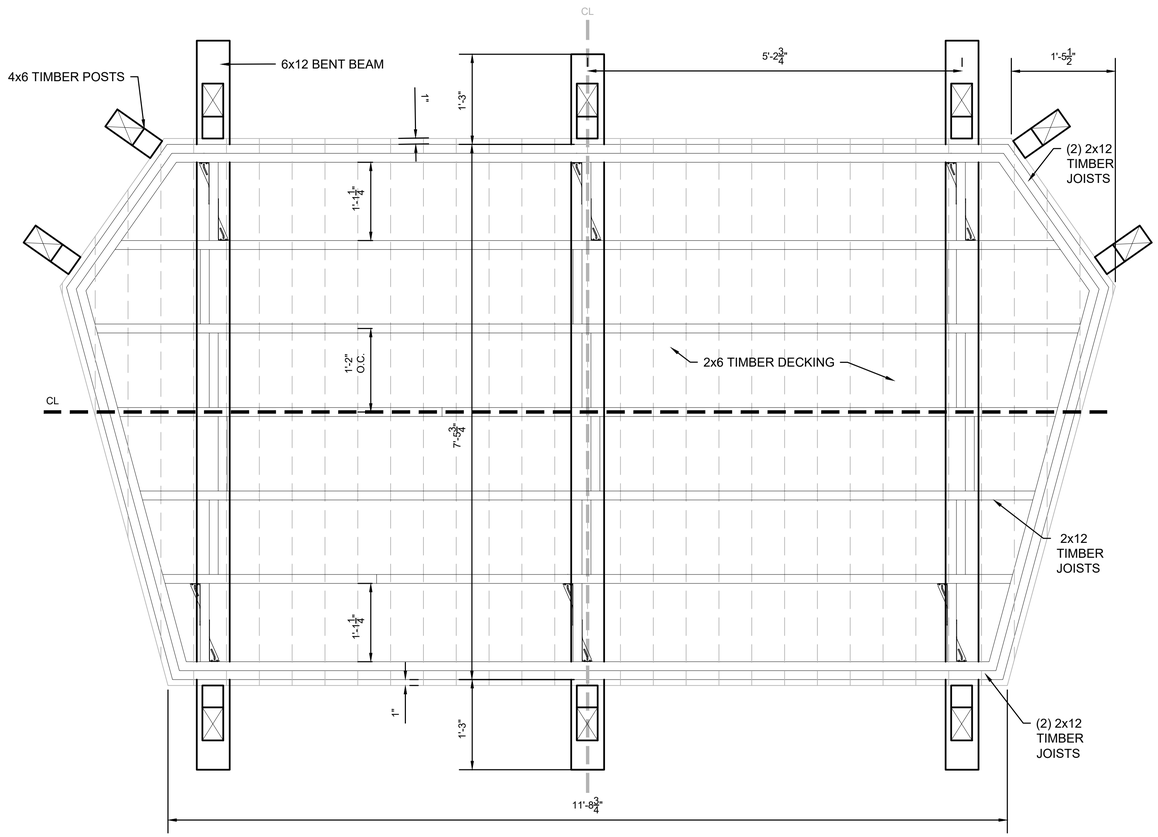


BOARDWALK OVERLOOK - TYPICAL SECTION

SCALE: 1/2" = 1' - 0"

NOTE:
1. SEE PLANS FOR OVERLOOK LOCATIONS



BOARDWALK OVERLOOK FRAMING PLAN

SCALE: 1" = 1' - 0"

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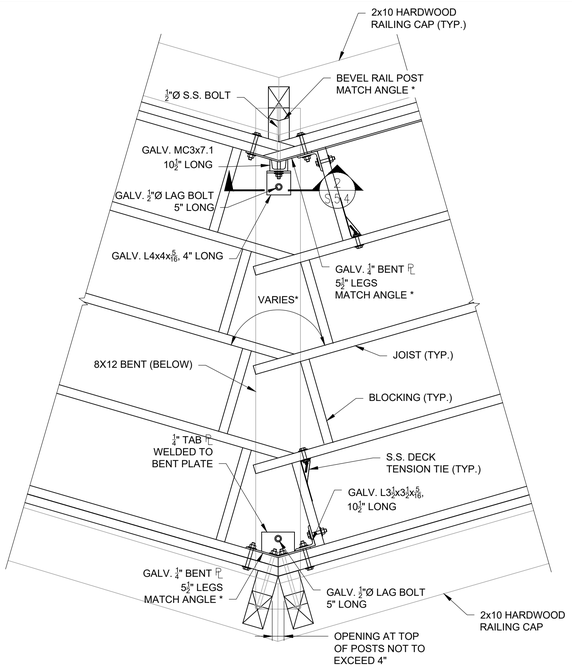
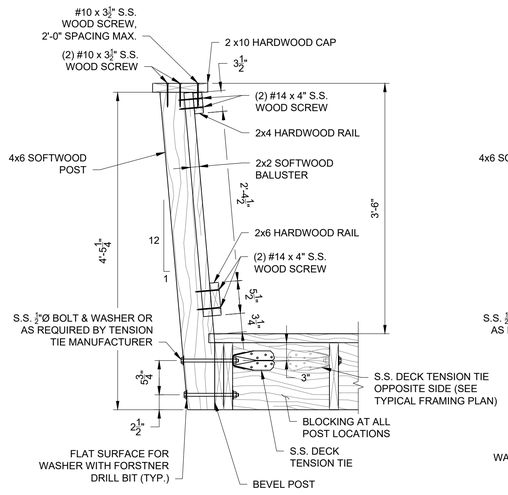
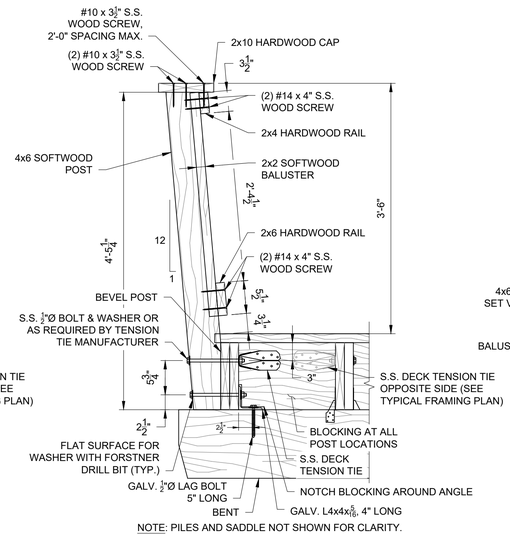


* SEE BOARDWALK PLAN FOR ANGLES

TYPICAL FRAMING AT ANGLE POINT
SCALE: 1" = 1'–0"

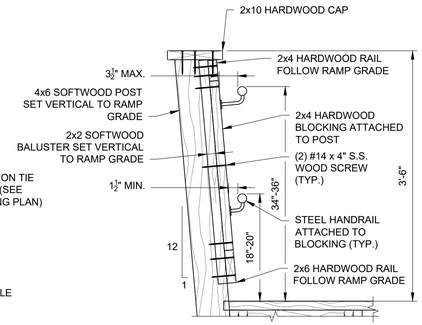


TYPICAL BOARDWALK RAILING SECTION
SCALE: 1" = 1'–0"

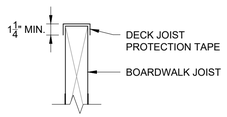


NOTE: PILES AND SADDLE NOT SHOWN FOR CLARITY.

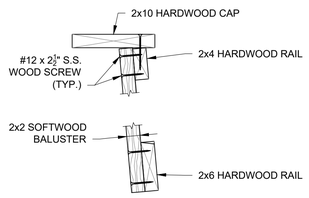
TYPICAL BOARDWALK RAILING SECTION AT BENT
SCALE: 1" = 1'–0"



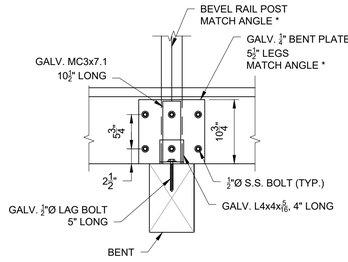
RAMP HANDRAIL SECTION
SCALE: 1" = 1'–0"



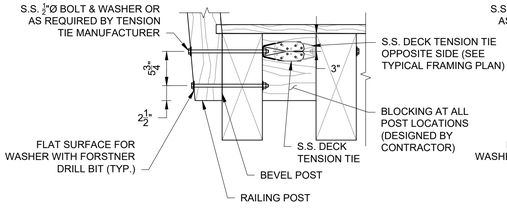
DECK JOIST PROTECTION
SCALE: 1½" = 1'–0"



BALUSTER DETAIL
SCALE: 1½" = 1'–0"

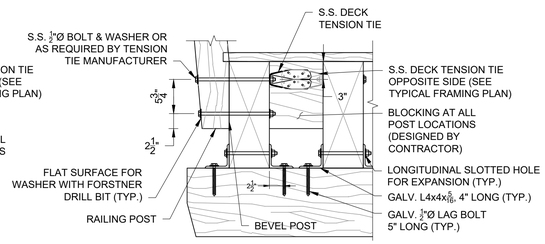


SECTION 2
SCALE: 1" = 1'–0"



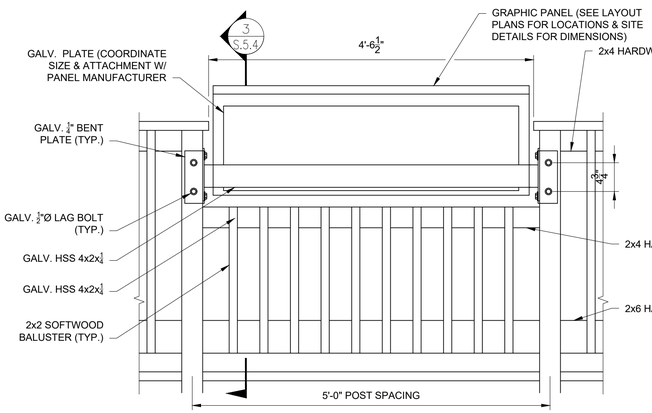
NOTE: RAILING SYSTEM NOT SHOWN FOR CLARITY.
SEE TYPICAL BOARDWALK RAILING SECTION.

TYPICAL BRIDGE RAILING ATTACHMENT SECTION
SCALE: 1" = 1'–0"

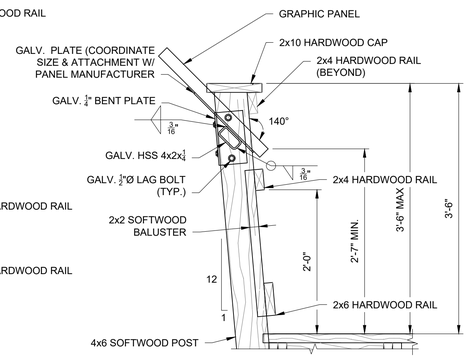


NOTE: RAILING SYSTEM, PILES, & SADDLES NOT SHOWN FOR CLARITY.
SEE TYPICAL BOARDWALK RAILING SECTION.

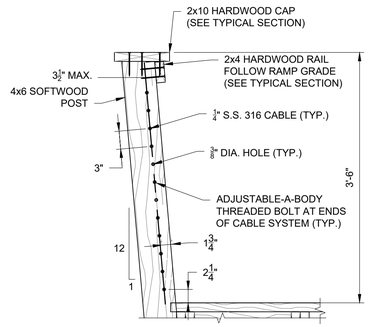
TYPICAL BRIDGE RAILING ATTACHMENT SECTION AT BENT
SCALE: 1" = 1'–0"



GRAPHIC PANEL ATTACHMENT ELEVATION
SCALE: 1" = 1'–0"



SECTION 3
SCALE: 1" = 1'–0"



CABLE RAILING AT OVERLOOKS SECTION
SCALE: 1" = 1'–0"

RAILING NOTES:

1. HANDRAIL SHALL BE GALVANIZED 1½"Ø SCH. 40 RAIL.
2. HANDRAIL BRACKETS AND PLATES SHALL BE GALVANIZED A36 STEEL.
3. ALL STAINLESS STEEL SCREWS, BOLTS, WASHERS, NUTS, HARDWARE, AND BRACKETS SHALL BE GRADE 316.

PREPARED BY

BETA
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REGISTERED PROFESSIONAL

REGISTERED PROFESSIONAL

PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

BOARDWALK DETAILS - 4

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
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SCALE

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Bid Documents

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S.5.4

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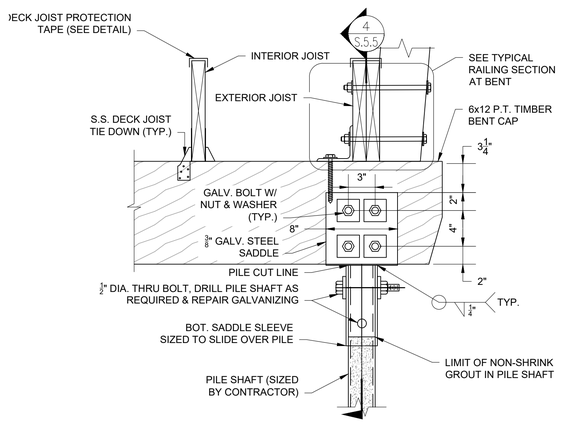
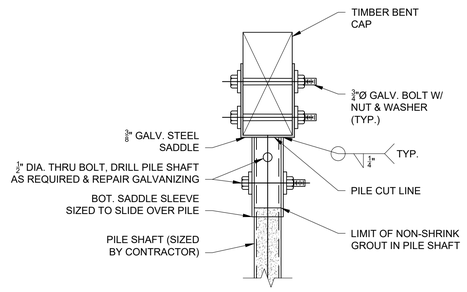


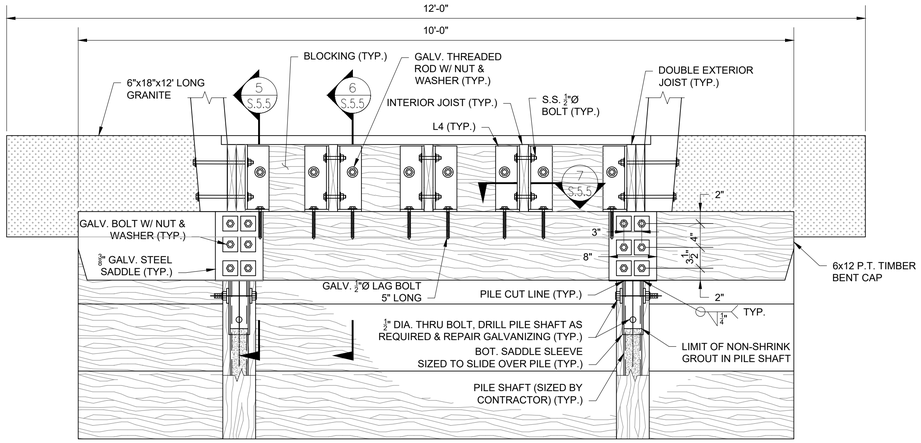
TYPICAL HELICAL PILE BENT CONNECTION
SCALE: 1½" = 1'–0"



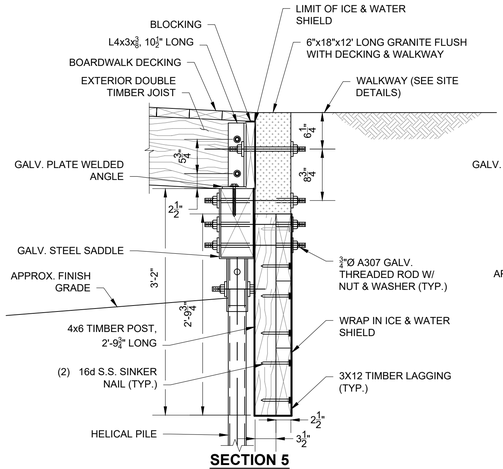
SECTION 4
SCALE: 1½" = 1'–0"

PILE NOTES:

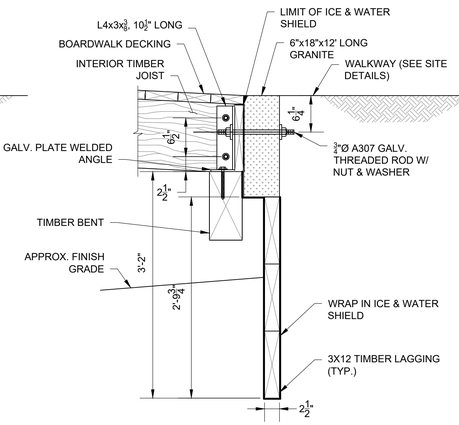
1. FOUNDATION PILES SHALL BE INSTALLED TO A SUFFICIENT DEPTH AND RESISTANCE TO ADEQUATELY DEVELOP THEIR SPECIFIED LOAD SUPPORTING CAPACITY. THE ENGINEER SHALL BE THE SOLE JUDGE, BASED ON SOIL DATA AND THE RESULTS OF THE PILE LOAD TEST, OF THE REQUIRED DEPTH AND RESISTANCE TO DEVELOP THE LOAD CAPACITY.
2. CONTRACTOR SHALL CALL DIG SAFE AT LEAST 72 HOURS PRIOR TO STARTING THE WORK TO VERIFY LOCATIONS OF EXISTING UTILITIES.
3. ALL STEEL FOR HELICAL PILES AND ACCESSORIES SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH ASTM A123 CLASS 100 (3.9 mils MINIMUM).
4. ALL HELICAL PILES, TIMBER SUPPORT BRACKETS, AND CAP PLATES ARE WELDED TO THE SHAFT IN CONFORMANCE TO THE AMERICAN WELDING SOCIETY, "STRUCTURAL WELDING CODE. AWS D1.1" AND APPLICABLE REVISIONS.
5. HELICAL ANCHOR BRACING SHALL BE A CONCENTRICALLY LOADED GALVANIZED SADDLE TYPE BRACKET HAVING COMPRESSION AND/OR TENSION CAPACITIES AS INDICATED. BRACKET SHALL BE CONNECTED TO THE TIMBER BENT WITH A MINIMUM OF 2 - ¾"Ø GALVINIZED. BOLTS.
6. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER, INFORMATION ON THE TYPE OF EQUIPMENT PROPOSED TO BE USED, PROPOSED METHODS OF OPERATION, PROPOSED SEQUENCE OF PILE INSTALLATION, AND DETAILS OF ALL PILE INSTALLATION EQUIPMENT AND ACCESSORIES FOR EACH PILE TYPE SPECIFIED.



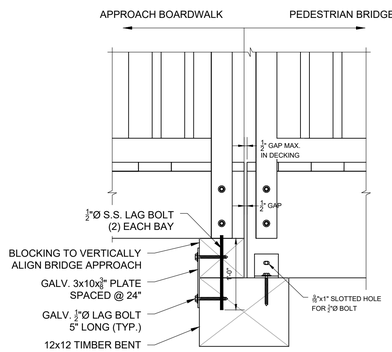
END BENT ELEVATION
SCALE: 1" = 1'–0"



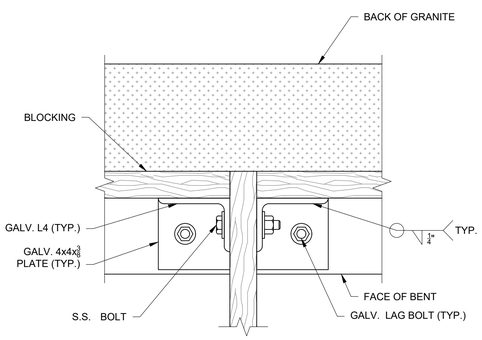
SECTION 5
SCALE: 1" = 1'–0"



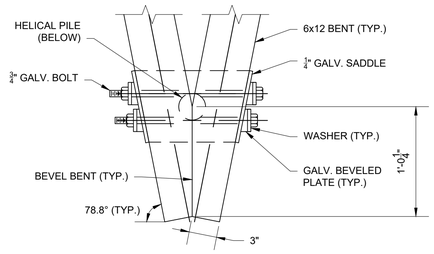
SECTION 6
SCALE: 1" = 1'–0"



PEDESTRIAN BRIDGE BENT
SCALE: 1" = 1'–0"



SECTION 7
SCALE: 3" = 1'–0"



COMMON SADDLE PLAN - BENT 4/5
SCALE: 1½" = 1'–0"

PREPARED BY

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

BOARDWALK - DETAILS - 5

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
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ISSUE DATE:	4/5/2024
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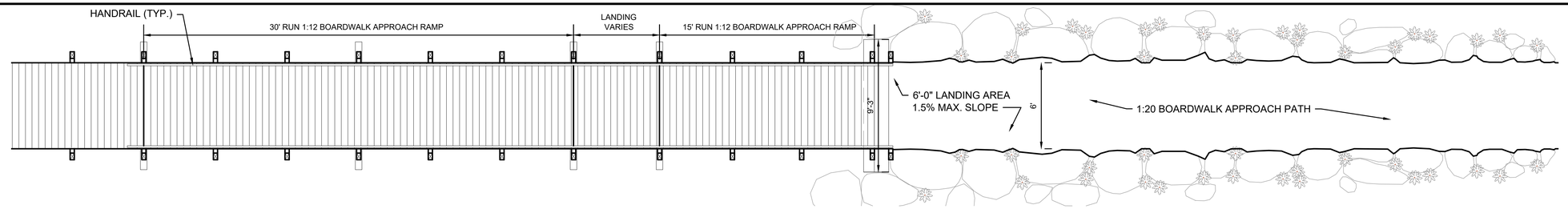
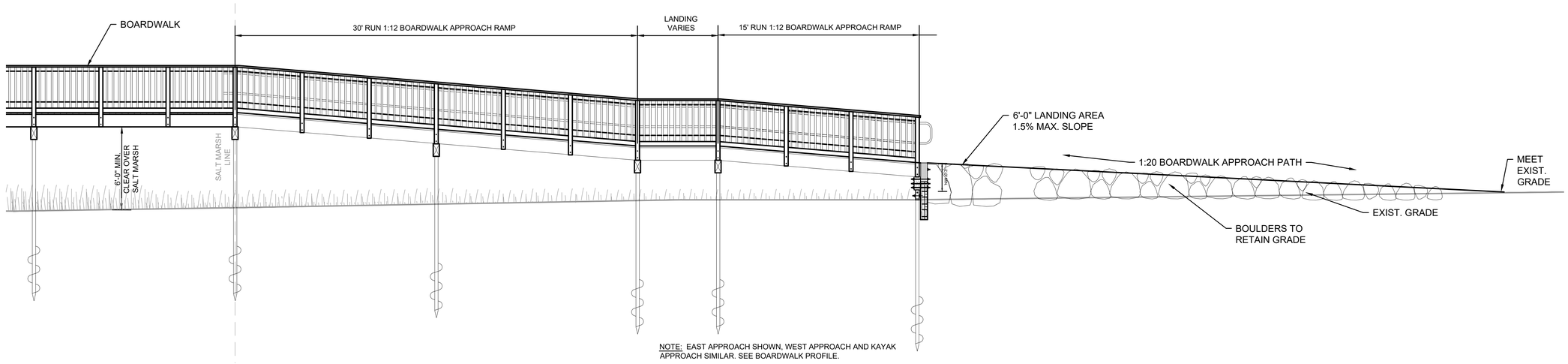
S.5.5



BOARDWALK EAST APPROACH - PLAN (WEST APPROACH SIMILAR)

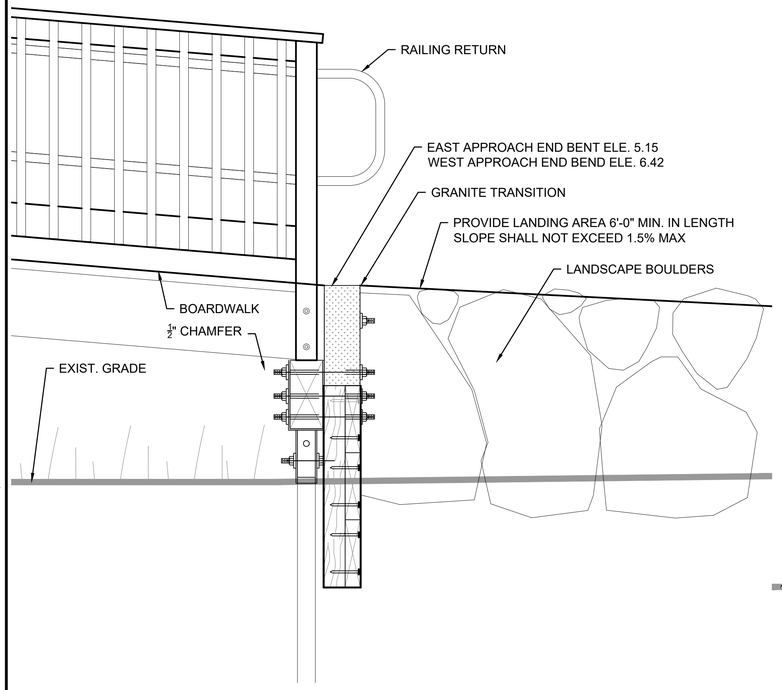
SCALE: 1" = 4' - 0"



NOTE: EAST APPROACH SHOWN, WEST APPROACH AND KAYAK APPROACH SIMILAR. SEE BOARDWALK PROFILE.

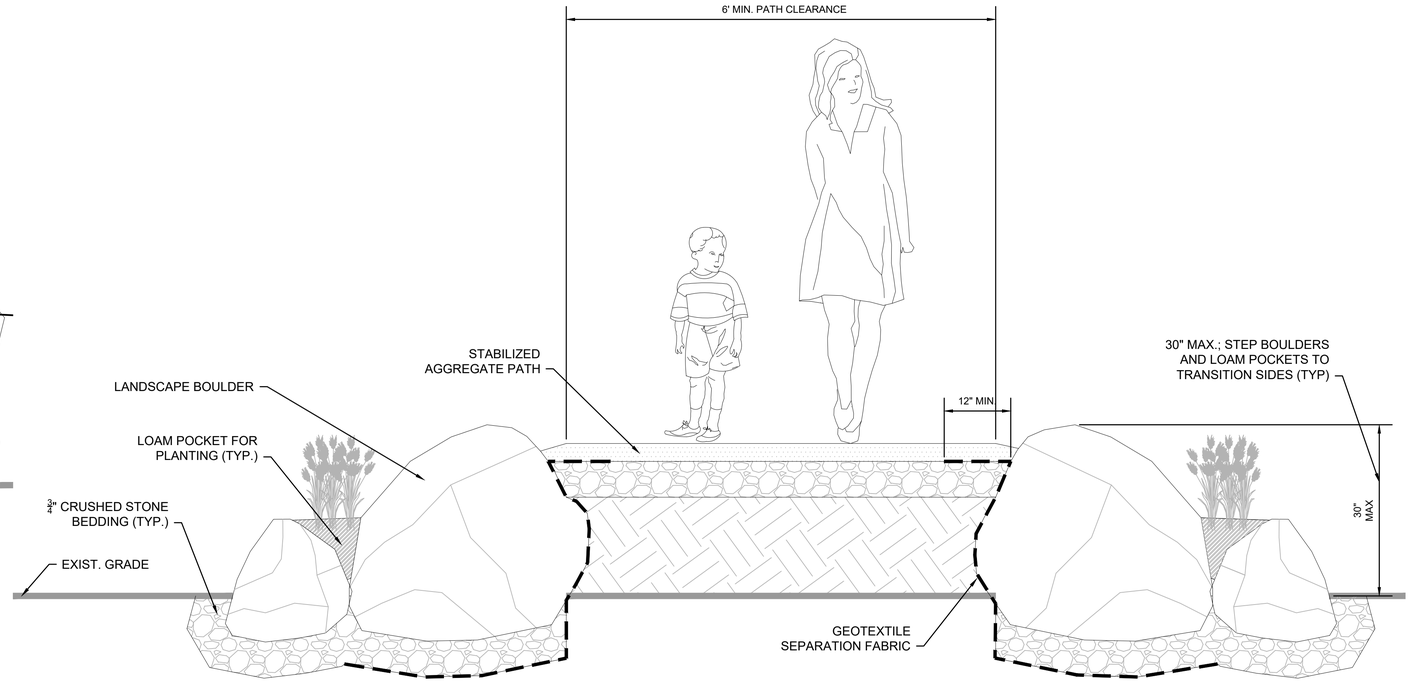
BOARDWALK EAST APPROACH - SECTION / ELEVATION

SCALE: 1" = 4' - 0"



EAST APPROACH END BENT SECTION

SCALE: 1" = 1' - 0"



SECTION AT BOARDWALK APPROACH PATH

SCALE: 1" = 1' - 0"

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

BOARDWALK - DETAILS - 6

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SCALE

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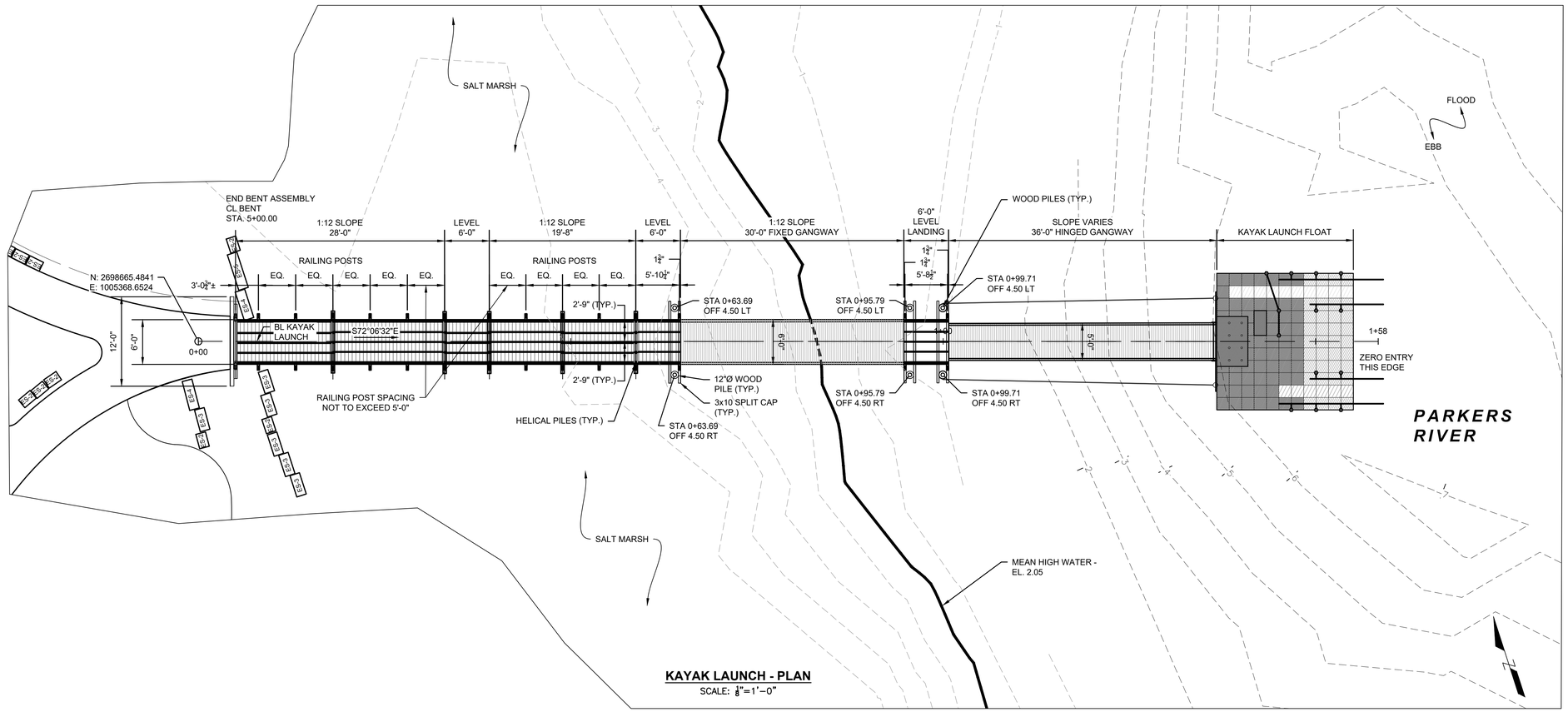
SHEET NO.

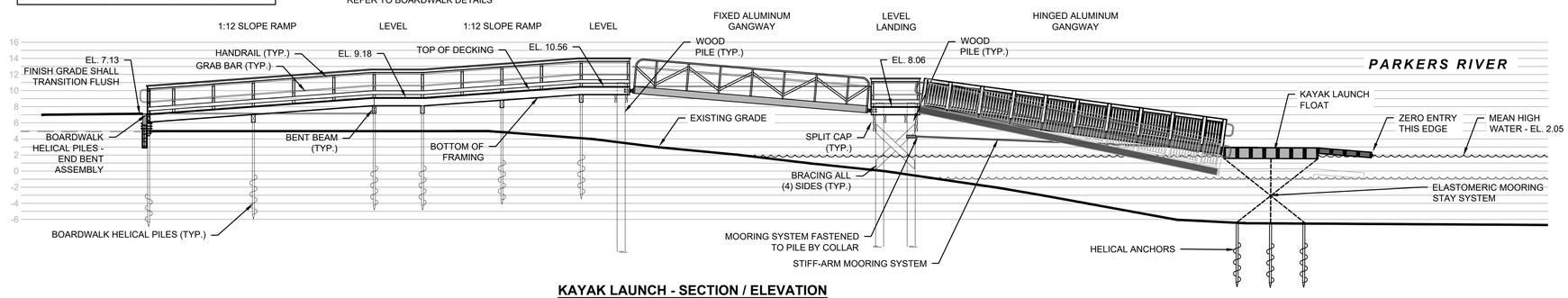
S.5.6



KAYAK LAUNCH - PLAN
SCALE: 1/8"=1'-0"

NOTE:
2x2 TIMBER PICKET RAILING NOT SHOWN FOR CLARITY.

KAYAK LAUNCH WOODEN BOARDWALK APPROACH -
REFER TO BOARDWALK DETAILS



KAYAK LAUNCH - SECTION / ELEVATION
SCALE: 1/8"=1'-0"

KAYAK LAUNCH FACILITY NOTES:

1. THE PARKERS RIVER IS A NAVIGABLE, TIDAL RIVER, UTILIZED BY MOTORIZED WATERCRAFT. THE KAYAK LAUNCH FACILITY SHALL BE A STABLE, ACCESSIBLE FLOAT, AVAILABLE FOR THE PUBLIC TO USE TO ACCESS THE RIVER. THE USE WILL BE PERSONAL, NON-MOTORIZED WATERCRAFT: KAYAKS AND PADDLEBOARDS, ETC.
2. THE KAYAK LAUNCH FACILITY COMPONENTS REQUIRED FOR THIS PROJECT, INCLUSIVE OF KAYAK LAUNCH FLOAT, RIVER-BOTTOM HELICAL ANCHORS, ELASTOMERIC MOORING STAYS, GANGWAY SYSTEM, WOODEN BOARDWALK SYSTEM, WOODEN PILES, AND LANDING PLATFORM SHALL BE COORDINATED IN A MANNER THAT RESULTS IN A FUNCTIONAL FACILITY THAT PROVIDES PUBLIC ACCESS SAFELY AND ACCOMODATES THE TIDAL RIVER CURRENTS, PASSING WATERCRAFT WAKES, AND TIDAL RANGE AND CONDITIONS ENCOUNTERED IN THIS LOCATION.
3. THE GANGWAYS, MOORING AND FLOAT SYSTEM SHALL BE DESIGNED TO WITHSTAND A 50 YEAR STORM EVENT. A HYDRAULIC & SCOUR REPORT FOR RTE. 28 BRIDGE REPLACEMENT PREPARED BY APPLIED COASTAL RESEARCH & ENGINEERING IN 2014 IDENTIFIED THE FOLLOWING HYDRAULIC PARAMETERS IN REGARD TO VELOCITY AND WATER LEVELS.
   a. 2 YR. STORM MAX FLOW 482 (CFS) MAX. WATER SURFACE ELEV. DOWNSTREAM OF BRIDGE 3.9 (NAVD 88).
   b. 50 YR. STORM MAX FLOW 2,081 (CFS) MAX. WATER SURFACE ELEV. DOWNSTREAM OF BRIDGE 7.4 (NAVD 88).
   c. 100 YR. STORM MAX FLOW 4,297 (CFS) MAX. WATER SURFACE ELEV. DOWNSTREAM OF BRIDGE 8.9 (NAVD 88).
4. THE FLOATS SHALL BE SECURED TO THE RIVER BOTTOM BY UTILIZING HELICAL ANCHORS WITH CHAINS AND AN ELASTOMERIC MOORING STAY SYSTEM CONFIGURED TO ACCODATE THE TIDAL RANGE OF THE PARKERS RIVER AND SHALL INCLUDE DESIGN PROVISIONS THAT ACCOMODATE STORM EVENTS. THE DESIGN OF THE GANGWAYS, KAYAK LAUNCH FLOAT AND MOORING SYSTEM SHALL BE FULLY COORDINATED BETWEEN THE GANGWAY AND FLOAT COMPONENTS. THE FINAL DESIGN AND LAYOUT OF THE RIVER BOTTOM HELICAL ANCHORS SHALL BE THE RESPONSIBILTY OF THE CONTRACTOR.
6. THE COMPONENTS SHALL INCLUDE INTEGRATED HARDWARE AND ATTACHMENT POINTS SUCH AS CLEATS, LOOP-EYES, CLEVIS SHACKLES, ETC. THAT SPECIFICALLY ALLOW FOR BOTH ON-SITE IN-SITU ADJUTMENTS TO THE FLOAT AS WELL AS ALLOW SEASONAL REMOVAL OF THE FLOAT.
7. SIX (6) SQUARE FEET OF RIVER BOTTOM IMPACTS HAVE BEEN PERMITTED FOR THE KAYAK FLOAT ELASTOMERIC MOORING SYSTEM.
8. TRANSITIONS BETWEEN BOARDWALK DECKING SURFACES, GANGWAYS AND FLOATS SHALL BE UNIFORM, NON-SLIP SURFACES, WITH ADA COMPLIANT, ACCESSIBLE TRANSITION PLATES AND HINGE POINTS CONFIGURED TO ACCMODATE THE TIDAL RANGE OF THIS LOCATION.
9. THE COMPONENTS SHALL BE DESIGNED TO PRESENT THE USERS WITH MINIMUM GANGWAY ACCESSWAY OF 4'-0" CLEAR WIDTH AND A STABLE, LEVEL, ZERO ENTY LAUNCH PLATFORM. REFER TO DETAILS AND CROSS SECTIONS.
10. THIS PROJECT IS HORIZONTALLY REFERENCED TO THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD83).
11. THIS PROJECT IS VERTICALLY REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

PREPARED BY

BETA
www.BETA-Inc.com

REGISTERED PROFESSIONAL

REGISTERED PROFESSIONAL

PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

GANGWAY & FLOAT ASSEMBLY

BID DOCUMENTS

NO.	REVISIONS	DATE

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DESIGNED BY:	AWG
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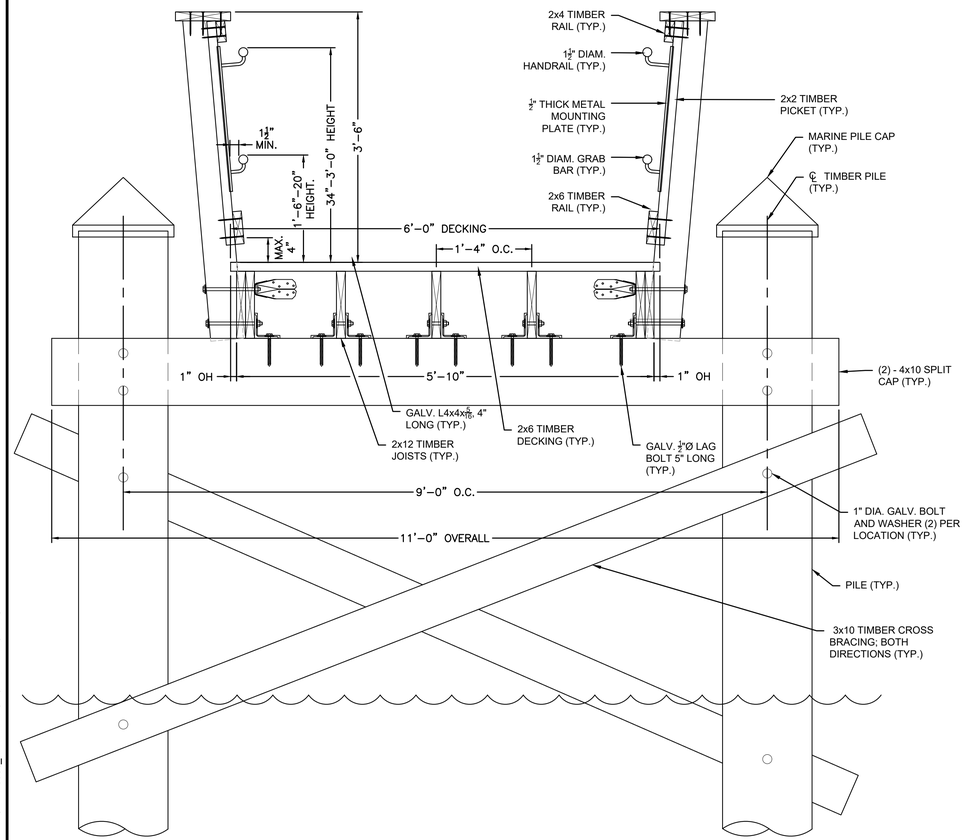
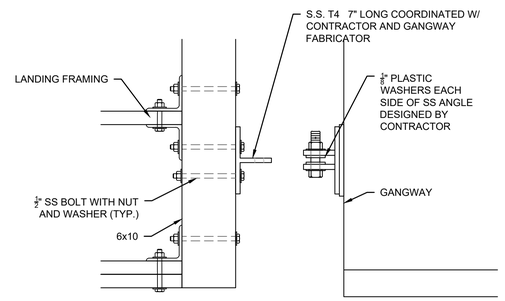
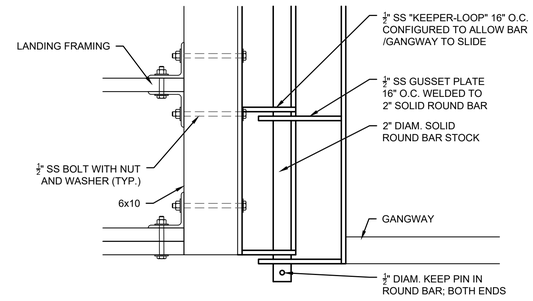


TYPICAL SECTION AT KAYAK LAUNCH LANDING
SCALE: 1"=1'-0"



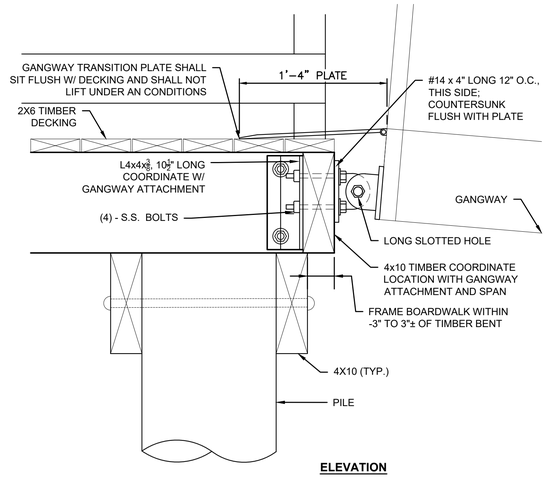
PLAN VIEW AT RAMP

PLAN VIEW AT FIXED GANGWAY



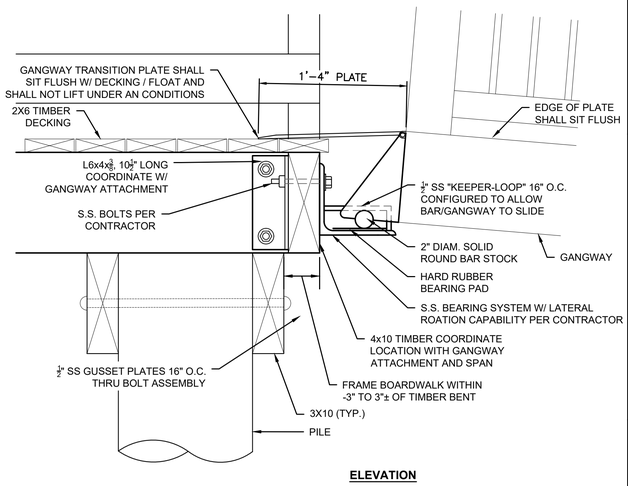
PLAN VIEW AT RAMP

PLAN VIEW AT FIXED GANGWAY



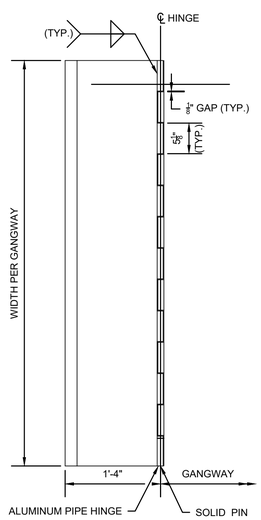
ELEVATION

TYPICAL SECTION AT FIXED GANGWAY
SCALE: 1½"=1'-0"

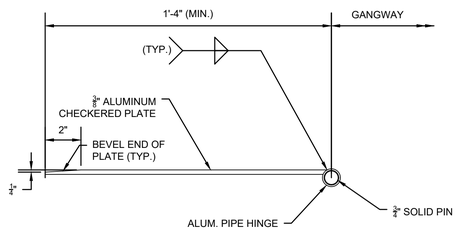


ELEVATION

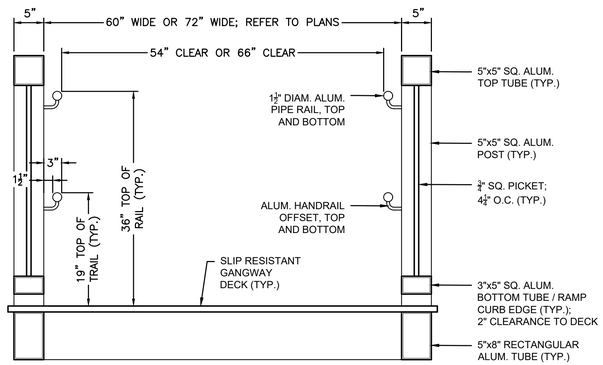
HINGED GANGWAY CONNECTION AT FLOAT GANGWAY
SCALE: 1½"=1'-0"



GANGWAY TRANSITION DETAIL
SCALE: 1" = 1'-0"



GANGWAY TRANSITION SECTION
SCALE: 3" = 1'-0"



NOTE:
ALL CONNECTIONS SHALL BE WELDED UNLESS OTHERWISE NOTED.

GANGWAY CROSS SECTION (HINGED & FIXED)
SCALE: 1"=1'-0"

NOTES:
1. THIS PROJECT IS HORIZONTALLY REFERENCED TO THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD83).
2. THIS PROJECT IS VERTICALLY REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
3. THE GANGWAY ATTACHMENT DETAILS SHOWN ARE CONCEPTUAL IN NATURE AND SHALL BE FULLY DESIGNED BY THE CONTRACTOR IN COORDINATION WITH THE GANGWAY FABRICATOR AND EXPECTED MOVEMENT WITH THE FLOAT SYSTEM.

PREPARED BY

BETA
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REGISTERED PROFESSIONAL

REGISTERED PROFESSIONAL

PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

KAYAK LAUNCH GANGWAY DETAILS

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
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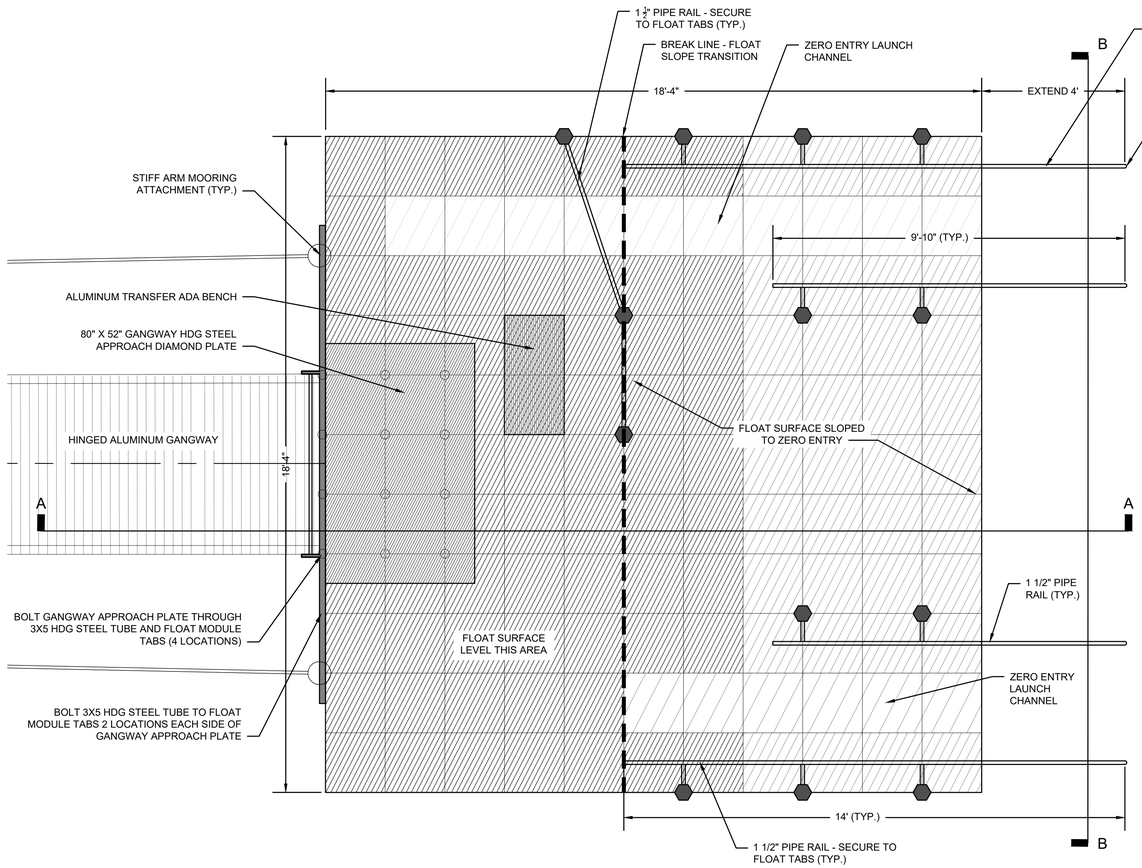
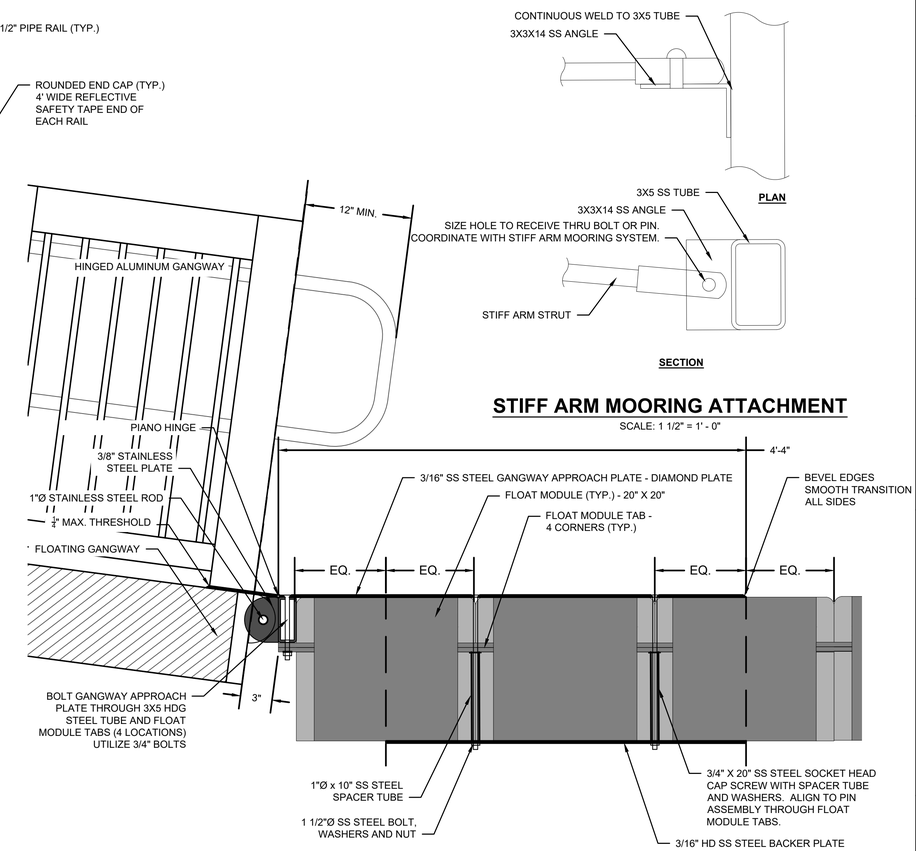


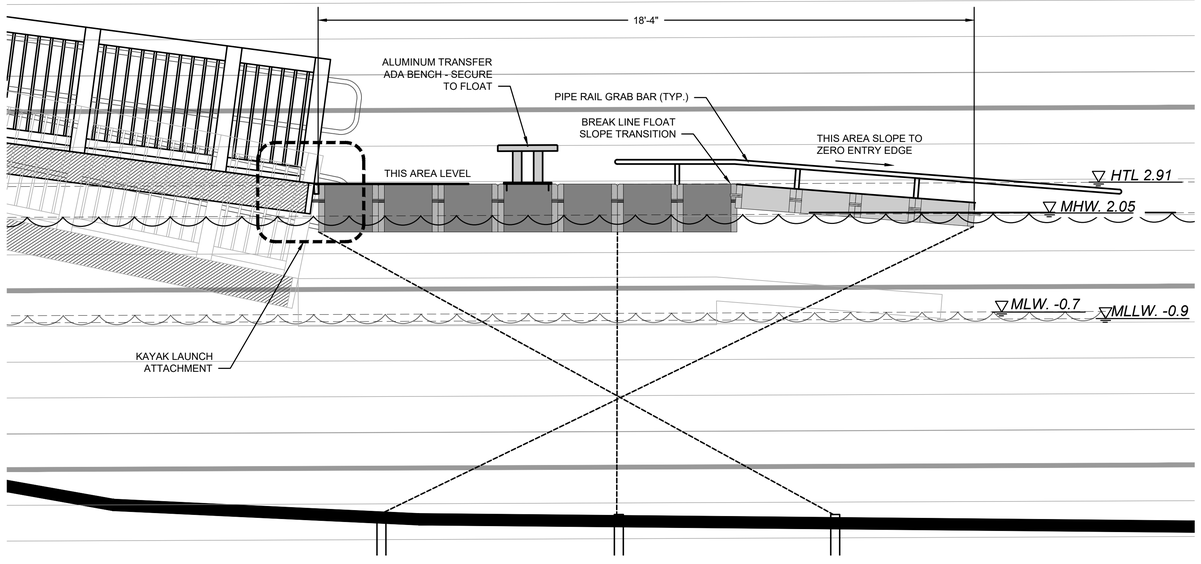
KAYAK LAUNCH FLOAT - ENLARGEMENT PLAN

SCALE: ¾" = 1' - 0"



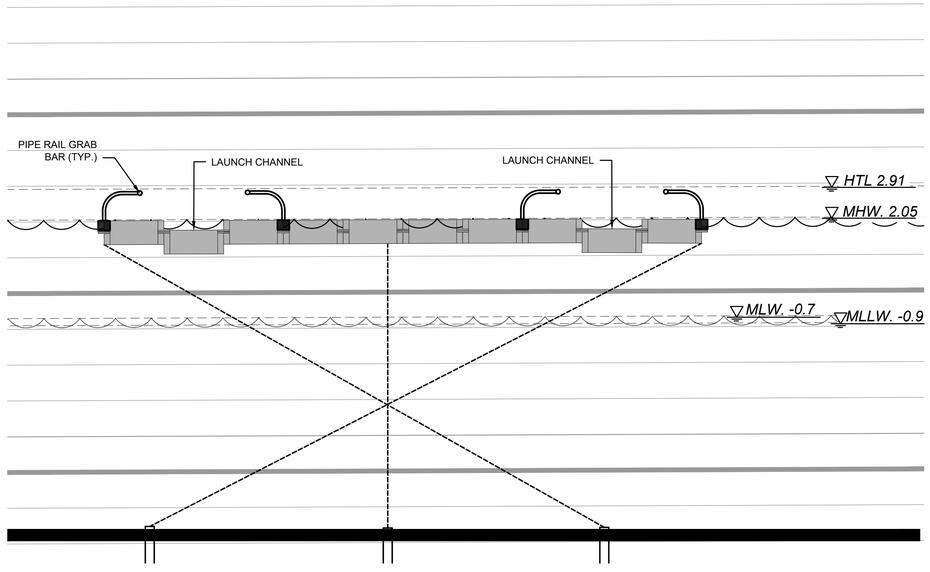
STIFF ARM MOORING ATTACHMENT

SCALE: 1 1/2" = 1' - 0"



KAYAK LAUNCH FLOAT - ELEVATION PROPOSED - A

SCALE: ¾" = 1' - 0"



KAYAK LAUNCH FLOAT - ELEVATION PROPOSED - B

SCALE: ¾" = 1' - 0"

KAYAK LAUNCH ATTACHMENT

SCALE: 1 1/2" = 1' - 0"

NOTE:
1. THIS PROJECT IS HORIZONTALLY REFERENCED TO THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD83).
2. THIS PROJECT IS VERTICALLY REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

PREPARED BY

BETA
www.BETA-Inc.com

REGISTERED PROFESSIONAL

REGISTERED PROFESSIONAL

PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

KAYAK LAUNCH FLOAT DETAILS

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SCALE

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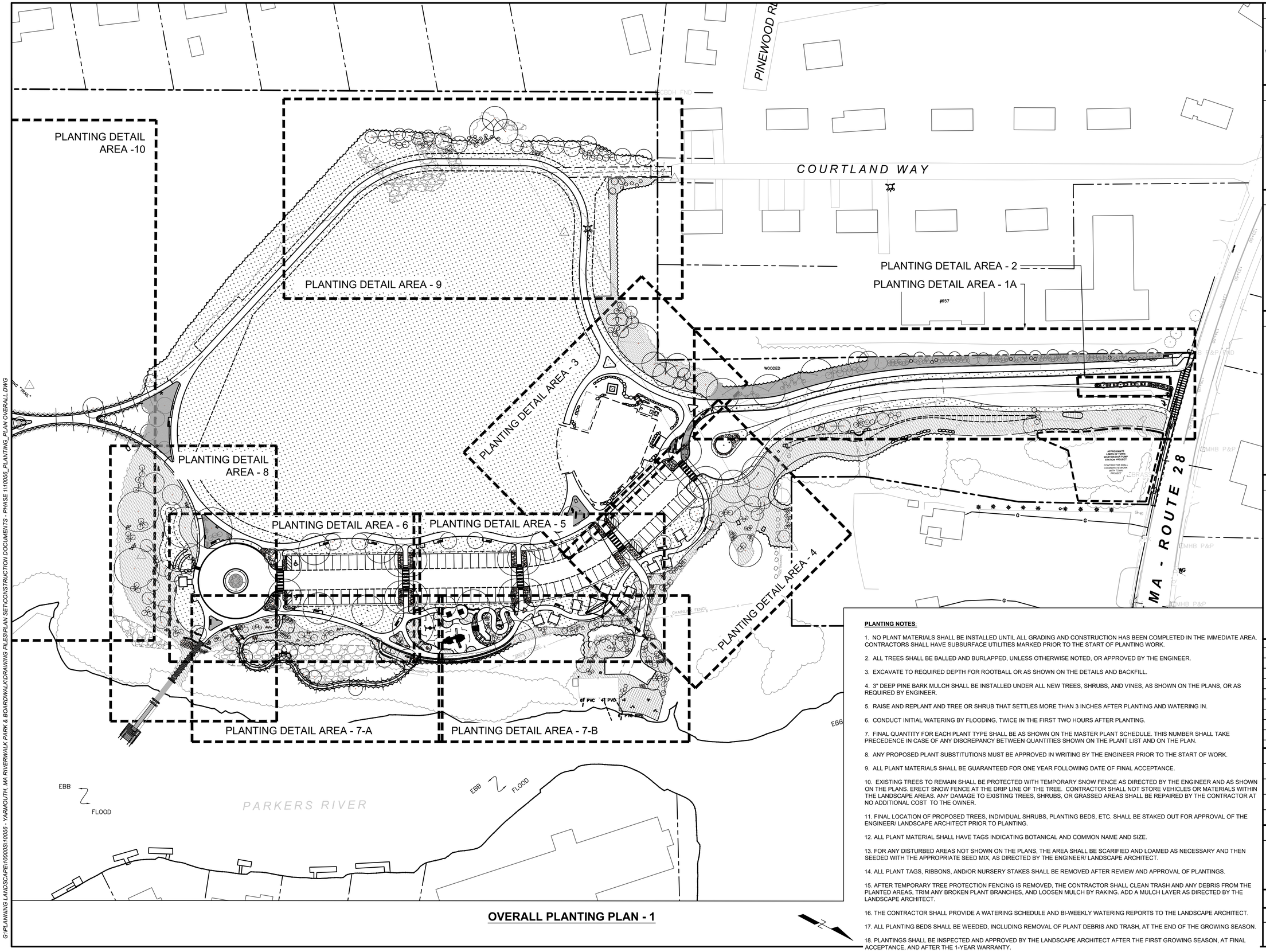

PLANTING NOTES:

1. NO PLANT MATERIALS SHALL BE INSTALLED UNTIL ALL GRADING AND CONSTRUCTION HAS BEEN COMPLETED IN THE IMMEDIATE AREA. CONTRACTORS SHALL HAVE SUBSURFACE UTILITIES MARKED PRIOR TO THE START OF PLANTING WORK.
2. ALL TREES SHALL BE BALLED AND BURLAPPED, UNLESS OTHERWISE NOTED, OR APPROVED BY THE ENGINEER.
3. EXCAVATE TO REQUIRED DEPTH FOR ROOTBALL OR AS SHOWN ON THE DETAILS AND BACKFILL.
4. 3" DEEP PINE BARK MULCH SHALL BE INSTALLED UNDER ALL NEW TREES, SHRUBS, AND VINES, AS SHOWN ON THE PLANS, OR AS REQUIRED BY ENGINEER.
5. RAISE AND REPLANT AND TREE OR SHRUB THAT SETTLES MORE THAN 3 INCHES AFTER PLANTING AND WATERING IN.
6. CONDUCT INITIAL WATERING BY FLOODING, TWICE IN THE FIRST TWO HOURS AFTER PLANTING.
7. FINAL QUANTITY FOR EACH PLANT TYPE SHALL BE AS SHOWN ON THE MASTER PLANT SCHEDULE. THIS NUMBER SHALL TAKE PRECEDENCE IN CASE OF ANY DISCREPANCY BETWEEN QUANTITIES SHOWN ON THE PLANT LIST AND ON THE PLAN.
8. ANY PROPOSED PLANT SUBSTITUTIONS MUST BE APPROVED IN WRITING BY THE ENGINEER PRIOR TO THE START OF WORK.
9. ALL PLANT MATERIALS SHALL BE GUARANTEED FOR ONE YEAR FOLLOWING DATE OF FINAL ACCEPTANCE.
10. EXISTING TREES TO REMAIN SHALL BE PROTECTED WITH TEMPORARY SNOW FENCE AS DIRECTED BY THE ENGINEER AND AS SHOWN ON THE PLANS. ERECT SNOW FENCE AT THE DRIP LINE OF THE TREE. CONTRACTOR SHALL NOT STORE VEHICLES OR MATERIALS WITHIN THE LANDSCAPE AREAS. ANY DAMAGE TO EXISTING TREES, SHRUBS, OR GRASSED AREAS SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
11. FINAL LOCATION OF PROPOSED TREES, INDIVIDUAL SHRUBS, PLANTING BEDS, ETC. SHALL BE STAKED OUT FOR APPROVAL OF THE ENGINEER/ LANDSCAPE ARCHITECT PRIOR TO PLANTING.
12. ALL PLANT MATERIAL SHALL HAVE TAGS INDICATING BOTANICAL AND COMMON NAME AND SIZE.
13. FOR ANY DISTURBED AREAS NOT SHOWN ON THE PLANS, THE AREA SHALL BE SCARIFIED AND LOAMED AS NECESSARY AND THEN SEEDED WITH THE APPROPRIATE SEED MIX, AS DIRECTED BY THE ENGINEER/ LANDSCAPE ARCHITECT.
14. ALL PLANT TAGS, RIBBONS, AND/OR NURSERY STAKES SHALL BE REMOVED AFTER REVIEW AND APPROVAL OF PLANTINGS.
15. AFTER TEMPORARY TREE PROTECTION FENCING IS REMOVED, THE CONTRACTOR SHALL CLEAN TRASH AND ANY DEBRIS FROM THE PLANTED AREAS, TRIM ANY BROKEN PLANT BRANCHES, AND LOOSEN MULCH BY RAKING. ADD A MULCH LAYER AS DIRECTED BY THE LANDSCAPE ARCHITECT.
16. THE CONTRACTOR SHALL PROVIDE A WATERING SCHEDULE AND BI-WEEKLY WATERING REPORTS TO THE LANDSCAPE ARCHITECT.
17. ALL PLANTING BEDS SHALL BE WEEDED, INCLUDING REMOVAL OF PLANT DEBRIS AND TRASH, AT THE END OF THE GROWING SEASON.
18. PLANTINGS SHALL BE INSPECTED AND APPROVED BY THE LANDSCAPE ARCHITECT AFTER THE FIRST GROWING SEASON, AT FINAL ACCEPTANCE, AND AFTER THE 1-YEAR WARRANTY.

OVERALL PLANTING PLAN - 1

G:\PLANNING LANDSCAPE\10000S\10056 - YARMOUTH, MA RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLAN SET\CONSTRUCTION DOCUMENTS - PHASE 1\10056_PLANTING_PLAN OVERALL.DWG

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

OVERALL PLANTING PLAN

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

50 0 50 100

SCALE IN FEET: 1"=50'

Bid Documents

SHEET NO.

L.1.1

SEED MIX TYPES

SEED MIX - TYPE A - APPLICATION RATE: 8 LBS/1000 SQ FT
Aztec II Tall Fescue
Escalade Tall Fescue
Allaire II Perennial Ryegrass
Blue Bonnet Kentucky Bluegrass
Panicum virgatum
Sorghastrum nutans

SEED MIX - TYPE B - APPLICATION RATE: 35 LBS/ACRE (1250 SQ FT/LB)	
Elymus canadensis	Canada Wild Rye
Festuca rubra	Red Fescue
Lolium multiflorum	Annual Ryegrass
Schizachyrium scoparium	Perennial Ryegrass
Panicum virgatum	Switch Grass
Sorghastrum nutans	Indian Grass

SEED MIX - TYPE C - APPLICATION RATE: 35 LBS/ACRE (1250 SQ FT/LB)	
Elymus canadensis	Canada Wild Rye
Schizachyrium scoparium	Perennial Ryegrass
Festuca rubra	Red Fescue
Andropogon gerardii	Big Bluestem
Panicum virgatum	Switch Grass
Vernonia noveboracensis	New Yor Ironweed
Agrostis perennans	Uplans Bentgrass
Bidens frondosa	Beggar Ticks
Eupatorium maculatum	Spotted Joe Pye Weed
Eupatorium perfoliatum	Boneset
Aster novae-angliae	New England Aster
Scirpus cyperinus	Wool Grass
Juncus effusus	Soft Rush

SEED MIX - TYPE D - APPLICATION RATE: 20 LBS/ACRE (2200 SQ FT/LB)	
Festuca rubra	Red Fescue
Schizachyrium scoparium	Perennial Ryegrass
Panicum virgatum	Switch Grass
Elymus virginicus	Virginia Wild Rye
Andropogon gerardii	Big Bluestem
Sorghastrum nutans	Indian Grass
Chamaecrista fasciculata	Partridge Pea
Agrostis perennans	Uplans Bentgrass
Juncus tenuis	Path Rush
Juncus effusus	Soft Rush

SEED MIX - TYPE E - APPLICATION RATE: 35 LBS/ACRE (1250 SQ FT/LB)	
Elymus riparius	Riverbank Wild Rye
Elymus virginicus	Virginia Wild Rye
Festuca rubra	Red Fescue
Panicum virgatum	Switch Grass
Carex scoparia	Blunt Broom Sedge
Cornus amomum	Silky Dogwood
Carex lurida	Lurid Sedge
Iris versicolor	Blue Flag
Asclepias incarnata	Swamp Milkweed
Viburnum dentatum	Arrow Wood Viburnum
Aster novae-angliae	New England Aster
Eupatorium perfoliatum	Boneset
Eupatorium maculatum	Spotted Joe Pye Weed
Sambucus canadensis	Elderberry
Scirpus atrovirens	Green Bulrush
Aster umbellutus	Flat Topped/ Umbrella Aster

SEED MIX SCHEDULE

SEED MIXES			
A	27027	SY	Maintained grass area (Approx. 270 SY with Jute Mesh)
B	1995	SY	Erosion control/ restoration mix for dry sites (Approx. 605 SY with Jute Mesh)
C	5732	SY	Erosion control/ restoration mix for detention basins and moist sites (Approx. 1,500 SY with Jute Mesh)
D	1530	SY	Restoration mix
E	195	SY	Wet meadow mix (Approx. 70 SY with Jute Mesh)

SEED MIX LEGEND

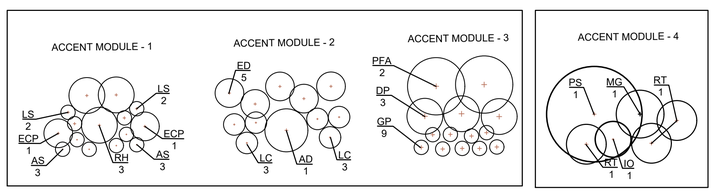
SEED MIX - TYPE A	MAINTAINED GRASS AREA
SEED MIX - TYPE B	EROSION CONTROL/ RESTORATION MIX FOR DRY SITES
SEED MIX - TYPE C	EROSION CONTROL/ RESTORATION MIX FOR DETENTION BASINS AND MOIST SITES
SEED MIX - TYPE D	RESTORATION MIX
SEED MIX - TYPE E	WET MEADOW MIX

MASTER PLANT SCHEDULE

MASTER PLANT SCHEDULE							
Bid item No.	SYM	QTY	BOTANICAL NAME	COMMON NAME	ANSI TYPE	SIZE	REMARKS
TREES							
90	AC	19	Amelanchier canadensis	Shadblow	3 ST	12-14'	B&B
88	AR	20	Acer rubrum	Red Maple	1 ST	3-3.5" cal.	B&B
90	BP	4	Betula populifolia	Gray Birch	1 ST	12-14'	B&B
94	IO	9	Ilex opaca	American Holly	5 BE	#15, 4'-6'	Cont.
94	JV1	22	Juniperus virginiana	Eastern Red Cedar	CT 5	#15, 4'-6'	Cont.
93	JV2	25	Juniperus virginiana	Eastern Red Cedar	CT 5	7-8'	B&B
88	LIS	4	Liquidambar styraciflua	Sweetgum	2 ST	3-3.5" cal.	B&B
88	LISS	4	Liquidambar styraciflua 'Slender Silhouette'	Slender Silhouette Sweetgum	2 ST	3-3.5" cal.	B&B
89	LL	10	Larix laricina	American Larch	1 ST	10'-12' Ht.	B&B
88	NS	16	Nyssa sylvatica	Tupelo	2 ST	3-3.5" cal.	B&B
88	OA	12	Oxydendrum arboreum	Sourwood	2 ST	3-3.5" cal.	B&B
92	PR1	3	Pinus rigida	Pitch Pine	4 CT	5-6'	B&B
93	PR2	2	Pinus rigida	Pitch Pine	4 CT	7-8'	B&B
91	PS	8	Prunus serotina	Wild Black Cherry	2 ST	#2, 2'-3'	Cont.
92	PS1	3	Pinus Strobus	White Pine	4 CT	5-6'	B&B
93	PS2	9	Pinus Strobus	White Pine	4 CT	7-8'	B&B
91	RT	27	Rhus typhina	Staghorn sumac	3 ST	#2, 2'-3'	Cont.
88	QB	9	Quercus bicolor	Swamp White Oak	1 ST	3-3.5" cal.	B&B
88	QC	1	Quercus coccinea	Scarlet Oak	1 ST	3-3.5" Cal.	B&B
88	QR	3	Quercus rubra	Red Oak	1 ST	3-3.5" cal.	B&B
SHRUBS							
97	AAB	19	Aronia arbutifolia 'Brilliantissima'	Red Chokeberry	2 DS	#3, 1.5'-2'	Cont.
96	AV	42	Azalea viscosum	Deciduous swamp azalea	2 DS	#2, 1'-1.5'	Cont.
97	CA	55	Clethra alnifolia	Summersweet	2 DS	#3, 1.5'-2'	Cont.
95	CAH	109	Clethra alnifolia 'Hummingbird'	Hummingbird Summersweet	2 DS	#1, 1'	Cont.
97	CR	7	Cornus racemosa	Gray Dogwood	3 DS	#3, 1.5'-2'	Cont.
97	IVS	24	Ilex verticillata 'Sparkelberry'	Sparkleberry Winterberry - Female	3 DS	#3, 1.5'-2'	Cont.
97	IVJD	54	Ilex verticillata 'Jim Dandy'	Jim Dandy Winterberry - Male	3 DS	#3, 1.5'-2'	Cont.
99	IG	31	Ilex glabra	Inkberry	4 BE	24-30"	B&B
97	JCS	20	Juniperus conferta	Shore Juniper	1 C	#3, 1'-1.5'	Cont.
96	KAPL	24	Kalmia angustifolia 'Poke Logan'	Poke Logan Sheep Laurel	4 BE	#2, 1'-1.5'	Cont.
98	KL	14	Kalmia latifolia	Mountain Laurel	4 BE	18-24"	B&B
97	LB	10	Lindera benzoin	Spice Bush	3 DS	#3, 1.5'-2'	Cont.
97	MP	32	Myrica pensylvanica	Northern Bayberry	3 DS	#3, 1.5'-2'	Cont.
101	PM	22	Prunus maritima	Beach Plum	2 DS	5-6'	B&B
96	PFA	16	Potentilla fruticosa 'Abbotswood'	Abbotswood Potentilla - white	2 DS	#2, 1'-1.5'	Cont.
100	RM	30	Rhododendron maximum	Rosebay Rhododendron	4 BE	3'	B&B
97	RV	14	Rosa virginiana	Virginia Rose - Pink	2 DS	#3, 1.5'-2'	Cont.
101	VCO	31	Vaccinium corymbosum	High Bush Blueberry	3 DS	5-7'	B&B
97	VD	9	Viburnum dentatum	Arrowwood Viburnum	3 DS	#3, 1.5'-2'	Cont.
GRASSES / PERENNIALS							
102	AB	46	Ammophila breviligulata	American Beach Grass	Perennial grass	4"	Cont.
103	AD	15	Aster divaricatus	White Aster	Perennial	#1	Cont.
103	ADPK	17	Aster dumosus 'Professor Kippenburg'	Lavender Blue Aster	Perennial	#1	Cont.
103	AS	108	Asclepias syriaca	Milkweed	Perennial	#1	Cont.
103	AT	17	Asclepias tuberosa	Butterfly Weed	Perennial	#1	Cont.
103	CAP	22	Carex appalachica	Creek Sedge	Perennial grass	#1	Cont.
103	CF	8	Chrysopsis falcata	Golden Aster	Perennial	#1	Cont.
103	CP	33	Comptonia peregrina	Sweet Fern	Perennial	#1	Cont.
103	DP	24	Dennstaedtia punctilobula	Hay Scented Fern	Perennial	#1	Cont.
103	ECP	36	Echinacea purpurea	Coneflower	Perennial	#1	Cont.
103	ED	75	Eupatorium dubium	Joe Pye Weed	Perennial	#1	Cont.
103	EP	6	Eupatorium perfoliatum	Boneset	Perennial	#1	Cont.
103	GP	72	Gaultheria procumbens	Tea Berry	Evergreen	#1	Cont.
103	JH	14	Juniperus horizontalis	Blue Chip Creeping Juniper	Evergreen	#1	Cont.
103	LC	103	Lobelia cardinalis	Cardinal flower	Perennial	#1	Cont.
103	LP	42	Lupinus perennis	Lupine	Perennial	#1	Cont.
103	LS	72	Liatris spicata	Gayfeather	Perennial	#1	Cont.
103	MD	7	Monarda didyma	Bee Balm	Perennial	#1	Cont.
103	OC	54	Osmunda cinnamomea	Cinnamon Fern	Perennial	#1	Cont.
103	OR	102	Osmunda regalis	Royal Cinnamon Fern	Perennial	#1	Cont.
103	PAH	127	Pennisetum alopecuroides 'Hameln'	Hameln Fountain Grass Dwarf	Perennial grass	#1	Cont.
103	PV	8	Panicum virgatum	Switchgrass	Perennial grass	#1	Cont.
103	RH	59	Rudbeckia hirta	Black Eyed Susan	Perennial	#1	Cont.
103	SLL	67	Solidago sempervirens	Seaside Goldenrod	Perennial	#1	Cont.
103	SSPB	89	Schizacharium scoparium 'Prarie Blues'	Prarie Blues Little Bluestem	Perennial grass	#1	Cont.
103	VA	104	Vaccinium angustifolium	Low-bush Blueberry	Perennial	#1	Cont.
SALT MARSH RESTORATION AREA							
102	SP	500	Spartina patens	Saltmeadow Cordgrass	Perennial grass	#1	18" O.C.
102	JG	315	Juncus gerardii	Saltmarsh Rush	Perennial grass	#1	18" O.C.

OVERALL PLANTING PLAN - 2

TYPICAL PLANTING ACCENT MODULES



NOTE:
1. FINAL PLACEMENT OF PLANTING ACCENT MODULES WITHIN EACH DETAIL AREA SHALL BE DIRECTED BY THE PROJECT LANDSCAPE ARCHITECT
2. PLANT QUANTITIES FOR PLANTING ACCENT MODULES ARE REFLECTED IN THE MASTER SCHEDULE, SEE SHEET L.1.2.
3. COORDINATE PLANT PLACEMENT WITH UTILITIES AND LIGHTING.

PREPARED BY

BETA
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REGISTERED PROFESSIONAL

REGISTERED PROFESSIONAL

PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

OVERALL PLANTING PLAN

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

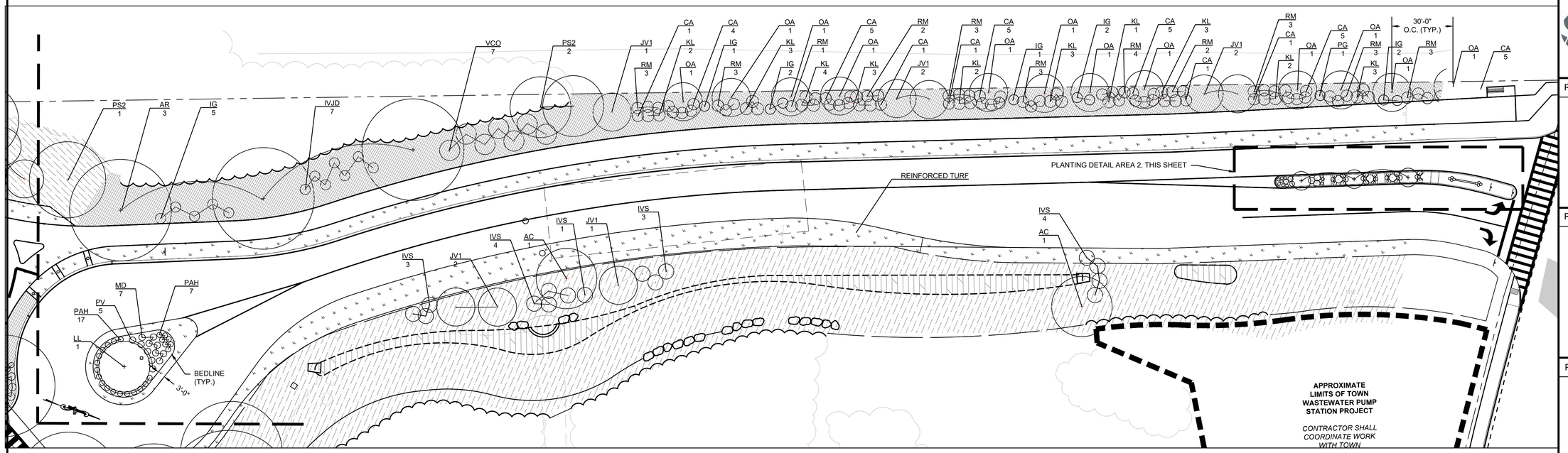
SCALE

50 0 50 100
SCALE IN FEET: 1"=50'

Bid Documents

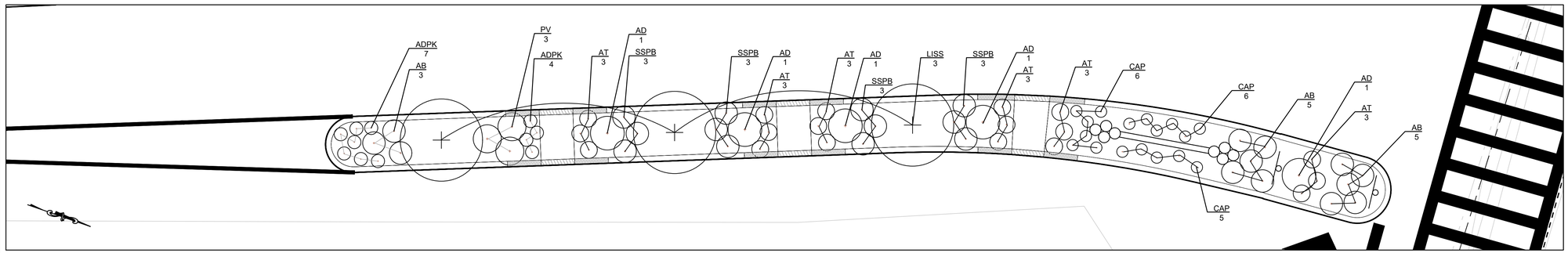
SHEET NO.

L.1.2



PLANTING DETAIL AREA 1

SCALE: 1" = 20'-0"



PLANTING DETAIL AREA 2

SCALE: 1/4" = 1'-0"

PLANTING DETAIL AREA 1

SYM	QTY	BOTANICAL NAME	COMMON NAME		SIZE	REMARKS
TREES						
AC	2	Amelanchier canadensis	Shadblow	3 ST	12-14'	B&B
AR	3	Acer rubrum	Red Maple	1 ST	3-3.5" cal.	B&B
JV1	8	Juniperus virginiana	Eastern Red Cedar	CT 5	#15	B&B
LL	1	Larix laricina	American Larch	Deciduous conife	10'-12' Ht.	B&B
OA	12	Oxydendrum arboreum	Sourwood	2 ST	3-3.5" cal.	B&B
PS2	3	Pinus Strobus	White Pine	4 CT	7-8'	B&B
SHRUBS						
CA	35	Clethra alnifolia	Summersweet	2 DS	#3, 1.5'-2'	Cont.
IG	14	Ilex glabra	Inkberry	4 BE	24-30"	B&B
IVJD	7	Ilex verticillata 'Jim Dandy'	Jim Dandy Winterberry - Male	3 DS	#3, 1.5'-2'	Cont.
IVS	15	Ilex verticillata 'Sparkelberry'	Sparkleberry Winterberry - Female	3 DS	#3, 1.5'-2'	Cont.
KL	26	Kalmia latifolia	Mountain Laurel	4 BE	18-24"	B&B
RM	30	Rhododendron maximum	Rosebay Rhododendron	4 BE	3'	B&B
VCO	7	Vaccinium corymbosum	High Bush Blueberry	3 DS	5-7'	B&B
GRASSES / PERENNIALS						
MD	7	Monarda didyma	Bee Balm	Perennial	#1	Cont.
PAH	24	Pennisetum alopecuroides 'Hameln'	Hameln Fountain Grass Dwarf	Perennial grass	#1	Cont.
PV	5	Panicum virgatum	Switchgrass	Perennial grass	#1	Cont.

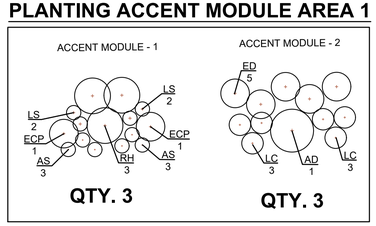
PLANTING DETAIL AREA 2

SYM	QTY	BOTANICAL NAME	COMMON NAME		SIZE	REMARKS
SHRUBS						
LISS	3	Liquidambar styraciflua 'Slender Silhouette'	Slender Silhouette Sweetgum	2 ST	3-3.5" cal.	B&B
GRASSES / PERENNIALS						
AB	13	Ammophila breviligulata	American Beach Grass	Perennial grass	4"	Cont.
AD	5	Aster divaricatus	White Aster	Perennial	#1	Cont.
ADPK	11	Aster dumosus 'Professor Kippenburg'	Lavender Blue Aster	Perennial	#1	Cont.
AT	18	Asclepias tuberosa	Butterfly Weed	Perennial	#1	Cont.
CAP	17	Carex appalachica	Creek Sedge	Perennial grass	#1	Cont.
PV	3	Panicum virgatum	Switchgrass	Perennial grass	#1	Cont.
SSPB	12	Schizacharium scoparium 'Prarie Blues'	Prarie Blues Little Bluestem	Perennial grass	#1	Cont.

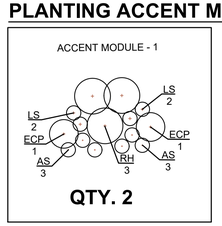
SEED TYPE LEGEND

	SEED MIX - TYPE A	MAINTAINED GRASS AREA
	SEED MIX - TYPE B	EROSION CONTROL/ RESTORATION MIX FOR DRY SITES
	SEED MIX - TYPE C	EROSION CONTROL/ RESTORATION MIX FOR DETENTION BASINS AND MOIST SITES
	SEED MIX - TYPE D	RESTORATION MIX
	SEED MIX - TYPE E	WET MEADOW MIX

PLANTING ACCENT MODULE AREA 1



PLANTING ACCENT MODULE AREA 2



NOTE:
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2. PLANT QUANTITIES FOR PLANTING ACCENT MODULES ARE REFLECTED IN THE MASTER SCHEDULE, SEE SHEET L.1.2.
3. COORDINATE PLANT PLACEMENT WITH UTILITIES AND LIGHTING.

PREPARED BY

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REGISTERED PROFESSIONAL

REGISTERED PROFESSIONAL

PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

PLANTING DETAIL AREA 1-2

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY: AKP

DESIGNED BY: AWG

CHECKED BY: AWG

ISSUE DATE: 4/5/2024

BETA JOB NO.: 10056

SCALE

AS SHOWN

Bid Documents

SHEET NO.

L.1.3

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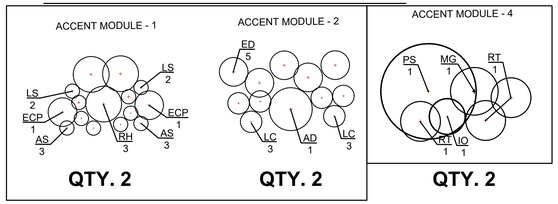
PLANTING DETAIL AREA 3

SYM	QTY	BOTANICAL NAME	COMMON NAME		SIZE	REMARKS
TREES						
AC	4	Amelanchier canadensis	Shadblow	3 ST	12-14'	B&B
AR	1	Acer rubrum	Red Maple	1 ST	3-3.5" cal.	B&B
JV1	2	Juniperus virginiana	Eastern Red Cedar	CT 5	#15	B&B
JV2	7	Juniperus virginiana	Eastern Red Cedar	CT 5	7-8'	B&B
NS	2	Nyssa sylvatica	Tupelo	2 ST	3-3.5" cal.	B&B
PS2	3	Pinus Strobus	White Pine	4 CT	7-8'	B&B
QB	2	Quercus bicolor	Swamp White Oak	1 ST	3-3.5" cal.	B&B
QC	1	Quercus coccinea	Scarlet Oak	1 ST	3-3.5" Cal.	B&B
SHRUBS						
AV	627	Azalea viscosum	Deciduous swamp azalea	2 DS	#2, 1'-1.5'	Cont.
CA	2	Clethra alnifolia	Summersweet	2 DS	#3, 1.5'-2'	Cont.
CAH	12	Clethra alnifolia 'Hummingbird'	Hummingbird Summersweet	2 DS	#1, 1'	Cont.
IVS	13	Ilex verticillata 'Sparkelberry'	Sparkleberry Winterberry - Female	3 DS	#3, 1.5'-2'	Cont.
JCS	37	Juniperus conferta	Shore Juniper	1 C	#3, 1'-1.5'	Cont.
MP	7	Myrica pensylvanica	Northern Bayberry	3 DS	#3, 1.5'-2'	Cont.
RV	3	Rosa virginiana	Virginia Rose - Pink	2 DS	#3, 1.5'-2'	Cont.
VCO	3	Vaccinium corymbosum	High Bush Blueberry	3 DS	5-7'	B&B
GRASSES / PERENNIALS						
AD	21	Aster divaricatus	White Aster	Perennial	#1	Cont.
AUU	23	Actostaphylos uva-ursi	Bearberry	Evergreen	#1	Cont.
LC	19	Lobelia cardinalis	Cardinal flower	Perennial	#1	Cont.
PAH	53	Pennisetum alopecuroides 'Hameln'	Hameln Fountain Grass Dwarf	Perennial grass	#1	Cont.
PV	10	Panicum virgatum	Switchgrass	Perennial grass	#1	Cont.
PQ	9	Parthenocissus quinquefolia	Virginia Creeper	Deciduous vine	#1	Cont.
RH	20	Rudbeckia hirta	Black Eyed Susan	Perennial	#1	Cont.
SL	48	Sisyrinchium 'Lucerne'	Blue eyed Grass	Perennial grass	#1	Cont.
SSPB	27	Schizacharium scoparium 'Prarie Blues'	Prarie Blues Little Bluestem	Perennial grass	#1	Cont.

PLANTING ACCENT MODULE AREA 3



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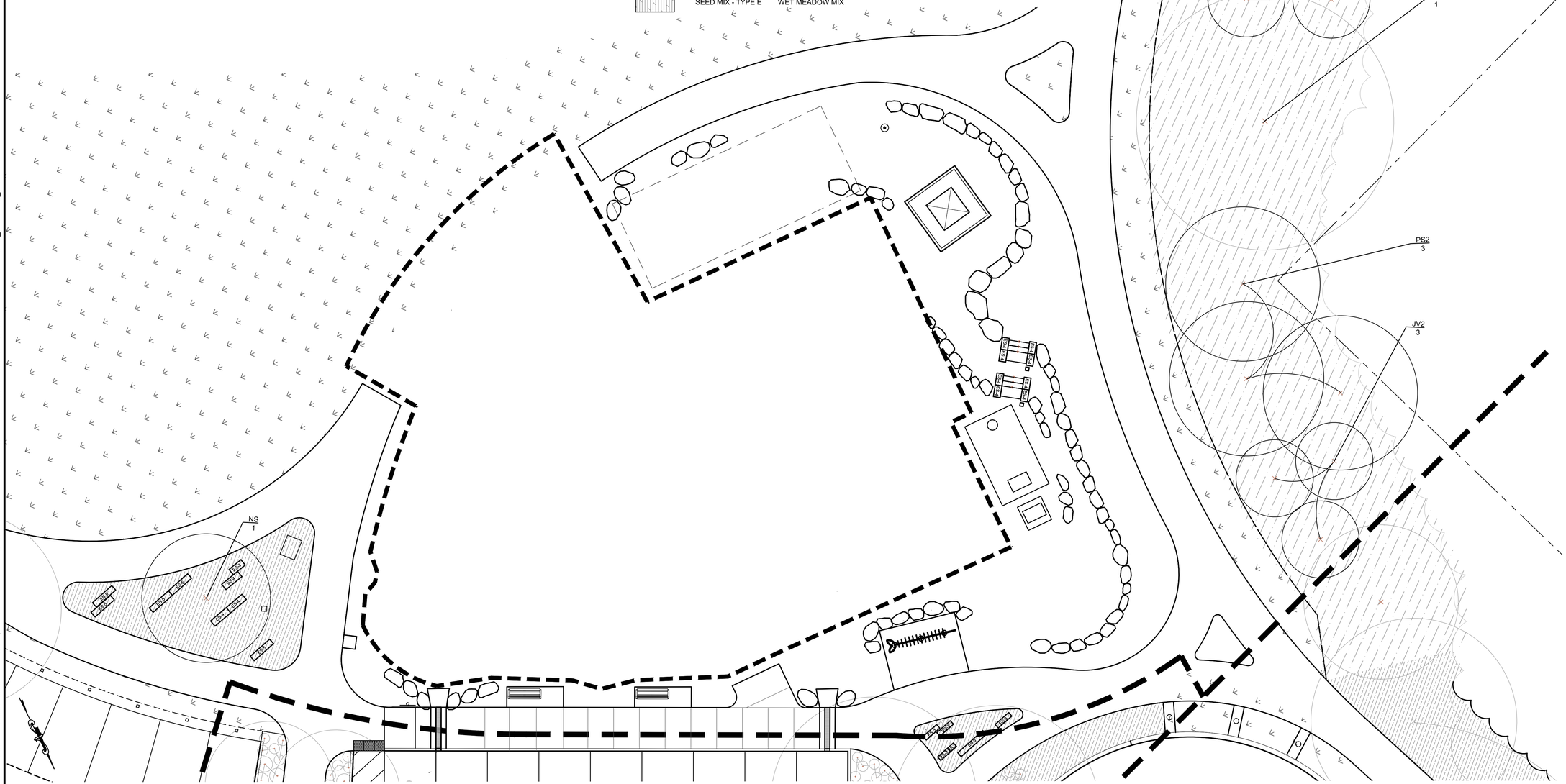
2. PLANT QUANTITIES FOR PLANTING ACCENT MODULES ARE REFLECTED IN THE MASTER SCHEDULE, SEE SHEET L.1.2.
3. COORDINATE PLANT PLACEMENT WITH UTILITIES AND LIGHTING.

SEED TYPE LEGEND

	SEED MIX - TYPE A	MAINTAINED GRASS AREA
	SEED MIX - TYPE B	EROSION CONTROL/ RESTORATION MIX FOR DRY SITES
	SEED MIX - TYPE C	EROSION CONTROL/ RESTORATION MIX FOR DETENTION BASINS AND MOIST SITES
	SEED MIX - TYPE D	RESTORATION MIX
	SEED MIX - TYPE E	WET MEADOW MIX



PLANTING DETAIL AREA 3
SCALE: 1" = 10'-0"

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

PLANTING DETAIL AREA 3

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

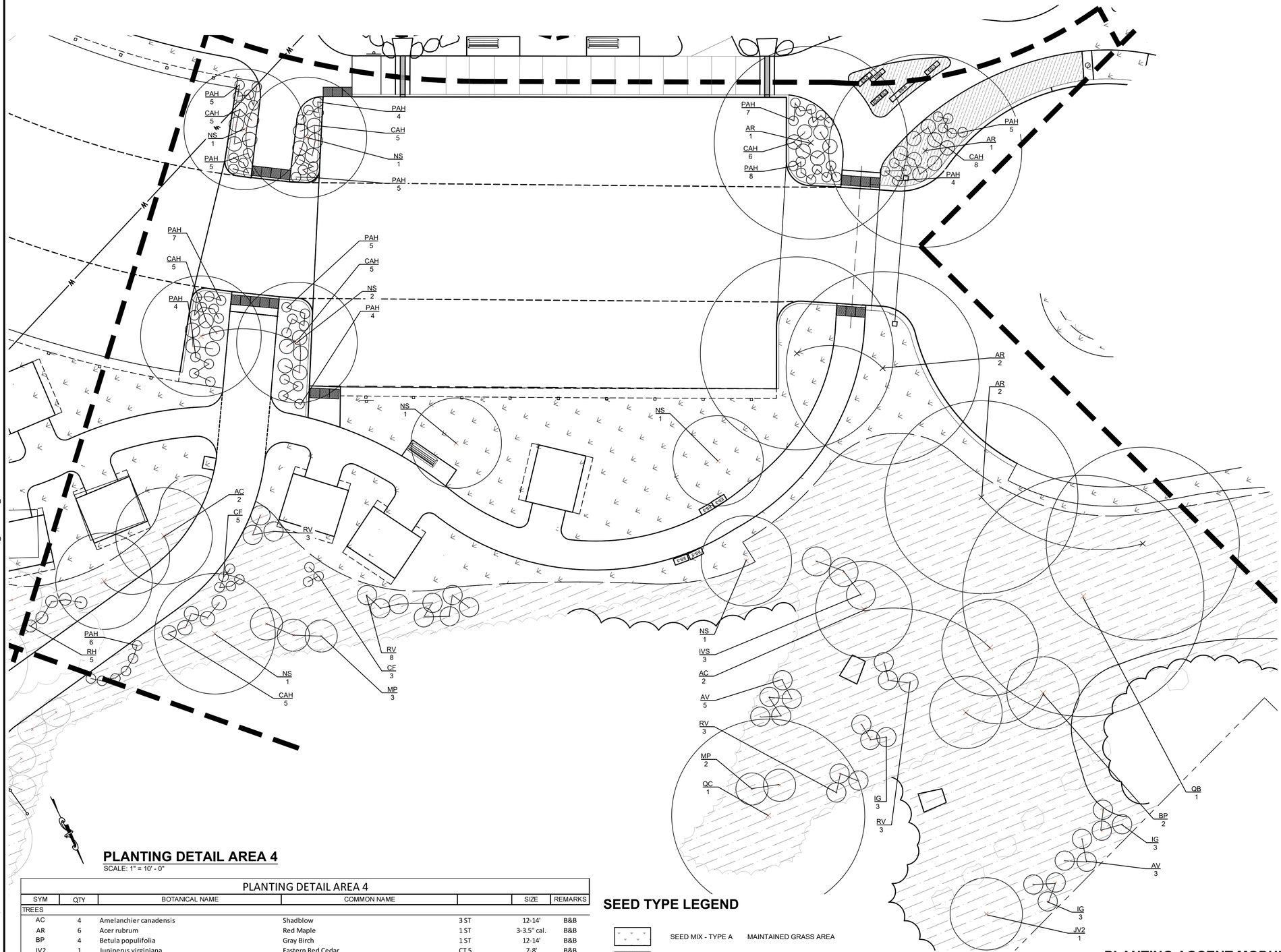
SCALE

10 0 10 20
SCALE IN FEET: 1"=10'

Bid Documents

SHEET NO.

L.1.4



PLANTING DETAIL AREA 4

SCALE: 1" = 10' - 0"

PLANTING DETAIL AREA 4

SYM	QTY	BOTANICAL NAME	COMMON NAME		SIZE	REMARKS
TREES						
AC	4	Amelanchier canadensis	Shadblow	3 ST	12-14'	B&B
AR	6	Acer rubrum	Red Maple	1 ST	3-3.5" cal.	B&B
BP	4	Betula populifolia	Gray Birch	1 ST	12-14'	B&B
JV2	1	Juniperus virginiana	Eastern Red Cedar	CT 5	7-8'	B&B
NS	8	Nyssa sylvatica	Tupelo	2 ST	3-3.5" cal.	B&B
QB	1	Quercus bicolor	Swamp White Oak	1 ST	3-3.5" cal.	B&B
QC	1	Quercus coccinea	Scarlet Oak	1 ST	3-3.5" Cal.	B&B
SHRUBS						
AV	8	Azalea viscosum	Deciduous swamp azalea	2 DS	#2, 1'-1.5'	Cont.
CAH	39	Clethra alnifolia 'Hummingbird'	Hummingbird Summersweet	2 DS	#1, 1'	Cont.
IG	9	Ilex glabra	Inkberry	4 BE	24-30"	B&B
IVS	3	Ilex verticillata 'Sparkelberry'	Sparkleberry Winterberry - Female	3 DS	#3, 1.5'-2'	Cont.
MP	5	Myrica pensylvanica	Northern Bayberry	3 DS	#3, 1.5'-2'	Cont.
RV	17	Rosa virginiana	Virginia Rose - Pink	2 DS	#3, 1.5'-2'	Cont.
GRASSES / PERENNIALS						
CF	8	Chrysopsis falcata	Golden Aster	Perennial	#1	Cont.
PAH	69	Pennisetum alopecuroides 'Hameln'	Hameln Fountain Grass Dwarf	Perennial grass	#1	Cont.
RH	5	Rudbeckia hirta	Black Eyed Susan	Perennial	#1	Cont.

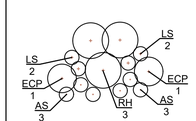
SEED TYPE LEGEND

	SEED MIX - TYPE A	MAINTAINED GRASS AREA
	SEED MIX - TYPE B	EROSION CONTROL/ RESTORATION MIX FOR DRY SITES
	SEED MIX - TYPE C	EROSION CONTROL/ RESTORATION MIX FOR DETENTION BASINS AND MOIST SITES
	SEED MIX - TYPE D	RESTORATION MIX
	SEED MIX - TYPE E	WET MEADOW MIX

NOTE:
1. FINAL PLACEMENT OF PLANTING ACCENT MODULES WITHIN EACH DETAIL AREA SHALL BE DIRECTED BY THE PROJECT LANDSCAPE ARCHITECT
2. PLANT QUANTITIES FOR PLANTING ACCENT MODULES ARE REFLECTED IN THE MASTER SCHEDULE, SEE SHEET L.1.2.
3. COORDINATE PLANT PLACEMENT WITH UTILITIES AND LIGHTING.

PLANTING ACCENT MODULE AREA 4

ACCENT MODULE - 1



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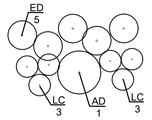
ACCENT MODULE - 2



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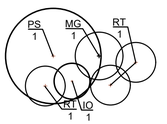

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

PLANTING DETAIL AREA 4

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY: AKP

DESIGNED BY: AWG

CHECKED BY: AWG

ISSUE DATE: 4/5/2024

BETA JOB NO.: 10056

SCALE

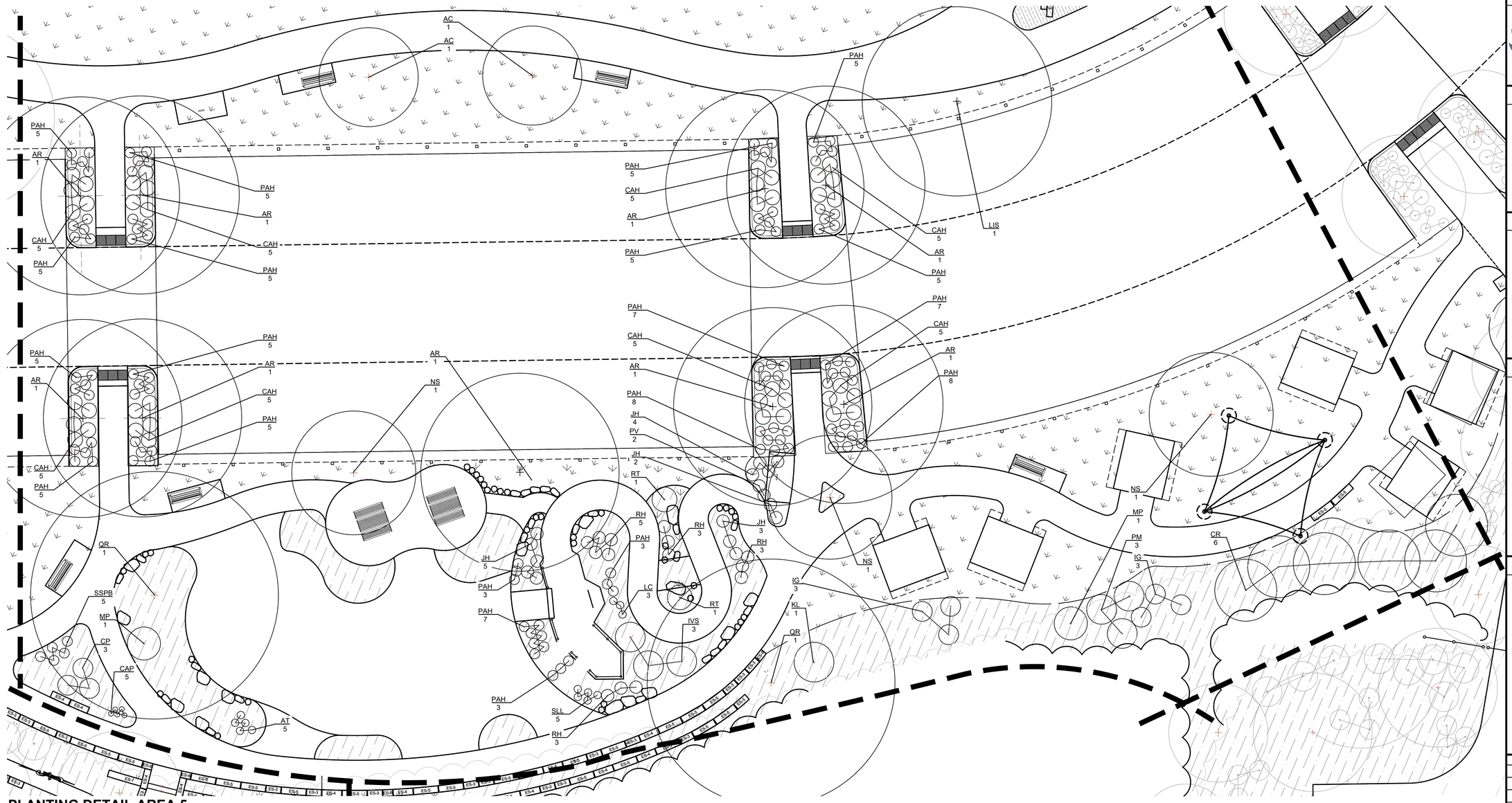
10 0 10 20

SCALE IN FEET: 1"=10'

Bid Documents

SHEET NO.

L.1.5



PLANTING DETAIL AREA 5

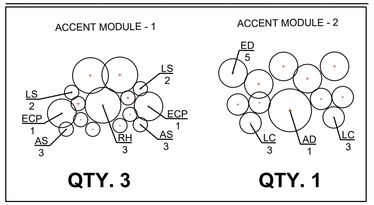
SCALE: 1" = 10'-0"

PLANTING DETAIL AREA 5						
SYM	QTY	BOTANICAL NAME	COMMON NAME		SIZE	REMARKS
TREES						
AC	2	Amelanchier canadensis	Shadblow	3 ST	12-14'	B&B
AR	9	Acer rubrum	Red Maple	1 ST	3-3.5" cal.	B&B
LIS	1	Liquidambar styraciflua	Sweetgum	2 ST	3-3.5" cal.	B&B
NS	3	Nyssa sylvatica	Tupelo	2 ST	3-3.5" cal.	B&B
QR	2	Quercus rubra	Red Oak	1 ST	3-3.5" cal.	B&B
SHRUBS						
CAH	40	Clethra alnifolia 'Hummingbird'	Hummingbird Summersweet	2 DS	#1, 1'	Cont.
CR	6	Cornus racemosa	Gray Dogwood	3 DS	#3, 1.5'-2'	Cont.
IG	6	Ilex glabra	Inkberry	4 BE	24-30"	B&B
IVS	3	Ilex verticillata 'Sparkelberry'	Sparkleberry Winterberry - Female	3 DS	#3, 1.5'-2'	Cont.
KL	1	Kalmia latifolia	Mountain Laurel	4 BE	18-24"	B&B
MP	2	Myrica pensylvanica	Northern Bayberry	3 DS	#3, 1.5'-2'	Cont.
PM	3	Prunus maritima	Beach Plum	2 DS	5-6'	B&B
RT	2	Rhus typhina	Staghorn sumac	3 ST	#2, 2'-3'	Cont.
GRASSES / PERENNIALS						
AT	5	Asclepias tuberosa	Butterfly Weed	Perennial	#1	Cont.
CAP	5	Carex appalachica	Creek Sedge	Perennial grass	#1	Cont.
CP	3	Comptonia peregrina	Sweet Fern	Perennial	#1	Cont.
JH	14	Juniperus horizontalis	Blue Chip Creeping Juniper	Evergreen	#1	Cont.
LC	3	Lobelia cardinalis	Cardinal flower	Perennial	#1	Cont.
RH	14	Rudbeckia hirta	Black Eyed Susan	Perennial	#1	Cont.
PAH	106	Pennisetum alopecuroides 'Hameln'	Hameln Fountain Grass Dwarf	Perennial grass	#1	Cont.
PV	2	Panicum virgatum	Switchgrass	Perennial grass	#1	Cont.
SLL	5	Solidago sempervirens	Seaside Goldenrod	Perennial	#1	Cont.
SSPB	5	Schizacharium scoparium 'Prarie Blues'	Prarie Blues Little Bluestem	Perennial grass	#1	Cont.

SEED TYPE LEGEND

SEED MIX - TYPE A	MAINTAINED GRASS AREA
SEED MIX - TYPE B	EROSION CONTROL/ RESTORATION MIX FOR DRY SITES
SEED MIX - TYPE C	EROSION CONTROL/ RESTORATION MIX FOR DETENTION BASINS AND MOIST SITES
SEED MIX - TYPE D	RESTORATION MIX
SEED MIX - TYPE E	WET MEADOW MIX

PLANTING ACCENT MODULE AREA 5



NOTE:
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2. PLANT QUANTITIES FOR PLANTING ACCENT MODULES ARE REFLECTED IN THE MASTER SCHEDULE, SEE SHEET L.1.2.
3. COORDINATE PLANT PLACEMENT WITH UTILITIES AND LIGHTING.

PREPARED BY

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

PLANTING DETAIL AREA 5

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

10 0 10 20
SCALE IN FEET: 1"=10'

Bid Documents

SHEET NO.

L.1.6

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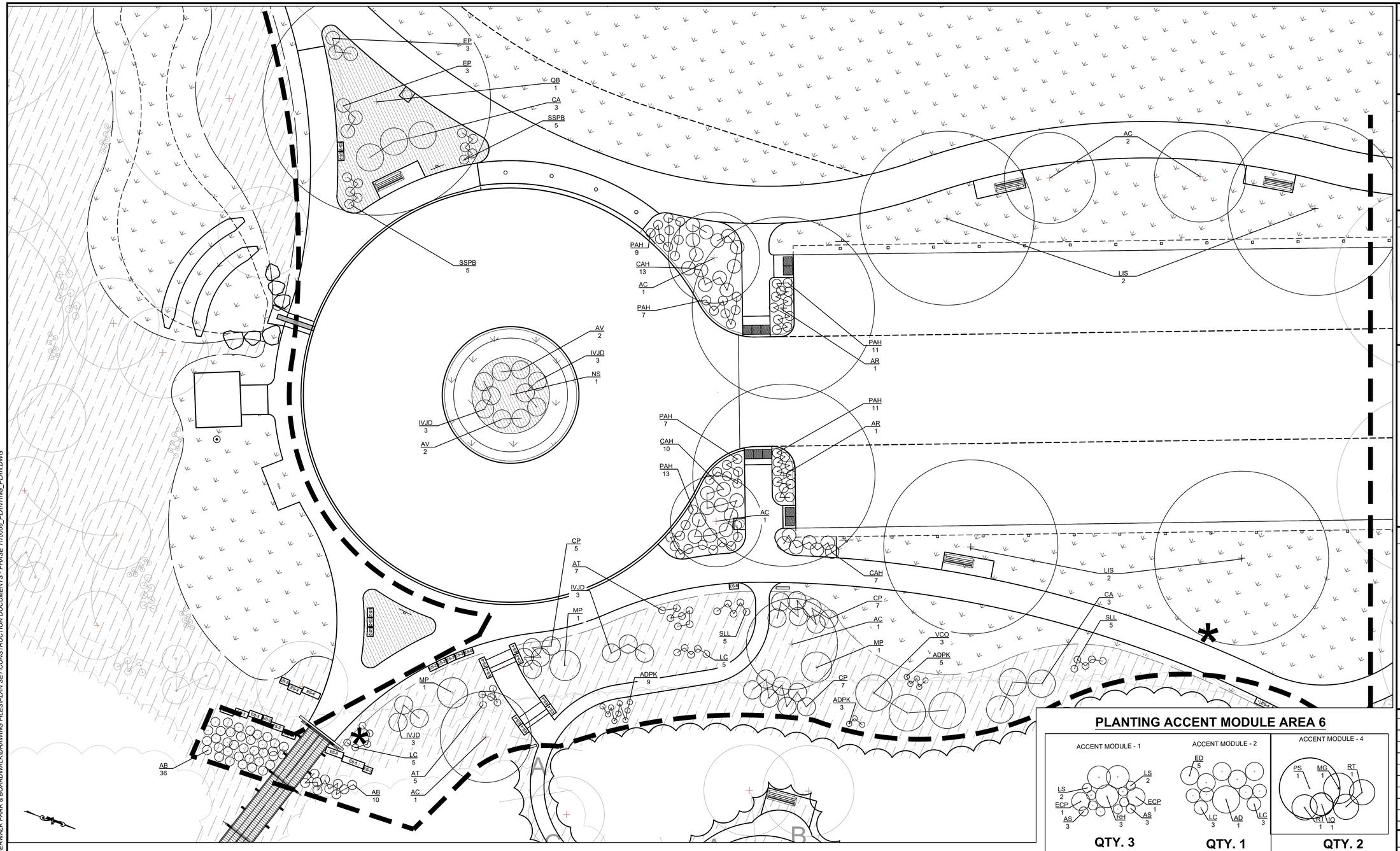
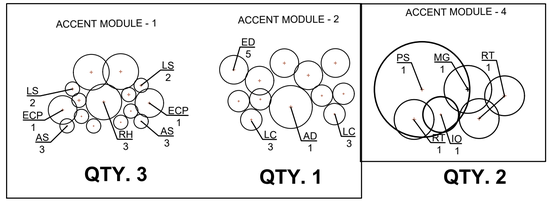


PLANTING ACCENT MODULE AREA 6



PLANTING DETAIL AREA 6

SCALE: 1" = 10'-0"

PLANTING DETAIL AREA 6

SYM	QTY	BOTANICAL NAME	COMMON NAME		SIZE	REMARKS
TREES						
AC	6	Amelanchier canadensis	Shadblow	3 ST	12-14'	B&B
AR	2	Acer rubrum	Red Maple	1 ST	3-3.5" cal.	B&B
LIS	4	Liquidambar styraciflua	Sweetgum	2 ST	3-3.5" cal.	B&B
NS	1	Nyssa sylvatica	Tupelo	2 ST	3-3.5" cal.	B&B
QB	1	Quercus bicolor	Swamp White Oak	1 ST	3-3.5" cal.	B&B
SHRUBS						
AV	4	Azalea viscosum	Deciduous swamp azalea	2 DS	#2, 1'-1.5'	Cont.
CA	6	Clethra alnifolia	Summersweet	2 DS	#3, 1.5'-2'	Cont.
CAH	30	Clethra alnifolia 'Hummingbird'	Hummingbird Summersweet	2 DS	#1, 1'	Cont.
IVJD	12	Ilex verticillata 'Jim Dandy'	Jim Dandy Winterberry - Male	3 DS	#3, 1.5'-2'	Cont.
MP	3	Myrica pensylvanica	Northern Bayberry	3 DS	#3, 1.5'-2'	Cont.
VCO	3	Vaccinium corymbosum	High Bush Blueberry	3 DS	5-7'	B&B

GRASSES / PERENNIALS					
AB	46	Ammophila breviligulata	American Beach Grass	Perennial grass	4"	Cont.
ADPK	17	Aster dumosus 'Professor Kippenburg'	Lavender Blue Aster	Perennial	#1	Cont.
CP	19	Comptonia peregrina	Sweet Fern	Perennial	#1	Cont.
AT	12	Asclepias tuberosa	Butterfly Weed	Perennial	#1	Cont.
EP	6	Eupatorium perfoliatum	Boneset	Perennial	#1	Cont.
LC	10	Lobelia cardinalis	Cardinal flower	Perennial	#1	Cont.
PAH	58	Pennisetum alopecuroides 'Hameln'	Hameln Fountain Grass Dwarf	Perennial grass	#1	Cont.
SLL	10	Solidago sempervirens	Seaside Goldenrod	Perennial	#1	Cont.
SSPB	10	Schizacharium scoparium 'Prarie Blues'	Prarie Blues Little Bluestem	Perennial grass	#1	Cont.

SEED TYPE LEGEND

	SEED MIX - TYPE A	MAINTAINED GRASS AREA
	SEED MIX - TYPE B	EROSION CONTROL/RESTORATION MIX FOR DRY SITES
	SEED MIX - TYPE C	EROSION CONTROL/RESTORATION MIX FOR DETENTION BASINS AND MOIST SITES
	SEED MIX - TYPE D	RESTORATION MIX
	SEED MIX - TYPE E	WET MEADOW MIX

NOTE:
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3. COORDINATE PLANT PLACEMENT WITH UTILITIES AND LIGHTING.

PREPARED BY

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

PLANTING DETAIL AREA 6

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

10 0 10 20

SCALE IN FEET: 1"=10'

Bid Documents

SHEET NO.

L.1.7

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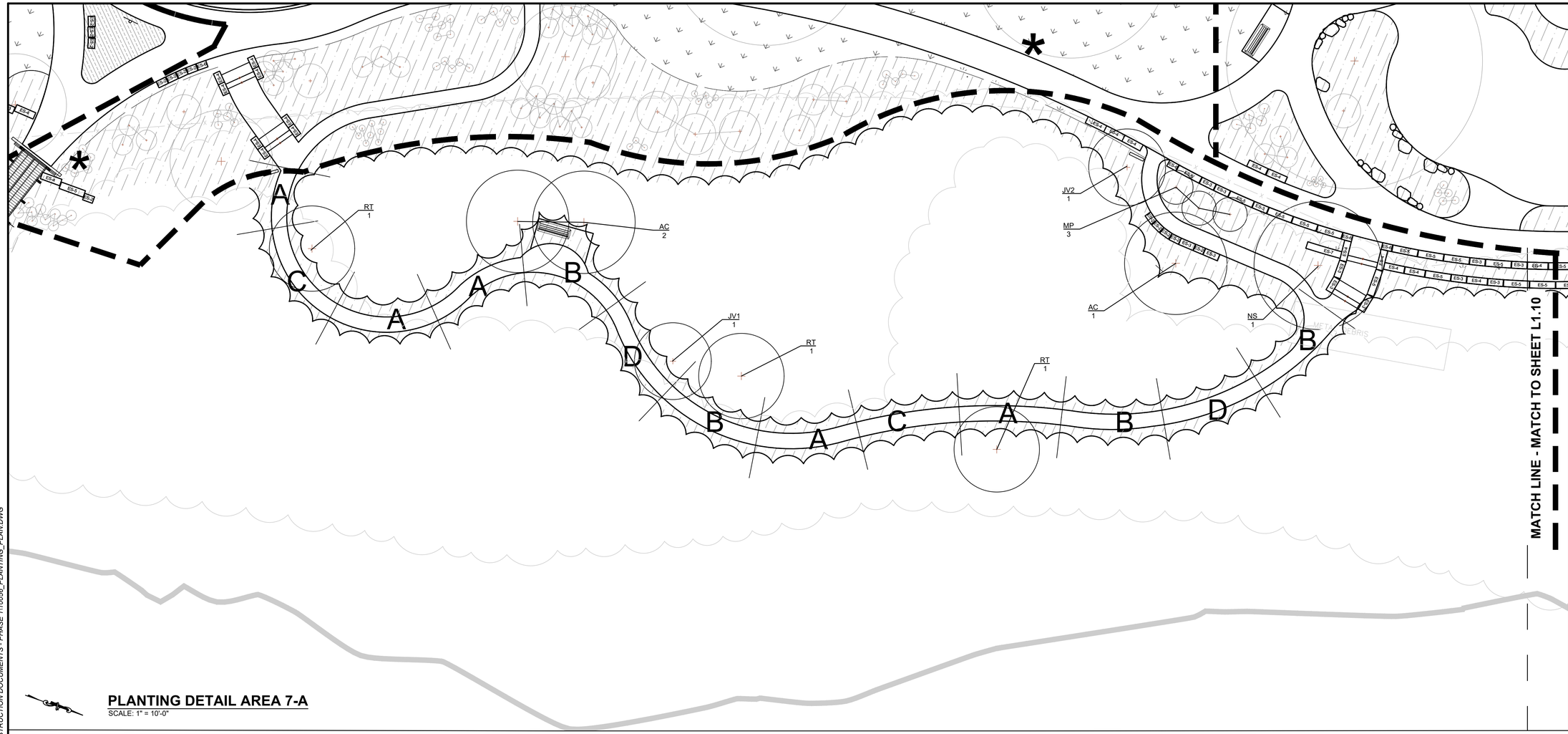
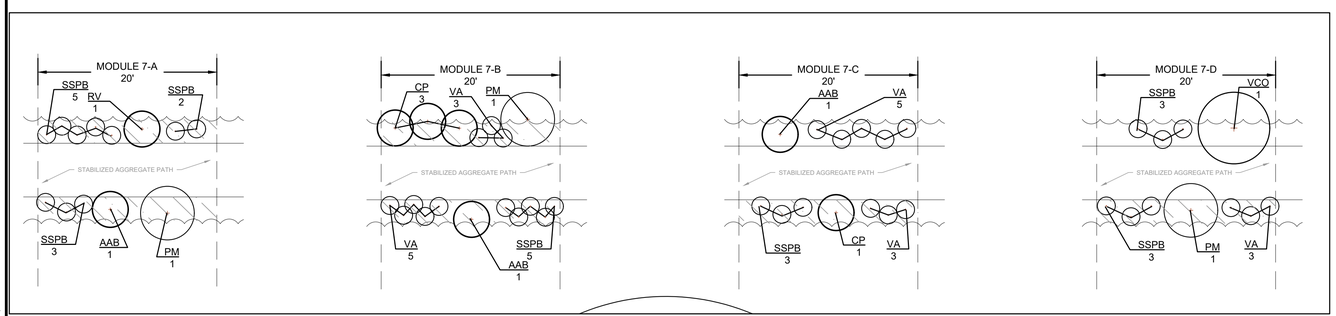


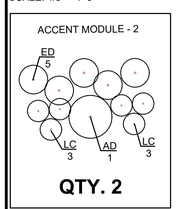
PLANTING DETAIL AREA 7-A

SCALE: 1" = 10'-0"



PLANTING DETAIL AREA 7 - MODULES

SCALE: 1/8" = 1'-0"



QTY. 2

PLANTING ACCENT MODULE AREA 7-A

PLANTING DETAIL AREA 7A

SYM	QTY	BOTANICAL NAME	COMMON NAME		SIZE	REMARKS
TREES						
AC	3	Amelanchier canadensis	Shadblow	3 ST	12-14'	B&B
JV1	1	Juniperus virginiana	Eastern Red Cedar	CT 5	#15	B&B
JV2	1	Juniperus virginiana	Eastern Red Cedar	CT 5	7-8'	B&B
NS	1	Nyssa sylvatica	Tupelo	2 ST	3-3.5" cal.	B&B
RT	3	Rhus typhina	Staghorn sumac	3 ST	#2, 2'-3'	Cont.
SHRUBS						
MP	3	Myrica pensylvanica	Northern Bayberry	3 DS	#3, 1.5'-2'	Cont.

SEED TYPE LEGEND

	SEED MIX - TYPE A	MAINTAINED GRASS AREA
	SEED MIX - TYPE B	EROSION CONTROL/ RESTORATION MIX FOR DRY SITES
	SEED MIX - TYPE C	EROSION CONTROL/ RESTORATION MIX FOR DETENTION BASINS AND MOIST SITES
	SEED MIX - TYPE D	RESTORATION MIX
	SEED MIX - TYPE E	WET MEADOW MIX

NOTE:
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3. COORDINATE PLANT PLACEMENT WITH UTILITIES AND LIGHTING.

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

PLANTING DETAIL AREA 7-A

BID DOCUMENTS

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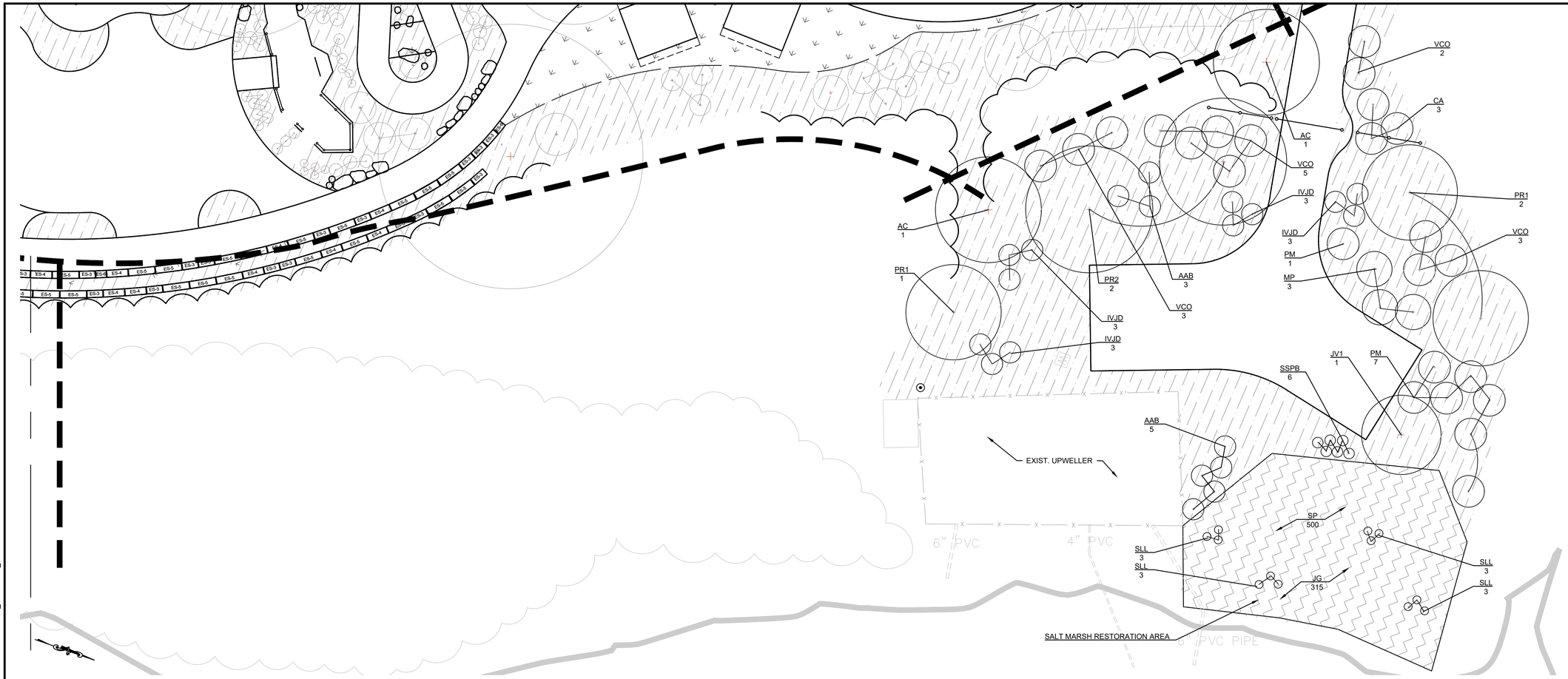
SCALE

10 0 10 20
SCALE IN FEET: 1"=10'

Bid Documents

SHEET NO.

L.1.8



PLANTING DETAIL AREA 7-B

SCALE: 1" = 10'-0"

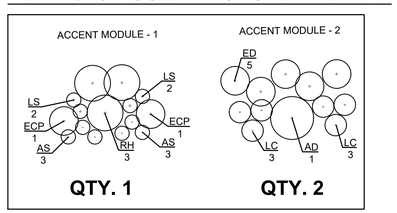
PLANTING DETAIL AREA 7B							
TREES							
AAB	8	Aronia arbutifolia 'Brilliantissima'	Red Chokeberry	2 DS	#3, 1.5'-2'	Cont.
AC	2	Amelanchier canadensis	Shadblow	3 ST	12-14'	B&B
JV1	1	Juniperus virginiana	Eastern Red Cedar	CT 5	#15	B&B
PR1	3	Pinus rigida	Pitch Pine	4 CT	5-6'	B&B
PR2	2	Pinus rigida	Pitch Pine	4 CT	7-8'	B&B
SHRUBS							
CA	3	Clethra alnifolia	Summersweet	2 DS	#3, 1.5'-2'	Cont.
IVJD	12	Ilex verticillata 'Jim Dandy'	Jim Dandy Winterberry - Male	3 DS	#3, 1.5'-2'	Cont.
MP	3	Myrica pensylvanica	Northern Bayberry	3 DS	#3, 1.5'-2'	Cont.
PM	8	Prunus maritima	Beach Plum	2 DS	5-6'	B&B
VCO	13	Vaccinium corymbosum	High Bush Blueberry	3 DS	5-7'	B&B
GRASSES / PERENNIALS							
SLL	12	Solidago sempervirens	Seaside Goldenrod	Perennial	#1	Cont.
SSPB	6	Schizacharium scoparium 'Prarie Blues'	Prarie Blues Little Bluestem	Perennial grass	#1	Cont.

SALT MARSH RESTORATION AREA						
SP	500	Spartina patens	Saltmeadow Cordgrass	Perennial grass	#1	18" O.C.
JG	315	Juncus gerardii	Saltmarsh Rush	Perennial grass	#1	18" O.C.

SEED TYPE LEGEND

	SEED MIX - TYPE A	MAINTAINED GRASS AREA
	SEED MIX - TYPE B	EROSION CONTROL/ RESTORATION MIX FOR DRY SITES
	SEED MIX - TYPE C	EROSION CONTROL/ RESTORATION MIX FOR DETENTION BASINS AND MOIST SITES
	SEED MIX - TYPE D	RESTORATION ROAD MIX
	SEED MIX - TYPE E	WET MEADOW MIX

PLANTING ACCENT MODULE AREA 7-B



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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

PLANTING DETAIL AREA 7-B

BID DOCUMENTS

NO.	REVISIONS	DATE

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ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

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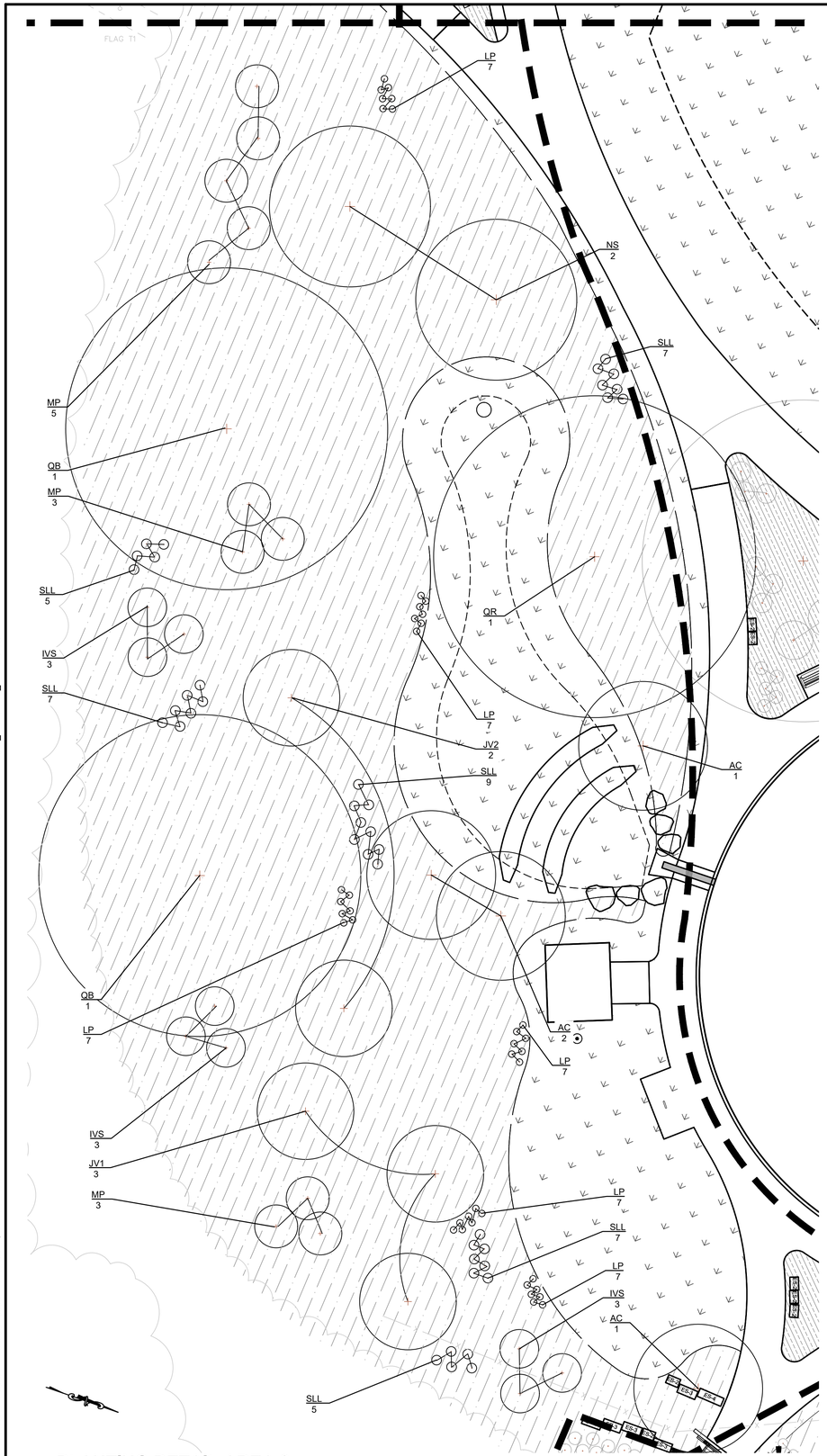
SCALE IN FEET: 1"=10'

Bid Documents

SHEET NO.

L.1.9

G:\PLANNING LANDSCAPE\10000S\10056 - YARMOUTH, MA RIVERWALK PARK & BOARDWALK\DRAWING FILES\PLAN SET\CONSTRUCTION DOCUMENTS - PHASE 1\10056_PLANTING_PLAN.DWG



PLANTING DETAIL AREA 8

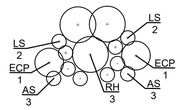
SYM	QTY	BOTANICAL NAME	COMMON NAME		SIZE	REMARKS
TREES						
AC	4	Amelanchier canadensis	Shadblow	3 ST	12-14'	B&B
JV1	3	Juniperus virginiana	Eastern Red Cedar	CT 5	#15	B&B
JV2	2	Juniperus virginiana	Eastern Red Cedar	CT 5	7-8'	B&B
NS	2	Nyssa sylvatica	Tupelo	2 ST	3-3.5" cal.	B&B
QB	2	Quercus bicolor	Swamp White Oak	1 ST	3-3.5" cal.	B&B
QR	1	Quercus rubra	Red Oak	1 ST	3-3.5" cal.	B&B
SHRUBS						
IVS	9	Ilex verticillata 'Sparkelberry'	Sparkleberry Winterberry - Female	3 DS	#3, 1.5'-2'	Cont.
MP	11	Myrica pensylvanica	Northern Bayberry	3 DS	#3, 1.5'-2'	Cont.
GRASSES / PERENNIALS						
LP	42	Lupinus perennis	Lupine	Perennial	#1	Cont.
SLL	40	Solidago sempervirens	Seaside Goldenrod	Perennial	#1	Cont.

SEED TYPE LEGEND

	SEED MIX - TYPE A	MAINTAINED GRASS AREA
	SEED MIX - TYPE B	EROSION CONTROL/ RESTORATION MIX FOR DRY SITES
	SEED MIX - TYPE C	EROSION CONTROL/ RESTORATION MIX FOR DETENTION BASINS AND MOIST SITES
	SEED MIX - TYPE D	RESTORATION MIX
	SEED MIX - TYPE E	WET MEADOW MIX

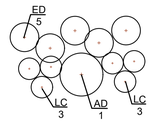
PLANTING ACCENT MODULE AREA 8

ACCENT MODULE - 1



QTY. 2

ACCENT MODULE - 2



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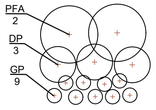
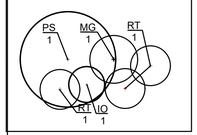
ACCENT MODULE - 3



QTY.3

ACCENT MODULE - 4



QTY.2

NOTE:
1. FINAL PLACEMENT OF PLANTING ACCENT MODULES WITHIN EACH DETAIL AREA SHALL BE DIRECTED BY THE PROJECT LANDSCAPE ARCHITECT
2. PLANT QUANTITIES FOR PLANTING ACCENT MODULES ARE REFLECTED IN THE MASTER SCHEDULE, SEE SHEET L.1.2.
3. COORDINATE PLANT PLACEMENT WITH UTILITIES AND LIGHTING.

PLANTING DETAIL AREA 8

SCALE: 1" = 10'-0"

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

PLANTING DETAIL AREA 8

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

10 0 10 20

SCALE IN FEET: 1"=10'

Bid Documents

SHEET NO.

L.1.10

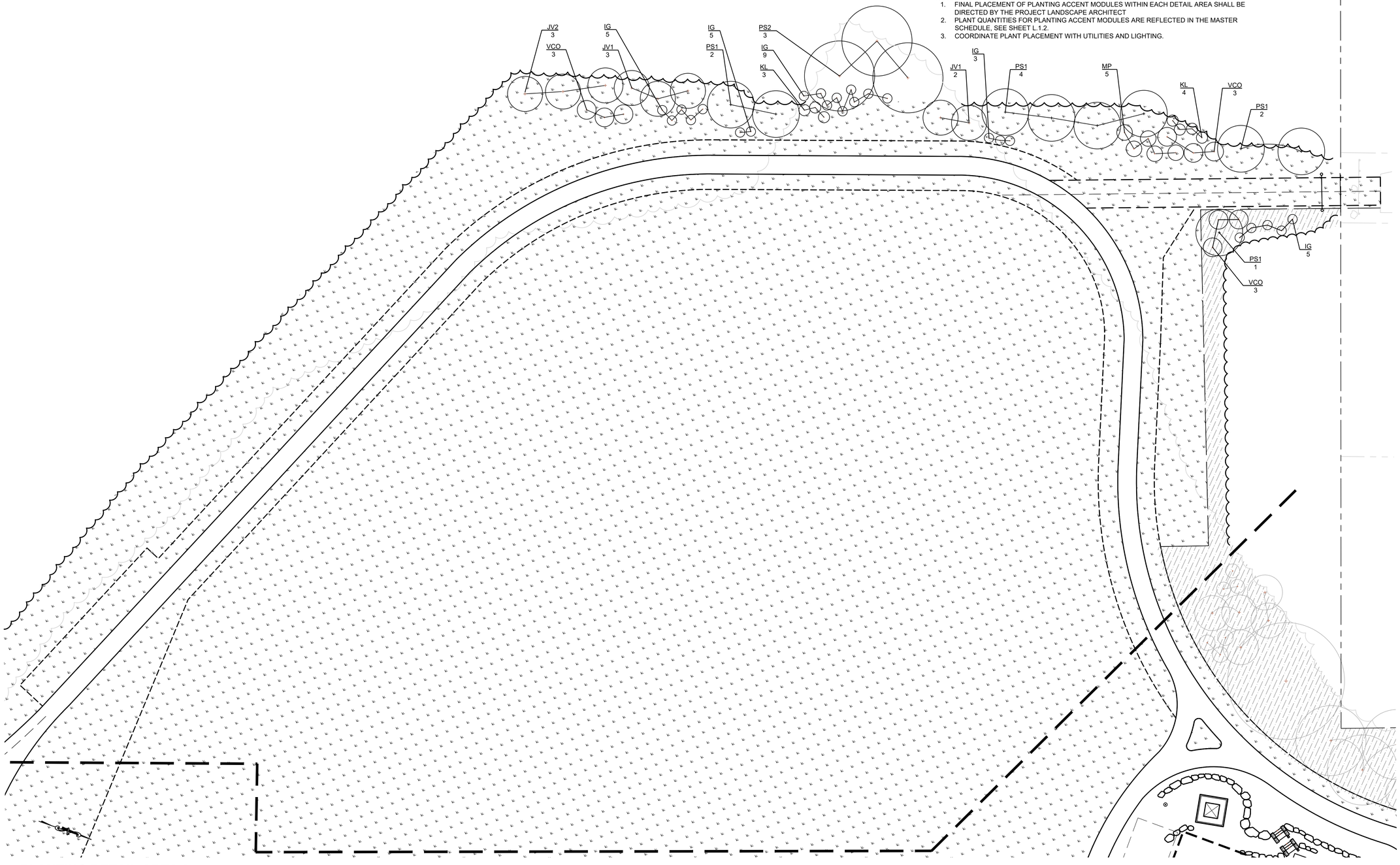
PLANTING DETAIL AREA 9

SYM	QTY	BOTANICAL NAME	COMMON NAME		SIZE	REMARKS
TREES						
JV1	5	Juniperus virginiana	Eastern Red Cedar	CT 5	#15	B&B
JV2	3	Juniperus virginiana	Eastern Red Cedar	CT 5	7-8'	B&B
PS1	9	Pinus Strobus	White Pine	4 CT	5-6'	B&B
PS2	3	Pinus Strobus	White Pine	4 CT	7-8'	B&B
SHRUBS						
IG	24	Ilex glabra	Inkberry	4 BE	24-30"	B&B
KL	7	Kalmia latifolia	Mountain Laurel	4 BE	18-24"	B&B
MP	5	Myrica pensylvanica	Northern Bayberry	3 DS	#3, 1.5'-2'	Cont.
VCO	9	Vaccinium corymbosum	High Bush Blueberry	3 DS	5-7'	B&B

SEED TYPE LEGEND

- SEED MIX - TYPE A — MAINTAINED GRASS AREA
- SEED MIX - TYPE B — EROSION CONTROL/ RESTORATION MIX FOR DRY SITES
- SEED MIX - TYPE C — EROSION CONTROL/ RESTORATION MIX FOR DETENTION BASINS AND MOIST SITES
- SEED MIX - TYPE D — RESTORATION MIX
- SEED MIX - TYPE E — WET MEADOW MIX

NOTE:
1. FINAL PLACEMENT OF PLANTING ACCENT MODULES WITHIN EACH DETAIL AREA SHALL BE DIRECTED BY THE PROJECT LANDSCAPE ARCHITECT
2. PLANT QUANTITIES FOR PLANTING ACCENT MODULES ARE REFLECTED IN THE MASTER SCHEDULE, SEE SHEET L.1.2.
3. COORDINATE PLANT PLACEMENT WITH UTILITIES AND LIGHTING.



PLANTING DETAIL AREA 9
SCALE: 1" = 20'-0"

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

PLANTING DETAIL AREA - 9

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
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CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

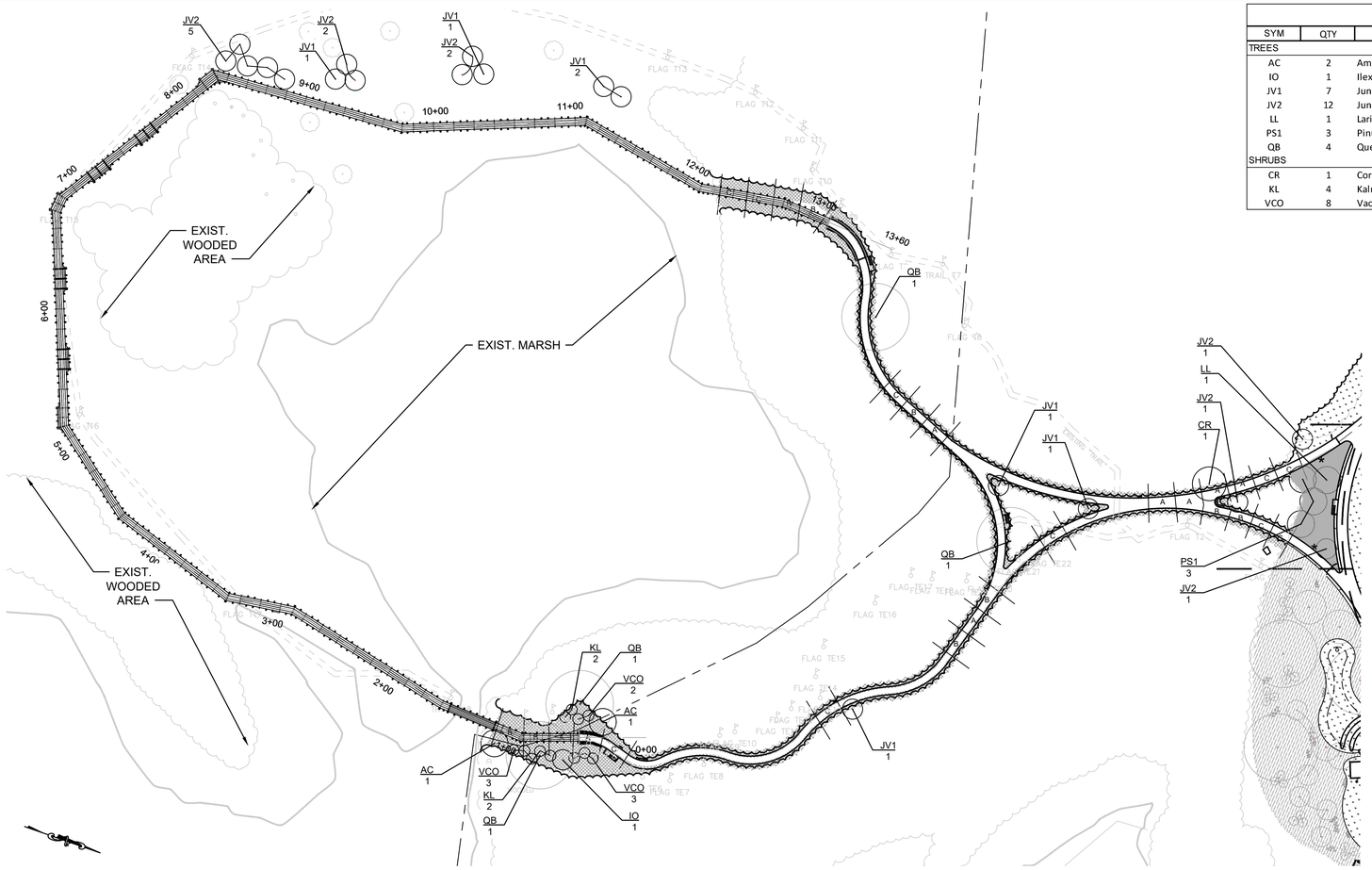
SCALE

20 0 20 40
SCALE IN FEET: 1"=20'

Bid Documents

SHEET NO.

L.1.11



PLANTING DETAIL AREA 10

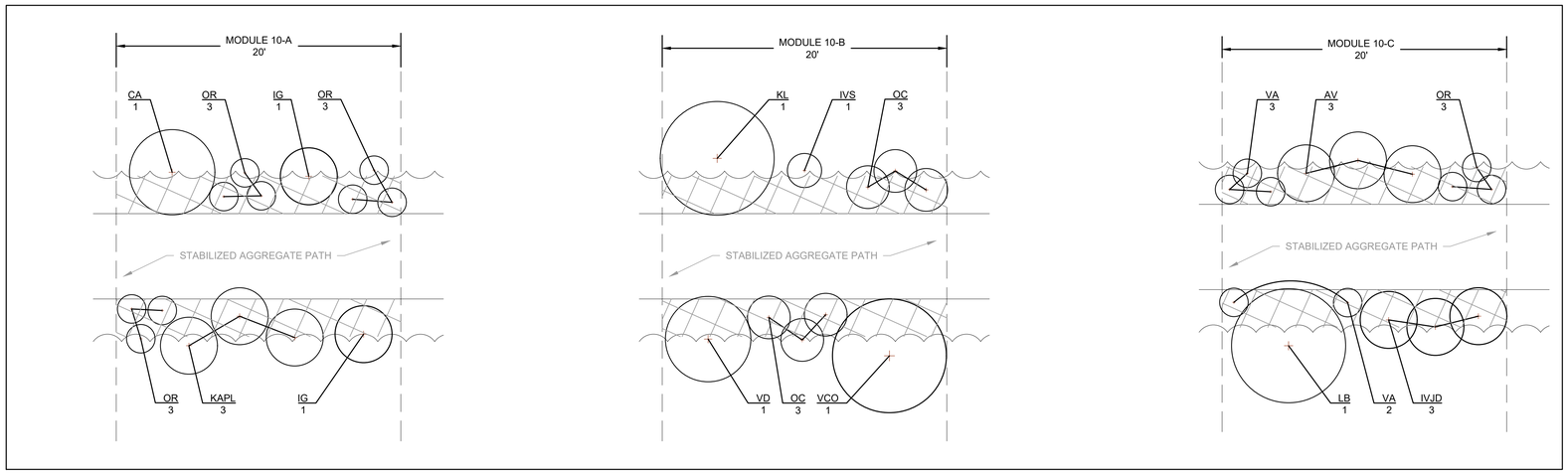
SCALE: 1" = 50'-0"

PLANTING DETAIL AREA 10						
SYM	QTY	BOTANICAL NAME	COMMON NAME		SIZE	REMARKS
TREES						
AC	2	Amelanchier canadensis	Shadblow	3 ST	12-14'	B&B
IO	1	Ilex opaca	American Holly	5 BE	#15	B&B
JV1	7	Juniperus virginiana	Eastern Red Cedar	CT 5	#15, 4'-6'	Cont.
JV2	12	Juniperus virginiana	Eastern Red Cedar	CT 5	7-8'	B&B
LL	1	Larix laricina	American Larch	1 ST	10'-12' Ht.	B&B
PS1	3	Pinus Strobus	White Pine	4 CT	5-6'	B&B
QB	4	Quercus bicolor	Swamp White Oak	1 ST	3-3.5" cal.	B&B
SHRUBS						
CR	1	Cornus racemosa	Gray Dogwood	3 DS	#3, 1.5'-2'	Cont.
KL	4	Kalmia latifolia	Mountain Laurel	4 BE	18-24"	B&B
VCO	8	Vaccinium corymbosum	High Bush Blueberry	3 DS	5-7'	B&B

NOTE:
1. FINAL PLACEMENT OF PLANTING ACCENT MODULES WITHIN EACH DETAIL AREA SHALL BE DIRECTED BY THE PROJECT LANDSCAPE ARCHITECT
2. PLANT QUANTITIES FOR PLANTING ACCENT MODULES ARE REFLECTED IN THE MASTER SCHEDULE, SEE SHEET L.1.2.
3. COORDINATE PLANT PLACEMENT WITH UTILITIES AND LIGHTING.

SEED TYPE LEGEND

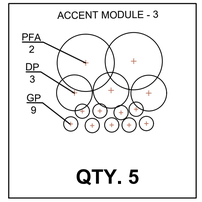
	SEED MIX - TYPE A	MAINTAINED GRASS AREA
	SEED MIX - TYPE B	EROSION CONTROL/ RESTORATION MIX FOR DRY SITES
	SEED MIX - TYPE C	EROSION CONTROL/ RESTORATION MIX FOR DETENTION BASINS AND MOIST SITES
	SEED MIX - TYPE D	RESTORATION MIX
	SEED MIX - TYPE E	WET MEADOW MIX



PLANTING DETAIL AREA 10 - MODULES

SCALE: 1" = 5'-0"

PLANTING ACCENT MODULE AREA 10



NOTE:
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3. COORDINATE PLANT PLACEMENT WITH UTILITIES AND LIGHTING.

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RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

PLANTING DETAIL AREA - 10

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DESIGNED BY:	AWG
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ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

SCALE

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SHEET NO.

L.1.12

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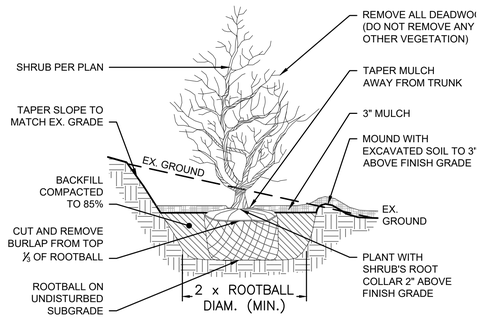
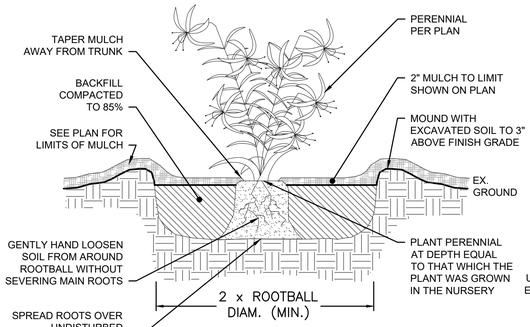
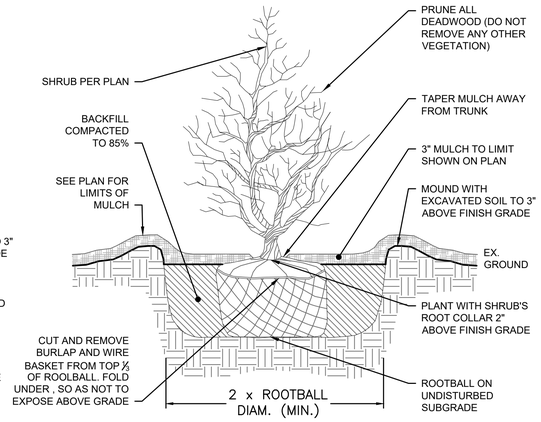


SHRUB PLANTING ON SLOPE
NOT TO SCALE

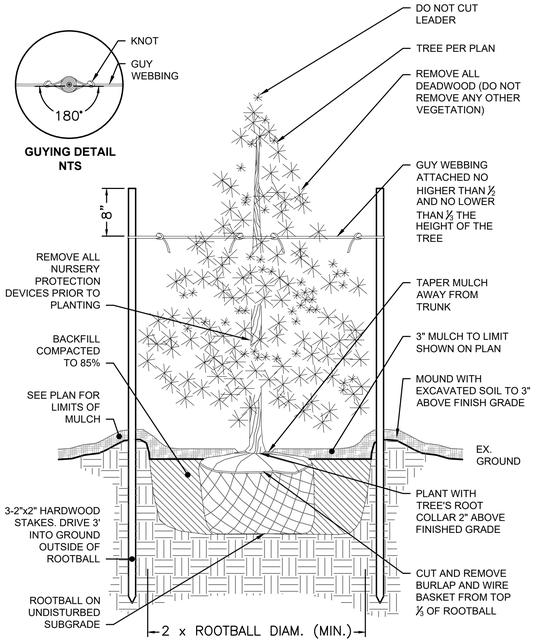


PERENNIALS & GRASSES PLANTING
NOT TO SCALE



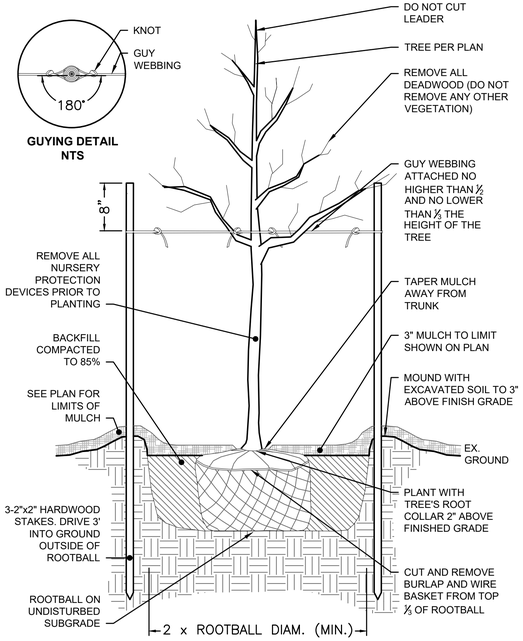
SHRUB PLANTING
NOT TO SCALE

NOTES:
1. UTILIZE LOAM FOR PLANTS AS BACKFILL MIX, BLENDED WITH EXISTING SOIL, SEE SPECIFICATIONS.
2. FURNISH AND INSTALL JUTE MESH ON ALL 3:1 SLOPES AND GREATER.
3. MODIFIED LOAM FOR LAWN AT EVENT SPACE SHALL BE A BLEND OF 70% GRAVEL BORROW AND 30% LOAM.



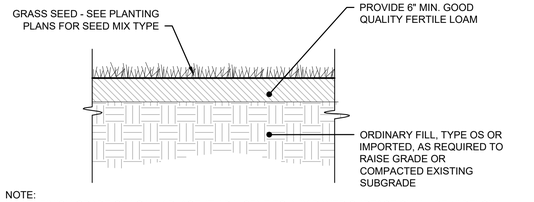
NOTE:
AFTER THE GUARANTEE PERIOD THE CONTRACTOR WILL BE RESPONSIBLE FOR THE REMOVAL OF STAKES AND GUY WEBBING.

EVERGREEN TREE STAKING & PLANTING
NOT TO SCALE



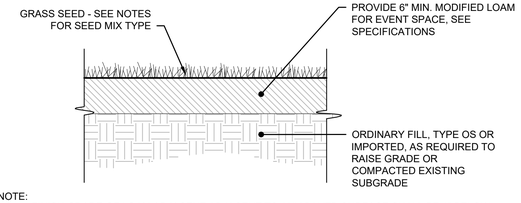
NOTE:
AFTER THE GUARANTEE PERIOD THE CONTRACTOR WILL BE RESPONSIBLE FOR THE REMOVAL OF STAKES AND GUY WEBBING.

DECIDUOUS TREE STAKING & PLANTING
NOT TO SCALE



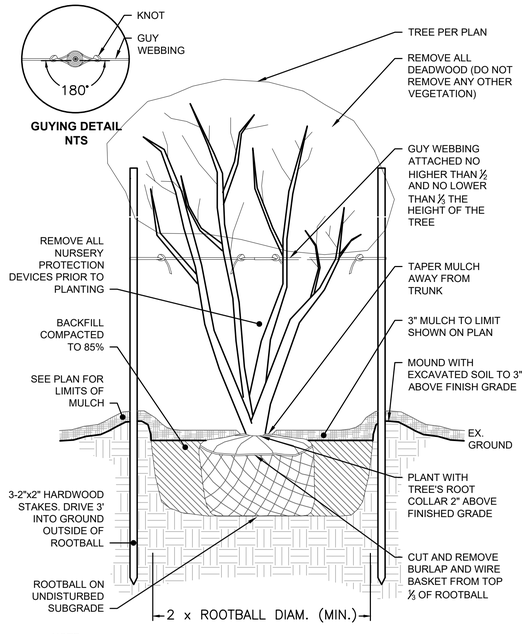
NOTE:
1. FINISH GRADE OF LOAM ADJACENT ADJACENT TO ANY PAVED SURFACE SHALL BE 1" BELOW FINISH GRADE OF PAVEMENT.
2. LOAM DEPTH SHALL BE 6" DEEP IN AREAS WITH SEED MIX - TYPE A. LOAM DEPTH SHALL BE 6" DEEP IN ALL OTHER SEEDED AREAS

LOAM AND SEED
NOT TO SCALE



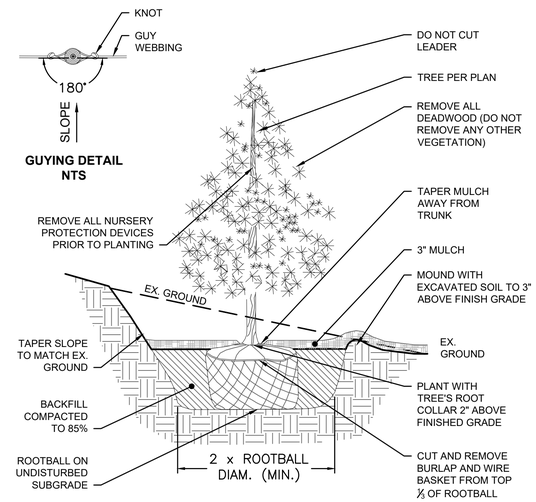
NOTE:
1. FINISH GRADE OF LOAM ADJACENT ADJACENT TO ANY PAVED SURFACE SHALL BE 1" BELOW FINISH GRADE OF PAVEMENT.

LAWN AT EVENT SPACE
NOT TO SCALE



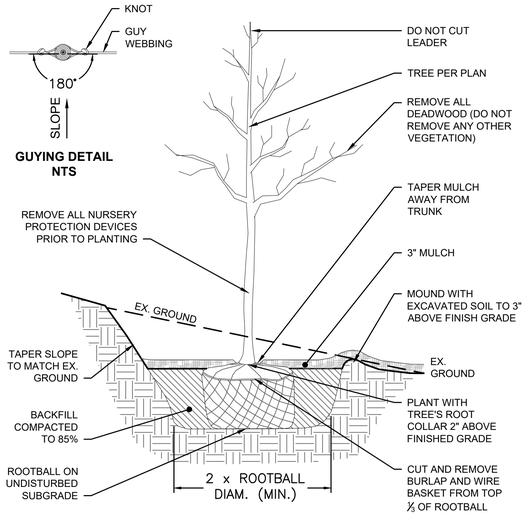
NOTE:
AFTER THE GUARANTEE PERIOD THE CONTRACTOR WILL BE RESPONSIBLE FOR THE REMOVAL OF STAKES AND GUY WEBBING.

MULTI-STEM TREE STAKING & PLANTING
NOT TO SCALE



NOTE:
SLOPE PLANTING STAKES SHALL BE PLACED PARALLEL TO SLOPE.

EVERGREEN TREE PLANTING ON SLOPE
NOT TO SCALE



NOTE:
SLOPE PLANTING STAKES SHALL BE PLACED PARALLEL TO SLOPE.

DECIDUOUS TREE PLANTING ON SLOPE
NOT TO SCALE

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PROJECT

RIVERWALK PARK, BOARDWALK LOOP & EVENT SPACE

PHASE 1

West Yarmouth, MA

TITLE

PLANTING DETAILS

BID DOCUMENTS

NO.	REVISIONS	DATE

DRAWN BY:	AKP
DESIGNED BY:	AWG
CHECKED BY:	AWG
ISSUE DATE:	4/5/2024
BETA JOB NO.:	10056

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