TOWN OF YARMOUTH, MASSACHUSETTS

1146 Route 28
South Yarmouth, MA 02664
(508) 398-2231

INVITATION FOR BIDS

FOR

Chase Brook Park Restoration & Pedestrian Bridge
West Yarmouth, MA

BIDS DUE: December 19, 2025, no later than 9:00 a.m.

NOTE: This document and any addenda thereto are issued electronically only. It is the responsibility of every bidder who receives this bid document and all associated documents to check the Town of Yarmouth Website for any addenda or modification to this solicitation if they intend to respond. The Town of Yarmouth accepts no liability to provide accommodation to bidders who submit a response based upon an out-of-date solicitation document or documents obtained from a source other than the Town. Bidders may not alter (manually or electronically) the bid language or any bid documents. Unauthorized modifications to the body of the bid, specifications, terms or conditions, or which change the intent of this bid are prohibited and may disqualify a response. **Please Sign up to receive a text message or email when new bids are added.**

TOWN OF YARMOUTH, MASSACHUSETTS
INVITATION FOR BIDS FOR

Chase Brook Park Restoration & Pedestrian Bridge
West Yarmouth, MA

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1 INTRODUCTION

1.1 Legal Notice

The Town of Yarmouth, the Awarding Authority, invites sealed bids for the Chase Brook Park Restoration & Pedestrian Bridge, located in, West Yarmouth, MA, in accordance with the documents prepared by Tighe & Bond, Inc, dated November 26, 2025

The work includes, without limiting the generality thereof, constructing a timber pedestrian bridge, riverbank stabilization, vegetative plantings, and stabilized stone dust (aggregate) walking paths with interpretive signage within Town property located at Chase Brook Park in West Yarmouth, MA. The contractor is responsible for providing all materials, labor, and equipment as specified to perform the work. Bids should be submitted in a sealed envelope bearing the words:

"Chase Brook Park Restoration & Pedestrian Bridge"

Bid specifications may be examined and obtained online at https://www.yarmouth.ma.us/bids.aspx on December 3, 2025.

Sealed Bids will be received by the Town of Yarmouth at the Town of Yarmouth DPW, 74 Town Brook Road, West Yarmouth, MA 02673, until 9:00 a.m. on December 19, 2025. General Bids will be opened publicly.

Project Estimate: $1,580,000.00. The project's substantial completion date is **December 31, 2026**, which includes the first year of Invasive Species Management. Two additional years of Invasive Species Management are included in the project. Project construction must start no later than **February 9, 2026**, unless otherwise approved in writing by the Town.

Each Bid must be submitted in accordance with the Instructions to Bidders and must be accompanied by a Bid Security in the amount of five percent of the Bid in the form of a certified treasurer's or cashier's check issued by a responsible bank or trust company, or a bid bond issued by a surety company licensed to do business in the Commonwealth of Massachusetts.

The Successful Bidder must furnish a 50 percent Payment Bond with a surety company an acceptable bonding company qualified to do business under the laws of the Commonwealth of Massachusetts and satisfactory to the Town of Yarmouth.

Minimum Wage Rates as determined by the Executive Office of Labor and Workforce Development under the provision of the Massachusetts General Laws, Chapter 149, Section 26 to 27H, as amended, apply to this project.

It is the responsibility of the Bidder, before bid opening, to request, if necessary, any additional information on Prevailing Wage Rates for those tradespeople who may be employed for the proposed work under this contract. Prevailing Wage Rates Schedule number 20251110212254 are

applicable to this project.

A weekly certified payroll submittal shall be required of the successful bidder in accordance with MGL C149, S27B. No payments will be made by the Town until all payroll information necessary for the Town to determine compliance with prevailing wage law requirements for the time of the payment request has been submitted. The Contractor shall not discriminate with regard to the personnel employed on this project based on race, color, creed, national origin, gender, sexual preference, handicap, or age.

Bidders are not to include in their bid proposal sales and compensating use taxes on materials and supplies purchased for this project. All materials used are tax-exempt.

Bidders may not withdraw their Bids for a period of thirty days, excluding Saturdays, Sundays, and legal holidays after the actual date of the opening of the Bids.

The bidding and award of this Contract will be under the provisions of M.G.L. c30B, §39M.

The Town of Yarmouth reserves the right to waive any informalities in bids and to reject any or all bids or waive any formalities that appear to be in the best interest of the Town. A bid that includes an abnormally low or high amount for any item may be rejected as unbalanced.

The Engineer of Record for the project is Tighe & Bond, Inc., 53 Southampton Road, Westfield, MA, 01085.

2 KEY PROJECT DATES AND SCHEDULE

Procurement Contact	Laura Hayden, Administrative Supervisor., Yarmouth DPW Engineering lhayden@yarmouth.ma.us 508-398-2231 ext. 1250	
EVENT	DATE	DESCRIPTION
Advertisement	December 3, 2025 December 3, 2025	Advertisements will be posted in the Cape Cod Times newspaper. Massachusetts' online procurement platform: COMMBUYS; and in the Massachusetts Inspector General's Office –Central Register. Town of Yarmouth website and Yarmouth DPW office
Invitation for Bid Available	December 3, 2025	IFB documents containing information and details of bidding requirements may be obtained online at the Town of Yarmouth Official Website http://www.yarmouth.ma.us/ "Doing Business" page.
Time and Place For Pre-Bid Conference	Not Applicable	Not applicable
Deadline for Written Questions	December 12, 2025 By 12:00 p.m.	**Via email only to Laura Hayden:** lhayden@yarmouth.ma.us. Clearly label questions by using the following subject line: QUESTION – Chase Brook Park Restoration & Pedestrian Bridge
Addenda	May be issued up to 7 days prior to the due date of responses.	If any changes are made to this bid, an addendum will be posted on the Town's website. **Bidders must check the website for addenda before submitting a bid.** Respondents will not be notified of Addenda. All respondents are required to acknowledge all addenda in their responses.
When and Where Bids are Due, IFB Opening	December 19th, 2025 at 9:00 a.m.	Bids must be received by the due date and time at: Yarmouth DPW 74 Town Brook Road West Yarmouth, MA 02673 **Late submissions will not be considered.** No faxed or emailed submissions will be accepted. Bids will be opened at this date/time, the Bidder and Price will be announced.
Anticipated Evaluation Period	Until 12/30/2025	

Anticipated Award	1/9/2026	
Contract executed	Within 21 days of the due date	
Latest Construction Start	2/9/2026	
Substantial Completion	12/31/2026	
Prior to Contract Execution		
Bid Deposit	Applicable	five percent (5%) of the Bid Price
Payment Bond	Applicable	50% of the contract amount.
Performance Bond	Not Applicable	
Insurance	Refer to contract terms	Certificate of insurance will need to be provided upon execution of the contract

3 SCOPE OF SERVICES AND SPECIFICATIONS

3.1 Purchase Description/Scope of Services

The Town of Yarmouth is requesting bids for the following: Chase Brook Park Restoration & Pedestrian Bridge. The work performed under this contract includes, but is not limited to:

- Removal of Brick Walkway, Trees, and Vegetation
- Installation of Timber Piles for Pedestrian Bridge
- Construction of Pedestrian Bridge
- Vegetative Plantings
- Coir Logs for Bank Stabilization
- Site Grading, Park Walkways
- Installation of Benches, Picnic Tables, and Interpretive Signage
- A 3-year Program of Invasive Species Management
- Other related items.

Specific requirements are included in **Exhibit 1.**

3.2 Contract Term Length and Renewal Options

After the selection of the lowest eligible responsible bidder, a written contract containing the terms of this IFB and the bidder's response shall be executed by the successful respondent and the Town.

This contract is being partially paid with grant funds and must be substantially complete by December 31, 2026. Please see Exhibit 1 Supplement C item #21 of this IFB for liquidated damages.

The terms and conditions are specified in the Contract attached to this IFB in Section 7.1 - APPENDIX 1 – IFB EXHIBITS. Any terms or conditions imposed by a respondent must be contained within their responses and must not conflict with the requirements and/or specifications contained within this IFB.

3.3 Work Schedule, Time Limits, and Notice to Proceed

The contractor shall furnish a proposed work schedule, in writing, with their bid. A final work schedule shall be submitted at the time of delivery of the properly executed contract, bonds, and certificates of insurance to the Town, allowing for completion of the contract work prior to the date specified in the IFB documents and appearing on the Contract Form. The Town will review the completed documents and proposed schedule, ask for revisions or corrections, if any, and issue a "Notice to Proceed," indicating the Town's agreement with the final contract terms and schedule.

Work may begin immediately upon receipt of the Notice to Proceed.

4 INFORMATION & INSTRUCTIONS TO BIDDERS

4.1 Definitions

All definitions set forth in the General Conditions are applicable to all IFB documents, which include the Legal Notice, Instructions to bidders, and Addenda issued prior to receipt of bids.

i. Whenever the terms "Town" or "Owner" are used, they refer to the Town of Yarmouth and are considered singular in the Contract Documents. The term "Owner" encompasses the Owner's Authorized Representative, the Owner's Project Manager, or any other employee or agent of the Owner. The Owner's Project Manager is authorized to act on behalf of the Owner and has the responsibility to approve all matters related to the Work.

ii. Whenever the term **IFB** is used, the reference is to this Invitation for Bids or portions thereof, together with any exhibits, attachments, or addenda it may contain.

iii. The term "Contractor" refers to the person or entity identified as such in the Agreement and is considered singular throughout the Contract Documents. The Contractor must be lawfully licensed, if required, in the Commonwealth of Massachusetts, where the Project is located. Additionally, the Contractor must appoint a representative in writing who has the authority to bind the Contractor in all matters related to this Contract. The term "Contractor" refers to either the Contractor or the Contractor's authorized representative.

iv. **Drawings & Specifications**: The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams. The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services. Each of these are produced for the purpose of the Contractor providing an initial bid proposal for consideration by the Owner.

v. **Effective Date**: The latest date of the original execution of this Contract.

vi. **Signature or Signed** means the discrete, verifiable symbol of an individual that, when affixed to a writing with the knowledge and consent of the individual, indicates a present intention to authenticate the writing. This includes electronic symbols attached to or logically associated with the IFB documents and executed or adopted by a person with the intent to sign the documents.

vii. **Substantial Completion** refers to the point at which the Work is sufficiently complete, in accordance with the Contract Documents, so that the project or a designated portion thereof can be safely and effectively used for its intended purpose.

viii. The term **Work** as used in the Contract Documents includes all labor necessary to produce the construction required by the Contract Documents and all permits, materials and equipment incorporated or to be incorporated in such construction.

4.2 Notice of Pre-Bid Conference – Not Applicable

4.3 Questions and Clarifications

Questions concerning this project must be submitted in writing to Laura Hayden, at lhayden@yarmouth.ma.us prior to the date indicated above in **Key Project Dates and Schedule** in order to afford the Town adequate time to respond with a correction or additional information prior to the deadline for submission of responses. After that day, no requests or questions will be accepted. Questions should be through a single point of contact coordinating the questions over the Respondent's team and not through multiple contacts. Please put "Question-Chase Brook Park Restoration & Pedestrian Bridge" in the subject line of the email.

Should it be found necessary, written addenda will be incorporated into the IFB and will become part of the Contract. Bidders will **not** be notified individually of such changes. Bidders shall check the Town Website for addenda prior to submitting a bid. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

4.4 Changes to the IFB (Addenda)

Bidders will not receive notice of addenda issued. Bidders must check the Town Web Site for addenda.

If you are not registered in the Town's Bid System, you must register as a Seller on the Town of Yarmouth Bid and Contract Opportunity page, Bid Posting at https://www.yarmouth.ma.us/list.aspx?Mode=Subscribe#bids.

This solicitation is being conducted in accordance with the provisions of Massachusetts General Laws Chapter 30, §39M, and all contracts must be strictly awarded in accordance with the requirements of the Invitation for Bid. If it becomes necessary to revise any part of this IFB or otherwise provide additional information, an addendum will be posted to the Town Web Site.

The Town will make no attempt to contact vendors with updated information. Addenda will be posted on the Town's website. It is the responsibility of each vendor to periodically check https://www.yarmouth.ma.us/bids.aspx for any and all notifications, releases, and addenda associated with the IFB. Failure of a Respondent to receive or acknowledge any addendum shall not release the Respondent from the obligations under their response.

4.5 Bid Deposits.

(i) At least **FIVE PERCENT (5%)** of the greatest possible bid amount, considering all alternates;

(ii) Made payable to the Town of Yarmouth;

(iii) Conditioned upon the faithful performance by the principal of the agreements contained in the Bid, and in the form of cash, certified check, treasurers', or cashier's check issued by a responsible bank or trust company, or a bid bond issued by a surety company licensed to do business in the Commonwealth of Massachusetts.

(iv) All bid deposits, except those of the three lowest responsible and eligible bidders, shall be returned within five (5) days, Saturdays, Sundays and legal holidays excluded, after the opening of the general bids. Bid deposits of the three lowest responsible and eligible bidders will be held by the Awarding Authority during the time stipulated for the execution of the contracts and may be disposed of in such a manner as will accomplish the purpose for which they are submitted. After expiration of such period, bid guarantees not disposed, or the amounts thereof, will be returned within five (5) days, Saturdays, Sundays, and legal holidays excluded.

4.6 Responsive Bid

A responsive bid is one that has been properly and timely submitted in a sealed envelope, contains all required attachments, and follows the form of submission outlined below and in Section 5 of this IFB.

4.6.1. Bid Delivery

Bids must be submitted in a sealed envelope **on or before the deadline specified in the "Legal Notice."** Include one (1) original bid.

The Bid must be placed in its own sealed envelope, which is marked:

"BID ENCLOSED FOR –
CHASE BROOK PARK RESTORATION & PEDESTRIAN BRIDGE."

Submitted by: (Name of Respondent/Bidder)

Bids shall be delivered or mailed to the following address:

Town of Yarmouth DPW,
74 Town Brook Road,
West Yarmouth, MA 02673
Attn: Laura Hayden

Bids or any parts thereof received after the deadline specified in the "Legal Notice" will be rejected as non-responsive to the Invitation for Bids (IFB). Deliveries made to any office or location other than the one mentioned will not be considered as received by the Town. It is the sole responsibility of the Respondent to ensure that bids arrive at the correct location before the stated deadline. Respondents should plan accordingly to ensure timely delivery. Please note that faxed or emailed bids will not be accepted.

4.6.2. Preparation of Bid.

- Bids must follow the specifications and requirements outlined in **Section 5** of this IFB.
- The Respondent should ensure their Bid provides the information and/or documentation necessary to satisfy the Minimum Criteria set forth in **Section 6** of this IFB.
- The Respondent should ensure their Bid acknowledges all
- um(s) have been received and includes all required attachments as indicated in **Section 5** of this IFB.

4.7 Bid Acceptance and Rejection

Notice of the acceptance of the Bid will be provided to the successful proposer via a Notice of Award letter from the Town, which shall include the agreed-upon Contract between the Town of Yarmouth and the Respondent. The Respondent shall deliver the Contract, duly signed and properly executed, within ten (10) calendar days of receipt of the notice of acceptance. The acceptance of the Bid shall bind the successful bidder to the Contract. The rights and obligations provided for in the Contract shall become effective and binding upon the parties only upon its formal execution.

The Town reserves the right to reject any or all bids, or any part(s) thereof, if in the best interest of either to do so and to amend any contract to the extent permitted by law and as the Town deems to be in their best interest. The Town reserves the right to waive any mistakes or informalities in the bids received and may request supplementary information from any particular bidder if it is determined that the granting of such waiver or the receipt of such additional information would be in the best interest of the Town.

Each "Out-of-State" bidder shall furnish with its Bid a certification from the Office of the Secretary of State verifying that it is legally authorized to do business in the Commonwealth of Massachusetts.

Any bid which fails to include any material information or documentation specified in the bid submission requirements is non-responsive and will be rejected.

Discrepancies between words and figures will be resolved in favor of written words. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

In the event there are tied best prices from responsive and responsible bidders, the following methods of breaking the tie shall be employed unless otherwise provided for in the bid documents:

> The names of the tied bidders' will be written on a piece of paper and placed in a container. The award shall then be made to the bidder whose slip of paper is drawn from the container. This drawing will be performed with at least one witness and be performed in the presence of the tied bidders unless they waive their right to be present.

4.8 Qualifications of Bidder

A. Any bidder, if requested, shall submit a financial statement, experience records, and an equipment schedule on forms to be provided by the Town of Yarmouth. Financial statements shall reflect true financial conditions of the bidder within three months prior to the date of bid opening and shall be validated by a Certified Public Accountant.

B. A bidder, in order to be eligible for the contract, must be able to show their financial ability to carry on the work until the project is complete and accepted by the Town of Yarmouth. No award will be made to any bidder who cannot satisfy the Owner that he has sufficient ability and experience in this class of work and sufficient capital and plant to enable him to prosecute and complete the work successfully within the time named. The Owner's decision or judgment on these matters will be final, conclusive, and binding.

C. Experience references provided must be similar in size and scope to work being bid on, as determined in the sole discretion of the Owner, and on projects completed within the last three years. The Owner may make such investigations as deemed necessary, and the bidder shall furnish to the Owner, under oath if so required, all such information and data for this purpose as the Owner may request.

D. Owner reserves the right to reject any bid based on:1) any negative reference from the bidder's reference list; 2) any negative reference provided through the Owner's own investigations; and/or 3) the Owner's prior negative experience working with the bidder regardless of whether the prior work is similar or not similar to the proposed work.

4.9 Incorporation of Bid Content

All or part of the successful Bid submitted shall become incorporated into the final contract documents.

4.10 Expenses

Expenses for developing bids are entirely the responsibility of the bidder and shall not be chargeable in any manner to the Town. All costs of meeting the requirements of this IFB and any resulting contracts, including those for insurance, professional services, or licensure, shall likewise be the exclusive responsibility of the proposer and not the Town.

4.11 Term of Validity of Bids

All bids shall remain valid for a minimum period of 60 days from the due date, and the Respondent shall specifically reference said provision within their bids. Negligence on the part of the Respondent in preparing the Bid confers no rights for the withdrawal of the proposal after it has been opened.

4.12 Acceptance of IFB. Terms and Conditions, Bidders Representations

Submission of a bid shall be conclusive evidence that the Respondent has examined this IFB and is familiar with terms of this IFB and all provisions of the Contract included with this IFB and accepts all terms and conditions of both. Upon finding any omissions or discrepancies in this IFB, each Respondent shall notify the Town immediately so that any necessary addenda may be issued. Failure of a Respondent to investigate this IFB completely and/or to be thoroughly familiar with this IFB shall in no way relieve the Respondent from any obligation with regards to their Bid.

Each Respondent represents they understand the bidding documents, including any reports, test results, drawings, or other documents provided pursuant to this IFB if required or needed, a site visit was completed in order to become familiar with local conditions under which work will be performed. Drawings and

specifications have been compared to the site, and bidders have satisfied themselves as to the conditions of delivery and all other matters that may be incidental to the work before submitting their Bid.

The Respondent's Bid will be incorporated within the Contract. If the Respondent's Bid does not comply with the requirements of this Invitation for Bid, or if an item is not understood in any way, a copy of that section of the IFB must then be included in the Respondent's Bid (and all copies) clearly stating the deviation, additions, or other comments.

4.13 Bid Modification and Withdrawal

Bidders may correct, modify or withdraw the original bids on or before the date and time as stated in the Notice of Invitation for Bid. Corrections or modifications shall be in sealed envelopes, clearly marked to indicate the contents, with the name and address of the bidder. Any late correction or modification to the Bid will not be accepted. A bidder who wishes to withdraw a bid must make a request in writing.

4.14 Unexpected Closure or Delays

If, at the time of the scheduled bid submission deadline, the designated location for delivery of the Bid is closed due to uncontrolled events such as fire, snow, ice, wind, building evacuation, or other the deadline will be postponed until 9:00 a.m. on the next normal business day (Monday through Friday, excluding Holidays). Bids will be accepted at the same location until that date and time.

4.15 Late Submissions

Any bids received after the date and time stated in the "Legal Advertisement" will be deemed "non-responsive" and shall not be considered.

4.16 Rule for Award

4.16.1. The Contract will be awarded to the lowest responsible and eligible bidder pursuant to Massachusetts General Laws Chapter 30, Section 39M.

A responsible and eligible bidder is one who possesses the skill, ability, and integrity necessary for the faithful performance of the work, whose bid complies with all requirements of this IFB and applicable law, and who is capable of performing the work in harmony with all other elements of labor to be employed on the project.

4.16.2. A Bid that includes for any item a Bid Price that is abnormally low or high may be rejected as unbalanced.

4.17 Execution of Contract

4.17.1. Any bid that does not comply with the provisions of Massachusetts General Laws Chapter 149, Sections 44A through 44H, as amended, need not be accepted, and the Owner may reject every such bid.

4.17.2. Upon receiving a Notice of Award, the successful bidder will be responsible for executing and signing all contract documents. Any contractor whose Bid is accepted will be required to execute the contract within five (5) days, Saturdays, Sundays, and legal holidays excluded after the notice that the Contract has been awarded to them.

4.17.3. The Contract Document represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Change Order. The Contract Documents shall not be construed to create a contractual relationship of any kind between 1) the Contractor and the Town Engineer 2) the Owner and a Subcontractor or a Sub-subcontractor, 3) the Owner or the consultants, if applicable, or 4) any persons or entities other than the Owner and the Contractor.

4.18 Taxes

The Contractor shall not pay, and the Town shall not reimburse or pay the Contractor for any sales taxes for building supplies or materials for which exemption is provided by law. The Owner's Tax Exemption number to be used by the Contractor in this regard will be provided by the Owner to the Contractor.

4.19 Performance and Payment Bonds

Within five (5) days after the date on the Notice of Award of contract, Saturdays, Sundays, and legal holidays excluded, the bidder to whom the award is made shall furnish a performance bond and labor and materials bond, each equal to the full amount of the contract price, including accepted alternates (if applicable) to guaranty the faithful performance of all terms, covenants, and conditions of the same. The bonds are to be issued by an acceptable bonding company qualified to do business under the laws of the Commonwealth of Massachusetts and satisfactory to the Town of Yarmouth.

Every such bond shall have a power of attorney attached thereto, authorizing the Town of Yarmouth to enter judgment thereon in any court in the United States of America or elsewhere against the obligors therein named for the amount therein named and shall be conditioned for the honest and faithful compliance with all provisions of the bidder or bidders.

4.19.1 Performance Bond Requirements -Not required for this project

The performance bond shall guarantee the satisfactory completion of the project and that the contractor will make good any faults or defects in their work, which may develop during the period of said guarantee as a result of improper or defective workmanship, material, or apparatus. The full performance bond shall remain in effect until one year after the date when the final payment becomes due or until any warranty period under the Contract expires, whichever is later.

4.19.2 Payment Bond Requirements – A 50% Payment Bond is Required.

The payment bond shall guarantee that the contractor shall pay in full all persons, firms, or corporations who furnish labor or material or both labor and materials for, or on account of the work included herein. Payment bonds will be in effect until such time as the contractor furnishes proof that payment in full has been made for all materials used on the contract work. The bonds shall be paid for by the contractor. The Town of Yarmouth shall have the right to demand proof that parties signing the bonds are duly authorized to do so.

4.20 "Or Equal" Clause:

(Statutory reference: M.G.L. Ch.30, §39M(b)) Where products, materials, or equipment are prescribed by manufacturer name, trade name, or catalog reference, the word "or approved equal" shall be understood to follow. An item shall be considered equal to the item so named or described if, in the opinion of the Town Engineer:

a. it is at least equal in quality, durability, appearance, strength and design;
b. it performs at least equally the function imposed by the general design for the public work being contracted for or the material being purchased; and
c. it conforms substantially, even with deviations, to the detailed requirements for the items as indicated by the specifications.

Any structural or mechanical changes made necessary to accommodate substituted Equipment under this paragraph shall be at the expense of the Contractor or Subcontractor responsible for the work item. See other paragraphs of the General Conditions for any procedures that may be used in determining compliance with the standards of this paragraph.

4.21 Substitutions

A. Bids shall be based on using the products as specified and provided in the IFB documents. Where several materials are specified by name for one use, any of those so specified may be supplied.

B. Whenever the specified products are specified exclusively by trade name, by manufacturer's name or by catalog reference, only such items shall be provided unless the Town's written approval for substitution is secured in accordance with the conditions of the IFB and/or contract.

4.22 Insurance

Insurance coverages and limits are included as part of the Town of Yarmouth Contract terms and conditions. Review all contract documents in the Exhibits to this IFB to ensure compliance with these requirements.

4.23 Licenses and Permits

The proposer is responsible for attaining and holding in good standing all relevant permits, licenses, and certificates associated with the completion of these services, as applicable. Evidence of these requirements is to be made part of the Bid. If a permit is not currently held or the application process is pending, the bidder should indicate such. The Town of Yarmouth reserves the sole right to decide if the Contract may be awarded to the successful bidder despite the failure to produce the actual permits or copies thereof. Licenses and permits must be held in force throughout the terms of the services as contracted. See Section 6 for additional information.

4.24 Prohibitions

Bidders are prohibited from communicating directly with any employee of the procuring Department regarding this IFB except as specified in this IFB, and no other individual Town employee or representative is authorized to provide any information or respond to any question or inquiry concerning this IFB Bidders may contact the contact person using the contact information provided in Section 2 in the event that this IFB is incomplete or the information is missing.

5 INSTRUCTIONS FOR SUBMISSION OF BIDS

Please adhere to the following format when responding to this Invitation for Bid (IFB). Your Bid Proposal should align with the general specifications outlined in Section 4 of this IFB. It is essential for respondents to include all necessary information in their bid proposals to demonstrate that they meet the minimum criteria.

5.1 Submission Requirements

Bid Submittal Form

The following pages in Section 5 must be filled out in their entirety by the Bidder and submitted with the bid.

Additionally, a **5% bid deposit** in the form of a bid bond, bank, or certified check is required with your bid submittal.

5.1.1. Form of General Bid
5.1.2. Combined Certification Form
5.1.3. Reference Form.
This is the section where the Town will rely on information for references. Therefore, please include correct contact information (including phone numbers, email addresses, and business addresses) on any contacts who may have relocated.

Other Attachments

Please ensure all other IFB attachments are properly executed and included in your response, as necessary per the IFB instructions.

Note: 50% Payment bonds, and a Certificate of Insurance are required with the submission of the signed contract.

- ☐ Checklist of Required Signed Submittals:
- ☐ Bid Form
- ☐ Bid Signature Page with Corporate Resolution or List of Partners if applicable
- ☐ Combined Certification Form
- ☐ Reference Form along with a complete list of ongoing projects, projects completed within the past two years, including project names, values and contact names, and email addresses.
- ☐ 5% Bid Bond (payable to TOWN OF YARMOUTH)
- ☐ Sample Contract with each page initialed as acknowledgment. Any terms or conditions that cannot be met by the bidder must be brought to the Town's attention in a Written Question before the deadline. If the matter can be resolved in an Addendum, one will be issued so that all Bidders are notified of any exceptions allowed.

Items required at Contract Signing:

- Proof of Insurance with the Town of Yarmouth named as Additional Insured
- 50% Labor and Materials Payment Bond executed by Massachusetts Licenses Surety

6 MINIMUM CRITERIA

Respondents submitting a bid for this IFB must satisfy all of the Minimum Criteria listed below. Respondents should ensure that bids clearly identify meeting these criteria so that it is easily noted and determined to be met by the evaluator(s). **Bids that do not demonstrate compliance with the Minimum Criteria will be considered non-responsive and will not be further considered.**

6.1. The Respondent must be from an established business, corporation, partnership, firm, or individual who normally provides such services as part of their primary business and has been in operation for at least five (5) years.

6.2. The contractor must have completed a minimum of three similar projects of the same size and scope including the installation of piles, timber framed pedestrian bridge, and land management.

7 APPENDICES

7.1 APPENDIX 1 – IFB EXHIBITS

Exhibits are included within the IFB documents to provide additional information relating to the Chase Brook Park Restoration & Pedestrian Bridge project and to disclose contractual terms and conditions. Exhibits are intended to assist Bidders in formulating their responses and in determining the price. Questions or clarifications relating to this information should be sought following the instructions included in Section 4 of the IFB. The following Exhibits are included with this IFB:

7.1.1 Exhibit 1 Supplement "C"
7.1.2 Exhibit 2 Chase Brook Park Restoration & Pedestrian Bridge – Technical Specifications
7.1.3 Exhibit 3 Town of Yarmouth Standard Contract Form
7.1.4 Exhibit 4 Prevailing Wage Rates #20251110212254
7.1.5 Exhibit 5 Town of Yarmouth Order of Conditions
7.1.6 Exhibit 6 Chapter 91 License
7.1.7 Exhibit 7 Land Management Plan
7.1.8 Exhibit 8 Project Construction Drawings
7.1.9 Exhibit 9 Meadow Establishment Protocol

APPENDIX 1

Tighe&Bond

EXHIBIT 1

Exhibit 1

SUPPLEMENT "C"

[] CONSTRUCTION
SUPPLEMENT "C" - Applicable to Contracts for the construction of:

(1) Public Buildings and Public Works
(governed by the provisions of General Laws Chapter 30B);

(2) Public Buildings
(governed by the provisions of General Laws Chapter 149, § 44A,
et seq.); and

(3) Public Works
(governed by the provisions of General Laws Chapter 30, §39M, et seq)

1. This form supplements the Town of Yarmouth "Contract and General Conditions" and applies only to contracts for the construction, reconstruction, alteration, remodeling or repair of public works or public buildings.

2. Wherever the law requires one contracting with a city or town to be bonded, such obligation shall be understood to be a term and condition of this Contract. The Contractor agrees to secure such bonds (where required) in the form required by the Town and provide an original thereof to the Town prior to the commencement of performance.

3. Equality:

3.1. In the case of a closed Specification written for a specific item or items to be furnished under the Base Bid, such specifications shall, as applicable, be in compliance with the Massachusetts General Laws, Chapter 30, Section 39M and Chapter 149, Sec. 44A et seq.

3.2. Where the name of an item, material or manufacturer is mentioned in the Specifications or on the Drawings, except as above noted, the intent is to establish a standard and in no way should be construed to exclude any item or manufacturer not mentioned by name, but whose product meets the Specifications as to design, utility and quality. Final decision shall rest solely with the Town's Project Representative (herein after "Project Representative") as to its acceptability.

4. Change Orders:

4.1. Change orders must receive the approval of the Town Administrator and the appropriate Department or Division Head and must be supported by the project engineers and architects, if any.

4.2. Change orders to contracts governed by General Laws Chapter 30B may not increase the quantity of goods or services provided by more than twenty-five (25%) percent, in compliance with Sec. 13 of Chapter 30B.

5. The Contractor will carry out the obligations of this contract in full compliance with all of the requirements imposed by or pursuant to General Laws Chapter 151, Sec. 1, et seq. (Minimum

Wage Law) and any executive orders, rules, regulations, and requirements of the Commonwealth of Massachusetts as they may from time to time be amended. The Contractor will at all times comply with the wage rates as determined by the Commissioner of the Department of Labor and Industries, under the provisions of General Laws Chapter 149, Sections 26 and 27D (Prevailing Wage), as shall be in force and as amended.

6. The Contractor shall continuously maintain adequate protection of all work from damage and shall protect the property of the Town and others, including adjacent property, from injury or loss arising in connection with the Contract. The Contractor shall make good any such damage, injury or loss, except as may be directly due to errors in the Contract Documents or caused by agents or employees of the Town, or due to causes beyond the Contractor's control and not the Contractor's fault or negligence.

7. The Contractor shall take all necessary precautions for the safety of employees on the work, and shall comply with all applicable provisions of Federal, State and local laws and codes to prevent accidents or injury to persons on, about or adjacent to the premises where the work is being performed. The Contractor will erect and properly maintain at all times, as required by the conditions and progress of the work, all necessary safeguards for the protection of workers and the public, shall post danger signs warning against the hazards created by such features of construction such as pits, protruding nails, hosts, well holes, elevator hatchways, scaffolding, window openings, stairways and falling materials; and shall designate a responsible member of its organization on the work, whose duty shall be the prevention of accidents.

8. The Town shall at all times have access to the work wherever it is in preparation or progress and the Contractor shall provide suitable accommodations for such access.

9. The Contractor shall appoint a competent superintendent and foreman and any necessary assistants, all of whom shall be satisfactory to the Town. If the Town in its sole discretion determines that the construction superintendent, foreman, or assistants are unacceptable to the Town, then upon seven days' notice from the Town, the Contractor shall replace such person or persons with people acceptable to the Town.

10. The Contractor shall give efficient supervision to the work, using its best skill and attention. The Contractor shall carefully study and compare the drawings, specifications and other instructions and shall at once report to the Town any error, inconsistency or omission which shall be discovered. Included in this responsibility shall be supervision of all work performed by subcontractors on the work.

11. Notwithstanding any other provision of this Contract to the contrary, if the Contractor should neglect to prosecute the work properly, or fail to perform the contract or any of its provisions, the Town, upon three days' written notice, may, without prejudice to any other remedy it may have, make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due the Contractor.

12. Inspection by the Town's Project Representative

12.1. The Town shall have the right to designate a Project Representative who may make periodic 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 Project 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 Project 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 Project 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 to stop the work whenever such stoppage may reasonably be necessary to insure the proper execution of the Contract.

12.2. In connection with the work, 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.

13. Decisions of the Project Representative

13.1. The Project Representative shall, within a reasonable time, make decisions on all claims of the Town or the Contractor and on all other matters relating to the execution and progress of the structural work or the interpretation of the Contract Documents.

13.2. The Project Representative's decision, in matters relating to the project, shall be final, if within the terms of the Contract Documents.

13.3. If, however, the Project Representative fails to render a decision within ten days after the parties have presented their evidence, either party may then avail itself of the remedies provided in this Contract or available to it by law. If the Project Representative renders a decision after such remedies have commenced, such decision may be entered as evidence but shall not disturb or interrupt such proceedings except where such decision is acceptable to the parties concerned.

14.1 Use of Premises by the Contractor:

14.1. The Contractor shall confine its apparatus, the storage of materials and the operations of its workmen to limits indicated by law, by-laws, permits or directions of the Town and shall not unreasonably encumber the premises with its materials.

14.2. The Contractor shall not load or permit any part of the structure to be loaded with a weight that will endanger its safety.

15. Maintenance of Premises:

The Contractor shall at all times keep the premises free from accumulation of waste materials or rubbish caused by its employees or work, and at the completion of the work it shall remove all its rubbish from and about the work site and all its tools, scaffolding and surplus materials and shall leave its work "broom-clean", or its equivalent, unless more exactly specified. In case of dispute, the Town may remove the rubbish and charge the cost to the several contractors, as the Town shall determine to be just.

16. Right to Terminate

16.1 In addition to any other remedies herein provided and notwithstanding any other provisions hereof to the contrary, if the Contractor should (1) be adjudged a bankrupt, (2) make a general assignment for the benefit of creditors, (3) have a receiver appointed on account of its insolvency, (4) persistently or repeatedly refuse or fail to supply enough personnel and resources to perform the contract, (5) fail to make prompt payment to subcontractors or to providers of materials or labor, (6) persistently disregard laws and regulations or lawful directives of the Town, or (7) be guilty of a substantial violation of any provision of the Contract, then the Town may, without prejudice to any other right or remedy and after giving the Contractor (or any surety) seven (7) days' written notice, terminate the contract and the employment of the Contractor and take possession of the premises and of all materials, tools and appliances thereon and finish the work by whatever method it deems appropriate.

16.2 In such cases, the Contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid amount owed to the Contractor for work already completed shall exceed the expense of finishing the work, including compensation for additional architectural, managerial, legal and administrative services, such excess shall be paid to the Contractor. If such expenses shall exceed such unpaid balances, the Contractor shall pay the difference to the Town.

16.3 The Contractor shall not be relieved of liability to, or duty to indemnify, the Town by virtue of any termination of this Contract, and any claim for damages against the Contractor relating to the Contractor's performance under this contract shall survive any termination hereunder.

Notwithstanding any other provision of this Contract, the Town reserves the right at any time in its absolute discretion to suspend or terminate this Contract in whole or in part for its convenience upon seven (7) days' written notice to the Contractor. The Town shall incur no liability by reason of such termination except for the obligation to pay compensation for all work performed by the Contractor and accepted by the Town to the termination date.

17. Progress Payments:

17.1. The Contractor shall, before the first application for payment, submit to the Town a schedule of values of the various parts of the work, including quantities aggregating the total sum of the Contract, divided so as to facilitate payments to Subcontractors, made out in such form as the Town and the Contractor may agree upon, and, if required, supported by such evidence as to its correctness. This schedule, when approved by the Town, shall be used as a basis for payment, unless it is found to be in error. If applying for payments, the Contractor shall submit a statement based upon this schedule.

17.2. The Contractor shall submit to the Town an itemized Application for Payment, supported to the extent required by the Town by invoices or other vouchers, showing payments for materials and labor, payments to Subcontractors and such other evidence of the Contractor's right to payment.

17.3 Subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

17.3.1 Take that portion of the Contract Sum properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the Contract Sum allocated to that portion of the Work in the schedule of values, less retainage of five percent (5 %). Pending final determination of cost to the Owner of changes in the Work, amounts not in dispute shall be included;

17.3.2 Add that portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction (or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing), less retainage of 5 percent (5 %);

17.3.3 Subtract the aggregate of previous payments made by the Town; and

17.3.4 Subtract amounts, if any, for which the Town has withheld or nullified a Certificate for Payment as provided in Section 18, below.

18. Withholding of Payments

18.1. The Town may withhold or, on account of subsequently discovered evidence, nullify the whole or part of any payment to such extent as may be necessary in its reasonable opinion to protect the Town of Yarmouth from loss on account of:

18.1.1. Defective work not remedied.

18.1.2. Claims filed or reasonable evidence indicating probable filing of claims.

18.1.3. Failure of the Contractor to make payments properly to Subcontractors or for material or labor.

18.1.4. A reasonable doubt that the Contract can be completed for the balance then unpaid.

18.1.5. Damage to another contractor.

18.1.6. Delays resulting in liquidated damages.

18.2. Withholding of payments shall be in strict compliance with statutory requirements.

19. Claims by Contractor and Liability of Town

19.1 All claims by the Contractor against the Town shall, unless otherwise provided by law, be initiated by a written claim submitted to the Town no later than seven (7) calendar days' after the event or the first appearance of the circumstances causing the claim. The claim shall set forth in detail all known facts and circumstances supporting the claim. The Contractor shall continue its

performance under this contract regardless of the submission or existence of any claims.

19.2 The limit of liability of the Town under this Contract is limited to the compensation provided herein for work actually performed, and shall in no event include liability for delays or for incidental, special or consequential damages or lost profits or for damages or loss from causes beyond the Town's reasonable control.

20. Damages for Delay:

The Contractor shall have no claims for any damages, costs, or expenses of any kind or nature, for any suspension, delay, interruption, frustration, obstruction, hindrance, interference, compression or acceleration of the work on the part of the Town, architect, or any of their consultants in performing or furnishing any work, or resulting from problems or deficiencies with materials, information, or documentation and/or decisions in connection with the execution of the work. Except as otherwise provided by applicable law, the Contractor's sole remedy for such delay shall be for a claim for an extension of time to the time for contract performance.

21. Liquidated Damages:

Because both parties recognize (1) that the time for completion of this Contract is of the essence, (2) that the Town will suffer loss if the work is not completed within the contract time specified, plus any extension thereof allowed in accordance with the provisions of this contract, and (3) the delays, expense and difficulties involved in a legal proceeding to determine the actual loss suffered by the Town if the work is not completed in time, it is agreed that the Contractor will pay the Town as liquidated damages representing an estimate of delay damages to which the Contractor agrees by entering into this Contract, not as a penalty, the sum of One Thousand Dollars ($1,000) per day for each calendar day of delay until the work is completed, whether the work is completed by the Contractor or some other person. The Town's right to impose liquidated damages shall in no way prohibit or restrict the Town's right to bring a legal action for damages in lieu of or in addition to its option to impose liquidated damages. The Town may deduct any liquidated damages from money due the Contractor, and if such payment is insufficient to cover the liquidated damages, then the Contractor shall pay the amount due.

22. The Contractors' Mutual Responsibility:

Should the Contractor cause damage to any separate subcontractor on the work, the Contractor agrees, upon due notice, to settle with such contractor by agreement, or by recourse to remedies provided by law or by the provisions of the contract. If such separate contractor sues the Town on account of any damage alleged to have been sustained, the Town shall notify the Contractor, who shall defend such proceedings at the Town's expense and, if any judgment against the Town arises therefrom, the Contractor shall pay or satisfy it and pay all costs incurred by the Town including attorney's fees and related costs of litigation.

23. Separate Contracts:

23.1. The Town reserves the right to let other Contracts in connection with this work under similar General Conditions. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate its work with theirs.

23.2. If any part of the Contractor's work depends, for proper execution or results, upon the work of any other contractor, the Contractor shall inspect and promptly report to the Town any defects in such work that render it unsuitable for such proper execution and results. Failure of the Contractor to so inspect and report shall constitute an acceptance of the other contractor's work as fit and proper for the reception of its work except as to defects which may develop in the other contractor's work after the execution of its work.

23.3. To ensure the proper execution of its subsequent work, the Contractor shall measure work already in place and shall at once report to the Town any discrepancy between the executed work and the Drawings.

24. Subcontracts:

24.1. All Subcontracts shall be awarded in conformity with the requirements of the General Laws, Commonwealth of Massachusetts, Chapter 149, Sections 44A to 44L, inclusive.

24.2. The Contractor agrees that it is as fully responsible to the Town for the acts and omissions of its Subcontractors and of persons either directly or indirectly employed by them, as it is for the acts and omissions of persons directly employed by it.

24.3. Nothing contained in the Contract Documents shall create any contractual relationship between any Subcontractor and the Town.

25. Contractor-Subcontractor Relations:

The Contractor agrees to bind every Subcontractor and every Subcontractor agrees to be bound by the terms of the Agreement, the General Conditions of the Contract, the Supplementary General Conditions, the Drawings and Specifications, as far as applicable to its work, including the provisions of the General Laws, Commonwealth of Massachusetts, Chapter 149, Section 44A, et seq.

26. The Contractor's Insurance:

Notwithstanding any other provisions of this Contract to the Contrary and in addition to any requirements set forth in the Contract, the Contractor shall provide and maintain the following insurance:

26.1. The Contractor shall purchase and maintain such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations under the Contract, whether such operations be by itself or by any Subcontractor or by anyone directly or indirectly employed by any of them or by anyone for whose acts any of them may be liable.

26.2 Liability Insurance Requirements

In addition to the liability insurance requirements set forth in the Contract, the liability insurance shall include all major divisions and shall be on a comprehensive general basis including Premises and Operations, Owners and Contractor's Protective, Products and Completed

Operations, and Owned, Non-owned and Hired Motor Vehicles. All such insurance shall be written for not less than any limits of liability required by law, unless otherwise provided in the Contract Documents. The Contractor's insurance shall include:

Excess Liability (Umbrella) $3,000,000

Excess Liability (Umbrella) Insurance (Subcontractors) $1,000,000 or 1.5 times the value of the subcontract, whichever is higher.

26.3. The above insurance policies shall also be subject to the following requirements:

26.3.1. Insurance coverage for the Contractor's Comprehensive General Liability, as hereinafter specified under Paragraph entitled "Protective Liability Insurance" shall be written by one and the same insurance company to avoid the expense of duplicate and/or overlapping coverage and to facilitate and expedite the settlement of claims.

26.3.2 All premium costs shall be included in the Contractor's bid.

27. Protective Liability Insurance:

27.1. The Contractor shall purchase and maintain such insurance as described in the preceding paragraph as will protect the Town from claims which may arise from operations under the Contract, including operations performed for the named insureds by independent contractors and general inspection thereof by the named insureds.

27.2. The Contractor shall also purchase and maintain such insurance as will protect the Town against Automobile Non-Ownership Liability in connection with the Contractor's operations under the Contract, whether such operations be by itself or by any Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable.

27.3. The limits of liability for coverage required under the Contract shall be as specified within the Contract Documents.

27.4 The Town shall be named as an additional insured on the above referenced liability Policies, and the Contractor's insurance shall be the primary coverage. The cost of such insurance, including required endorsements and amendments, shall be the sole responsibility of the Contractor.

28. Liens:

Neither the Final Payment nor any part of the retained percentage shall become due until the Contractor, if required, shall deliver to the Town a complete release of all liens arising out of the Contract, or receipts in full in lieu thereof and, if required in either case, an affidavit that as far as it has knowledge or information, the releases and receipts include all the labor and material for which a lien could be filed. The Contractor shall comply with all statutory provisions of the General Laws of the Commonwealth of Massachusetts with regard to liens, Chapter 254 and 149 as amended (as a minimum requirement).

29. Guarantees:

29.1 The Contractor guarantees and warrants to the Town that all labor furnished under this Contract will be competent to perform the tasks undertaken, that the product of such labor will yield only first-class results, that materials and equipment furnished will be of good quality, new, and of recent manufacture unless otherwise permitted by this Contract, and that the Work will be of good quality, free from faults and defects and in strict conformance with this Contract. All Work not conforming to these requirements may be considered defective.

29.2. If at any time any part of the work constructed under the terms of this contract shall in the opinion of the Town Administrator require repairing due to defective work or materials furnished by the Contractor, he may notify the Contractor in writing to make the required repairs. If the Contractor shall neglect to start such repairs within ten days of the date of giving it notice thereof and to complete the same to the satisfaction of the Town Administrator with reasonable dispatch, then the latter may employ other persons to make such repairs. The Town shall charge the expense thereof to the Contractor and may use any moneys still retained to pay for the same, and if such sum is insufficient, the Contractor shall be obligated to pay the balance thereof.

29.3. All guarantees and warranties required in the various Sections of the Specifications which originate with a Subcontractor or Manufacturer must be delivered to the Town before final payment to the Contractor may be made for the amount of that subtrade or for the phase of work to which the guarantee or warranty relates. The failure to deliver the required guarantee or warranty shall be held to constitute a failure of the Subcontractor to fully complete his work in accordance with the Contract Documents. The Contractor's obligation to correct work is in addition to, and not in substitution of, such guarantees or warranties as may be required in the various Sections of the Specifications.

Exhibit 2 – CHASE BROOK PARK RESTORATION & PEDESTRIAN BRIDGE – TECHNICAL SPECIFICAITONS

Tighe&Bond

EXHIBIT 2

Chase Brook Park Restoration & Pedestrian Bridge
Technical Specifications
Town of Yarmouth, Massachusetts
Chase Brook Park, Yarmouth, MA

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SECTION 01110

SUMMARY OF WORK

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Work of the Contract is shown and described in Drawings and Project Manual entitled:

Chase Brook Park Restoration & Pedestrian Bridge
Public Works Department
Town of Yarmouth
October 2025

Tighe & Bond, Inc.
Consulting Engineers
Westfield, Massachusetts

2. The Work includes the following major items:

a. Removal of Brick Walkway, Trees, and Invasive Management

b. Installation of Timber Piles for Pedestrian Bridge

c. Site Grading, Park walkways

d. Construction of Pedestrian Bridge

e. Vegetative Plantings

f. Coir Logs for Bank Stabilization

g. Benches and Interpretive Signs

h. Ongoing invasive management

B. Related Requirements

1. Town of Yarmouth Contract Documents

1.2 SUBMITTALS

A. Informational Submittals

1. Submit copies of permits or approvals required for the Work, prior to initiating the Work.

1.3 PROJECT/SITE CONDITIONS

A. Permits

1. Obtain the permits and approvals listed below:

a. US EPA Dewatering General Permit

b. Permits and licenses of a temporary nature necessary to perform the Work.

c. Permits for disposal of construction wastes including disposal of cleared and grubbed materials.

d. Other permits or licenses required for the Contractor's operations or required elsewhere in the Contract Documents and not included herein.

2. Comply with the permits and approvals listed below:

a. Town of Yarmouth Conservation Commission Order of Conditions. A copy of the Order of Conditions is included in Exhibit 5.

b. MADEP Chapter 91 License. A copy is included in Exhibit 5.

c. ACOE Approval of Preconstruction Notification Requirements in Exhibit 5

3. Obtain required time extensions to permits obtained by the Contractor, if construction authorized by permits has not been completed by the expiration date noted on these permits.

4. Permits require that a representative of the permitting authority or the Owner be present on site during construction or given the opportunity to observe conditions prior to backfilling or otherwise proceeding with construction. Notify the Owner, Engineer, and the permitting authority prior to performing Work that is governed by the permit.

5. Obtain permits and approvals from appropriate jurisdictional agencies and property owners for use of premises not furnished by the Owner, and for all off-site areas.

6. Submit copies of permits prior to performance of Work authorized by permits.

B. Existing Conditions

1. Use of Premises and Off-site Work

a. The Work shall occur on the Owner's property within the limits of Work shown on the Drawings.

b. Land owned by the Owner is available for staging and is shown on the Drawings.

c. Obtain permits and approvals for use of any land and access thereto that is deemed necessary for the Work, where such land is not available for use by the Owner, including land for temporary construction facilities, access and egress, or for storage of materials. Confine apparatus and storage to such additional areas.

d. Obtain permits and written approvals from appropriate jurisdictional agencies for the use of premises not available for use by the Owner, including all offsite staging areas, borrow pits and waste areas. Submit copies of all permits and approvals to the Owner prior to using areas.

e. Provide for the disposal of waste materials off-site in accordance with all applicable laws.

f. Adhere to the limits of Work as indicated, to minimize obstruction to traffic and inconvenience to the Owner, general public, and residents in the vicinity of the Work, and to protect people and property. Keep fire hydrants on or adjacent to the Work accessible to fire fighting equipment at all times.

g. Make temporary provisions for the use of sidewalks and maintain functioning gutters, stormwater systems, drainage ditches, and culverts.

h. Maintain public access to businesses and residences including driveways and parking lots at all times during the Work.

C. Other Requirements

PART 2 PRODUCTS

2.1 MATERIALS FURNISHED BY OWNER

A. The Owner will not furnish any materials, labor or equipment under this Contract.

PART 3 EXECUTION – NOT USED

END OF SECTION

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SECTION 01140

WORK RESTRICTIONS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Work Schedule
2. Construction Constraints
3. Vehicle Access
4. Available Work Area
5. Site Usage Plan

B. Related Requirements

1. Section 01310 - Coordination
2. Section 01325 - Scheduling of Construction

1.2 SUBMITTALS

A. Incorporate the requirements of this Section in the project schedule submitted under Section 01325.

B. Action Submittals

1. Submit site usage plan within 30 days of the Notice to Proceed.

1.3 WORK SCHEDULE

A. Conduct the Work during daylight hours on Monday through Friday, and within the time between 7:00 a.m. and 5:00 p.m. No work is to be done on Owner's holidays, Saturdays, Sundays or outside of the work hours described above, without prior approval. No equipment or machinery may be started at the sites before 8:00 a.m. and all equipment must be shut off by 4:00 p.m.

B. No tree cutting shall occur between April 1st and October 1st of any year.

C. Invasive species removal shall be completed between September 1st and April 1st of any year.

D. No herbicide treatment shall be used between April 1st and June 30th of any year.

E. Planting shall occur after the removal of plants is 80% complete and occur within April 15th to June 15th or September 15th to October 15th of any year.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 VEHICLE ACCESS

A. No vehicles will be permitted to travel over the wetland, except within approved staging locations or where work has have been approved by the Engineer, Owner, or Conservation Commission for Contractor access as shown on the drawings.

3.2 AVAILABLE WORK AREA

A. The Contractor shall make as minimal disturbances to wetland areas as possible during construction. Any disturbed areas shall be restored to their original conditions at the contractors expense.

B. Limits of construction are defined on the Drawings. No work will be permitted to be performed outside these boundaries.

3.3 SITE USAGE PLAN

A. Locations of available staging areas are shown on the Drawings.

B. Submit a site usage plan showing all proposed staging areas, locations of all office and storage trailers, and material laydown areas. The site usage plan should be a drawing showing the proposed locations and shall include on-site traffic modifications and temporary utilities as may be applicable. Submit plan to Owner for review. Modify plan per Owner comments.

END OF SECTION

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SECTION 01295

SCHEDULE OF VALUES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Schedule of Values

1.2 SUBMITTALS

A. Action Submittals

1. Submit 3 copies of the Schedule of Values for approval within 10 days after the Effective Date of the Agreement.

1.3 SCHEDULE OF VALUES

A. Schedule of Values shall be a detailed breakdown of the lump sum Work items showing values allocated to the various elements of the Work.

B. The format of the Schedule of Values shall be a breakdown by Specification Section and content and shall be submitted on EJCDC C-620, Contractor's Application for Payment. The Engineer may require additional detailed documentation to support the values in the form of executed purchase orders, subcontracts, or other agreements.

C. The Engineer will determine the level of breakdown and detail required. The breakdown shall include materials, installation, and start-up for equipment and controls where applicable. The final document will be the basis of payment requests for the duration of the Contract. No progress payment will be made until the Schedule of Values is approved by the Engineer.

D. An unbalanced Schedule of Values providing overpayment on items of work performed first will not be accepted.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

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SECTION 01310

COORDINATION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Project Management
2. General Coordination Procedures
3. Requests for Information (RFIs)
4. Coordination Drawings
5. Project Meetings

B. Related Requirements

1. Section 01140 - Work Restrictions
2. Section 01325 - Scheduling of Construction

C. Related Work Not Included

1. Operation of existing facilities will be performed by the Owner unless otherwise specified. The Owner will assist in arranging operation of any existing facilities or equipment required by the Contractor to connect to existing facilities, and the Contractor shall not operate existing valves or equipment. Only the Owner will operate Owner valves.

1.2 SUBMITTALS

A. Incorporate the requirements of this Section, as well as Work which may impact the existing system operation, or the operations of any adjacent utility, in the project schedule submitted under Section 01325.

B. Informational Submittals

1. Submit to the affected utility company, the Owner, and the Engineer, in writing, all requests for temporary shutdowns of facilities or interruption of operations. No shutdowns or interruptions to existing operations will be permitted except as outlined in this Section. Submit requests at least 2 weeks prior to the beginning of the Work requiring shutdown or interruption. No shutdown shall occur without the approval of the utility company or the Owner.
2. RFI Log
3. At the pre-construction conference, supply to the Owner the cell phone number of a responsible person who may be contacted during off-hours for emergencies 24 hours a day, seven days a week.
4. Prepare a contact list of phone numbers, including cell phone numbers, and emails for all Project personnel and submit to the Engineer within one week

after the pre-construction conference. Include Contractor, Owner, Engineer, and Town personnel including police, fire, and ambulance.

1.3 PROJECT MANAGEMENT

A. Retain a full-time Superintendent, satisfactory to the Owner and Engineer. The Superintendent shall not be changed except with the consent of the Owner and Engineer. The Superintendent shall be in full charge of the Work.

B. Complete the Work in a continuous uninterrupted operation. Use sufficient personnel and adequate equipment to complete the Work within the Contract Time.

1.4 GENERAL COORDINATION PROCEDURES

A. Do not interfere with the operation of the existing facilities.

B. Coordinate with appropriate utility companies, as well as with the Owner, where the Work crosses or is adjacent to existing utilities.

A. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Include the following:

1. Project name
2. Name and address of Contractor
3. Name and address of Engineer
4. RFI number including RFIs that were returned without action or withdrawn
5. RFI description
6. Date the RFI was submitted
7. Date Engineer response was received
8. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate

B. On receipt of Engineer's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Engineer within seven days if Contractor disagrees with response.

1.5 REQUEST FOR INFORMATION (RFI)

A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

1. Engineer will return without response those RFIs submitted to Engineer by other entities controlled by Contractor.
2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name

2. Project number
3. Date
4. Name of Contractor
5. Name of Engineer
6. RFI number, numbered sequentially
7. RFI subject
8. Specification Section number and title and related paragraphs, as appropriate
9. Drawing number and detail references, as appropriate
10. Field dimensions and conditions, as appropriate
11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
12. Contractor's signature
13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

C. Engineer's Action: 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.

1.6 PROJECT MEETINGS

A. Pre-Construction Conference

1. The Contractor shall be prepared to discuss the following subjects at the Pre-Construction Conference. Documentation for these items is required to be submitted within the time frames included in individual specification sections.
    a. Project scheduling
    b. Sequencing of critical path Work items
    c. Shop Drawing procedures
    d. Project changes and clarification procedures
    e. Use of sites, access to Work areas, office and storage areas, security and temporary facilities
    f. Contractor safety plan and representative
    g. Progress payments and procedures
    h. Required documentation
    i. Project personnel contact list

B. Progress Meetings

1. Progress meetings will be held every 2 weeks and at other times as requested by the Owner or as required by the Progress of the Work.

2. The Contractor's Superintendent shall attend all progress meetings.

3. At a minimum, progress meetings will review Work progress, schedule, Shop Drawing submission schedule, Applications for Payment, and other matters needing discussion and resolution.

4. Review the schedule with all parties to be affected by upcoming work.

5. Review the monthly construction report required under Section 01325.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 GENERAL

A. Notify DIGSAFE at 1-888-344-7233 at least 72 hours prior to any digging, trenching, rock removal, demolition, borings, backfill, grading, landscaping, or any other earth moving operations.

3.2 COORDINATION WITH THE OWNER'S OPERATIONS

A. Notify the Owner and Engineer, in writing, a minimum of 1 week in advance of commencing Work on site. Work on site shall not occur until all required permits are obtained. It is the responsibility of the contractor to obtain all necessary construction permits.

B. Notify the Owner and Engineer, in writing, a minimum of 1 week before commencing any work which may affect the Owner's operations.

C. Perform all construction activities so as to avoid interference with operations of the facility and the work of others.

D. The Owner has the authority to order the Work stopped. Any costs and/or delays associated with these work stoppages due to the Contractor's operation shall be borne by the Contractor.

3.3 SEQUENCE OF CONSTRUCTION

A. The Contractor will be allowed reasonable flexibility in scheduling the construction activities. Provide a detailed construction schedule as required in Section 01325.

END OF SECTION

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SECTION 01320

CONSTRUCTION PHOTOGRAPHS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Photographs taken at specified intervals before, during, and after construction.

1.2 SUBMITTALS

A. Informational Submittals

1. Submit electronic files of each photograph .

PART 2 PRODUCTS

2.1 CONSTRUCTION PHOTOGRAPHS

A. Electronic files shall be in .jpg format.

PART 3 EXECUTION

3.1 PRE-CONSTRUCTION PHOTOGRAPHY

A. Prior to the commencement of any Work under this Contract, take photographs to clearly show the existing conditions of the project area. The photographs will serve as a record of the original conditions where construction activities will occur.

B. The area to be photographed shall include, but not be limited to, the area within and adjacent to the proposed construction, including roadways, utilities, driveways, landscaping, trees, structures and buildings.

C. Provide a minimum of 50 preconstruction photographs, or more as required to document the preconstruction condition of the Site and adjacent properties.

3.2 PROGRESS PHOTOGRAPHY

A. Take construction photographs of active work areas at least every week throughout the life of the Contract. The photographs shall be indicative of the work that is currently in progress.

B. Take photographs of all utility abandonments.

C. Take photographs of all relocated utility connections.

3.3 POST-CONSTRUCTION PHOTOGRAPHY

A. Provide post construction photography after all Work has been completed at each location. The locations to be photographed and the number of photographs required shall be as specified in Paragraph 3.1 for the preconstruction photography.

END OF SECTION

SECTION 01325

SCHEDULING OF CONSTRUCTION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Progress Schedule

B. Related Requirements

1. Section 01140 - Work Restrictions

2. Section 01310 - Coordination

1.2 PROGRESS SCHEDULE

A. Graphically show the order and interdependence of activities, sequence of Work, how the start of a given activity depends on completion of preceding activities, and how completion of an activity may restrain the start of subsequent activities.

B. The Work shall be planned by the Contractor and his Project field superintendent in coordination with all Subcontractors and Suppliers whose Work is shown on the Progress Schedule.

C. Take into consideration Shop Drawing submittal and approval time, the delivery times of equipment and materials, Subcontractors' Work, availability and abilities of workmen, weather conditions, any restrictions in operations at the Work site, and all other items that may affect completion of the Work within the Contract Time.

D. The Progress Schedule shall reflect the requirements and constraints outlined in Section 01310, Coordination.

E. The Progress Schedule shall reflect Work restrictions outlined in Section 01140.

F. Show information in such detail that duration times of activities will range from one to 15 days. The selection and number of activities shall be subject to the approval of the Owner and Engineer.

G. The Progress Schedule should show preceding and following event numbers for each activity, description of each activity, and activity duration in calendar days.

H. Submit the Progress Schedule on maximum sheet size 30-inches high by the width required.

1.3 SUBMITTALS

A. Informational Submittals

1. Submit four prints of the preliminary Progress Schedule prepared in accordance with Section 3.3 of the Initation for Bids and the requirements of this section. Progress schedule must be submitted within 10 days after the Effective Date of the Agreement. Progress Schedule must be approved by the Owner and Engineer before the first progress payment will be made.

2. Revised analyses - Within 10 days after receipt of the review comments, submit four prints of the Progress Schedule revised in accordance with those comments.

3. Periodic reports - On the first progress meeting of each month, submit four prints of the updated Progress Schedule, as well as a report of construction activities in the prior month.

4. Before initiating the Work, submit an estimated monthly rate of Contractor payments for the project. If the payment schedule deviates from the original projection, submit a revised rate of expenditure schedule.

1.4 PERIODIC REPORTS

A. At the first scheduled progress meeting of each month, present four copies of a construction report which details the Work performed during the preceding period. The report shall include the following at a minimum:

1. Actual progress of Work. Update the Progress Schedule accordingly.

2. The Progress Schedule, or revised Progress Schedule, should show the portions of the Progress Schedule impacted by the Work progress.

3. Activities or portions of activities completed during the reporting period, and their total value as basis for Contractor's periodic request for payment. Payment made will be based on the total value of such activities completed or partially completed after verification by the Engineer.

4. State the percentage of the Work actually completed and scheduled as of the report date, and the progress along the critical path in terms of days ahead of or behind the dates defined in the Progress Schedule.

5. If the Work is behind the dates set forth in the Progress Schedule, also report progress along other paths with negative slack.

6. Include a narrative which includes:

a. A description of problem areas, anticipated and current

b. Delaying factors and their impact

c. An explanation of corrective actions taken or proposed

7. Show the date of latest revision.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

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SECTION 01330

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Action Submittals

2. Informational Submittals

1.2 DEFINITIONS

A. Action Submittals – includes written and graphic information submitted by Contractor that requires Engineer's approval.

B. Informational Submittals – includes information submitted by Contractor that does not require Engineer's approval. The Engineer will acknowledge receipt of such documents and provide comments when the submittals lack the detail required by the Contract Documents.

1.3 ACTION SUBMITTALS

A. Shop Drawings

1. Shop Drawings as defined in the General Conditions, and as specified in individual work sections include, but are not necessarily limited to, custom-prepared data such as fabrication and erection/installation drawings, schedule information, piece part drawings, actual shop work manufacturing instructions, special wiring diagrams, coordination drawings, individual system or equipment inspection and test reports including performance curves and certification, as applicable to the Work.

2. Shop Drawings shall be of standardized sizes to enable the Owner to maintain a permanent record of the submissions. Approved standard size drawings shall be

a. 24 inches by 36 inches

b. 22 inches by 34 inches

c. 11 inches by 17 inches

d. 8.5 inches by 11 inches

3. Submit Shop Drawings at the proper time to prevent delays in delivery of materials. Coordinate submittals for related or interdependent equipment.

4. Advise the Engineer in writing of any deviations from the requirements of the Contract Documents.

5. Check all Shop Drawings regarding measurements, size of members, materials, and details to determine if they conform to the Contract Documents. Shop Drawings found to be inaccurate, not in compliance, or otherwise in error shall be returned to the Subcontractors or Suppliers for correction before submission to the Engineer. Drawings that are current shall be marked with the date, name, and approval stamp of the Contractor.

6. All details on Shop Drawings submitted for approval shall show clearly where correct fabrication of the work depends upon field measurements and such measurements shall be made and noted on the Shop Drawings before being submitted for approval.

7. Detailed installation drawings (benches, signs, piles, and bridge, etc.) shall be drawn to scale and fully dimensioned.

8. No material or equipment shall be purchased or fabricated until the required Shop Drawings have been submitted and approved. Materials and equipment and the work involved in their installation or incorporation into the Work shall then be as shown in and represented by the Shop Drawings.

9. Until the necessary approval has been given, do not proceed with any portion of the work, the design or details of which are dependent upon the design or details of work, materials, equipment or other features for which approval is required.

10. If submitted equipment requires modifications to any details shown on the Drawings, details of the proposed modifications must also be submitted for approval. If such equipment and modifications are approved, perform all Work necessary to make such modifications at no additional cost to the Owner.

B. Product Data: Product data as specified in individual Sections, include, but are not necessarily limited to, standard prepared data for manufactured products (catalog data), such as the manufacturer's product specification and installation instructions, availability of colors and patterns, manufacturer's printed statements of compliances and applicability, roughing-in diagrams and templates, catalog cuts, product photographs, standard wiring diagrams, printed performance curves and operational-range diagrams, production or quality control inspection and test reports and certifications, mill reports, product operating and maintenance instructions and recommended spare-parts listing, and printed product warranties, as applicable to the Work.

C. Samples and color selection charts: Provide sample, when requested by individual Specification to establish conformance with the Specifications, and as necessary to define color, texture and pattern selections available.

D. Product Substitutions: In accordance with Section 01630.

E. Operation and Maintenance Manuals: In accordance with Section 01770.

F. Schedule of Values: In accordance with Section 01295.

G. Site Usage Plan: In accordance with Section 01140.

1.4 INFORMATIONAL SUBMITTALS

A. Schedule of Submittals

1. Submit a preliminary Schedule of Submittals within 10 days of the Effective Date of the Agreement in accordance with Section 3.3 of the Invitation for Bids.

B. Schedule of Manufacturers and Suppliers

1. Submit a schedule of manufacturers and Suppliers within 7 days after Notice to Proceed including the names and addresses of the manufacturers and Suppliers of materials and equipment to be incorporated into the Work.

C. Schedule of Major Products

1. Submit a schedule of major products within 30 days after Notice to Proceed including a complete list of major products proposed for use, with specification section number, name of manufacturer, trade name, and model number of each product.

D. Product Listing and Manufacturers Qualifications

1. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation and reference standards. Specifically identify the products, the anticipated schedule for delivery and storage, and the estimated value thereof for materials which the Contractor intends to request approval for off-site storage.

E. Certificates of Compliance

1. General:

a. Submit sworn certificates from the manufacturer or material supplier that the materials and fabrications provided under the Specification section conform with the Contract Documents.

b. Certificates shall be signed by an officer of the manufacturer's corporation and witnessed by a Notary Public.

2. Welding: Submit in accordance with individual Specification sections.

3. Installer: Prepare written statements on manufacturer's letterhead certifying that installer complies with requirements as specified in individual Specification sections.

4. Material Test: Prepared by qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.

5. Certificates of Successful Testing or Inspection: Submit when testing or inspection is required by Laws and Regulations or governing agency, or when specified in individual Specification sections.

6. Manufacturer's Certificate of Compliance: In accordance with individual Specification sections.

F. Application for Payment

1. Submit applications for payment in accordance with Section 01270, Measurement and Payment, Application and Certificate for Payment.

2. Submit schedule of stored materials when requesting payment for materials not yet installed.

G. Construction Photography and Videography: Provide preconstruction, progress, and post-construction photography and videography in accordance with Sections 01320 and 01321.

H. Contract Closeout Submittals: In accordance with Section 01770.

I. Contractor Design Data

1. Written and graphic information
2. List of assumptions
3. List of performance and design criteria
4. Summary of loads or load diagram
5. Calculations
6. List of applicable codes and regulations
7. Name and version of software
8. Information requested in individual Specification section

J. Manufacturer's Instructions: Written or published information that documents manufacturer's recommendations, guidelines, and procedures in accordance with individual Specification sections.

K. Schedules - Submit construction progress schedules and schedule updates in accordance with Section 01325.

L. Statement of Qualifications: Submit evidence of qualification, certification, or registration as required in Contract Documents to verify qualifications of professional land surveyor, engineer, materials testing laboratory, specialty subcontractor, trade, specialist, consultant, installer, and other professionals.

M. Submittals Required by Laws, Regulations, and Governing Agencies

1. Submit promptly notifications, reports, certifications, payrolls, and other required information as may be required, directly to the applicable federal, state, or local governing agency or their representative.
2. Transmit to Engineer for Owner's records, one copy of correspondence and transmittals (including enclosures and attachments) between Contractor and governing agency.

N. Test and Inspection Reports

1. Submit test and inspection reports as required by individual Specification sections.
2. Test and inspection reports shall contain signature of person responsible for test or report.
3. Reports shall include identification of product and Specification, project name, date and time of test, type of test, location, test results, corrective action required if report indicates test is not in compliance with Contract Documents, interpretation of test results, and other information as required in individual Specification sections.

O. Equipment Data: Submit information on equipment to be used in the performance of the Work as required by individual Specification sections.

P. Testing and Start-up Data: Prepare and submit testing procedures proposed to perform testing required by individual Specification sections.

Q. Vendor Training Plan: At least two weeks prior to scheduling training of Owner's personnel, submit lesson plans for vendor training in accordance with individual Specification section and manufacturer's Operations and Maintenance Manuals.

R. Health & Safety Plans: When specified in individual Specification sections, prepare and submit a Health and Safety Plan modified or supplemented to include job-specific considerations.

S. Submittals stamped by another Professional Engineer: When specified in individual Specification sections, prepare and submit calculations and/or drawings stamped by a Professional Engineer licensed in the State where the work is being performed.

T. Coordination Drawings: When specified in individual Specification sections, prepare and submit drawings to show how multiple system and interdisciplinary work will be coordinated. Examples are conduit routing diagrams, duct layouts, utility coordination drawings, sprinkler plans etc.

U. Work Plans: When specified in individual Specification sections, prepare and submit copies of all work plans needed to demonstrate to the Owner that Contractor has adequately thought-out the means and methods of construction and their interface with existing facilities.

V. Erosion Control Plan: When specified in Contract Documents or required by local ordinances or regulations, prepare and submit copies of erosion control plans.

W. Traffic Control Plan: When specified in Contract Documents or required by local ordinances or regulations, prepare and submit copies of traffic control plans.

X. Shutdown Requests: Submit notification of any outages required (electrical, flow processes, etc.) as may be required to tie-in new work into existing facilities. Unless otherwise specified, provide outage requests a minimum of 7 days' notice shall be provided.

Y. Equipment Data: When specified in other Specification sections, information on equipment used by the Contractor to complete the Work, such as compaction equipment and closed-circuit television inspection equipment.

1.5 PROCEDURES

A. Coordination

1. Prepare and submit documentation in advance of fabrication and product manufacturer, so that the installation will not be delayed, other related work can be properly coordinated, and there is adequate time for review and resubmission, if required.

2. Provide no less than 30 days for review of submittals from the time received by the Engineer. For submittals of major equipment, that require more than 30 days to review, due to complexity and detail or those requiring review by multiple engineering disciplines, Engineer will notify Contractor of the circumstances and identify the anticipated date when the submittal will be returned.

3. Re-submittals will be subject to same review time.

4. No extension of time will be authorized due to failure to provide approvable submittals sufficiently in advance of the Work.

B. Review Shop Drawings, product data, and samples prior to submission and verify and determine:

1. Field measurements

2. Conformance with the Contract Documents. Advise the Engineer in writing of any deviations from the requirements of the Contract Documents.

3. Delete or strike out information that is not applicable to the Work.

C. Upload the electronic submittal files via Procore. Access to Procore will be provided by the Engineer. Files must be in .pdf format. The submittals will be returned in electronic .pdf format via Procore.

D. In addition to the electronic submission requirement, submit three hard copies of each submittal: two for Owner and one for Engineer's construction observer.

1. Samples – Provide three unless otherwise noted in the individual Specification section. Sample will be retained by Engineer in the field.

2. Mark up and retain one returned sample set as the project record sample.

E. Numbering: Submissions shall be accompanied by a transmittal form referencing the project name and applicable Specification section. Submittals shall be numbered sequentially, with the applicable Specification section and a hyphen preceding the number. (*e.g.* Submittal number 11330-01). Resubmittals shall bear the same transmittal number with a revision number commencing with "1" (*e.g.* Submittal number 11330-01-1).

F. Provide a copy of the Submittal Certification Form (copy attached at the end of this section) which shall be attached to every copy of each submittal as required under Article 7.16 A.2 of Section 00700. Apply the Contractor's stamp and initials or signature certifying that the submission has been thoroughly reviewed for completeness, compliance with the Contract Documents, coordination with adjacent construction and dimensional compatibility. Items submitted without the stamp or that are incomplete will be returned by the Engineer for rework and resubmission.

G. Provide a copy of the PE Certification Form (copy attached at the end of this section) which shall be attached to every copy of each submittal stamped by another Professional Engineer. Items submitted without the completed certification form will be returned by the Engineer for resubmission.

H. Distribute copies of reviewed submittals along with the Engineer's transmittal to concerned parties with instructions to promptly report any inability to comply with the provisions or integrate the requirements with interfacing work.

I. Partial and Incomplete Submittals

1. Shop Drawings shall be submitted as a complete package by Specification section, unless otherwise reviewed and approved by the Engineer. It is the intent that all information, materials, and samples associated with each Specification section be included as a single submittal for the Engineer's review.

2. Engineer will return entire submittals if preliminary review deems it incomplete including:

a. Missing or incomplete Submittal Certification Form

b. Insufficient number of copies

c. Missing content

3. Partial submittals may be considered, at Engineer's option, only when necessary to expedite the Project.

4. Partial submittals shall be clearly identified as such on the transmittal to identify missing components.

J. Submittals not required by the Specification will be returned without review or action code.

K. Resubmission

1. Make corrections and modifications required by the Engineer and resubmit until approved.

2. Clearly identify changes made to submittals and indicate other changes that have been made other than those requested by the Engineer.

3. A maximum of two re-submissions of each shop drawing will be reviewed, checked and commented upon without charge to the Contractor (total of 3 submittals). Any additional submissions which are required by the Engineer to fulfill the stipulations of the Contract Documents will be charged to the Contractor as described in paragraph 7.16.E.2 of Section 00700.

L. Distribution

1. Distribute approved Shop Drawings and approved product data to the Project Site and elsewhere as required to communicate the information to Suppliers, Subcontractors, and field personnel.

1.6 ENGINEER'S REVIEW

A. The Engineer will review submittals for design, general methods of construction and detailing. The Engineer's review and approval of submittals shall not be construed as a complete check nor does it relieve the Contractor from responsibility for any departures or deviations from the requirements of the Contract Documents unless he has, in writing, called the Engineer's attention to such deviations at the time of submission. It will not extend to means, methods, technique, sequences, or procedures of construction (except where specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto.

B. The Engineer's review of the submittals shall not relieve the Contractor from the responsibility for proper fitting of the Work, or the responsibility of furnishing any work required by the Contract Documents which may not be indicated on the submittals. The Contractor shall be solely responsible for any quantities shown on the submittals.

C. If the Contractor considers any correction indicated on the submittals to constitute a change to the Contract Documents, the Contractor shall provide written notice to the Engineer at least 7 working days prior to release for manufacture.

D. When the submittals have been completed to the satisfaction of the Engineer, the Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the Engineer.

E. Action submittals as defined in paragraph 1.2 will be reviewed and returned under one of the following codes:

1. Approved (Action Code 1) is assigned when there are no notations or comments on the submittal. Equipment or materials may be released for manufacture, provided that it complies with requirements of the Contract Documents.

2. Approved as Noted (Action Code 2) is assigned when there are notations or comments on the submittal, but the equipment or materials may still be released for manufacture. All notations and comments must be incorporated in the final product. Resubmission is not necessary.

3. Revise and Resubmit (Action Code 3) is assigned when there are notations and comments requiring a resubmittal of the package. Work cannot proceed until the submittal is revised and resubmitted for review.

4. Not Approved (Action Code 4) is assigned when the submittal contains non-specified items or does not meet the requirements of the Contract Documents. It may also be assigned when there is a significant amount of missing material required for the Engineer to perform a complete review. The entire package must be resubmitted, revised to bring the submittal into conformance. It may be necessary to resubmit using a different manufacturer/vendor to meet the requirements of the Contract Documents.

F. Informational submittals as defined in paragraph 1.2 do not require approval by the Engineer. Such submittals will be returned under one of the following codes:

1. Receipt Acknowledged (Action Code 5) is assigned when the submittal is provided for documentation purposes and is acknowledged as received. Comments may be noted using this action code.

2. Revise and Resubmit (Action Code 6) is assigned when there are notations and comments requiring a resubmittal of the package.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

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SUBMITTAL CERTIFICATION FORM

PROJECT:_____
ENGINEER:_____ ENGINEER'S PROJECT NO.:_____
CONTRACTOR:_____ CONTRACTOR'S PROJECT NO.:_____

TRANSMITTAL NO.:_____ SUBMITTAL NO.:_____
SPECIFICATION NO.:_____ DRAWING NO:_____
DESCRIPTION:_____
MANUFACTURER:_____

The above referenced submittal has been reviewed by the undersigned and I/we certify that the materials and/or equipment meets or exceeds the project specification requirements; that field measurements, dimensions, quantities, specified performance criteria, installation requirements, materials, catalog numbers and related materials have been verified; that all materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the work has been determined and verified; that review includes all information related to the contractor's sole responsibility for means, methods, techniques, sequences, and procedures of construction and safety; and item has been coordinated with the overall project with:

NO DEVIATIONS

A COMPLETE LIST OF DEVIATIONS AS FOLLOWS:

_____
_____
_____
_____
_____
_____

SUBMITTED BY:_____ DATE:_____

GENERAL CONTRACTOR'S STAMP

PE CERTIFICATION FORM

The undersigned hereby certifies that he/she is a Professional Engineer registered in the Commonwealth of Massachusetts and that he/she has been employed by

_____ to design
(Name of Contractor)

_____
(Insert PE Responsibilities)

In accordance with Specification section _____for the

_____
(Name of Project)

The undersigned further certifies that he/she has performed the said design in conformance with all applicable local, state and federal codes, rules and regulations; and, that his/her signature and PE stamp have been affixed to all calculations and drawings used in, and resulting from, the design.

The undersigned hereby agrees to make all original design drawings and calculations available to the

_____
(Insert Name of Owner)

or Owner's representative within seven days following written request therefor by the Owner.

_____	_____
PE Name	Contractor's Name
_____	_____
Signature	Signature
_____	_____
Title	Title
_____	_____
Address	Address

SAMPLE AMERICAN IRON AND STEEL CERTIFICATION

The following information is provided as a sample letter of certification for AIS compliance. Documentation must be provided on company letterhead.

Date

Company Name

Company Address
City, State, Zip

Subject: American Iron and Steel Certification for Project (_____)

I, (company representative), certify that the following products and/or materials shipped/provided to the subject project are in full compliance with the American Iron and Steel requirement as mandated in EPA's State Revolving Fund Loan Programs.

Item, Products and/or Materials:

1. _____
2. _____
3. _____

Such process took place at the following location:

_____

If any of the above compliance statements change while providing material to this project we will immediately notify the prime Contractor and the Engineer.

Signed by company representative:

_____

SECTION 01350

HEALTH & SAFETY PLAN

PART 1 GENERAL

1.1 SUMMARY

A. The Contractor shall:

1. Develop a site-specific Health and Safety Plan (HASP) specifically addressing the potential hazards that may be encountered at the work site. The HASP shall include the information described in this specification (as applicable) and meet all applicable OSHA requirements.

2. Furnish all labor, equipment, materials, and employee training for effective implementation of the HASP and worker health and safety protection of all Contractor personnel.

3. Furnish all labor, equipment, materials, and employee training to effectively complete any required air monitoring and/or decontamination.

4. Review the requirements and data provided for the project and supplement the HASP with any additional measures deemed necessary to fully comply with applicable regulatory requirements and to adequately protect personnel on the site.

5. Maintain a copy of the HASP at the worksite, accessible to employees working at the site.

6. Post the emergency response plan section of the HASP, inclusive of emergency alerting and response procedures and directions to the nearest hospital, in a visible location for all workers to see.

B. Related Sections

1. 02220 – Demolition

1.2 SITE-SPECIFIC PROJECT CONDITIONS

A. The Contractor shall review and understand all existing information as it relates to potential exposure to subsurface site contaminants, environmental data and reports. Reference Section 00800 for copies of applicable environmental data.

B. The nature of the materials present at the site may require use of special protective clothing and the possible use of respiratory protective equipment, which is intended to help minimize worker exposure to known or suspected site hazards.

1. Levels of personal protection are established in reference standards and generally described for Levels C and D herein. It is anticipated that a majority of the Work to be performed on this project may be performed at Personnel Protection Level D.

2. The Contractor shall be responsible for determining if a higher level of personnel protection is required based on the criteria outlined in the

Contractor's HASP. In the event that the Contractor determines that a level of protection higher than Level D is required, the Contractor's personnel shall take the necessary steps outlined in the Contractor's HASP.

3. The Contractor shall notify the Engineer and Owner in writing prior to implementing any upgrades in personal protection. The Engineer will review the Contractor's notification and determine the need to notify other applicable agencies.

1.3 REFERENCES

A. OSHA 29 CFR Part 1910 (General Industry standards)

B. OSHA 29 CFR Part 1926 (Construction Standards)

C. OSHA Regulation 29 CFR §1926.62 (Lead)

1.4 DEFINITIONS

A. CHMM: Certified Hazardous Materials Manager, as certified by the Institute of Hazardous Materials Management.

B. CIH: Certified Industrial Hygienist, as certified by the American Board of Industrial Hygiene®.

C. CSP: Certified Safety Professional, as certified by the Board of Certified Safety Professionals.

D. Site Safety and Health Official (SSHO): The individual located at a job site who is responsible to the Contractor and has the authority and knowledge necessary to implement the HASP and verify compliance with applicable safety and health requirements.

1.5 SUBMITTALS

A. On-site Work shall not begin until the HASP has been submitted by the Contractor and accepted by the Owner/Engineer.

B. Informational Submittals

1. Submit the following within thirty (30) days after the Effective Date of the Agreement.

a. A site-specific HASP, including the information described in this Specification as applicable.

1) The HASP must be reviewed, approved, and signed by Contractor representative, with specific responsibility for safety for the Contracting company.

2) The Engineer's review is only to determine if the HASP is consistent with the minimum requirements of this specification. Engineer has no control over contractor's health & safety and the means and methods of health & safety implementation. Engineer also does not perform health & safety monitoring of Contractor's Work.

3) The review will not determine the adequacy of the HASP to address all potential hazards, as that remains the sole responsibility of the Contractor.

b. Documentation of qualifications and experience of the SSHO.

c. Applicable health and safety training records.

1.6 CONTRACTOR'S RESPONSIBILITIES

A. The Contractor is solely responsible for the health and safety of workers employed by the Contractor, any subcontractor, vendors/manufacturers, site visitors and anyone directly or indirectly employed by any of them.

B. Provide a designated SSHO for the project.

C. Pre-arrange emergency medical care services at a nearby hospital or medical clinic, including establishment of an emergency notification process and emergency routes of travel.

D. Conduct pre-entry and weekly safety meetings with all site personnel, documenting attendance and topics covered.

E. Develop and implement the site-specific HASP, inclusive of the elements in contained in this specification.

F. For projects where contaminated media are known, likely, or suspected to be encountered:

1. monitor air quality in and around the work area using appropriate air monitoring equipment.

2. develop and implement a respiratory protection program per 29 CFR §1910.134 and 29 CFR §1926.103 for all workers authorized to wear respirators.

3. record all air quality readings and maintain records on site.

4. stop work and/or upgrade respiratory protection or personal protective equipment levels if action levels established in the HASP are exceeded.

5. ensure that the degree and type of respiratory protection provided is protective for the monitored concentrations and individual chemical parameters.

6. lawfully dispose of all personal protective equipment that cannot be decontaminated.

1.7 HEALTH & SAFETY PLAN (HASP) REQUIREMENTS

A. The following items shall be included/addressed in the HASP:

1. a safety and health risk or hazard analysis for each site task and operation in the workplan;

a. a physical hazard evaluation and hazard control plan shall be included covering, but not limited to the following, as applicable:

1) equipment operation;

2) confined space entry;

3) slips, trips, and falls;

4) building collapse;

5) falling debris;

6) encountering unmarked utilities;

7) cold and heat stress;

8) hot work (cutting and welding);

9) drum and container handling;

10) trench and/or excavation entry.

2. the employee safety and health training program covering each site task and operation in the workplan.

3. personal protective equipment to be used for each site task and operation in the workplan.

4. site control measures to address visitors, delivery personnel, and to protect the worksite from unauthorized access.

5. an emergency response plan for the safe and effective response to foreseeable emergencies;

a. including, but not limited to the following:

1) a map indicating the route to a nearby hospital or medical clinic for emergency medical care;

2) procedures for emergency medical treatment and first aid;

3) site evacuation routes and procedures;

4) emergency alerting and response procedures.

PART 2 PRODUCTS

2.1 AIR MONITORING EQUIPMENT

A. If organic vapors or total hydrocarbons are known, likely, or suspected to be encountered during the work:

1. provide and maintain a portable photo-ionization detector (PID) or flame-ionization detector (FID) capable of detecting organic vapors or total hydrocarbons. Equipment shall be sensitive to the 0.5 parts per million (PPM) level.

B. If hazardous atmospheres (oxygen, hydrogen sulfide, carbon monoxide, methane, etc.) are known, likely, or suspected to be encountered during the work:

1. provide and maintain an applicable multi-gas analyzer to measure concentrations in applicable work environments (i.e. confined spaces, trenches, tunnels, buildings, etc.).

C. If there is a potential for the accumulation of explosive gas:

1. provide and maintain an explosimeter (LEL meter).

D. If there is a potential for visible dust emissions or the site, dust monitoring must be considered.

1. The Contractor is responsible for monitoring fugitive dust emissions in accordance with applicable local, state, and federal regulations.

2. Equipment shall be sensitive to particulate matter less than 10 micrometer in size (PM_{10}) at a level of 100 micrograms per cubic meter ($\mu g/m^3$).

3. Contractor shall outline the dust monitoring program in their HASP, including applicable action levels.

E. All air monitoring equipment shall remain the property of the Contractor.

F. All air monitoring equipment readings must be recorded and be available for federal, state, and/or local regulatory personnel to review.

2.2 PERSONAL PROTECTIVE EQUIPMENT (PPE)

A. All PPE must conform to the OSHA requirements, as indicated in the previous Reference Standards Section. Various PPE to be furnished by the Contractor under different levels of protection for their own personnel and subcontractor's personnel include, but are not limited to, the following:

1. Level D Protection:

a. Coveralls or Tyvek

b. Gloves

c. Safety boots/shoes

d. Safety glasses

e. Hearing protection (for high noise operations)

f. Hard hat with optional face shield

2. Level C Protection:

a. Air-purifying respirator

b. Chemical protective overalls or Coveralls (e.g., Saran coated Tyvek)

c. Gloves, inner (disposable, surgical type)

d. Gloves, outer (Neoprene, Nitrile, Viton or Butyl)

e. Boots, chemical protective, steel toe and shank (Neoprene or Nitrile)

f. Booties, chemical protective (disposable PVC)

g. Hard hat

h. Face shield (if necessary)

3. Levels B and A represent increased levels of personal protection and are described in the Reference Standards.

4. Contractor is fully responsible for all PPE selection (including the various stages of protection), proper use, maintenance, and continuous monitoring.

PART 3 EXECUTION

3.1 HEALTH AND SAFETY PLANNING AND IMPLEMENTATION

A. Implement the HASP throughout the execution of all applicable work.

B. The Contractor shall perform all monitoring as detailed in the HASP.

C. Contractor(s) shall implement routine health and safety meetings and any follow-up supplemental briefings.

D. Provide applicable health and safety training for all personnel who may come in contact with or be exposed to various dangerous, hazardous, or changing site conditions.

E. Personnel who have not received applicable training and who are not equipped with the required PPE, shall not be permitted access to the site by the Contractor during the course of the work that may result in potential exposures to unsafe or hazardous site conditions.

3.2 PERSONNEL AND EQUIPMENT DECONTAMINATION

A. All equipment shall be provided to the work site free of contamination. Engineer may prohibit from the site any equipment which in his opinion has not been thoroughly decontaminated prior to arrival. Any decontamination of Contractor's equipment prior to arrival at the site shall be at the expense of Contractor. Contractor is prohibited from decontaminating equipment on the project site which is not thoroughly decontaminated prior to arrival.

B. Contractor shall furnish labor, materials, tools, and equipment for decontamination of all personnel, equipment and supplies which are used to handle contaminated materials.

C. Properly store and dispose of contaminated PPE and all other generated decontamination waste.

3.3 INCIDENT REPORTING

A. The Contractor shall comply with all accident and/or incident reporting requirements, including the following:

1. Should any unforeseen safety-related factor, hazard, or condition become evident during the course of the work, the Contractor must immediately take action to establish, maintain, and secure the site and working conditions. This shall be followed by immediate notice to the Owner and Engineer.

2. If injury to any person on-site occurs, the Contractor shall immediately report the incident to the Owner and Engineer. Corrective actions shall be implemented.

END OF SECTION

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SECTION 01420

REFERENCES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Standards referenced in the Contract Documents.

1.2 GENERAL

A. Comply with the requirements of standards referenced in the Contract Documents.

1.3 ABBREVIATIONS

A. Abbreviations used in the Specifications are defined as follows:

1. AA – Aluminum Association
2. AABC – Associated Air Balance Council
3. AASHTO – American Association of State Highway and Transportation Officials
4. ACI - American Concrete Institute
5. ACOE - U.S. Army Corps of Engineers
6. ADA – Americans with Disabilities Act
7. ADC – Air Diffusion Council
8. AFBMA – Antifriction Bearing Manufacturers Association
9. AGA – American Gas Association
10. AGC – Associated General Contractors of America
11. AGMA - American Gear Manufacturer Association
12. AI – Asphalt Institute
13. AIA – American Institute of Architects
14. AISC – American Institute of Steel Construction
15. AISI - American Iron and Steel Institute
16. AITC - American Institute of Timber Construction
17. AMCA – Air Movement and Control Association
18. ANSI – American National Standards Institute
19. APA – American Plywood Association
20. API – American Petroleum Institute

21. ARI – Air Conditioning and Refrigeration Institute
22. ASCE – American Society of Civil Engineers
23. ASHRAE – American Society of Heating, Refrigeration and Air Conditioning Engineers
24. ASME – American Society of Mechanical Engineers
25. ASPA – American Sod Producers Association
26. ASTM – American Society for Testing and Materials
27. AWG – American Wire Gauge
28. AWI - Architectural Woodwork Institute
29. AWPA – American Wood Preservers' Association
30. AWS – American Welding Society
31. AWWA – American Water Works Association
32. BIA – Brick Institute of America
33. CDA – Copper Development Association
34. CLFMI – Chain Link Fence Manufacturer's Institute
35. CPM - Critical Path Method
36. CPVC – Chlorinated Polyvinyl Chloride
37. CRSI – Concrete Reinforcing Steel Institute
38. CI – Cast Iron
39. DEP - Massachusetts Department of Environmental Protection
40. DCAMM - Division of Capital Asset Management and Maintenance
41. DHI – Door and Hardware Institute
42. DI – Ductile Iron
43. EJCDC – Engineers' Joint Contract Documents Committee
44. EJMA – Expansion Joint Manufacturers Association
45. EPDM – Ethylene Propylene Diene Monomer
46. EPT – Electrical Plastic Tubing
47. EVT – Equiviscous Temperature
48. FGMA - Flat Glass Marketing Association
49. FM – Factory Mutual
50. FS – Federal Specifications
51. GA – Gypsum Association

52. GFCI – Ground Fault Circuit Interrupter
53. GPR - Ground Penetrating Radar
54. GPS – Global Positioning System
55. HVAC – Heating, Ventilating and Air Conditioning
56. IBC – International Building Code
57. IBR – Institute of Boiler and Radiator Manufacturers
58. ICBO – International Conference of Building Officials
59. ICS – Industrial Control and Systems
60. IEEE – Institute of Electrical and Electronics Engineers
61. IMI – International Masonry Institute
62. ISA – Instrument Society of America
63. JIC – Joint Industrial Council
64. LCD – Liquid Crystal Display
65. MADEP – Massachusetts Department of Environmental Protection
66. MBMA – Metal Building Manufacturer's Association
67. MEC – Massachusetts Electric Code
68. MFMA Maple Flooring Manufacturers Association
69. MGL – Massachusetts General Law
70. ML/SFA – Metal Lath/Steel Framing Association
71. MSS – Manufacturer's Standardization Society
72. NAAMM – National Association of Architectural Metal Manufacturers
73. NAVD – North American Vertical Datum
74. NCMA – National Concrete Masonry Association
75. NEBB – National Environmental Balancing Bureau
76. NEC – National Electrical Code
77. NECA – National Electrical Contractors Association
78. NEMA – National Electrical Manufacturers Association
79. NFPA – National Fire Protection Association
80. NRCA – National Roofing Contractors Association
81. NRS – Non-rising Stem
82. NSF – National Sanitation Foundation

83. NSWMA – National Solid Waste Management Association
84. NWMA – National Woodwork Manufacturers Association
85. O&M – Operation and Maintenance
86. OSHA – Occupational Safety and Health Administration
87. PCA – Portland Cement Association
88. PCI – Precast/Prestressed Concrete Institute
89. PDOP – Positional Dilution of Precision
90. PLC – Programmable Logic Controller
91. PS – Product Standard
92. PVC – Polyvinyl Chloride
93. QA/QC – Quality Assurance/Quality Control
94. RCP – Reinforced Concrete Pipe
95. RCSHSB – Red Cedar Shingle and Handsplit Shake Bureau
96. RIS – Redwood Inspection Service
97. RTU – Remote Telemetry Unit
98. SCADA – Supervisory Control and Data Acquisition
99. SDI – Steel Deck Institute
100. SDS – Safety Data Sheets
101. SSPC – The Society for Protective Coatings
102. TCA – Tile Council of America
103. UL – Underwriter's Laboratories
104. UPS – Uninterruptable Power Supply
105. USCS – Unified Soil Classification System
106. USDA – United States Department of Agriculture
107. WCLIB – West Coast Lumber Inspection Bureau
108. WOG – Water, Oil, Gas
109. WWPA – Western Wood Products Association

END OF SECTION

SECTION 01450

QUALITY CONTROL

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Quality assurance and control of the Work
2. Testing and inspection services
3. Product test reports
4. Manufacturer's field service

B. Related Requirements

1. Testing requirements are described in various Sections of the Project Manual.

1.2 SUBMITTALS

A. Informational Submittals

1. Product test reports

1.3 QUALITY ASSURANCE

A. Monitor quality control over Suppliers, products, services, site conditions, and workmanship to produce Work of specified quality.

B. Comply fully with manufacturer's instructions. Should these instructions conflict with the Specifications, request clarification from the Owner before proceeding.

C. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or requirements indicate higher standards or more precise workmanship.

1.4 TESTING SERVICES FURNISHED BY CONTRACTOR

A. Furnish all testing services required for materials and equipment proposed to be used in the Work, and quality control tests made in the field including:

1. Concrete materials and mix designs
2. Concrete in place
3. Modified proctor analyses for all borrow materials used on the Project
4. Modified proctor analysis of all subgrade material to be compacted during surface preparation and fine grading and compaction work
5. Sieve analyses for all borrow materials used on the Project
6. Soil structure and nutrient analyses for all loam and topsoil used on the Project
7. Compaction tests performed during trench backfilling and compaction, rough grading and site preparation, fine grading and compaction of roadway and sidewalk subgrades, and placement of roadway and sidewalk subbase materials

8. Design of asphalt mixtures
9. Asphalt in place
10. Field welded joints
11. All other tests and engineering data as required in the Contract Documents.

B. An independent commercial testing laboratory, with current Massachusetts certification, shall perform all tests that require the services of a laboratory to determine compliance with the Contract Documents.

C. Secure and deliver the required number of samples to the laboratory as required by the Contract Documents.

D. Notify Owner and Engineer of time, location and material being sampled.

E. Schedule necessary testing laboratory services.

F. Furnish written reports of each test within 48 hours of completion of testing.

G. Notify the Engineer 48 hours prior to operations requiring inspections and laboratory testing services so the Engineer may witness testing. All failed test areas shall be re-worked and re-tested until passing results are obtained.

H. The Owner may hire its own independent testing laboratory for quality control tests made in the field or laboratory on materials and equipment during and after their incorporation in the Work. Cooperate with the Owner and independent testing laboratory and furnish samples of materials, design, mix, equipment, tools, storage, and assistance as requested.

I. Re-work all failed test areas until passing results are obtained. All re-tests required as a result of the Contractor's failure to perform the work in accordance with the Contract Documents shall be at the Contractor's expense.

1.5 TESTING SERVICES FURNISHED BY THE OWNER

A. The Owner will not furnish any testing services throughout the duration of the project. It is the sole responsibility of the contractor to coordinate all independent testing services at the contractor's expense.

1.6 CODE COMPLIANCE TESTING

A. Provide inspections and tests required by codes or ordinances, or by a legally constituted authority having jurisdiction over the Work.

1.7 PRODUCT TEST REPORTS

A. Submit 2 copies of product test reports where required by the Contract Documents.

1.8 SUPPLIERS' FIELD SERVICE

A. Provide qualified field service and installation personnel from material and equipment Suppliers to observe site conditions, installation techniques, quality of workmanship, equipment start-up, adjustment, and performance test where required by the Contract Documents. Observations are to be reported and incorporated in the Work procedures.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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SECTION 01570

TEMPORARY CONTROLS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Dust control
2. Drainage and erosion control
3. Haybales and siltation fence
4. Erosion Control Barrier
5. Mulch
6. Sediment trapping devices

1.2 SUBMITTALS

A. Informational Submittals

1. Haybales, siltation fence, mulch, and sediment trapping devices

PART 2 PRODUCTS

2.1 HAYBALES

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

2.2 FILTER FABRIC

A. Filter fabric siltation fencing shall be a woven filter fabric having a weight of at least 2.5 ounces per square yard, a thickness of at least 17 mils, a coefficient of permeability of not less than 0.0009 centimeters per second and allows a water flow rate of a minimum 40 gallons per minute per square yard. The material shall have a high sediment filtration capacity, high slurry flow and minimum clogging characteristics. The material shall be equal to FW-300 as manufactured by Mirafi, Inc., Charlotte, North Carolina; Amoco 2130 by Nilex, Inc., Centennial, CO; MISF 180 by Mutual Industries, PA; or equal.

2.3 EROSION CONTROL BARRIER

A. Straw wattles shall be dense 9” diameter tubes, made with certified noxious weed-free straw bound by netting of the type normally used for siltation or erosion control or construction projects.

2.4 SEDIMENT TRAPPING DEVICES

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

2.5 MULCH

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

PART 3 EXECUTION

3.1 DUST CONTROL

A. Prevent dust from becoming a nuisance or hazard. During construction, excavated material and open or stripped areas are to be policed and controlled to prevent spreading of the material.

B. Control dust during the work on-site using calcium chloride and/or water.

C. During the Work on-site, all paved road and driveway surfaces shall be scraped and broomed free of excavated materials on a daily basis. The surfaces shall be hosed down or otherwise treated to eliminate active or potential dust conditions and the natural road or wearing surface shall be exposed.

D. Ensure that the existing equipment, facilities, and occupied space adjacent to or nearby areas of the work do not come in contact with dust or debris as a result of concrete demolition, excavation or surface preparation for coatings.

E. Control dust by the construction of temporary wooden frame/polyethylene sheeting walls and covering enclosures separating adjacent or nearby areas and equipment from the Work site.

F. Submit for approval materials proposed for use for dust control, prior to start of the Work.

3.2 DRAINAGE AND EROSION CONTROL

A. Control erosion and siltation during the construction through mulching, haybales, siltation fencing, diversion and control of storm water run-off, ponding areas and similar methods.

B. Provide and maintain sediment trapping systems.

C. Discharge surface runoff from any disturbances to the site into silt containment basins. Utilize siltation prevention measures including haybale and geotextile fences before discharge to drainage systems.

D. Install sediment trapping devices in catch basins located in existing paved areas with sediment trapping devices to minimize the transport of sediment through the subsurface stormwater collection system.

3.3 HAYBALES AND SILTATION FENCE

A. Place and maintain both haybales and a staked filter fabric siltation fence along the entire length of the proposed construction between the area of construction and its surrounding wetlands where shown on the Drawings or required by permit.

B. Install haybales by anchoring bales butted together to existing ground with at least 2 stakes per bale. The stake shall be a minimum of 1-inch square cross section and shall be long enough to penetrate 12 inches into the ground. Replace deteriorated haybales. Remove and dispose of the haybales following the successful growth of vegetation in the areas disturbed by the construction. Haybales shall not be removed until their removal is approved by the Engineer.

C. Install a filter fabric siltation fence in addition to the staked haybales, prior to construction and remove after full surface restoration has been achieved. Install the

siltation fence parallel and immediately adjacent to the haybales as shown on the Drawings. Install as follows:

1. Hand shovel excavate a small trench on the upstream side of the desired fence line location.

2. Unroll the siltation fence system, position the post in the back of the trench (downhill side), and hammer the post at least 1½ feet into the ground.

3. Lay the bottom 6 inches of the fabric into the trench to prevent undermining by storm water run-off.

4. Backfill the trench and compact.

D. Perform work in accordance with Town of Yarmouth Conservation Commission Order of Conditions.

3.4 RESTORATION

A. Provide erosion control, seed and mulch and netting for surface restoration of areas disturbed during construction activities.

B. Provide temporary stabilization of disturbed areas that remain inactive greater than 14 consecutive days to minimize erosion. Methods to minimize erosion may include but are not limited to:

1. Spreading straw and/or providing temporary planting stabilization.

2. Installing jute netting.

3. Preparing surfaces to increase the runoff flow path, reduce the runoff flow velocity, or create small storage pockets to retain surface flows. Methods of accomplishing this include using mechanical devices such as track equipment or sheep's foot rollers.

C. Restore the ground surface in brush and/or woodland areas by machine spreading of existing stripped surface soils (loam and humus), liming, fertilizing, seeding and mulching, as well as installing jute netting where required by steep slopes.

D. Salvage existing loam and topsoil and stockpile this material for re-spreading where originally removed. On backfilling, grading shall be returned to preconstruction contours and the stockpile of loam shall be spread over areas disturbed during construction activities.

E. Place mulch on seeded areas. Use jute netting on areas having a slope greater than 3 horizontal to 1 vertical, to anchor the mulch until a satisfactory growth is obtained. If seeding is not possible because of the time of the year, apply mulch and netting to stabilize the area until such time as seed can be sown.

F. Provide grading, refertilizing, reseeding, remulching and/or netting to maintain the restored areas until the Work is accepted by the Owner.

G. Seed shall be as specified on the contract drawings.

3.5 CLEANING

A. Remove any sediment that builds up around the haybales or catch basins.

B. Clean sediment trapping devices periodically during the Work. Devices shall be cleaned on a weekly basis, or more frequently if the devices become clogged.

C. Clean catch basins that collect sediment as a result of the Work.

END OF SECTION

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SECTION 01582

PROJECT IDENTIFICATION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Project Identification Signs

B. Related Requirements

1. Section 01330, Submittal Procedures

1.2 SUBMITTALS

A. Action Submittals

1. Information on paints to be used for items under this section.

2. Layout of each sign.

1.3 QUALITY ASSURANCE

A. Finishes and painting shall resist weathering and fading for scheduled construction period.

1.4 MAINTENANCE

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

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Project Identification Sign

1. Do not erect or display advertising signs of any kind on site. At start of Work, furnish, erect, and maintain on site where directed by the Owner four signs, each 2 ft. by 3 ft. in size, bearing the following information:

a. Name of Project and Contract number

b. Name of Owner and emblem. The emblem will be furnished electronically by the Owner

c. Name of Consulting Engineer

d. Name and Address of Contractor

e. Contact telephone number

2. Provide two additional portable signs of the same size and information.

B. Informational Signs

1. Provide Informational signs as required by the Town of Yarmouth.

2.2 MATERIALS

A. Sign Materials

1. Structure and Framing: May be new or used, wood or metal, in sound condition, structurally adequate to work, and suitable for specified finish.

2. Sign Surfaces: Exterior softwood plywood with medium density overlay, standard large sizes to minimize joints:

a. Thickness: As required by standards to span framing members, to provide even, smooth surface without waves or buckles.

3. Wrought Hardware: Galvanized.

4. Paint:

a. Apply a coat of white alkyd primer wood oil to entire woodwork of sign.

b. Apply 2 coats of white exterior latex paint to sign including framework.

B. Sign layout shall be approved by the Owner prior to fabrication.

PART 3 EXECUTION

3.1 PREPARATION

A. Project Identification Sign

1. Paint exposed surface of supports, framing and surface material; one coat of primer and one coat of exterior white paint.

2. Paint graphics in styles, sizes, and colors selected.

3. Sign to be minimum of 48 inches by 96 inches.

3.2 ERECTION

A. Project Identification Sign

1. Erect Project signs at locations approved by the Owner.

2. Maintain in good condition until completion of the Project.

a. Remove sign, framing, supports and foundations at completion of the Project.

END OF SECTION

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SECTION 01600

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Products and Materials

2. Product Delivery Requirements

3. Packaging, Handling and Storage Requirements

4. Inspection of Offsite Work

1.2 QUALITY ASSURANCE

A. Review all contract Drawings and Specifications with respect to specific system characteristics, applicability of materials and equipment for the intended purposes, sizes, orientation, and interface with other systems, both existing and proposed, and certify that the materials and equipment proposed will perform as specified prior to submitting shop drawings.

B. Provide sworn certificates as to quality and quantity of materials where specified or requested by the Engineer.

C. Obtain concurrence of the Engineer prior to processing, fabricating, or delivering material or equipment.

1.3 PRODUCTS AND MATERIALS

A. Furnish products of qualified manufacturers suitable for intended use. Furnish products of each type by a single manufacturer unless specified otherwise.

B. Use only new and first quality material in the Work. Material shall conform to the requirements of these Specifications and be approved by the Engineer. If, after trial, it is found that sources of supply that have been approved do not furnish a uniform product, or if the product from any source proves unacceptable at any time, the Contractor shall furnish approved materials from other approved sources.

C. Immediately remove defective materials and equipment from the site, at no additional cost to the Owner. The Contractor may be required to furnish sworn certificates as to the quality and quantity of materials before materials are incorporated in the Work.

D. Engineer has the right to approve the source of supply of all material prior to delivery.

1.4 PRODUCT DELIVERY REQUIREMENTS

A. Transport and handle products in accordance with manufacturer's instructions.

B. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.

C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

D. Progressively deliver materials and equipment to the Site so there will be neither delay in progress of the Work nor an accumulation of material that is not to be used within a reasonable time.

E. Deliver products to the Site in their manufacturer's original container, with labels intact and legible.

1. Maintain packaged materials with seals unbroken and labels intact until time of use.

2. The Engineer may reject as non-complying such material and products that do not bear identification satisfactory to the Engineer as to the manufacturer, grade, quality, source, and other pertinent information.

1.5 PACKAGING, HANDLING AND STORAGE REQUIREMENTS

A. Provide storage and handling of all materials and equipment required for the Work.

B. Except as otherwise indicated in the Contract Documents, determine and comply with the manufacturer's recommendations on product storage, handling, and protection. Provide manufacturer's documentation on recommended storage procedures when requested by the Engineer.

C. Familiarize workmen and subcontractors with hazards associated with materials, equipment, and chemicals specified herein and take all necessary safety precautions.

D. Areas available on the construction site for storage of material and equipment shall be as shown on the Drawings or approved by the Owner.

E. Materials and equipment to be incorporated in the Work shall be handled and stored by the manufacturer, fabricator, supplier, and Contractor before, during and after shipment in a manner to prevent warping, twisting, bending, breaking, chipping, rusting, and any injury, theft, or damage of any kind to the material or equipment.

F. Protect finished surfaces including floor surfaces, stairs, joints, and soffits of passageways from damage until accepted by the Engineer.

G. Promptly remove materials from the site of the Work which have become damaged or are unfit for the use intended or specified. The Contractor will not be compensated for the damaged materials or their removal costs.

H. Handle, haul, and distribute all materials and all surplus materials on the different portions of the Work, as necessary or required. Provide suitable and adequate 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, until the final completion and acceptance of the Work.

I. Storage and demurrage charges by transportation companies and vendors shall be borne by the Contractor.

J. All materials and equipment to be incorporated in the Work shall be placed so as to not damage 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. Keep materials and equipment neatly piled and compactly stored in such locations as will cause a minimum of inconvenience to the Owner.

K. No material or equipment will be permitted to be stored in any of the Owner's facilities, unless otherwise approved by the Engineer.

L. Do not store material or equipment in any wetland or environmentally sensitive area. Stockpile sites shall be level, devoid of mature stands of natural vegetation, and removed from drainage facilities and features, wetlands, and stream corridors.

M. Contractor shall be fully responsible for loss or damage to stored materials and equipment.

N. No item judged rusty, corroded or otherwise damaged during storage will be accepted. Any electrical or instrumentation item determined by the Engineer to be damaged shall be removed from the Site and replaced by a completely new item in first class condition. Items not properly stored will not be considered for any partial payment.

O. Provide protective and preventive maintenance during storage consisting of manually exercising equipment where required, inspecting mechanical surfaces for signs of corrosion or other damage, lubricating, applying any coatings as recommended by the equipment manufacturer as necessary for its protection and other precautions as necessary to assure proper protection of equipment stored.

P. Treat ferrous surfaces not receiving finish coats of paint with rust preventive coating, and protect non-ferrous metal work and devices with suitable wrappings.

1.6 INSPECTION OF OFFSITE WORK

A. The Owner and Engineer will inspect Work performed away from the construction site during fabrication, manufacture, or testing, or before shipment. Give a week written notice regarding the place and time where such fabrication, manufacture, testing, or shipping will be done.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

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SECTION 01630

PRODUCT SUBSTITUTION DURING CONSTRUCTION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Product substitution procedures

1.2 CONTRACTOR'S OPTIONS

A. For materials or equipment (hereinafter products) specified only by performance or reference standard, select product meeting that standard, by any Supplier. To the maximum extent possible, provide products of the same generic kind from a single source.

B. For products specified by naming several products or manufacturers, select any one of the products or Suppliers named, which fully complies with the Drawings and Specifications. Another "or-equal" product can also be considered by the Engineer if it complies with the provisions of Article 7.04, Section 00700. If a product proposed by the Contractor does not qualify as an "or-equal" item, then it can be considered as a proposed substitute item, and the Contractor must comply with the requirements of Article 7.05, Section 00700.

C. For products specified by naming products or manufacturers and followed by words indicating that no "or-equal" item or substitution is permitted, there is no option and no substitution will be allowed.

D. Where more than one choice is available as a Contractor's option, select product that is compatible with other products already selected or specified.

1.3 SUBSTITUTIONS

A. If in the Engineer's sole discretion, a product proposed by the Contractor does not qualify as an "or-equal" item under the provisions of this document.

B. The Engineer will consider written requests from the Contractor for substitutions within 30 days after the Notice to Proceed. After this period, requests will be considered only in case of unavailability of product or other conditions beyond control of the Contractor.

C. Submit 5 copies of request for substitutions. Submit a separate request for each proposed substitution. In addition to the submittal requirements outlined in this document, include the following in each substitution request:

1. For products or Suppliers:

a. Product identification, including Supplier & manufacturer's name and address.

b. Manufacturer's literature with product description, performance and test data, and reference standards.

c. Samples, if appropriate.

d. Name and address of similar projects on which product was used, and date of installation.

2. For construction methods (if specified):

a. Detailed description of proposed method.

b. Drawings illustrating method.

3. Such other data as the Engineer may require to establish that the proposed substitution is equal to the product, Supplier or method specified.

D. The substitution request shall include written certification and statements that are outlined in Article 7.05 of Section 00700.

E. A request constitutes a representation that Contractor:

1. Has investigated proposed product and determined that it meets or exceeds quality level of specified product.

2. Will provide same or better guarantees, warranties or bonds for proposed substitution as for specified product.

3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.

4. Waives all claims for additional costs or time extension which may subsequently become apparent.

5. Will reimburse Owner for review or redesign services associated with re-approval by authorities having jurisdiction.

F. A proposed substitution will not be accepted if:

1. Acceptance will require changes in the design concept or a substantial revision of the Contract Documents.

2. It will delay completion of the Work.

3. It is intended or implied on a Shop Drawing and is not accompanied by a formal request for substitution from the Contractor.

G. The Contractor is responsible for all costs relating to substitution requests.

H. Approval of a substitution does not relieve the Contractor from the requirement for submission of Shop Drawings as set forth in the Contract Documents.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

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SECTION 01725

PRESERVATION AND RESTORATION OF PROJECT FEATURES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Protection and replacement of trees, shrubs, signs, property markers, fences, asphalt pavement, porous pavement, and related project features.

2. Taking precautions, providing programs, and taking actions necessary to protect public and private property and facilities that are outside the demolition scope from damage.

1.2 DEFINITIONS

A. Underground Structures

1. Underground structures are defined to include, but not be limited to, sewer, water, gas, and other piping, and manholes, chambers, electrical and signal conduits, tunnels and other existing subsurface work located within or adjacent to the limits of the Work.

2. Underground structures known to the Engineer are shown on the Drawings to the extent that locations are available. This information is shown for the assistance of the Contractor in accordance with the best information available, but is not guaranteed to be correct or complete. The Contractor shall be responsible for checking on the actual locations of water, sewer, gas electric and telephone service connection lines to avoid potential interferences.

B. Surface Structures

1. Surface structures are defined as existing buildings, structures and other facilities above the ground surface. Included with such structures are their foundations or any extension below the surface. Surface structures include, but are not limited to, buildings, tanks, walls, bridges, roads, dams, channels, open drainage, piping, poles, wires, posts, signs, markers, curbs, walks and all other facilities that are visible above the ground surface.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 REPAIR/RESTORATION

A. Trees, shrubs, and similar items shall not be removed except where indicated on the drawings or as necessary to access the required demolition work, as approved by the Engineer. Items to be removed shall be clearly marked as directed by the Engineer. If objects not to be removed are damaged or removed, they shall be repaired or replaced to their original condition.

B. Trees and shrubs on private property, which are removed or damaged by the Contractor shall be replaced in kind.

C. Signs, fences, property markers, walls, guard rails and other public or private property that are outside the demolition scope shall be replaced in kind if damaged. Supports and protective devices required shall be provided.

D. Any asphalt pavement or porous pavement damaged, at the discretion of the owner, as a result of the construction activities within the limit of work shall be replaced in kind at no additional cost to the owner. Porous pavement sections shall not be used for the storage of any construction equipment, material, or contractor parking.

E. Underground and Surface Structures

1. In the event of damage, injury or loss to existing utilities and structures that were not indicated to be removed or abandoned, whether shown on the Drawings or not, make all reasonable efforts to facilitate repairs and to mitigate the impact of such events upon the utility or structure owner's normal operations. Restore the existing utility or structure to the condition required by the owner of the utility or structure or at least to the condition found immediately prior to the Work. In the event that the utility owner elects to make the repairs, provide all reasonable access and assistance, and reimburse the utility owner for the cost of repairs. If utility service is interrupted due to damage to facilities, alternate facilities shall be provided.

2. All other existing surface facilities, including but not limited to, guard rails, posts, guard cables, signs, poles, markers and curbs which are temporarily removed to facilitate the Work shall be replaced and restored to their original condition at the Contractor's expense unless otherwise indicated in other sections of these specifications.

3. Wherever water, sewer, gas or petroleum mains, electric or telephone lines, cables or other utilities and structures are encountered and may be in any way interfered with, inform the Engineer and the appropriate utility company. Cooperate with the Engineer and utility company in the protection, removal, relocation, and replacement of structures and facilities.

4. Prior to proceeding with any demolition or construction, notify in writing owners of utilities and structures within the vicinity of the proposed Work.

5. Work affecting water distribution systems, which will take fire hydrants out of service, must be coordinated with the local fire department. The Contractor shall be prepared to restore fire flows in the event of an emergency or to provide for temporary fire flow service in accordance with the requirements of the local fire department.

6. Materials used for relocation or replacement of utilities and structures shall be of an equivalent material, type, class, grade and construction as the existing or as approved by the respective owners thereof, unless otherwise shown or specified.

7. When any survey monument or property marker, whether of stone, concrete, wood or metal, is in the line of any trench or other demolition or construction work and may have to be removed, notify the Engineer in advance of removal. Under no circumstances shall any monument or marker be removed or disturbed by the Contractor or by any of his Subcontractors, employees or agents, without

the permission of the Engineer. Monuments or markers removed or disturbed shall be reset by a land surveyor licensed in the State where the Work is located at the Contractor's expense. Should any monuments or markers be destroyed through accident, neglect or as a result of the Work under this Contract, the Contractor shall, at his own expense, employ a land surveyor licensed in the State where the Work is located to re-establish the monument or marker.

3.2 PROTECTION

A. The construction of certain portions of the project may require excavation within the root systems of trees. Roots with a diameter of 2 inches or more within the excavation shall not be cut. If necessary, excavation shall be made with small powered equipment or by hand to comply with this requirement. It may be necessary to excavate from more than one direction to avoid damage to the roots.

B. The trunks of trees that are to remain and are within the swing radius of the excavating machine bucket when fully extended shall be wrapped with burlap and 2 inch by 4 inch protective wood slats (8 inch spacing maximum) wired around the circumference of the trees to protect them from damage.

C. Tree limbs shall not be cut except upon written approval of the Owner and the Engineer. Tree limbs cut shall be painted with approved forestry paint manufactured specifically for that purpose.

D. Underground and Surface Structures

1. Sustain in their places and protect from direct or indirect injury underground and surface structures within or adjacent to the limits of the Work unless otherwise noted. Such sustaining and supporting shall be done carefully and as required by the party owning or controlling such structure. Before proceeding with the work of sustaining and supporting such structure, satisfy the Engineer that the methods and procedures to be used have been approved by the party owning same.

2. Pay utility service company charges related to the temporary support of utility poles if required to complete the Work.

3. Assume risks associated with the presence of underground and surface structures within or adjacent to the limits of the Work. The Contractor shall be responsible for damage and expense for direct or indirect injury caused by his Work to any structure. Immediately repair damage caused by the Work to the satisfaction of the owner of the damaged structure.

END OF SECTION

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SECTION 01770

CLOSEOUT PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Documentation required for the transfer of the completed Work to the Owner

2. Final Cleaning

1.2 SUBMITTALS

A. Closeout Submittals

1. As-built drawings

2. Evidence of payment and release of liens

3. List of Subcontractors, service organizations, and principal vendors

1.3 SUBSTANTIAL COMPLETION

A. Refer to contractor documents for procedures relating to obtaining Substantial Completion.

1.4 PROJECT CLOSEOUT DOCUMENTS

A. As-Built Drawings - Submit as-built drawings for review, approval, or comment. The as-built drawings shall show the completed work, including all deviations from the original Drawings.

1. Timber pile driving logs.

2. Timber pile driving locations. .

3. Placement of walkways and sidewalks.

4. Final installed configuration of pedestrian bridge.

5. Final installation of benches.

6. Final installation of informational signs.

B. Provide warranties and bonds for items so listed in pertinent sections of the Project Manual.

C. Provide evidence of compliance with requirements of governmental agencies having jurisdiction.

D. Provide evidence that all Work, materials and equipment will pass to Owner free and clear of any Liens or other title defects upon final payment. Such evidence may take the form of receipts or releases from all Subcontractors and Suppliers and an affidavit from Contractor as to the completeness of the receipts and releases as described in the Contract Documents.

E. Provide list of Subcontractors, service organizations, and principal vendors, including names, addresses, and telephone numbers where they can be reached for emergency service at all times including nights, weekends, and holidays.

1.5 FINAL PAYMENT

A. Refer to the Contract Documents for procedures relating to final inspection and payment.

B. The Contract shall be considered complete and final payment made, only when:

1. All provisions of the Contract Documents have been strictly adhered to.

2. The project and premises have been left in good order, including removal of all temporary construction, Contractor-owned and extraneous materials.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 CLEANING

A. Remove and entirely dispose of material or debris that has washed, flowed or has been placed in existing watercourses, ditches, gutters, drains, pipe, or structures, for work done under the Contract work limits. Leave ditches, channels, drains, pipes, structures, and watercourses in a clean and neat condition upon completion of the Work.

B. Restore or replace any public or private property damaged or removed during the course of the Work. Property shall be returned to a condition at least equal to that existing immediately prior to the beginning of operations. Complete all highway or driveway, walk, and landscaping work using suitable materials, equipment and methods. Perform restoration of existing property, signs or structures promptly as work progresses; do not leave restoration work until the end of the Contract Time.

END OF SECTION

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O&M MANUAL CERTIFICATION FORM

PROJECT:_____
ENGINEER:_____ ENGINEER'S PROJECT NO.:_____
CONTRACTOR:_____ CONTRACTOR'S PROJECT NO.:_____

TRANSMITTAL NO.:_____ SHOP DRAWING NO.:_____
SPECIFICATION NO.:_____ DRAWING NO:_____
DESCRIPTION:_____
MANUFACTURER:_____

The above referenced O&M manual has been reviewed by the undersigned and I/we certify that the manual is customized as needed for this project, and contains the following items, where applicable for the materials or equipment provided:

- ☐ 3-ring binder with title on binder and binding edge
- ☐ Electronic CD, when specified
- ☐ Comprehensive index broken down into sections
- ☐ Dividers for sections and sub-sections
- ☐ Warranties
- ☐ Troubleshooting information
- ☐ Startup, operation & shutdown procedures
- ☐ Safety procedures
- ☐ Manufacturer's contact information
- ☐ Complete parts list of equipment supplied
- ☐ Complete specifications/data on each item
- ☐ Detailed maintenance & operations instructions
- ☐ "As constructed" layout & schematic drawings
- ☐ Wiring diagrams
- ☐ Lubrication & maintenance schedules
- ☐ Equipment performance curves
- ☐ List of spare parts supplied and current cost
- ☐ Parts & service contact information

SUBMITTED BY:_____ DATE:_____

GENERAL CONTRACTOR'S STAMP

SECTION 02075

GEOSYNTHETICS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes

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

1.2 REFERENCES

A. ASTM D1248 - Specification for Polyethylene Plastics Molding and Extrusion Materials

B. ASTM D1388 - Test Methods for Stiffness of Fabrics

C. ASTM D3786 - Test Method for Hydraulic Bursting Strength of Knitted Goods and Non-woven Fabrics: Diaphragm Bursting Strength Tester Method

D. ASTM D4218 - Test Method for Carbon Black Content in Polyethylene Compounds by the Muffle-Furnace Technique

E. ASTM D4491 - Test Methods for Water Permeability of Geotextiles by Permittivity

F. ASTM D4533 - Test Method for Trapezoid Tearing Strength of Geotextiles

G. ASTM D4632 - Test Method for Grab Breaking Load and Elongation of Geotextiles

H. ASTM D4751 - Test Method for Determining the Apparent Opening Size of a Geotextile

I. ASTM D4833 - Test Method for Index Puncture Resistance of Geotextiles Geomembranes and Related Products

J. ASTM D5261 - Test Method for Measuring Mass per Unit Area of Geotextiles

K. ASTM D5262 – Standard Test Method for Evaluating the Unconfined Tension Creep Behavior of Geosynthetics

1.3 SUBMITTALS

A. Product samples and data for all geosynthetics proposed for use on this project.

B. Manufacturer-approved construction quality assurance/quality control manual for all of the geosynthetics proposed for use on this project.

C. Manufacturing quality control testing data specified. Submit certification of required performance testing on all geosynthetics by an independent laboratory and label and identify all geosynthetic products delivered to the site.

D. Required interface friction angle testing data, before receiving any geogrid materials on site.

E. Required transmissivity testing before receiving any drainage geocomposite materials on site.

F. Manufacturer's recommended installation and fastening details for the erosion control blankets and turf reinforcement matrices. The following details are required:

1. Typical stapling pattern and spacing. List staple density in terms of staples per square yard.

2. Anchoring details for channels and slopes.

3. Transverse blanket lap splice details, as well as longitudinal lap splice details if parallel blankets are to be installed.

4. Termination details for the origin and termination of the channels and slopes.

G. Manufacturer's recommended installation details including, orientation, overlap, and joining/seaming information for all drainage geocomposite products.

1.4 QUALITY ASSURANCE

A. Obtain from the geosynthetic product manufacturers a warranty that their products are free from defects in materials and workmanship at the time of delivery to the project site.

B. Material found to be defective or which does not conform to these specifications will be rejected.

1.5 DELIVERY, STORAGE AND PROTECTION

A. The Engineer reserves the right to reject and require replacement of any damaged materials delivered to the site, at no additional cost to the Owner.

B. Stockpile and store the materials in accordance with the manufacturer's recommendations.

C. Label and bag all geosynthetic rolls in packing that is resistant to photo degradation by ultraviolet (UV) radiation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Group 1 Non-Woven Geotextile

1. "C-46NW" as manufactured by Contech Construction Products, Inc.

2. "FX-40HS" as manufactured by Carthage Mills

3. "140N" as manufactured by Mirafi Inc.

4. Or equal

B. Group 1 Woven Geotextile

1. "FW700" as manufactured by Mirafi Inc.

2. "US 670" as manufactured by US Fabrics

3. "M706" as manufactured by SKAPS

4. Or equal

C. Temporary 100% Degradable Erosion Control Blankets

1. "LANDLOK ENC2" as manufactured by SI Geosolutions, Inc.,

2. "C125 BN" as manufactured by North American Green,

3. Or equal

2.2 MATERIALS

A. Non-woven geotextiles shall be manufactured from a continuous polypropylene filament. A needle punching process shall achieve bonding.

B. Woven geotextiles shall be manufactured from a polypropylene slit-film monofilament.

C. Non-woven protection geotextiles shall have a minimum mass per unit area of 32oz/yd^2.

D.

E. Temporary, 100% degradable ECBs shall be composed of a core of 100% coconut fibers encased between two confining meshes of degradable material.

1. As a minimum, 100% degradable ECBs shall be recommended by the manufacturer for use on 2:1 slopes.

PART 3 EXECUTION

3.1 EXAMINATION

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

3.2 INSTALLATION

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

3.3 QUALITY CONTROL

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

END OF SECTION

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SECTION 02200

SITE PREPARATION

PART 1 GENERAL

1.1 SUMMARY

A. Section includes

1. Clearing and grubbing

2. Grading

3. Stripping and stockpiling of soil and sod

1.2 SUBMITTALS

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

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 CLEARING AND GRUBBING

A. Except as otherwise directed, cut, grub, remove and dispose of all trees, stumps, brush, shrubs, roots and any other objectionable material within the limits of the Work on the site and where required to construct the work.

B. Protect trees or groups of trees, designated by the Engineer to remain, from damage by all construction operations by erecting suitable barriers, or by other approved means. Conduct clearing operations to prevent falling trees from damaging trees designated to remain.

1. All damage done to the trees by the Contractor's operation shall be trimmed and painted where cut as directed or as necessary to provide adequate vertical clearance for construction activities. The dressing or paint shall be applied no later than two days after the cuts are made.

2. Use all necessary precautions to prevent injury to other desirable growth in all areas. Contractor shall assume full responsibility for any damage.

C. Protect areas outside the limits of clearing from damage. No equipment or materials shall be stored in these areas.

D. No stumps, trees, limbs, or brush shall be buried in fills or embankments.

3.2 DISPOSAL OF MATERIALS

A. Remove all tree trunks, limbs, roots, stumps, brush, foliage, other vegetation and objectionable material from the site and dispose of in a legal manner.

B. Burning or direct burial of cleared and grubbed materials on-site will not be permitted.

3.3 GRADING

A. In preparation for placing loam, paved drives and appurtenances, perform grading to the lines, grades and elevations shown on the Drawings, and otherwise directed by the

Engineer and perform in such a manner that the requirements for formation of embankments can be followed. All material encountered, regardless of its nature, within the limits indicated, shall be removed and disposed of as directed. During the process of grading, maintain the subgrade in such condition that it will be well drained at all times. Install temporary drains and drainage ditches to intercept or divert surface water that may affect the work when necessary.

B. If at the time of grading it is not possible to place material in its final location, stockpile material in approved areas for later use. No extra payment will be made for the stockpiling or double handling of excavated material.

C. The right is reserved to make minor adjustments or revisions in lines or grades if found necessary as the work progresses.

D. Stones or rock fragments larger than 4 inches in their greatest dimensions will not be permitted in the top 12 inches of the finished subgrade of all fills or embankments except along the access roadways and rip-rap where shown on the Drawings.

E. In cuts, loose or protruding rocks on the excavated slopes shall be barred loose or otherwise removed to line or finished grade of slope. Cut and fill slopes shall be uniformly dressed to the slope, cross-section and alignment shown on the Drawings or as directed by the Engineer.

3.4 DUTCH ELM WOOD

A. Dutch Elm diseased wood shall be disposed of in accordance with any local regulations.

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

C. Where the work includes the removal and disposal of stumps of elm trees, such stumps shall be completely disposed of immediately after cutting in the manner specified above.

END OF SECTION

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SECTION 02220

DEMOLITION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Demolition of features within the park such as fences, signs, brick paths, and benches as noted on the drawings.

2. Demolition of trees and other vegetation within the park as indicated on the drawings.

B. Related Sections

1. Section 01320 - Construction Photographs

2. Section 01350 - Health & Safety Plan

3. Section 01725 - Preservation and Restoration of Project Features

4. Section 02315 - Excavation, Backfill, Compaction and Dewatering

1.2 DEFINITIONS

A. Demolish – To tear down, segregate waste streams and lawfully recycle or dispose of all debris generated in the process including structure contents.

B. Limit of Work – Area delineated on Drawings that defines the extent of demolition work under the Contract.

1.3 SUBMITTALS

A. Informational Submittals

1. Methods of demolition and equipment proposed to demolish features. This submittal should be sufficient to demonstrate a thorough understanding of the Work to be completed and the means that will be implemented to safely complete the demolition within the Contract Time without damage to surrounding structures or resources.

2. Waste Management Plan to indicate the types of wastes to be generated and the proposed disposal or recycling locations. Include back-up disposal facilities.

3. Copies of any authorizations and permits required to perform the Work, including disposal/recycling facility permits.

B. The following records and disposal documentation must be maintained and kept current throughout the Project. These documents will be maintained in chronological order in a 3-ring binder with appropriate tabbed dividers. The binder will be reviewed for completeness at each progress meeting. Requests for periodic payments may be rejected, in whole or in part, if documentation is not current.

1. Records of the amounts of waste generated, by waste type

2. Evidence of lawful disposal or recycling of all wastes generated

3. Documentation of underground structures and utilities

4. Copies of any analytical results generated as a result of waste stream characterization

1.4 REGULATORY REQUIREMENTS

A. Contractor is solely responsible for obtaining permits or approvals which may be required to perform the work of this section, including all costs, fees and taxes required or levied, except for the following permits that will be obtained by the Owner:

B. Notify and obtain such permits or approvals from agencies having jurisdiction over demolition prior to starting work.

C. Complete, sign, and submit a Notice of Intent to be covered under EPA's General Permit for Construction Activity. Comply with the requirements of the site-specific Stormwater Pollution Prevention Plan that is appended to this Project Manual.

D. Comply with all applicable federal, state, and local environmental, safety and health requirements regarding the demolition of structures and other site features and recycling or disposal of demolition debris, as applicable.

E. Conform to procedures identified in Section 01350 – Health and Safety Plan if hazardous or contaminated materials are discovered.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 PROJECT MANAGEMENT

A. Provide a full-time Project Superintendent who shall serve as a direct communication among the Contractor, subcontractors, and the Owner.

B. Require all subcontractors to provide a foreman or superintendent. That individual must be on site at all times that the subcontractor is working.

3.2 EXAMINATION

A. Verify site conditions before proceeding with demolition work. Field check the accuracy of the Drawings and inspect structures and utilities prior to start of work and notify the Engineer in writing, of any hazardous conditions and/or discrepancies. Primary structures and other site features are shown on the Drawings. The Owner/Engineer may require the contractor to demolish other small site features not designated on the drawings such as, concrete walks and pads, miscellaneous signs, lamp posts, railings, and fencing. .

1. Unknown Site Conditions - The information provided on the Drawings and in the Specifications is believed accurate. Field verify all information. Bear full responsibility for obtaining all locations of underground structures, utilities and their connections. Maintain services to buildings outside the limits of work.

3.3 HAZARDOUS MATERIALS

A. Lead Paint

1. A number of state, federal and local agencies regulate work which involves lead paint. Paint coatings on the structures to be demolished that contain lead. This

lead could present a hazard to workers and requires regulatory compliance with 29 CFR 1926.62 "Lead in Construction."

2. Of specific concern is the cutting of steel components using torch methods. If the Contractor intends to torch cut painted steel, lead paint must be removed from the area to be cut with a chemical stripper or other means prior to cutting. Sufficient paint must be removed from the area to prevent volatilization of lead during the heating of the steel. Other means of controlling worker exposure to lead will be acceptable provided that they are addressed in the Lead Exposure Control Plan outlined in Section 01350 and that they meet the requirements of 29 CFR 1926.62.

3. Where activities may generate leaded dust or impact a leaded surface, regulate work area so that dust migration is contained properly within the regulated area. Once the work is complete, properly clean up and dispose of leaded dust and materials.

B. Oil and Hazardous Material Contamination

1. There is no known soil contamination at the site. However, contaminated soil may be encountered during excavation. In the event that contaminated soil is encountered, handle such material in accordance with Section 01350 – Health and Safety Plan.

2. Contractor personnel working in areas of the site where contamination is likely to be encountered shall be appropriately trained, as required under Section 01350, Article 1.5.

3. When working in areas of the site where contamination is likely to be encountered, Contractor's Site Safety Officer shall monitor the work area in accordance with Section 01350, Article 1.5.

3.4 DEMOLITION

A. Preform Demolition by methods that will not cause damage to surrounding structures, underground and overhead utilities, or other existing items and structures that are to remain in place.

B. Promptly and properly manage all debris as the demolition progresses. Construct and/or prepare material staging/stockpile areas at locations approved by the Engineer.

C. Miscellaneous Site Structures and Features

1. Trees: Trees are an important resource and shall be treated as such. Unless specifically noted to be demolished, protect all trees and obtain approval of the Engineer prior to removing or pruning any other trees. Refer to section 01725.

3.5 DISPOSAL

A. Legally dispose of or recycle all materials from demolition as well as equipment and other materials that are within the buildings. The disposal site shall be permitted to accept the waste stream by the applicable State Agency. Perform the loading of demolition materials in a manner that prevents materials and activities from generating excessive dust and ensures minimum interference with roads, sidewalks and streets both onsite and offsite.

B. Provide evidence that the demolition materials have been received at a legal disposal, recycle, reuse or salvage location. Such proof may include truck weigh slips from an approved disposal facility or documentation of transfer of title. Transport of all materials off site shall be in accordance with applicable Department of Transportation Regulations. All materials leaving the site shall become the property of the Contractor.

3.6 SITE RESTORATION

A. Prior to any backfilling, document the location of any structures that remain in place through construction photographs (Section 01320) and by obtaining swing ties to and elevations of any structures to be buried. Progress payments may be withheld if current documentation is not maintained.

B. Backfill areas from which structures were removed to match the surrounding grade or to achieve the final grades indicated on the Drawings. Backfilling shall be conducted in accordance with Section 02315.

C. Restore damaged areas of the site or neighboring properties in accordance with Sections 01725 and stabilize slopes in accordance with the erosion and sedimentation control requirements of the Contract.

D. Loam and seed all disturbed areas in accordance with the Contract Drawings.

END OF SECTION

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SECTION 02230

SITE CLEARING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Clearing and Grubbing

2. Stripping and Stockpiling of Soil and Sod

B. Related Sections

1. Section 02370 - Erosion Control

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 CLEARING AND GRUBBING

A. Confine all work to the limits of construction as indicated in the Drawings, as well as any temporary easements obtained for the Work.

B. Carry out all clearing and grubbing in accordance with the Contract Documents. Minimize removal of all vegetation with particular care to protect all trees. In residential yard areas, remove only those trees specifically identified by Engineer.

C. Prior to commencing Work, all temporary erosion and pollution control devices shall be installed at locations shown on the Drawings or as ordered.

D. Burning of trees, brush, and stumps will not be permitted. Provide a satisfactory method of disposal.

E. If sufficient quantities of material are available on-site, a chipper may be used for branches, limbs, etc. obtained during clearing, to produce woodchips. The chips shall be the property of the Contractor and shall be removed from the Site by the Contractor.

F. In all cleared areas and under all embankments, grub and remove stumps of all trees, brush and major roots.

G. For tree trimming and pruning, painting with an approved tree dressing or paint will be required on all cuts 2 inches or over in diameter. Apply the dressing or paint no later than two days after the cuts are made. All limbs and branches which require removal and all stubs, regardless of age, must be cut flush either to a union with the next larger sound limb or branch or flush to the trunk of the tree. The cutting shall be performed by experienced arborist. Trained tree climbers are required for pruning of tall growth. Take care not to damage major root systems of trees and shrubs to remain during grading operations. Repair an injury to limbs, bark or roots of such plants, or replace the plants at no additional cost to the Owner. If within one (1) year of the acceptance of the Project, any tree affected by the Work dies, replace it with a tree of equal value as determined by the Engineer.

H. All trees and branches 4 inches to 12 inches in diameter shall be cut in 4 foot lengths and stockpiled on a site designated by the Engineer and shall remain the property of the

Owner. Satisfactorily dispose of all remaining wood, stumps, brush, twigs, leaves, roots and trash as soon as practicable and in such a manner as not to detract from the appearance of the area.

3.2 STRIPPING TOPSOIL AND UNSUITABLE MATERIAL

A. As necessary to properly complete the work, and in areas to be excavated, all stumps, roots, foreign matter and unsuitable earth shall be stripped from the ground surface. Topsoil and loam which is deemed suitable by the Engineer shall be stockpiled and used, where possible, for finished surfacing and to construct earth beams and graded mounds.

B. Keep stockpile of salvage material separate from the other stockpiles of excavated material.

C. Excess topsoil is the property of the Contractor and shall be legally disposed of off-site.

D. Unsuitable earth, stumps, roots and foreign matter shall be legally disposed of off-site by the Contractor.

3.3 DISPOSAL OF CLEARED AND GRUBBED MATERIALS

A. All cleared and grubbed unsuitable materials unless otherwise noted shall become the property of the Contractor and shall be removed from the Site and disposed of in compliance with Federal, State and local Laws and Regulations.

B. Dutch Elm Wood

1. Dispose of Dutch Elm diseased wood in accordance with the provisions of Massachusetts General Law, Chapter 87, Section 5 and Chapter 132, Sections 8 and 11, as amended; and in accordance with any additional local Regulations.

2. Dispose of elm trees or limbs immediately after cutting or removal and in such a manner as to prevent the spread of Dutch Elm disease. Accomplish by covering them with earth to a depth of at least 6 inches in areas outside the right-of-way locations where the Contractor has arranged for disposal.

3. Where the work includes the removal and disposal of stumps of elm trees, completely dispose of such stumps immediately after cutting in the manner specified above.

3.4 CLEANING UP

A. During construction, maintain the Project Site and adjacent areas clean and free of all rubbish, debris, surplus materials and unnecessary construction equipment.

B. Where material or debris has washed, flowed or in any way accumulated in watercourses, ditches, gutters, drains, pipes or structures during the course of the Contractor's operations, such material or debris shall be entirely removed and satisfactorily disposed of as necessary, and upon completion of the work shall be cleaned, flushed and left in neat conditions to the satisfaction of the Engineer.

C. Restore or replace, when and as directed, any public or private property damaged by the Work to a condition at least equal to that existing immediately prior to the beginning of operations. All drainage structures, curbstones, signs, guardrails, fences and stone walls which are removed or damaged as a result of the work under this contract shall be reset or replaced as required.

3.5 PROTECTION

A. Save trees and shrubs that are specifically designated by the Engineer not to be cut, removed, destroyed or trimmed from harm and injury. All damage done to trees by the Contractor's operation and all branches of trees extending within the roadway shall be trimmed and painted where cut or as necessary to provide adequate vertical clearance for construction, including selective trimming of such trees as directed.

B. Use all necessary precautions to prevent injury to other desirable growth in all areas. If the existing ground in the area is disturbed by any of the Work or equipment, rough-grade, loam and seed the disturbed areas. After removal, dispose of all stumps including the major root systems where the material will not cause obstructions to streams and will not detract from the appearance of the roadside.

END OF SECTION

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SECTION 02315

EXCAVATION, BACKFILL, COMPACTION, AND DEWATERING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Excavation, backfill and compaction for general site construction.
2. Removal, handling and disposal of rock not covered under Section 02410
3. Earth retention systems
4. Temporary dewatering systems

B. Related Sections

1. Section 01570 - Temporary Controls
2. Section 02320 - Borrow Materials

1.2 REFERENCES

A. ASTM D1557-07 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3))

B. Federal Register 40 CFR Part 122, United State Environmental Protection Agency (USEPA) Administered Permit Programs (National Pollution Discharge Elimination System or NPDES), Storm Water Discharge

C. ASTM D1556-07 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method

D. ASTM D2487-06e1 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)

E. ASTM D6938-08a - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

F. 29 CFR Part 1926 Subpart P - OSHA Excavation Regulations 1926.650 through 1926.652 including Appendices A through F

G. 520 CMR 14.00 Excavation and Trench Safety

H. Commonwealth of Massachusetts Highway Department “Standard Specifications for Highways and Bridges,” 1988 Edition as amended

I. Manual on Uniform Traffic Control Devices for Streets and Highways, U.S. Department of Transportation, Federal Highway Administration, latest edition

1.3 DEFINITIONS

A. Benching - A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

B. Earth Retention Systems - Any structural system, such as sheeting and bracing or cofferdams, designed to retain in-situ soils in place and prevent the collapse of the sides of an excavation in order to protect employees and adjacent structures.

C. Excavation - Any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

D. Protective System - A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include earth retention systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

E. Registered Professional Engineer - A person who is registered as a professional engineer in the state where the work is to be performed. However, a professional engineer, registered in any state is deemed to be a "registered professional engineer" within the meaning of this standard when approving designs for "manufactured protective systems" or "tabulated data" to be used in interstate commerce.

F. Licensed Site Professional - A person who is registered by the Commonwealth of Massachusetts to render Hazardous Waste Site Cleanup Activity Opinions.

G. Shield System - A structure that is designed to withstand the forces imposed on it by a cave-in and thereby protects employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either pre-manufactured or job-built in accordance with 29 CFR 1926.652(c)(3) or (c)(4). Shields used in trenches are usually referred to as "trench boxes" or "trench shields."

H. Sloping - A method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

I. Temporary Dewatering System – A system to lower and control water to maintain stable, undisturbed subgrades at the lowest excavation levels. Dewatering shall be provided for all pipelines, structures and for all other miscellaneous excavations.

J. Trench - A narrow excavation (in relation to its length) made below the surface of the ground, of at least three feet in depth. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 m).

1.4 SUBMITTALS

A. Drawings and calculations for each Earth Retention System required in the Work. The submittal shall be in sufficient detail to disclose the method of operation for each of the various stages of construction required for the completion of the Earth Retention Systems.

1. Submit calculations and drawings for Earth Retention Systems prepared, signed and stamped by a Professional Engineer registered in the state where the work is performed.

B. Performance data for the compaction equipment to be utilized

C. Construction methods that will be utilized for the removal of rock

D. Dewatering plan for the excavation locations. Design shall include calculations and drawings stamped and signed by a Professional Engineer registered in the state where the work is performed.

1.5 QUALITY ASSURANCE

A. All Excavation, Trenching, and related Earth Retention Systems shall comply with the requirements of OSHA excavation safety standards (29 CFR Part 1926 Subpart P), 520 CMR 14.00, and other State and local requirements. Where conflict between OSHA and State regulations exists, the more stringent requirements shall apply.

B. Employ the services of a dewatering specialist or firm when well points, deep wells, recharge systems, or equal systems are required. Specialist shall have completed at least 5 successful dewatering projects of equal size and complexity and with equal systems.

1.6 PROJECT CONDITIONS

A. Notify Dig Safe and obtain Dig Safe identification numbers.

B. Notify utility owners in reasonable advance of the work and request the utility owner to stake out on the ground surface the underground facilities and structures. Notify the Engineer in writing of any refusal or failure to stake out such underground utilities after reasonable notice.

C. Make explorations and Excavations to determine the location of existing underground structures, pipes, house connection services, and other underground facilities in accordance with Paragraph 3.2.D of this Section.

D. In accordance with 520 CMR 14.00, no person shall, except in an emergency, make an excavation in any public way, public property, or privately owned land until a permit is obtained from the appropriate designated permitting authority.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

A. Fill material is subject to the approval of the Engineer and may be either material removed from excavations or borrow from off site. Fill material, whether from the excavations or from borrow, shall be of such nature that after it has been placed and properly compacted, it will make a dense, stable fill.

B. Satisfactory fill materials shall include materials classified by ASTM D 2487 as GW, GP, GM, GP-GM, GW-GM, GC, GP-GC, SW, and SP. Additional requirements are included in Section 02320.

C. Satisfactory fill materials shall not contain trash, refuse, vegetation, masses of roots, individual roots more than 18 inches long or more than 1/2 inch in diameter, or stones over 6 inches in diameter. Unless otherwise stated in the Contract Documents, organic matter shall not exceed minor quantities and shall be well distributed.

D. Satisfactory fill materials shall not contain frozen materials nor shall backfill be placed on frozen material.

E. Excavated surface and/or pavement materials such as gravel or trap rock that are salvaged may be used as a sub-grade material, if processed to the required gradation and compacted to the required degree of compaction. In no case shall salvaged materials be substituted for the required gravel base.

2.2 DEWATERING MATERIALS

A. Provide haybales and silt fence in accordance with Section 01570.

B. Provide silt filter bags (Dandy Dewatering Bag, Dirtbag, JMP Environ-Protection Filter Bag, or equal) of adequate size to match flow rate.

C. Provide dewatering equipment and materials for engineered dewatering systems.

PART 3 EXECUTION

3.1 PREPARATION

A. Public Safety and Convenience

1. Adhere to the requirements of 520 CMR 14.00 for all excavation work.

2. Take precautions for preventing injuries to persons or damage to property in or about the Work.

3. Provide safe access for the Owner and Engineer at site during construction.

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

3.2 CONSTRUCTION

A. Earth Retention Systems

1. Provide Earth Retention Systems necessary for safety of personnel and protection of the Work, adjacent work, utilities and structures.

2. Maintain Earth Retention Systems for the duration of the Work.

3. Sheeting

a. Systems shall be constructed using interlocking corner pieces at the four corners. Running sheet piles by at the corners, in lieu of fabricated corner pieces, will not be allowed.

b. Drive sheeting ahead of and below the advancing excavation to avoid loss of materials from below and from in front of the sheeting.

c. Sheeting is to be driven to at least the depth specified by the designer of the earth retention system, but no less than 2 feet below the bottom of the Excavation.

4. Remove earth retention system, unless designated to be left in place, in a manner that will not endanger the construction or other structures. Backfill and properly compact all voids left or caused by the withdrawal of sheeting.

a. Remove earth retention systems, which have been designated by the Engineer to be left in place, to a depth of 3 feet below the established grade.

B. Excavation

1. Perform excavation to the lines and grades indicated on the Drawings. Backfill unauthorized over-excavation in accordance with the provisions of this Section, at no additional cost to the Owner.

2. Excavate with equipment selected to prevent damage to existing utilities or other facilities. Hand excavate as necessary to locate utilities or avoid damage.

3. Sawcut the existing pavement in the vicinity of the excavation prior to the start of excavation in paved areas, so as to prevent damage to the paving outside the requirements of construction. The sawcut shall be neat in appearance with no ragged lines; trim pavement as necessary.

4. Perform excavation in such a manner as to prevent disturbance of the final subgrade. The Engineer or Owner may require the final six inches of excavation be performed by hand, with the use of a smooth-faced bucket, or other means acceptable to the Engineer or Owner, at no additional cost if subgrade disturbance is considered excessive as judged by the Engineer or Owner.

5. During excavation, material satisfactory for backfill shall be stockpiled in an orderly manner at a distance from the sides of the excavation equal to at least one half the depth of the excavation, but in no case closer than 2 feet.

   a. Excavated material not required or not suitable for backfill shall be removed from the site and disposed of in accordance with local, State and Federal laws and regulations.

   b. Perform grading to prevent surface water from flowing into the excavation.

   c. Pile excavated material in a manner that will endanger neither the safety of personnel in the excavation nor the Work itself. Avoid obstructing sidewalks and driveways.

   d. Hydrants under pressure, valve pit covers, valve boxes, manholes, curb stop boxes, fire and police call boxes, or other utility controls shall be left unobstructed and accessible until the Work is completed.

6. Grade or create berms or swales to direct surface water from excavations to appropriate structures designed to accommodate storm water. If no structures exist, direct water to areas that minimize impacts to adjacent structures and properties.

   a. \

7. If satisfactory materials are not encountered at the design subgrade level, excavate unsatisfactory materials to the depth directed by the Engineer and properly dispose of the material. Backfill the resulting extra depth of excavation with satisfactory fill materials and compact in accordance with the provisions of this Section.

C. Backfill and Compaction

1. Unless otherwise specified or indicated on the Drawings, use satisfactory material removed during excavation for backfilling trenches. The Engineer may

require stockpiling, drying, blending and reuse of materials from sources on the Project.

2. Spread and compact the material promptly after it has been deposited. When, in the Engineer's judgment, equipment is inadequate to spread and compact the material properly, reduce the rate of placing of the fill or employ additional equipment.

3. When excavated material is specified for backfill and there is an insufficient amount of this material at a particular location on the Project due to rejection of a portion thereof, consideration will be given to the use of excess material from one portion of the Project to make up the deficiency existing on other portions of the Project.

    a. Use borrow material if there is no excess of excavated material available at other portions of the Project.

4. Backfilling and compaction methods shall attain 95% of maximum dry density at optimum moisture content as determined in accordance with ASTM D1557.

5. Do not place stone or rock fragment larger than six inches in greatest dimension in the backfill.

6. Maximum loose lift height for backfilling existing or borrow material shall be 12 inches, unless satisfactory compaction is demonstrated otherwise to the Engineer through field-testing. In no case shall loose lift height for backfilling exceed 3 feet.

D. Dewatering

1. Obtain the following construction dewatering permits, as necessary to complete the work:

    a. US EPA Dewatering General Permit

3.3 PROTECTION

A. Protection of Existing Structures

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

B. Accommodation of Traffic

1. Streets and drives shall not be unnecessarily obstructed. The Contractor shall take such measures at his own expense to keep the street or road open and safe for two-way traffic unless otherwise indicated.

2. Construct and maintain such adequate and proper bridges over excavations as may be necessary or as directed for the safe accommodation of pedestrians and vehicles. Provide substantial barricades at crossings of trenches, or along the trench to protect the traveling public.

3. Where deemed necessary, such additional passageways as may be directed shall be maintained free of such obstructions. All material piles, open excavations, equipment, and pipe which may serve as obstructions to traffic shall be protected by proper lights, signage, or guards as necessary.

4. All traffic controls shall be in accordance with the Manual on Uniform Traffic Control Devices for Streets and Highways, latest edition.

C. Erosion and Sedimentation Control

1. Take all necessary steps to prevent soil erosion.

2. Plan the sequence of construction so that only the smallest practical area of land is exposed at any one time during construction.

3. Temporary vegetation and/or mulching shall be used to protect critical areas exposed during construction as judged by the Engineer.

END OF SECTION

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SECTION 02320

BORROW MATERIALS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Processed Gravel Borrow for Sub-base
2. Stone Borrow
3. Ordinary Borrow
4. Modified Rockfill
5. Stone Dust Surfacing – Stabilized Aggregate

B. Related Sections

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

1.2 REFERENCES

A. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

B. ASTM C117 - Standard Test Method for Materials Finer than 75 μm (No. 200) Sieve in Mineral Aggregates by Washing

C. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method

D. ASTM D1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lb./ft3)

E. ASTM D2434 - Standard Test Method for Permeability of Granular Soils (Constant Head)

F. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System)

G. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

H. AASHTO – Standard Specification for Transportation Materials and Methods of Sampling and Testing, 1986 Edition as amended

I. Commonwealth of Massachusetts Highway Department “Standard Specification for Highways and Bridges,” 1988 Edition as amended

1.3 SUBMITTALS

A. Representative Samples of borrow materials taken from the source. Tag, label, and package the Samples as requested by Engineer. Provide access to the borrow site for field evaluation and inspection.

B. Provide sieve analysis (ASTM C136) and permeability analysis (ASTM D2434) from certified soils testing laboratory for all borrow materials. Take and test a sample, at no additional cost to the Owner for each 1,500 c.y. of borrow material placed.

C. Provide modified proctor analysis (ASTM D1557) from certified soils testing laboratory for all borrow materials.

1. Take and test a sample of low permeability soil for each 5,000 cy of material placed, or as directed by the Engineer.

2. All other borrow materials shall be tested once unless more frequent testing is deemed necessary by the Engineer or Owner due to material variation.

D. Provide sieve analysis (ASTM 422) from certified soils testing laboratory for all borrow materials (including hydrometer analysis for silts and clays).

1. Take and test a sample of sand for each 1,500 cy of material placed or as directed by the Engineer.

2. Test all other borrow materials once unless more frequent testing is deemed necessary by the Engineer due to material changes.

E. The Engineer reserves the right to require more frequent testing than that which is specified above should the borrow characteristics change.

1.4 QUALITY ASSURANCE

A. No borrow shall be placed prior to the approval of Samples by the Engineer.

1.5 PROJECT/SITE CONDITIONS

A. Existing Conditions

1. Comply with any environmental requirements and restrictions.

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

PART 2 PRODUCTS

2.1 GRAVEL BORROW

A. Gravel Borrow shall consist of inert material that is hard, durable stone and coarse sand, free from loam and clay, surface coatings, and deleterious materials. The coarse aggregate shall have a percentage of wear, by the Los Angeles Abrasion Test, of not more than 50.

Gradation requirements for Gravel Borrow shall be determined by AASHTO-T11 and T27 and shall conform to the following:

Sieve	Percent Passing
½ inch	50 – 85
No. 4	40 – 75

No. 50	8 – 28
No. 200	0 - 10

Maximum size of stone in Gravel Borrow shall be 2 inches.

2.2 PROCESSED GRAVEL BORROW FOR SUBBASE

A. The compacted Processed Gravel Borrow to be used for gravel access roads and pavement subbase, or other area where a firm, free-draining subgrade is needed shall consist of inert material that is hard, durable stone and coarse sand, free from loam and clay, surface coatings and deleterious materials. The coarse aggregate shall have a percentage of wear, by the Los Angeles Abrasion Test, of not more than 50.

B. Gradation requirements shall conform to the following:

Sieve	**Percent Passing**
3”	100
1 ½”	70 – 100
¾”	50 – 85
No. 4	30 – 60
No. 200	0 - 10

C. Stockpile the processed materials in such a manner to minimize segregation of particle sizes. All processed gravel shall come from approved stockpiles.

2.3 MODIFIED ROCKFILL

A. Stone used for modified rockfill shall meet the requirements of Article M2.02.4 “Modified Rockfill” as detailed in the “Massachusetts Specifications for Highways and Bridges”, 1988 edition and any revisions thereto. Modified rockfill shall consist of hard, durable, angular shaped stones which are the product of the primary crushing of a stone crusher. Rounded stone, boulders, sandstone and similar soft stone or relatively thin slabs will not be acceptable. Stone shall be free from overburden, spoil, shale, and organic material and shall conform to the following gradation requirements:

	Percent Passing Through	
Stone Size	**Minimum**	**Maximum**
8″	95	100
4″	0	25
2½″	0	5

2.4 ORDINARY BORROW

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

2.5 STABILIZED STONE DUST SURFACING

A. Stabilized stonedust is pulverized stone precision blended with a water-activated binding agent, 'Stabilizer' for Stabilized Aggregate surfaces by the following Manufacturer:

1. Stabilizer Solutions, stabilizersolutions.com; as supplied by Read Custom Soils, 158 Tihonet Road, Wareham, MA 02571, tel: 781-828-6300, sales@readcustomsoils.com .

B. Stone Dust Aggregate:

1. Stone Dust or 3/8" or 1/4" crushed aggregate screenings

a. Sand and crushed stone shall consist of inert materials that are hard and durable, with stone free from surface coatings and deleterious materials. Gradation requirements shall be as follows:

b. Gradation requirements for Stone Dust shall be determined by AASHTO-T11 and T27 and shall conform to the following:

Sieve	Percent Passing
3/8 inch	100
No. 4	90 - 100
No. 8	75 - 80
No. 16	55 - 65
No. 30	40 – 50
No. 50	25 – 35
No. 100	15 – 20
No. 200	10 - 15

2. Stone Dust Color: to be selected from the four colors that have been approved for use with binding agent: Blue, Sandy-Taupe, Nickel and or Natural Gray.

C. Stabilizer Binder

1. Patented, non-toxic, organic binder that is a colorless and odorless concentrated powder that binds decomposed granite or crushed 3/8" or 1/4" minus aggregate.

a. Product to have 64% pre-consumer recycled content.

b. Product shall have 25 years experience at same formulation.

D. Filter Fabric – Separation layer – Mirafi 140 N Geotextile Fabric.

E. Excess Material

1. Provide owner's authorized rep. with the following excess materials for use in future Stabilized Aggregate repair: 40 to 50 lb. Bags of the Stabilized Aggregate blended with proper amount of Stabilizer®.

PART 3 EXECUTION

3.1 STONE DUST SURFACING – STABILIZED AGGREGATE

A. Preparation

1. Base shall be 6" min.compacted layer of your state's DOT recommended crushed granular road base. Make any corrections necessary to base furnished and installed to bring gravel to the elevations shown on the drawing.

2. Pre-soak base material with water and compact to 95% determined by Test Method ASTM D 1557 prior to installing Stabilized Aggregate. Compaction testing to be provided by project owner, one test per 2,000 square feet of base.

3. Although porous, it is recommended to have proper drainage available to ensure no standing water on surface or adjacent to Stabilized Aggregate, including downspouts when placed under roof overhang and surface drains.

B. Blending Stabilizer

1. Stabilizer® shall be thoroughly pre-mixed with aggregate at the rate of 15-lbs of Stabilizer® per 1-ton of aggregate. Verify with manufacturer correct Stabilizer® rate for your project and climate. Drop spreading of Stabilizer® over pre-placed aggregate or mixing by rototilling is not acceptable. Stabilizer shall be mechanically pre-mixed per manufacturer's recommendations using an approved mechanical blending unit to adequately blend Stabilizer® with aggregate (Bucket blending is not an approved blending apparatus). Always blend Stabilizer® and aggregate DRY.

C. Placement

1. After pre-blending, place Stabilized Aggregate directly on prepared sub-grade. Level to desired grade and cross section. Depth of pathways shall be as noted on drawings. DO NOT place on filter fabric. Contact Stabilizer Solutions, Inc. for installation on slopes greater than 8%.

D. Watering

1. The recommended product supplier, Read Custom Soils, delivers Stabilized Stonedust that has water added.

2. Contractor shall wait a minimum of 6 – 72 hours or until such time that the Stabilized Aggregate is able to accept compaction from a 1 to 5 ton roller without separation, plowing or any other physical compromise of the aggregate.

3. If surface aggregate dries significantly quicker than subsurface material, lightly mist surface before compaction.

E. Compaction

1. Compact Stabilized Aggregate to 85% relative compaction by equipment such as; a 2 to 5-ton double drum roller making 3 to 4 passes. Do not begin compaction for 6 hours after placement and up to 72 hours. DO NOT use a vibratory plate compactor or vibration feature on roller, as vibration separates large aggregate particles. If pumping or pancaking of surface occurs, surface is still too wet to roll.

2. Take care in compacting surface when adjacent to planting and irrigation systems, use 8” or 10” hand tamp. Installation of Stabilized Aggregate more than 3” thick shall be installed in lifts. If 4” thick compacted (2) 2” lifts. If 5” thick compacted (2) 2.5” lifts. If Stabilized Aggregate is pre-moistened before installation entire 4” or 5” lift may be installed.

3. Lightly spray surface area following compaction. Do not disturb aggregate surface with spray action.

F. Inspection

1. Finished surface shall be smooth, uniform and solid with no evidence of chipping or cracking. Cured and compacted pathway shall be firm throughout profile with no spongy areas. Loose material shall not be present on surface after installation, but may appear after use and according to environmental conditions. Pathway shall remain stable underneath loose granite on top with a “natural” look. Any significant irregularities in path surface shall be repaired to the uniformity of entire installation.

G. Protection

1. Contractor shall furnish and install construction fence around new surface to prevent public access. Fencing shall be maintained in place for a minimum of 12 - 72 hours after completion of installation, or as directed by the Owner’ Representative. Drying period may take longer due to weather conditions.

2. Contractor shall notify Owner’s Representative that landscape irrigation shall be restricted near Stabilized Aggregate surface until drying period is complete. Standing water on surface and adjacent to path shall be restricted at all times.

H. Maintenance

1. Remove debris, such as paper, grass clippings, or organic material by mechanically blowing or hand raking as needed. When plowing snow, use rubber baffle on plow blade or wheels on plow to lift blade 1/4" off the surface.

2. During first year, minor amounts of loose aggregate may appear on surface (1/16 to 1/4"). If material exceeds a ¼”, redistribute over entire surface. Water to 1” depth and compact with power roller of no less than 1000-lbs. Repeat as needed. If cracking occurs, sweep fines into cracks, water thoroughly and hand tamp with an 8” – 10” hand tamp

I. Repairs

1. Excavate damaged area to the depth of the Stabilized Aggregate and square off sidewalls.

2. If area is dry, moisten damaged portion lightly.

3. Pre-blend the dry required amount of Stabilizer® with the proper amount of aggregate in a concrete mixer.

4. Add water to the pre-blended Stabilized Aggregate. Thoroughly moisten mix with 25 to 45 gallons per 1-ton of pre-blended material or to approximately 10% moisture content.

5. Apply moistened pre-blended Stabilized Aggregate to excavated area to finish grade.

6. Compact with an 8” to 10” hand tamp or 250 to 300 pound roller. Keep traffic off areas for 12 to 48 hours after repair has been completed.

3.2 INSTALLATION

A. Prior to the placement of borrow material, site preparation shall be completed as required by the Contract Documents, and approved by the Engineer.

B. Ensure that all materials are properly stockpiled on site to prevent contamination by other materials.

C. Place borrow material over the entire area in uniform lifts and compact in accordance with Section 02315.

D. Utilize on-site soils prior to using off-site borrow provided on-site soils meet the requirements of the specifications.

E. Utilize gravel borrow in all locations where a surface treatment has not been specified but requires a firm finish surface.

F. Processed gravel for pavement subbase is intended to provide a stable foundation for driveways, sidewalk and roadway repair where a gravel base has been specified.

G. Borrow shall be used as a replacement for unsuitable materials where poor soil conditions are encountered during the progress of the work, where approved by the Engineer. Borrow type will be determined by the Engineer. Borrow material used as a replacement for unsuitable soil is not intended to be an aid to dewatering.

H. Shape borrow used for pipe foundation material so that it supports the pipe properly and will not damage the pipe, bells, collars, or the pipe fittings.

I. Place all borrow to keep it free of other materials and to prevent segregation.

END OF SECTION

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SECTION 02870

SITE AND STREET FURNISHINGS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Plastic and Metal Bench
2. Plastic and Metal Picnic Table
3. Interpretive Signage

B. Related Sections

1. Section 02315 – Excavation, Backfill and Compaction for Utility Systems
2. Section 02320 – Borrow Materials

1.2 REFERENCES

1.3 SUBMITTALS

A. Shop drawings showing the plan layout, spacing of fixtures, foundation dimensions, hardware anchorage, and schedule of components.

B. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, finishes, field-assembly requirements, and installation details.

C. Submit location of product manufacture

D. Product Schedule: For site furnishings, use same designations indicated on Drawings.

E. Material Certificates: For site furnishings, signed by manufacturers.

F. Recycled plastic.

G. Maintenance Data: For site furnishings, include maintenance manuals.

H. Include the following paragraph for submission of physical samples for selection of finish, color, texture, and other properties.

1.4 QUALITY ASSURANCE

A. Qualify welders in accordance with AWS D1.1/D1.1M using procedures, materials, and equipment of the type required for the work.

B. Source Limitations: Obtain each type of site and street furnishings through one source from a single manufacturer.

C. Fabrication Drawings – Submit fabrication drawings showing layout(s), connections to structural systems, and anchoring details as specified in AISC 303.

D. Installation Drawings - Submit templates, erection and installation drawings indicating thickness, type, grade, class of metal, and dimensions. Show construction details, reinforcement, anchorage, and installation.

E. Assembly Instruction Drawings - Submit assembly instruction drawings showing layout(s), connections, bolting and anchoring details in accordance with manufacturer's standards. Submit drawings showing scaled details of proposed site furnishings, elevations for each type of site furnishing; dimensions, details, and methods of mounting or anchoring; shape and thickness of materials; and details of construction.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Ship items knocked-down (KD) ready for site assembly. Packaged components shall be complete including all accessories and hardware. Materials shall be delivered, handled, and stored in accordance with the manufacturer's recommendations. Site furnishings shall be inspected upon arrival at the job site for conformity to specifications and quality in accordance with paragraph MATERIALS. Protect from corrosion, staining, and other types of damage. Store items in designated area free from contact with soil and weather. Remove and replace damaged items with new items.

PART 2 PRODUCTS

FPLASTIC AND METAL BENCH

A. "Bench 131-60 AR" manufactured by DuMor, Inc. Toll Free (800) 598-4018. Website www.DuMor.com

1. 6' long Bench with Center Arm
2. Slats: Cedar recycled plastic
3. Finish: Textured grey frame
4. Mounting: Surface

2.2 PLASTIC AND METAL PICNIC TABLE

A. "Table 298-60-2PL" manufactured by DuMor, Inc. Toll Free (800) 598-4018. Website www.DuMor.com

1. 6' long ADA Picnic Table
2. Slats: Cedar recycled plastic
3. Finish: Textured grey frame
4. Mounting: Surface

2.3 INTERPRETIVE SIGNAGE

A. Contractor shall submit a interpretive sign product that meet the specifications outline on the contractor documents for review and approval by the Owner and Engineer prior to construction.

B. Contractor shall coordinate with the owner for final graphics depicted on the interpretive sign prior to construction.

2.4 MATERIALS

1. Provide materials that are the standard products of a manufacturer regularly engaged in the manufacture of such products. The materials provided shall be of a type with proven satisfactory usage for at least two years.
2. Metals
   a. Furnish metal components with factory-drilled holes and free of excess weld and spatter. Metal components with holes that will not be filled by hardware or hidden by other components will be rejected. Structural steel products shall conform to ASTM A36/A36M, ASTM A500/A500M and ASTM A501.
3. Anchors and Hardware
   a. Provide anchors, where necessary, for fastening site furnishings securely in place and in accordance with approved manufacturer's instructions. Anchoring devices that may be used, when no anchors are otherwise specified or indicated, include anchor bolts, slotted inserts, expansion shields for concrete; toggle bolts and through bolts for masonry; machine carriage bolts for steel; and lag bolts and screws for wood. Anchor bolts

shall conform to ASTM A307. Hardware shall be stainless steel in accordance with ASTM A153/A153M and compatible with the material to which applied. All exposed hardware shall match in color and finish. Mounting hardware shall be concealed, recessed, and plugged.

b. Threaded Inserts and Expansion Anchors

1) Provide inserts recessed not less than 4 inches into concrete or masonry. Pullout 198 pounds in concrete with f'c of 3,000 psi, as tested in accordance with ASTM E488/E488M. Expansion shields shall conform to CID A-A-1925, group II, type 4, class 1. Provide embedment required by manufacturer.

c. Lag Screws and Bolts

1) ASME B18.2.1, type and grade best suited for the purpose.

d. Toggle Bolts

1) ASME B18.2.1.

e. Bolts, Nuts, Studs and Rivets

1) ASME B18.2.2 or ASTM A307.

f. Power Driven Fasteners

1) Follow safety provisions of ASSE/SAFE A10.3.

g. Screws

1) ASME B18.2.1, ASME B18.6.2, and ASME B18.6.3.

h. Washers

1) Provide plain washers to conform to ASME B18.22M ASME B18.21.1. Provide beveled washers for American Standard beams and channels, square or rectangular, tapered in thickness, and smooth. Provide lock washers to conform to ASME B18.21.2M ASME B18.21.1.

4. Concrete

a. Ready-mixed concrete shall conform to ASTM C94/C94M, using 3/4 inch maximum size aggregate, and having minimum compressive strength of 3,000 psi at 28 days. Portland cement shall conform to ASTM C150/C150M. Reinforcing steel shall conform to ASTM A615/A615M. Welded wire fabric shall conform to ASTM A185/A185M.

2.5 PRETREATMENT, PRIMING, AND PAINTING

A. Apply pretreatment, primer, and paint in accordance with manufacturer's printed instructions.

B. Nonferrous metal surfaces

1. Protect by plating, anodic, or organic coatings.

2.6 COATINGS AND FINISHES

A. Galvanizing

1. Hot-dip galvanize items specified to be zinc-coated, after fabrication where practicable. Galvanizing shall conform to ASTM A123/A123M, ASTM A153/A153M or ASTM A653/A653M, as applicable. Tailings and sharp protrusions formed as a result of the hot-dip process shall be removed and exposed edges burnished. Galvanize anchor bolts, grating fasteners, washers and parts or devices necessary for proper installation, unless otherwise indicated.

B. Polyester Powder

1. Powder-coated surfaces shall receive electrostatic zinc coating prior to painting. Powder coating shall be electrostatically applied and oven cured. Polyester powder coating shall be resistant to ultraviolet (UV) light.

C. Polyvinyl-Chloride (PVC)

1. PVC coating shall be primed with a clear acrylic thermosetting solution. The primed parts shall be preheated prior to dipping. The liquid polyvinyl chloride shall be ultraviolet (UV) stabilized and mold-resistant. The coated parts shall be cured. The coating shall be a minimum 2/25 inches thick plus or minus 0.020 inches and shall have an 85 durometer hardness with a slip-resistant finish.

B. Finish

1. Finish shall be as specified by the manufacturer or as indicated. Exposed surfaces and edges shall be rounded, polished, or sanded. Finish shall be non-toxic, non-glare, and resistant to corrosion. Exposed surfaces shall be smooth and splinter-free exposed surfaces. Submit two sets of color data for each furnishing displaying manufacturer's color selections and finishes, and identifying those colors and finishes proposed for use.

2. Paint

a. Paint shall be factory applied with a minimum of two coats. Paint shall be weather-resistant and resistant to cracking, peeling and fading.

PART 3 EXECUTION

3.1 INSTALLATION

A. Verify that finished grades and other operations affecting mounting surfaces have been completed prior to the installation of site furnishings. Site furnishings shall be installed plumb and true, at locations indicated, in accordance with the approved manufacturer's instructions.

3.2 ASSEMBLY AND ERECTION OF COMPONENTS

A. New parts shall be acquired from the manufacturer; substitute parts will not be accepted unless approved by the manufacturer. When the inspection of parts has been completed, the site furnishings shall be assembled and anchored according to manufacturer's instructions or as indicated. When site furnishings are assembled at the site, assembly shall not interfere with other operations or pedestrian and vehicular circulation.

3.3 ANCHORAGE, FASTENINGS, AND CONNECTIONS

A. Furnish metal work, mounting bolts or hardware in ample time for securing into concrete or masonry as the work progresses. Provide anchorage where necessary for fastening furniture or furnishings securely in place. Provide, for anchorage not otherwise specified or indicated, slotted inserts, expansion shields, and power-driven fasteners, when approved for concrete; toggle bolts and through bolts for masonry; machine and carriage bolts for steel; through bolts, lag bolts, and screws for wood. Do not use wood plugs in any material. Provide non-ferrous attachments for non-ferrous metal. Make exposed fastenings of compatible materials, generally matching in color and finish the fastenings to which they are applied. Conceal fastenings where practicable.

3.4 WELDING

A. Perform welding, welding inspection, and corrective welding, in accordance with AWS D1.1/D1.1M. Use continuous welds on all exposed connections. Grind visible welds smooth in the finished installation.

3.5 TESTING

A. Test each site furnishing to ascertain a secure and correct installation. A correct installation shall be according to the manufacturer's recommendations and by the following procedure: Measure the physical dimensions and clearance of each installed site furnishing for compliance with manufacturer's recommendations and as indicated. Site furnishings, which do not comply, shall be reinstalled. Fasteners and anchors determined to be non-compliant shall be replaced. Submit a written report describing the results of the testing and a report of post-installation test results.

3.6 FINISHES

A. Field Finishes

1. Where indicated, field finishes shall be applied in accordance with Section 09900 PAINTING. Where dissimilar metals are in contact, protect surfaces with a coat conforming to SSPC Paint 25 to prevent galvanic or corrosive action. Where aluminum is in contact with concrete, mortar, masonry, wood, or absorptive materials subject to wetting, protect with ASTM D1187/D1187M, asphalt-base emulsion.

B. Repair of Zinc-Coated Surfaces

1. Repair damaged surfaces with galvanizing repair method and paint conforming to ASTM A780/A780M or by the application of stick or thick paste material specifically designed for repair of galvanizing, as approved by the Owner. Clean areas to be repaired and remove the slag from the welds. Heat surfaces to which stick or paste material is applied, with a torch to a temperature sufficient to melt the metallics in stick or paste; spread the molten material uniformly over surfaces to be coated and wipe the excess material off.

3.7 RESTORATION AND CLEAN UP

A. When the installation has been completed, clean up and protect the site. Existing areas that have been damaged from the installation operation shall be restored to original condition at Contractor's expense.

1. Clean Up

a. The site shall be cleaned of all materials associated with the installation. Site furnishing surfaces shall be cleaned of dirt, stains, filings, and other blemishes occurring from shipment and installation. Cleaning methods and agents shall be according to manufacturer's instructions or as indicated.

2. Protection

a. The area shall be protected as required or directed by providing barricades and signage.

3. Disposal of Materials

a. Excess and waste material shall be removed and disposed of off Owner’s property.

3.8 RE-INSTALLATION

A. Where re-installation is required, the following shall be accomplished:

1. Re-install the product as specified. Material acquisition of replacement parts is the responsibility of the Contractor. Provide replacement materials that are new and supplied by the original manufacturer to match.

2. Damage caused by the failed installation shall be repaired.

END OF SECTION

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SECTION 06100

HEAVY TIMBER CONSTRUCTION

PART 1 GENERAL

1.1 DESCRIPTION

A. The Contractor shall furnish all labor, equipment, materials, tools, supervision, and transportation necessary to perform all operations necessary to furnish and install all items consistent with this Section and as shown on the Drawings.

B. Scope of work includes, but is not limited to the following:

1. Furnishing and installation of all new timber members including pile caps, stringers, decking, and railings, as shown on the Drawings.

1.2 RELATED SECTIONS

A. Section 05500 – Miscellaneous Metals

1.3 REFERENCES

A. The Commonwealth of Massachusetts State Building Code, latest edition

B. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware

C. ASTM A446 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality

D. ASTM D1761 - Testing Mechanical Fasteners in Wood

E. AWPA Analytical Standards: A2-98, A3-00, A9-00, A16-93, A17-97, A18-99

F. AWPA C1 - All Timber Products

G. AWPA C15 - Wood for Commercial-Residential Construction

H. AWPA P5 - Waterborne Preservatives

I. AWPA M4 - Standard for the Care of Preservative Treated Wood Products

J. ICBO ES ER-4981

K. National Evaluation Report (NER): Report No. NER-628

L. National Evaluation Report (NER): Report No. NER-643

M. Inspection Agencies - Inspection agencies and the abbreviations used to reference with lumber grades and species include the following:

ALSA - American Lumber Standards Committee: Softwood Lumber Standards

NFPA - National Forest Products Association

RIS - Redwood Inspection Service

NELMA – Northeastern Lumber Manufacturers Association

NLGA - National Lumber Grades Authority (Canadian)

SPIB - Southern Pine Inspection Bureau

WCLIB - West Coast Lumber Inspection Bureau

WWPA - Western Wood Products Association

1.4 QUALITY ASSURANCE

A. The Contractor providing this Work shall submit evidence of suitable experience in this type of work and of the competence and experience of the person in charge at the site. Approval of the Contractor's experience shall be solely based on the judgement of the Engineer. Granting approval by the Engineer shall in no way imply acceptance of responsibility by the Engineer for the Contractor's ability to perform the Work.

B. Quality Mark: All preservative-treated wood members shall bear an end tag or permanent

1. Name of wood treating company
2. Treatment plant city and state
3. Symbol for Chromated Copper Arsenate (CCA)
4. Preservative retention level
5. Approved use
6. Code report number

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Stack lumber and timber off the ground on skids and under cover in a manner that prevents warping and allows shedding of water. Handle timber with rope or chain slings without dropping, breaking outer fibers, bruising, or penetrating the surface with tools. Do not use cant dogs, peaveys, hooks, or pike poles.

B. The material shall be stored on site in an area which will be designated by the Owner.

C. Timber shall be handled in an approved manner such that the material will not be damaged.

1.6 SUBMITTALS

A. Product Data: Submit manufacturer's data to the Engineer not less than 21 days prior to the start of Work. Certify that the following materials meet or exceed the specification requirements outlined in Part 2 – Products, by submitting a notarized copy of chemical and physical test results:

1. New CCA-treated Southern Yellow Pine Timber: The Contractor shall submit to the Engineer for review duplicate copies of licensed independent testing laboratory certification that the materials were free from defects, were properly peeled, seasoned and otherwise prepared for the intended use.

B. At least 4 weeks prior to material delivery, the Contractor shall submit certificates from the treatment plant or qualified testing laboratory and/or lumber supplier attesting that:

1. All timber is free from decay.
2. All timber has been treated in conformance with these Specifications.
3. All timber is of the grade and quality specified herein.

C. The Contractor shall submit a Timber Framing Work Plan stamped/sealed by a Massachusetts Professional Engineer, not less than 21 days prior to starting timber framing Work. At a minimum, the Timber Framing Work Plan shall include a narrative and drawings describing the following:

1. Complete descriptive data to demonstrate compliance of the materials, procedures and the equipment with these Specifications.
2. Tabular summary of framing identification and order lengths for timber elements.
3. Member dimensions, location, size, and type.

D. Closeout Submittals:

1. Within 7 days of receiving request from the Owner to submit closeout submittals, unless otherwise agreed to by the Owner, submit the following:

a. Heavy Timber Records Summary: Within 2 days of completing installation, submit copies of heavy timber installation records to the Engineer, which shall include a summary of all testing and installation records.

1.7 LINE AND GRADE CONTROL

A. The Contractor shall be responsible for establishing and maintaining line and grade control for all aspects of the Work and as specified on the Drawings. All survey work conducted on the project shall correspond to the site coordinate system and vertical datum as shown on the Drawings.

B. Final grades for timber shall be within the following tolerances:

1. Horizontal tolerance: 0.05 feet
2. Vertical Tolerance:0.05 feet

PART 2 PRODUCTS

2.1 GENERAL

1. Grade Stamps - Factory-mark each piece of lumber with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, and moisture content at time of surfacing, and mill.

a. Apply grade stamps to ends or back of each piece or omit grade stamps entirely and issue certificate of grade compliance from inspection agency in lieu of grade stamp.

2. Nominal sizes are indicated, except as shown by detail dimensions. Provide actual sizes as required, for moisture content specified for each use.

a. Provide dressed lumber, S4S, unless otherwise indicated.

B. All timber shall be new, free of tags and staples, and supplied with nominal dimensions unless otherwise noted.

2.2 MATERIALS

A. Timber and lumber shall be of the nominal dimensions as shown on the Drawings.

B. All horizontal surfaces between timber components shall be covered with 30# tar paper with a 1-inch overhang on all sides. Tar paper shall be overlapped a minimum of six inches at seams.

C. Timber railing, decking, and balusters shall be hardwood lumber conforming to the hardwood lumber requirements of Section 2.3.

D. Deck boards shall be spaced a minimum of 1/8 inch apart and shall be fastened using flat head stainless steel deck screws as identified on the plans. Screw holes shall be predrilled to avoid splitting.

E. Timber post, stringers, and pile caps shall be No. 1 Southern Yellow Pine or better, as graded by SPIB, and with design values per the NFPA National Design Specification.

F. All timber shall be free from defects, which will materially impair strength and durability of the timber member.

2.3 HARDWOOD LUMBER

A. Parameters

1. Moisture Content: Air Dried, moisture content of 18 to 25 percent; all dimensions when net thickness is over 1 inch.
2. Surface Options: S4SE4E (surfaced four sides, eased four edges). Surfaces shall be planed smooth; Edges shall be eased to a radius of 1/8 inch.
3. Finish: Natural lumber finish with no oils or stains.
4. Dimensions on Drawings: Nominal and Actual Size shall be listed.
5. Dimensional Tolerance: Plus, or minus 0.125 inch in width and 0.0625 in thickness,measured at 25 percent moisture content.
6. 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.
7. All lumber shall be acclimated to the final installation location for a minimum of threedays 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.

2.4 DECKING RESERVE

A. A. The Contractor shall carry twenty (20) 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 coordi-nated 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.

2.5 PRESERVATIVE TREATMENT

A. Prior to treatment, all dimension lumber shall be kiln dried. Conditioning by heating is not permitted.

B. All new Southern Yellow Pine timber members shall be treated with Chromated Copper Arsenate (CCA), a copper-based wood preservative. Minimum retention shall be 0.31 pounds per cubic foot.

C. Treatment shall comply with the AWPA Standard U1: User Specification for Treated Wood, latest edition. Service Condition shall be UC4B – Ground Contact, Heavy Duty. The material shall be applied in accordance with AWPA Standard T1: Processing and Treatment Standard, latest edition.

D. End Cut Preservative: Treat cut ends in accordance with manufacturer's recommendations.

E. All pressure treated timber that has been field cut, dressed, and/or drilled shall be coated with two (2) coats of copper naphthenate, including the ends of any spliced segments.

F. Adhesive: Use adhesives in accordance with manufacturer's recommendations.

2.6 FASTENERS

A. All connecting steel and fasteners shall be hot-dipped galvanized in accordance with ASTM A123/A123M.

PART 3 EXECUTION

3.1 PREPARATION

A. Prior to installation, all demolition affecting the new work shall be completed.

3.2 INSTALLATION

A. Coat ends of field cut members in accordance with subsection 2.3.D.

B. Joints are to be square, tight, and well-fastened with all members assembled in accordance with the approved Timber Framing and Work Plan and the Drawings.

C. Bore holes for bolts with a bit 1/16 inch larger in diameter than the bolt. Bore holes for lag screws in two parts. Lead holes for the shank shall have the same diameter equal to approximately two-thirds of the shank diameter. Couter bore for countersinking where smooth faces are indicated or specified.

D. Holes shall be swapped with two (2) coats of sealing compound as specified herein before installing the bolts.

E. Bolts shall be tightened to provide a solid connection. No more than one (1) washer shall be installed under the bolt head or nut. Bolts shall have additional threading to provide at least 3/8 inch per foot of thickness of timber for future re-tightening. Bolt threads shall project no more than one bolt diameter beyond the nut.

F. Make tight connections between members. Install fasteners without splitting wood; predrill as required.

G. Vertical bolts shall have nuts on the lower end and horizontal bolts shall have nuts on the interior of the structure.

H. All timber shall be cut and fit in such a matter so as to have full bearing over the entire contact surface.

3.3 TEMPORARY SUPPORT

A. The Contractor shall be responsible for providing any temporary support or shoring required during construction.

3.4 ADJUSTING AND CLEANING

A. Repair damaged and defective woodwork where possible to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.

END OF SECTION

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SECTION 06130

WOOD PEDESTRIAN BRIDGE

PART 1 GENERAL

1.1 SUMMARY

A. Section includes

1. Section includes design, fabrication, bearing, and delivery of a fully engineered prefabricated glued laminated timber bridge for pedestrian and light maintenance equipment.

2. Work includes bridge superstructure, decking, hardware, and related components.

B. The Contractor is responsible for hiring a licensed Professional Engineer (PE), registered in the Commonwealth of Massachusetts, to design and approve bridge and bridge end anchorage structures. Construction drawings stamped by the Engineer must be submitted to The Engineer (Tighe & Bond) for approval prior to beginning construction.

C. It is the responsibility of The Contractor to secure all necessary permits for the construction and transportation of the wooden pedestrian bridge.

D. Related Sections

1. 06100 – Heavy Timber Construction

1.2 REFERENCES

A. Organizations

1. AASHTO - American Association of State Highway and Transportation Officials

2. AITC - American Institute of Timber Construction

3. ANSI – American National Standards Institute

4. ASTM – American Society for Testing and Materials

5. SPIB – Southern Pine Inspection Bureau

6. ADA - Americans with Disabilities Act

B. Documents

1. AASHTO LRFD Bridge Design Specifications, 9th Edition

2. AASHTO LRFD Guide Specifications for the Design of Pedestrian Bridges, 2nd Edition, with Interim Revisions through 2015

3. AITC 109 - Standard for Preservative Treatment of Structural Glued Laminated Timber, latest edition

4. AITC 117 – Standard Specifications for Structural Glued Laminated Timber of Softwood Species, latest edition

5. ANSI/AITC A190.1 – Product Standard for Structural Glued Laminated Timber, latest edition

6. AITC 200 – Manufacturing Quality Control Systems Manual, latest edition

7. ASTM A123/A123M – Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products, latest edition

8. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications

9. The Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities.

1.3 FABRICATORS QUAIFICATIONS

A. Certification: The Fabricator shall be approved under the AITC and shall maintain AITC certification.

B. Experience: The Fabricator shall have designed and fabricated at least ten (10) permanent prefabricated timber pedestrian bridges of approximately the same size and configuration as the project structure during a period of not more than five (5) continuous years immediately preceding the bid opening.

1.4 SUBMITTALS

A. Fabricator Qualifications: The Contractor shall submit for approval a package providing full documentation of their proposed Fabricator's qualifications, as listed in Section 1.3 of this Specification. If the Fabricator has facilities at more than one location, the Contractor shall provide AITC certifications and endorsements for the location of the facility where the project structure will be fabricated.

Approval of the Fabricator shall not be construed as approval of their preferred materials, laborers, and practices. The Fabricator shall be held to the full standards of the Construction Contract as detailed within the Contract Plans and Specifications.

B. Design Calculations: Following approval of the Fabricator, the Contractor shall submit for approval design calculations for the proposed prefabricated bridge, bearings, and anchor bolts. The design calculations will not be reviewed until the Fabricator has been approved, and any work performed prior to approval of the Fabricator shall be at the Contractor's sole risk. The design calculations shall be stamped by a Professional Engineer registered in the Commonwealth of Massachusetts.

Calculations shall be performed in conformance with the design criteria provided in Section 1.7 B of this specification.

C. Design Drawings: The Contractor shall submit for approval design drawings of the proposed prefabricated bridge, bearings, anchor bolts, and timber boardwalk connection stamped by a Professional Engineer registered in the Commonwealth of Massachusetts. Shop drawings may be utilized as design drawings, but only if they are stamped by a Massachusetts Professional Engineer. Shop drawings will not be reviewed until stamped design drawings have been provided or the shop drawings themselves are stamped.

The Contractor's design drawings shall provide all information necessary to coordinate the proposed prefabricated bridge with the substructure shown on the Contract Plans.

The drawings shall clearly show the locations of bearings and anchor bolts with respect to the proposed substructures, including the abutting timber boardwalk. Any modification of the proposed substructure shown on the Contract Plans shall be clearly noted. The drawings shall also note the size, grade, and design load for proposed anchor bolts, regardless of whether the bolts are to be supplied by the Fabricator or Contractor.

D. Shop Drawings: The Contractor shall submit for approval shop drawings for the proposed bridge, bearings, and boardwalk connection. The drawings shall include a fully dimensioned details, material designations and finishes for each unique piece prior to assembly. Fabrication of each assembly shall be accomplished using bolted and/or prequalified welded connections, which shall be fully detailed on the assembly drawings.

E. Erection Procedure: The Contractor shall submit for approval a narrative detailing the proposed erection procedure. The narrative shall be accompanied by calculations and drawings stamped by a Professional Engineer registered in the Commonwealth of Massachusetts. The submission shall include adequate information on the specific equipment that the Contractor will use to install the proposed bridge such that the safety of the entire operation can be ensured. This information shall include, but may not be limited to pick weights, crane charts, and cut sheets for all slings and attachments. Crane charts and cut sheets shall be clearly marked-up highlighting the specific size and configuration of all items.

The stability of the structure during erection shall be investigated and clearly demonstrated by the calculations and drawings.

F. Warranty: The Contractor shall submit for approval the Fabricator's signed warranty for the project structure. The structure shall be warrantied as follows:

1. The structure shall be free of design, material, and workmanship defects for a period of ten years.

2. Wood decking shall be free of rot, termite damage, and fungal decay for a period of ten years.

3. Galvanized and painted steel components shall be free of laminating rust for a period of 25 years.

Full payment will not be made for the project structure without the signed warranty.

G. Inspection and Maintenance Procedures: The Contractor shall submit for information a brief document outlining inspection and maintenance procedures for the project structure, including a recommended interval for each procedure. Full payment will not be made for the project structure without the document outlining inspection and maintenance procedures.

H. Product Data: The Contractor shall submit for approval all products used for adhesives, preservatives, and finishes.

I. Quality Control Reports: The Contractor shall submit for approval evidence of compliance with ANSI/AITC A190.1 and AITC 200 inspection requirements.

1.5 QUALITY ASSURANCE

A. Manufacturer shall be fully certified by the American Institute of Timber Construction (AITC).

B. Manufacturing facilities shall operate under an approved AITC quality control program.

C. Fabricator shall provide AITC quality marks on each structural member.

D. The Contractor shall have a minimum of five (5) years of experience in design, fabrication, and installation of similar systems.

E. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

F. All handrails, intermediate rails, kick rails, railing extensions, grating, etc. shall comply with ADA and the Commonwealth of Massachusetts Building Code.

1.6 DELIVERY, STORAGE, AND HANDLING

A. The Engineer reserves the right to reject and require replacement of any damaged materials delivered to the site, at no additional cost to the Owner.

B. Stockpile and store the materials in accordance with the manufacturer's recommendations.

C. Label and bag all geosynthetic rolls in packing that is resistant to photo degradation by ultraviolet (UV) radiation.

1.7 REQUIREMENTS

A. Layout

1. Structure Type: When specified, structure type (rolled beam, truss) for the prefabricated bridge shall be as noted on the Contract Plans. If applicable, truss configuration (Warren, Pratt, bowstring, etc.) shall be as noted on the Contract Plans.

2. Span Length: Total span for the bridge shall be approximately 40 feet in length as measured in a straight line from each end of the bridge structure

3. Profile and Camber: Bridge should be arched such that the slope of the bridge does not exceed ADA Slope requirements.

4. Pedestrian Railings: Safety Railings shall cover both sides of the bridge for the entire span of the bridge. Railing shall be a 42" above the bridge deck. Additional safety protection shall be installed between bridge deck and horizontal railing for the entire span length to prevent a 4" sphere passing through per ADA guidelines. Railings shall have a smooth surface all around with no protrusions, depressions, or sharp edges. All ends of angles and tubes shall be closed and ground smooth.

B. Design Criteria

1. Structural design of the bridge shall conform to the AASHTO LRFD Guide Specifications for the Design of Pedestrian Bridges. Items not covered in this guide specification shall be designed in conformance with the following supplemental documents, in order of decreasing priority:

a. AASHTO LRFD Bridge Design Specifications

b. AITC - American Institute of Timber Construction

The versions of these documents specified in Section 1.2 B of this specification shall apply.

Designs not performed utilizing the AASHTO specifications noted above as the primary codes will be rejected outright.

2. Design loads shall be in conformance with the AASHTO LRFD Guide Specifications for the Design of Pedestrian Bridges, as supplemented by the AASHTO LRFD Bridge Design Specifications. Design loads include the following:

   a. Dead Load (DL): The bridge structure shall be designed considering its own dead load (superstructure, original decking, and railing) only. No additional dead load shall be considered unless directly specified.

   b. Pedestrian Load (PL): A one hundred pound (100 lbs) per square foot live load shall be considered in the design and fabrication of all members. This load shall not be reduced and should be applied to those areas of the deck to produce maximum stress in the member being designed

   c. Snow Load (SL): A fifty five pound (55 lbs) per square foot snow load shall be considered in the design and fabrication of all members.

   d. Wind Load on Structure (WS): The bridge shall be designed for a wind load as specified by AASHTO LRFD Guide Specifications for the Design of Pedestrian Bridges. The wind load shall be applied horizontally at right angles to the longitudinal axis of the structure. Wind load shall be based on an Ultimate Wind Speed of 123 miles per hour.

3. Load combinations shall be in conformance with the Section 3.4 of the AASHTO LRFD Bridge Design Specifications, as modified by the limitations noted in Section 3.7 of the AASHTO LRFD Guide Specifications for the Design of Pedestrian Bridges.

4. Fatigue due to wind loading shall be investigated per Sections 3.5, 3.7 and 4 of the AASHTO LRFD Guide Specifications for the Design of Pedestrian Bridges.

5. The Vibration criteria of Section 6 of the AASHTO LRFD Guide Specifications for the Design of Pedestrian Bridges is waived.

6. Stability shall be thoroughly investigated per Section 7 of the AASHTO LRFD Guide Specifications for the Design of Pedestrian Bridges. Stability calculations shall include lateral loads on the top chord and guiderails due to Wind on Structure (WS) as specified in Section 3.4 of the AASHTO LRFD Guide Specifications for Pedestrian Bridges and Live Load (LL) on the guardrails and/or top chord as specified in Section 13.8.2 of the AASHTO LRFD Bridge Design Specifications.

7. The Pedestrian Bridge shall be designed to withstand flood elevations up to elevation 13.00 (NAVD 1988).

8. The Pedestrian Bridge shall be designed to withstand a wave height of 2 feet.

9. All connections shall be checked for all potential failure modes.

10. Timber boardwalk abutment connections shall be designed to withstand all applicable load combinations of the pedestrian bridge and maintain a seamless

transition (less than 1/4") between the abutting boardwalk and pedestrian bridge. Boardwalk abutment connection detail shall not effect the structural integrity of the pedestrian bridge. Design loads noted above shall not be reduced to allow for the connection of the timber boardwalk.

11. Bearings and joints shall be designed to accommodate a temperature range of -30 to 120 degrees Fahrenheit.

12. The abutment designs shown on the Contract Plans are based the reactions tabulated on the same plans. If design reactions for the Contractor's proposed structure are greater than those tabulated on the Contract Plans, the Contractor shall assume responsibility for the abutment design. If the abutments shown on the Contract Plans are to be retained, the Contractor shall submit for approval design calculations substantiating their adequacy. If the abutments shown on the Contract Plans require modification, the Contractor shall submit for approval design calculations and design drawings for the modified abutments. The design criteria for the modified abutments shall be as noted within this specification. All calculations and drawings shall be stamped by a Professional Engineer registered in the Commonwealth of Massachusetts.

13. The top chord, vertical members, and floor beams shall be designed for lateral wind loads, per Horizontal Forces section above, and for any loads required to provide top chord stability as outlined in Top Chord Stability section above. In no case shall the load be less than fifty pounds (50 lbs.) per linear foot or a two-hundred-pound (200 lb.) point load, whichever produces greater stresses, applied in any direction at any point along the top cord, or at the top of the safety system (42" above the deck level) if higher than the top chord.

14. The safety rail system shall be designed for all infill loading of two hundred pounds (200 lbs.) applied horizontally at right angles, to a one (1) square foot area at any point in the system.

C. Design Limitations

1. Vertical Deflection: The Vertical Deflection of the main structures due to service pedestrian live load shall not exceed L/360 where "L" is the span length. The service pedestrian live load shall not be reduced for deflection checks.

2. The minimum metal thickness of all structural steel members shall be three eighths (3/8") nominal and be in accordance with the AISC manual of Steel Constructions "Standard Mill Practice Guidelines".

3. Bolted Splices shall not be permitted.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Bridge manufacturer: EnWood Structures, Raleigh, North Carolina, or approved equal meeting all AITC requirements.

B. Bridge system shall be "The Woodland" design type or approved equal.

2.2 MATERIALS

A. Lumber

1. Laminated lumber shall be Southern Yellow Pine, kiln-dried to 15% maximum moisture content. Lumber shall be graded in accordance with AITC 117, and be AITC architectural grade.

2. Solid sawn lumber for railing post shall be be Sothern Yellow Pine graded in accordance with SPIB.

3. Timber railing, decking, and balusters shall be hardwood lumber conforming to Section 2.3 of the Heavy Timber Construction (Section 06100.)

B. Adhesives

1. Adhesives used for the lamination of timber shall be set-use (waterproof), complying with ANSI/AITC A190.1, latest edition.

C. Preservative Treatment

1. Laminated lumber members shall be pressure treated prior to gluing with CCA (Chromated Copper Arsenate) in accordance with AITC 109 and achieve a minimum preservative retention of 0.6 pcf.

2. Solid sawn lumber for railing post shall be pressure treated with CCA (Chromated Copper Arsenate).

D. Penetrating Sealer

1. All Southern Yellow Pine timber members shall receive a minimum of one coat of clear penetrating sealer.

2. All Hardwood Lumber members shall be natural finish with no oils or stains.

E. Hardware

1. All connecting steel and fasteners shall be hot-dipped galvanized in accordance with ASTM A123/A123M.

2. Abutment fasteners shall be a minimum ¾" diameter hot-dipped galvanized through bolt anchors.

3. All nuts shall be self-locking or provide double nuts on each bolt.

F. Abutment Leveling Plates

1. All abutment leveling plates shall be stainless steel conforming to ASTM A240/A240M, Type 316, annealed finish.

PART 3 EXECUTION

3.1 FABRICATION

A. Fabrication shall be in strict conformance with the requirements laid out in Parts 1 and 2 of this specification.

3.2 INSTALLATION

A. Erection shall not take place until written documentation has been provided to the Engineer that the timber substructure has been completed. The written documentation shall be available on site at the time of erection.

B. Erection shall be in conformance with the approved Erection Procedure submittal. Three copies of the approved submittal shall be available on site at the time of erection: one each for the Engineer, the Contractor's crane operator, and Contractor's support staff.

C. Install bridge structure in accordance with the manufacture's recommendations and shop drawings.

D. Contractor shall use non-marring slings for lifting and avoid chain or wire rope contact.

3.3 BEARINGS

A. Contractor shall have all hardware and materials necessary for the bridge bearing readily available for construction, prepared prior to installation of the pedestrian bridge.

END OF SECTION

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SECTION 06150

TIMBER PILES

PART 1 GENERAL

1.1 WORK INCLUDES

A. Furnishing and installing the timber support piles for the pre fabricated timber pedestrian bridge.

1.2 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. American Society of Testing and Materials (ASTM):

a. D25, Standard Specification for Round Timber Piles.

b. D2899, Methods for Establishing Design Stresses for Round Timber Piles.

2. American Wood Preservers Association (AWPA):

a. C3, Piles - Preservative Treatment by Pressure Process.

b. M2, Standard for Inspection of Treated Timber Products.

c. M4, Standard for the Care of Preservative - Treated Wood Products.

d. M6, Brands used on Forest Products.

1.3 DEFINITIONS

A. Design Position: The location of the centroid of a pile at cutoff (x, y, and z coordinates) as shown on the Drawings.

B. Elevations: Referenced to the datum shown on Drawings.

C. Fixed Leads: Leads that are pinned to a crane boom at the top and equipped with a hydraulic spotter at the bottom that is capable of spotting the pile to its correct position and maintaining pile alignment during driving.

D. Impact Stress: Stress transferred to the pile head at impact from the driving train, as determined from a Wave Equation Analysis.

E. Obstruction: Sudden and significant increase of penetration resistance and deviation of pile out of tolerance resulting from encountering a subsurface or physical condition.

F. Practical Refusal: Penetration resistance of at least 120 blows per foot for 3 consecutive feet, 200 blows per foot for 1 foot, or 50 blows per inch for 2 consecutive inches, whichever occurs first, and to continue pile driving would be impractical. These criteria apply only to the hammer sizes and operation as specified.

G. Rated Hammer Energy:

1. Open End Diesel Hammers and Single Acting Air or Hydraulic Hammers: Product of rated stroke multiplied by ram weight.
2. Closed End Diesel Hammers and Double Acting Air or Hydraulic Hammers: Rated

Energy from manufacturer's literature.

H. Set: Pile Penetration in inches per blow.

I. Sweep: Deviation from straightness measured along two perpendicular faces of pile while not subject to bending forces.

J. Swinging Leads: Pile driving leads that are not pinned at the top and do not have a hydraulic spotter to position the leads.

K. Termination Penetration Resistance: Penetration resistance (blows per foot) at which driving may be terminated, as established by the Owner/Engineer.

L. Transferred Hammer Energy: Energy transferred to the pile head from driving train impact, as determined from a Wave Equation Analysis.

1.4 SUBMITTALS

A. Administrative Submittals: Production pile driving sequence.

B. Quality Control Submittals:

1. Plan providing pile identification numbers.

2. Weight certificate of hammerhead for drop hammers.

3. Manufacturer's literature for proposed equipment and procedures.

4. Preservative treatment inspection affidavit conforming to AWPA M2, stating type of preservative used and actual net retention.

5. Piling installer qualifications.

6. Proposed method(s) to align and maintain pile alignment, including type of leads to be used with details on methods and equipment to be used to measure alignment.

7. Manufacturer's specifications of products, and maintenance manuals, for pile hammer, and auxiliary equipment.

8. Complete Pile Hammer Data Sheet (Attachment A).

C. Contract Closeout Submittals:

1. Pile Driving Log and Record: At end of each working day, submit two copies of each record to the Owner/Engineer for every pile constructed that day.

1.5 QUALIFICATIONS

A. Piling Installer: Minimum of 10 years of past successful experience with similar piling installation on at least 5 projects completed within the same time period.

1.6 STORAGE AND HANDLING

A. Protection:

1. Store all materials in such a manner as to ensure proper ventilation and drainage and to protect against damage and the weather. Avoid breaking through treated

surfaces. Do not use pikes, cant hooks, pickets, tongs, or other pointed tools that dig into wood.

2. Keep all material clearly identified with all grade marks legible; keep all damaged material clearly identified as damaged, and separately store to prevent its inadvertent use.

3. Do not allow installation of damaged or otherwise non-complying material.

4. Use all means necessary to protect the installed work and materials of all other trades.

B. Replacement: In the event of damage, immediately make all repairs and replacements necessary as approved by the Owner/Engineer and at no additional cost to the Owner.

1.7 VIBRATION MONITORING

A. The Owner may elect to perform vibration monitoring during timber pile driving. If timber pile driving produces excessive vibrations or has a detrimental effect on existing structures, stop pile driving and select a method of installation (e.g., alternative hammer), subject to the Engineer's approval, that will not cause detrimental effects.

PART 2 PRODUCTS

2.1 PRESSURE TREATED (PT) PILES

A. Pressure treated piles shall be 30-foot-long Douglas Fir or Southern Yellow Pine, which will provide a minimum of 5-feet of waste compared to the anticipated cut-off and toe elevations shown on the Drawings, and shall conform to the following minimum allowable stresses as determined in accordance with ASTM D-2899.

Compression Parallel to Grain (F_c) (psi)	**Extreme Fiber in Bending (F_b) (psi)**	**Horizontal Shear (F_v) (psi)**	**Compression Perpendicular to Grain (F_{c1}) (psi)**
1,200	2,450	110	230

B. Pressure treated piles shall conform in general to the physical characteristics of round timber piles as described in ASTM D-25. Minimum top diameter shall be 12"; minimum toe diameter shall be 8".

C. Clearly and permanently brand the piles in two places approximately 5 and 10 feet from the top. The brand shall identify species, class and length, preservative, retention, supplier, and month and year of treatment.

D. Tops of cut-off piles shall be cut square as shown on the Drawings. Caps shall also be installed on existing piles.

2.2 PRESERVATIVE TREATMENT

A. Pressure treat PT piles to 1.5 PCF (min) with a salt-type chemical preservative, chromated copper arsenate (CCA), in accordance with AWPA C3. Douglas Fir shall

be incised before treatment. Fabricate lumber and timbers as completely as possible before preservative treatment.

B. All drill holes, saw cuts, and abrasions made to pressure treated piles shall receive a field application of preservative equivalent in type to that originally used.

The tops of cut-off pressure treated piles and the ends of cut-off cap beams, stringers, and decking shall be treated in accordance with AWPA M4 (2% copper napthenate followed by coal-tar roofing cement).

PART 3 EXECUTION

3.1 GENERAL

A. It shall be the Contractor's responsibility to ensure that the construction proceeds in a smooth and logical sequence and in a manner that will not cause any damage to or create excessive stresses or loads on existing or proposed structures.

3.2 PILE INSTALLATION EQUIPMENT

A. For Timber Support Piles

1. The results of a Wave Equation Analysis completed by the Engineer indicate that an MKT 7 air/steam hammer having the manufacturer's rated energy indicated in the Penetration Resistance Criteria Table may satisfactorily drive the timber support piles for supporting the Pedestrian Bridge to the specified tip elevation. The results assume that the hammer is delivering the transferred energy and impact stresses indicated, and the driving train is working efficiently and according to the manufacturer's recommendations.

PENETRATION RESISTANCE CRITERIA TABLE

Pile Type	Hammer	Estimated Ultimate Capacity (Kips)	Rated Energy (ft-lbs)	Transferred Energy (ft-lbs)	Impact Stress (psi)	Penetration Resistance (blows/in)
Timber Support Pile	MKT 7	16.5	4,152	1,940	1,550	7

Notes:
1. The estimated ultimate capacity is the allowable capacity (3 tons) multiplied by a FOS of 2.75.

2. The manufacturer's rated energy, transferred energy, impact stress, and estimated penetration resistance are included for information purposes only.

3. Hammer sizes and types are subject to the Engineer's review and approval. The Engineer will evaluate the Contractor's proposed driving equipment using Wave Equation Analyses. The criteria the Engineer will use will be the required number of hammer blows per inch and the impact stress at the required ultimate capacity.

4. The required number of blows per inch at the ultimate capacity shall be between about 3 and 15 blows per inch. The pile stress during driving shall not exceed 90 percent of the pile yield stress.

5. If the Wave Equation Analysis indicates an inability to drive the piles to the ultimate capacity within the acceptable blow count range and below the acceptable stress level, change the proposed driving equipment. Submit changes to the Engineer for review and approval.

6. The driving cap or helmet shall seat into or on the pile and bear evenly upon the pile head and shall distribute the hammer blow uniformly throughout the cross section of the pile. The Engineer shall approve the driving cap or helmet.

7. Furnish the Engineer with the manufacturer's specifications and product and maintenance manuals for the hammer and auxiliary equipment prior to driving. Submit information on the proposed driving train and complete and submit the information on the Pile Hammer Data Sheet (Attachment A).

3.3 LOCATIONS FOR DRIVING

A. Layout the locations of the piles from the information shown on the Drawings and as furnished by the Engineer. The method used to determine pile locations shall be at the option of the Contractor.

3.4 PILE SPACING

A. No pile splicing shall be allowed.

3.5 ACCURACY IN DRIVING

A. Within 1/4-inch per foot of pile length from the vertical design position for vertical piles.

B. Within 1/2-inch per foot of pile length from the required angle for batter piles.

C. Centroid of the piles at cutoff elevation shall not vary by more than 3 inches horizontally from the design position shown.

3.6 DRIVING

A. Perform all driving in the presence of the Owner/Engineer. Notify the Owner/Engineer of intent to start work at least 5 days prior to the start of pile driving. Mark piles at 1-foot intervals for purposes of recording driving resistance and depth of penetration of pile. Do not drive piles within 100 feet of freshly placed concrete which has not obtained its specified 28 day compressive strength. If two or more pile driving rigs are being used simultaneously, they shall be located a minimum of 150 feet apart. Followers may not be used to drive piles.

B. Maintain and operate the driving equipment in accordance with the manufacturer's recommendations. Maintain the hammer concentric with the driving train in axial alignment on the pile and as much as possible, drive piles continuously. The hammer shall not be used to limit deviation of the pile during driving by exerting lateral forces or striking at an angle. The hammer and leads may be used to move and align the pile in the first 10 feet of driving before the pile has attained an initial set, unless the Owner/Engineer decides such movement may damage the pile. If damage to the pile head occurs during driving and the hammer can no longer strike the pile uniformly and axially, stop driving, provide a fresh cut at the head and check the pile for proper fit.

C. The penetration resistance presented in the Penetration Resistance Criteria Table is based on conditions where the hammer is operating efficiently and according to the

manufacturer's recommendations; the pile is not damaged and fits as specified with the driving cap; and penetration is reasonably quick and uniform.

D. Drive piles continuously, and without voluntary interruption, to the specified tip elevation or to refusal, whichever occurs first.

3.7 OBSERVATIONS AND RECORDING OF PILE BEHAVIOR

A. Pile behavior during driving will be monitored by the Engineer. Provide the Engineer with a suitable means or device that will indicate the penetration of the pile from a reasonable and safe distance from the pile and driving leads. Allow the Engineer access to any pile driving information recorded by the Contractor.

3.8 OBSTRUCTIONS DURING DRIVING

A. Where obstructions are encountered that result in a sudden, unexpected increase in penetration resistance and deviation from the specified tolerances, the Contractor may be required to perform one of the following options:

1. Remove or drill through the obstruction.

2. Extraction, repositioning, and re-driving.

3. Addition of extra piling.

B. Pursue the course of action selected by the Engineer. If, in the Engineer's opinion, the obstruction could not have been reasonably anticipated by the Contractor, work done under this Section, including necessary pile modifications, will be considered for payment as a Change Order. Obstructions within 15' of the ground surface shall be removed at no cost to the Owner.

3.9 DAMAGED PILES

A. Any pile that is bent, ruptured or broken because of material or workmanship defects or by improper handling or driving, or which is otherwise damaged so as to impair it for its intended use, shall be removed and replaced or, where directed, a replacement pile shall be driven adjacent thereto.

3.10 INSPECTION OF DRIVEN PILES

A. The Engineer may require the Contractor to pull selected piles after driving for testing and inspection to determine the condition of the pile. Any pile so pulled and determined by the Engineer to be damaged so as to impair the pile from its intended use shall be removed from the work and a replacement driven at the Contractor's expense. Piles pulled and found to be sound and in satisfactory condition shall be re-driven. The cost for additional work associated with pulling and re-driving satisfactory piles shall be considered for payment as a Change Order.

3.11 ELEVATION OF CUTOFF

A. After driving, the upper end of the piles shall be cut as shown on the Drawings in an approved manner.

3.12 VIBRATION MONITORING

A. Vibration criteria established by the Engineer are presented below. The Contractor shall be responsible for determining its means and methods for preventing the criteria presented below from being exceeded.

Structure	Sensor Location	Max. Vibration Level (Peak Particle Velocity, in/sec)
Existing Viewing Platform	Ground Surface Adjacent to Structure	1.0

B. The maximum vibration level established above is considered the threshold to help prevent minor damage from piling operations.

C. The sensors of the seismographs will be securely anchored into the ground by the Engineer. Sensors will be arranged so that one is in line with the vibration source and at the part of the structure nearest the source.

D. All costs borne by the Owner that result from the Contractor exceeding the maximum vibration levels as defined above, including but not limited to structure damage, shall be borne by the Contractor.

3.13 CLEANUP

The Contractor shall clean up all waste materials upon completion of the work specified herein.

END OF SECTION

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SECTION 32 8400
IRRIGATION

PART 1 – GENERAL

1.1 SUMMARY

A. Irrigation system required for this work includes but is not limited to the furnishing of all labor, tools, materials, appliances, tests, permits, taxes, etc., necessary for the installation of a temporary landscape irrigation system as herein specified and shown on the drawings, and the removal of all debris from the site.

1. Locate, purchase, deliver and install piping, conduit, sleeves, 120 volt and low voltage electrical and water connections, valves, backflow preventer devices, controllers, rain sensors, spray and bubbler heads, drip irrigation lines, and associated accessories for a fully operational automatic temporary irrigation system.
2. Trenching and water settling of backfill material (in areas where irrigation lines must be below-grade, such as walkways)
3. Provision of temporary, above-grade drip irrigation and/or bubblers for all trees and shrubs
4. Provision of temporary, above-grade spray system for No-Mow-Fescue Areas
5. Provision of temporary, above-grade spray system for meadow areas only if irregular weather conditions require supplemental irrigation or if seed germination is poor.
6. Testing and startup of the irrigation system.
7. Preparation of an as built diagram showing the designated irrigation zones as well as locations of conduits, water and electrical sources, backflow preventor(s), controller(s) and shutoff valves.
8. Training of the Owner's maintenance personnel in the operational requirements of the Irrigation system.
9. Clean up and disposal of all excess and surplus material.
10. Maintenance of the irrigation system during the proscribed maintenance period.
11. Removal of the temporary irrigation system and its components (above ground components only) once the plantings are well established. Cap and close off any irrigation conduits below grade / under pathways.

B. The system shall efficiently and evenly irrigate all areas and be complete in every respect and shall be left ready for operation to the satisfaction of the Owner's Representative.

C. Coordinate with other trades, as needed to complete work, including but not limited to Water Meter, Point of Connection (POC) and Backflow Preventer Device (BFPD) location and electrical hookups.

1.2 CONTRACT DOCUMENTS

A. Shall consist of specifications and its general conditions and the drawings. The intent of these documents is to include all labor, materials, and services necessary for the proper execution of the work. The documents are to be considered as one. Whatever is called for by any part shall be as binding as if called for in all parts.

1.3 RELATED DOCUMENTS AND REFERENCES

A. Related Documents:

1. Drawings and general provisions of contract, including general and supplementary conditions and Division I specifications, apply to work of this section.

Restoration Planting Plans and Details:
L-101 Master Plan (Overview)
L-201 Chase Brook Parcel Planting Plan
L-202 Yankee Village Parcel Demolition / Removal Plan

L-203 Mill Creek Parcel Demolition / Removal Plan
L-301 Chase Brook Parcel Planting Plan
L-302 Yankee Village Parcel Planting Plan
L-303 Mill Creek Parcel Planting Plan

L-401 Site Feature Details
L-402 Plant Installation Details

2. Related Specifications and Supplemental Documents

32 9100 Planting Soil Specifications
32 9200 Lawn & Grasses Specifications (No Mow Fescue Areas)
32 9300 Planting Specifications
Meadow Establishment Protocol
Land Management Plan (Invasive Species Management Protocol)

B. References:

1. American Society of Testing Materials (ASTM): cited section numbers.
2. National Sanitation Foundation (NSF): rating system.
3. Irrigation Association: Turf & Landscape Irrigation Best Management Practices

1.4 VERIFICATION

A. Contractor to coordinate water and electrical hookup locations with the owner /owner's representative and submit a preliminary diagram for locations of shutoff valves and other visible equipment for approval.

B. Piping and equipment is to be located within the designated planting areas wherever possible unless specifically defined or dimensioned otherwise.

C. The Contractor shall be responsible to install the work in such a manner that it will be in conformance to site conditions, complete, and in good working order.

1.5 PERMITS AND REGULATIONS

A. The Contractor shall obtain and pay for all permits related to this section of the work unless previously excluded under provision of the contract or general conditions. The Contractor shall comply with all laws and ordinances bearing on the operation or conduct of the work as drawn and specified. If the Contractor observes that a conflict exists between permit requirements and the work outlined in the contract documents, the Contractor shall promptly notify the Owner's Representative in writing including a description of any necessary changes and changes to the contract price resulting from changes in the work.

B. Wherever references are made to standards or codes in accordance with which work is to be performed or tested, the edition or revision of the standards and codes current on the effective date of this contract shall apply, unless otherwise expressly set forth.

C. In case of conflict among any referenced standards or codes or between any referenced standards and codes and the specifications, the more restrictive standard shall apply or Owner's Representative shall determine which shall govern.

1.6 PROTECTION OF WORK, PROPERTY AND PERSON

A. The Contractor shall adequately protect the work, adjacent property, and the public, and shall be responsible for any damages or injury due to the Contractor's actions.

1.7 CHANGES IN THE WORK

A. The Owner's Representative may order changes in the work, and the contract sum being adjusted

accordingly. All such orders and adjustments plus claims by the Contractor for extra compensation must be made and approved in writing before executing the work involved.

B. All changes in the work, notifications and Contractor's request for information (RFI) shall conform to the contract general condition requirements.

1.8 CORRECTION OF WORK

A. The Contractor shall re-execute any work that fails to conform to the requirements of the contract and shall remedy defects due to faulty materials or workmanship upon written notice from the Owner's Representative, at the soonest as possible time that can be coordinated with other work, and seasonal weather demands, but not more than 90 (ninety) days after notification**.**

1.9 DEFINITIONS

A. Owner's Representative: The person appointed by the Owner to represent their interest in the review and approval of the work and to serve as the contracting authority with the Contractor. The Owner's Representative may appoint other persons to review and approve any aspects of the work.

B. Substantial Completion Acceptance: The date at the end of the Planting, Planting Soil, and Irrigation installation where the Owner's Representative accepts that all work in these sections is complete and the Warranty period has begun. This date may be different that the date of substantial completion for the other sections of the project.

C. Final Acceptance: The date when the Owner's Representative accepts that the plants and work in this section meet all the requirements of specification. It is intended that the materials and workmanship warranty for Planting, Planting Soil, and Irrigation work run concurrently.

1.10 SUBMITTALS

A. See the contract General Conditions for policy and procedures related to submittals.

B. Other Submittals: Submit for approval:

1. Proposed/As-built Diagram showing the designated irrigation zones as well as locations of conduits, water and electrical sources, backflow preventor(s), controller(s) and shutoff valves.
2. Testing data from all required pressure testing.
3. Backflow prevention device certification: Certification from the manufacturer or their representative that the back flow prevention device has been installed correctly according to the manufactures requirements.
4. Booster pump certification: Certification from the manufacturer or their representative that the booster pump has been installed correctly according to the manufacturer's requirements.

1.11 OBSERVATION OF THE WORK

A. The Owner's Representative may inspect the work at any time.

B. The Owner's Representative shall be informed of the progress of the work so the work may be observed at the following key times in the construction process. The Owner's Representative shall be afforded sufficient time to schedule visit to the site. Failure of the Owner's Representative to make field observations shall not relieve the Contractor from meeting all the requirements of this specification.

1.12 QUALITY ASSURANCE

A. It is the intention of this specification to accomplish the work of installing an automatic and temporary irrigation system, which will operate in an efficient and satisfactory manner. The irrigation system shall be installed and made operational according to the workmanlike standards established for landscape installation and sprinkler irrigation operation as set forth by the most recent Best Management Practices (BMP) of the Irrigation Association.

B. The specification can only indicate the intent of the work to be performed rather than a detailed

description of the performance of the work. It shall be the responsibility of the Contractor to provide and install materials and equipment in such a manner that they shall operate efficiently and evenly and support optimum plant growth and health.

C. In the event the installation is contradictory to the direction of the Owner's Representative, the installation shall be rectified by the Contractor at no additional cost to the Owner. The Contractor shall immediately bring any such discrepancies to the attention of the Owner's Representative.

D. It shall be distinctly understood that no oral statement of any person shall be allowed in any manner to modify any of the contract provisions. Changes shall be made only on written authorization of the Owner's Representative.

1.13 IRRIGATION SYSTEM WARRANTY:

A. The Contractor shall Warrantee all workmanship and materials for a period of 1 year (s) following the acceptance of the work.

1. Any parts of the irrigation work that fails or is defective shall be replaced or reconstructed at no expense to the Owner including but not limited to: restoring grades that have settled in trenches and excavations related to the work. Reconstruction shall include any plantings, soil, mulch or other parts of the constructed landscape that may be damaged during the repair or that results from soil settlement.

B. The date of acceptance of the work and start of the Guarantee period shall be determined by the Owner's Representative, upon the finding that the entire irrigation system is installed as designed and specified, and found to be operating correctly, supplying water evenly to all planting and/or lawn areas.

C. Neither the final acceptance nor any provision in the contract documents shall relieve the Contractor of responsibility for faulty materials or workmanship. The Contractor shall remedy any defects within a period of 7 days (s) from the date of notification of a defect.

1.14 SITE CONDITIONS

A. It is the responsibility of the Contractor to be aware of all surface and sub-surface conditions, and to notify the Owner's Representative, in writing, of any circumstances that would negatively impact the installation of the work. Do not proceed with work until unsatisfactory conditions have been corrected.

1.15 DELIVERY, STORAGE, AND HANDLING

A. All materials and equipment shall be stored properly and protected as required by the Contractor. The Contractor shall be entirely responsible for damages or loss by weather or other cause to work under the contract. Materials shall be furnished in ample quantities and at such times as to ensure uninterrupted progress of the work.

B. Store in accordance with the manufacturers' recommendations.

1.16 PROTECTION

A. The Contractor shall continuously maintain adequate protection of all their work from damage, destruction, or loss, and shall protect the owner's property from damage arising in connection with this contract. Contractor shall make good any such damage, destruction, loss or injury. Contractor shall adequately protect adjacent property as provided by law and the contract documents.

B. The Contractor shall maintain sufficient safeguards, such as railings, temporary walks, lights, etc., against the occurrence of accidents, injuries or damage to any person or property resulting from their work, and shall alone be responsible for the same if such occurs.

C. All existing paving, structures, equipment or plant material shall be protected at all times, including the irrigation system related to plants, from damage by workers and equipment. The Contractor shall follow all protection requirements including plant protection provision of the general contract documents. All damages shall be repaired or replaced at the Contractor's expense. Repairs and or

replacement shall be to the satisfaction of the Owner's Representative, including the selection of a Contractor to undertake the repair or maintenance. Repairs shall be at no cost to the owner.

1. For trees damaged to the point where they will not be expected to survive or which are severely disfigured and that are too large to replace, the cost of damages shall be as determined by the Owner's arborist using accepted tree value evaluation methods.

D. The Contractor shall refrain from trenching within the drip line of any existing tree to remain.

1.17 EXCAVATING AROUND UTILITIES

A. Contractor shall carefully examine the civil, record, and survey drawings to become familiar with the existing underground conditions before digging.

1. Do not begin any excavation until all underground utilities have been located and marked.

Determine location of underground utilities and perform work in a manner that will avoid possible damage. Hand excavate, as required. Maintain stakes and or markings set by others until parties concerned mutually agree to their removal.

B. Notification of Dig Safe (1-888-344-7233), is required for all excavation around utilities. The Contractor is responsible for knowing the location and avoiding utilities that are not covered by the *Dig Safe*.

1.18 POINT OF CONNECTION

A. Unless otherwise specified, the point of connection of the irrigation system to its electrical power sources shall be provided by the Contractor's licensed electrical Contractor per governing codes at the location shown on the drawings. The irrigation Contractor will connect the power to provided junction box or grounded plug receptacle.

B. Unless otherwise specified, the point of connection of the irrigation system to its potable and or non-potable water sources, including the main shutoff valve and backflow preventer shall be provided by the Contractor's licensed plumbing Contractor per governing codes at the location shown on the drawings. The minimum size and water pressure of the pressurized line will be as noted on the irrigation drawing.

1.19 TEMPORARY UTILITIES

A. All temporary piping, wiring, meters, panels and other related appurtenances required between source of supply and point of use shall be provided by the Contractor and coordinated with the Owner's Representative. Existing utilities may be used with the written permission of the owner.

1.20 CUTTING, PATCHING, TRENCHING AND DIGGING

A. The Contractor shall do all cutting, fitting, trenching or patching of their work that may be required to make its several parts come together as shown upon, or implied by, the drawings and specifications for the completed project.

B. Digging and trenching operations shall be suspended when the soil moisture is above field capacity.

1.21 USE OF PREMISES

A. The Contractor shall confine their apparatus; the storage of materials, and the operations of their workers to limits indicated by the law, ordinances, or permits and shall not unreasonably encumber the premises with their materials.

B. Contractor parking, and material and equipment storage shall in areas approved by the Owner's Representative.

1.22 AS BUILT DIAGRAM

A. Before final acceptance of work, the Contractor shall provide an as built record set of drawings diagramming the irrigation system work as built. The drawings shall be transmitted to the Owner's Representative as a pdf file of each document. The drawings shall include all information shown on the original contract document and revised to reflect all changes in the work. The drawings shall include the following additional information:

1. Location of Water and Electrical Hookups
2. Location of any buried irrigation lines / conduits
3. Location of shutoff valves
4. Location of controllers & rain sensors
5. Boundaries of each irrigation zone

1.23 CONTROLLER CHARTS:

A. Provide one controller chart for each automatic controller installed.

1. On the inside surface of the cover of each automatic controller, prepare and mount a chart / diagram showing the valves, main line, and systems serviced by that particular controller. The chart shall be protected in laminated in a plastic cover and be secured to the inside back of the controller cabinet door.

PART 2 – PRODUCTS

2.1 MATERIALS GENERAL

A. Furnish all materials and equipment which are necessary for completion of the work as intended.

B. All materials shall be of standard, approved and first grade quality and shall be new and in perfect condition when installed and accepted.

C. Contractor to provide and install materials that will support the establishment of the plantings for a minimum of (3) years and meet ASTM standards.

2.2 RECLAIMED WATER SYSTEM DESIGNATION

A. Where irrigation systems use reclaimed water, all products including valve boxes, lateral and main line pipe, etc. where applicable and/or required by local code shall have the reclaimed water purple color designation.

2.3 BACKFLOW PREVENTION DEVICES

A. The backflow prevention device shall be certified to NSF/ANSI 372 shall be ASSE Listed 1013, rated to 180 degree F, and supplied with full port ball valves.

2.4 BACKFLOW PREVENTER CAGE

A. A heavy-duty steel mesh cage with rust proof finish. The caging shall be sized to allow space for the entire piping assembly associated with the Backflow Preventer unit, and all associated equipment.

B. The cage shall include the manufacturers' standard tamper proof locking mechanism.

C. Provide a concrete base

2.5 BOOSTER PUMP

A. If a Booster pump is required, it shall be housed in a sturdy, locking, weather-resistant case, furnished for maximum exterior protection.

B. Provide location of any booster pumps on the as-built diagram

2.6 AUTOMATIC CONTROLLER

A. Controller shall be housed in a sturdy, locking, weather-resistant case, furnished for maximum exterior protection.

B. Automatic controller location shall be included in an as-built diagram

2.7 ELECTRICAL CONTROL WIRING

A. Low voltage

1. The electrical control wire shall be direct burial type UF, no. 14 AWG, solid, single conductor, copper wire UL approved or larger, if required to operate system as designed.
2. For 2-Wire controllers all irrigation wire for the controller, and any other components such as flow sensor, master valve, hydrometer, remote control valves and moisture sensors shall be per the controller manufacturer's specifications and recommendations.
3. Color code wires to each valve. Common wire shall be white.
4. If multiple controllers are being utilized, and wire paths of different controllers cross each other, both common and control wires from each controller to be of different colors.
5. Control wire splices: Splices are when required shall be placed in splice boxes.
6. Wire connections shall be per the controller manufacturer's specifications and recommendations.

B. High voltage

1. Shall be of type as required by local codes and ordinances.
2. Shall be of proper size to accommodate needs of equipment it is to serve.

2.8 VALVE BOXES AND MATERIALS

A. Valve boxes: valve boxes shall be constructed of ABS (acrylonitrile butadiene styrene) plastic, green or gray in color, with rigid base and sides and shall be supplied with bolt lock cover secured with stainless steel bolts. Provide box extensions as required.

2.9 VALVE IDENTIFICATION TAGS

A. Valve Identification Tags shall be 2.25 inch x 2.65 inch polyurethane. Color: potable water; yellow / Non-potable water; purple. Tags shall be permanently attached to each remote control valve with tamper proof seals as indicated on the drawings.

2.10 EQUIPMENT TO BE FURNISHED TO OWNER

A. Two (2) sets of keys for each controller, gate valves, and any other components that require them.

2.11 BEDDING SAND FOR ANY BURIED LINES

A. Sand shall consist of natural or manufactured granular material, free of organic material, mica, loam, clay or other substances not suitable for the intended purpose.

B. Sand shall be masonry sand ASTM C 144 or coarse concrete sand, ASTM C 33.

PART 3 – EXECUTION

3.1 GENERAL REQUIREMENTS

A. Code requirements shall be those of state and municipal codes and regulations locally governing this work, providing that any requirements of the drawings and specifications, not conflicting therewith, but exceeding the code requirements, shall govern unless written permission to the contrary is granted by the Owner's Representative.

B. Extreme care shall be exercised at all times by the Contractor in excavating and working in the

project area due to existing utilities to remain. Contractor shall be fully responsible for expenses incurred in the repair of damages caused by their operation.

C. Final site conditions and existing and proposed plantings shall determine final locations and adjusted as necessary and as directed to obtain complete water coverage. Contractor to avoid damaging existing and proposed trees, piping, utilities, structures, etc..

1. The Contractor shall be held responsible for relocation of any items without first obtaining the Owner’s Representative's approval. The Contractor shall remove and relocate such items at their expense if so directed by the Owner’s Representative.

D. Permission to shut off any existing in-use water line must be obtained 48 hours in advance, in writing from the Owner. The Contractor shall receive instructions from the Owner’s Representative as to the exact length of time of each shut-off.

E. No fittings shall be installed on pipe underneath pavement or walls.

F. Prior to starting any work, Contractor shall obtain a reading of existing static water pressure (no flow condition) at the designated point of connection and submit written verification of pressure with date and time of recording to Owner’s Representative.

3.2 TRENCHING, DIRECTIONAL BORING AND SLEEVING

A. Perform any trenching, directional boring, sleeving and excavations as required for the installation of the work included under this section, including shoring of earth banks to prevent cave-ins.

B. The Contractor may directional bore lines where it is practical or where required on the plans.

1. Extend the bore 1’ past the edge of pavement unless noted differently on the plans

2. Cap ends of each bore and locate ends at finished grade using metal stakes.

3. All boring and sleeving shall have detectable locator tape placed at the ends of the pipe.

C. Make trenches for any buried lines straight and true to grade and free of protruding stones, roots or other material that would prevent proper bedding of pipe or wire.

D. Excavate trenches wide enough to allow a minimum of 4 - inch between parallel pipelines and 8 inch from lines of other trades. Maintain 3 - inch vertical clearance between irrigation lines. Minimum transverse angle is 45 degrees. All pipes shall be able to be serviced or replaced without disturbing the other pipes.

E. Trenches for any buried pipelines or electrical lines shall be made of sufficient depth to provide the minimum cover from finished grade.

F. On new on-site systems (post-meter), the required horizontal separation between potable water lines, reclaimed water constant pressure main lines and sewer lines shall be a minimum of four (4) feet apart as directed by the project engineer and/ or regulatory agency. Measurements shall be between facing surfaces, not pipe centerlines.

G. When trenching through areas of imported or modified soil, deposit imported or modified soils on one side of trench and subsoil on opposite side.

H. Backfill the trench per the requirements in paragraphs “Backfilling and Compacting” below.

3.3 PIPE INSTALLATION

A. General Pipe Installation

Note: The majority of the system is to be installed as an above-ground, temporary system. Trenching and burying is only required in areas that conflict with pedestrian activity and / or local codes.

1. Exercise caution in handling, loading and storing, of plastic pipe and fittings to avoid damage.
   a. The pipe and fittings shall be stored under cover until using, and shall be transported in a

vehicle with a bed long enough to allow the length of pipe to lay flat so as not to be subjected to undue bending or concentrated external load at any point.

b. All pipe that has been dented or damaged shall be discarded unless such dent or damaged section is cut out and pipe rejoined with a coupling.

2. Trench depth shall be as specified above from the finish grade to the top of the pipe.

3. Install a detectable pipe locator tape 6 to 8 inches above all main line pipes.

3.4 FLUSHING

A. Openings in piping system during installation are to be capped or plugged to prevent dirt and debris from entering pipe and equipment. Remove plugs when necessary to flush or complete system.

B. After completion and prior to the installation of any terminal fittings, the entire pipeline system shall be thoroughly flushed to remove dirt, debris or other material.

3.5 HYDROSTATIC PRESSURE TESTING

A. After flushing, and the installation of valves the following tests shall be conducted in the sequence listed below. The Contractor shall furnish all equipment; materials and labor necessary to perform the tests and all tests shall be conducted in the presence of the Owner's Representative.

B. Water pressure tests shall be performed on all pressure main lines before any couplings, fittings, valves and the like are concealed.

C. Immediately prior to testing, all irrigation lines shall be purged of all entrapped air or debris by adjusting control valves and installing temporary caps forcing water and debris to be discharged from a single outlet.

D. Test all pressure main line at 150 PSI. For a minimum of four (4) hours with an allowable loss of 5 PSI. Pressure and gauges shall be read in PSI, and calibrated such that accurate determination of potential pressure loss can be ascertained.

E. Re-test as required until the system meets the requirements. Any leaks, which occur during test period, will be repaired immediately following the test. All pipe shall be re-tested until final written acceptance.

F. The Contractor is responsible for proving documentation stating the weather conditions, date, the start time and initial water pressure readings, the finish time and final water pressure readings and the type of equipment used to perform the test. The documentation must be signed by a witness acceptable to the Owner, verifying all of the above-mentioned conditions.

G. Submit a written report of the pressure testing results with the other above required information to the Owner's Representative for approval.

3.6 BACKFLOW PREVENTER TESTING

A. The backflow preventer shall be tested according to procedures and results per the requirements of the Foundation for Cross-Connection Control and Hydraulic Research, University of Southern California or American Water Works Association whichever is more stringent.

B. Testing shall be performed by a Backflow Prevention Assembly Tester with a current certification from the American Backflow Preventer Association.

3.7 BACKFILLING AND COMPACTING

A. Any irrigation trenches shall be carefully backfilled with material approved for backfilling and free of rocks and debris one (1) inch in diameter and larger. When back filling trenches in areas of imported or modified planting soil, replace any excavated subsoil at the bottom and the imported soil or modified planting soil at the top of the trench.

B. Backfill shall be compacted with approved equipment to the following densities

1. Backfill under pavement and within 2 feet of the edge of pavement: Compact to 95% or greater of maximum dry density standard proctor.
2. Backfill of subsoil under imported planting mixes or modified existing planting soil: Between 85 and 90% of maximum dry density standard proctor.
3. Backfill of imported planting mixes or modified existing planting soil: Compact to the requirements of the adjacent planting mix or planting soil as specified in section “Planting Soil”.

C. Finish grade of all trenches shall conform to adjacent grades without dips or other irregularities. Dispose of excess soil or debris off site at Contractor's expense.

D. Any settling of backfill material during the maintenance or warranty period shall be repaired at the Contractor’s expense, including any replacement or repair of soil, lawn, and plant material or paving surface.

3.8 RESURFACING PAVING OVER TRENCHES

A. Restore all surfaces and repair existing underground installations damaged or cut as a result of the excavation to their original condition, satisfactory to the Owner’s Representative.

B. Trenches through paved areas shall be resurfaced with same materials quality and thickness as existing material. Paving restoration shall be performed by the project paving Sub-contractor or an approved Contractor skilled in paving work.

C. The cost of all paving restoration work shall be the responsibility of the irrigation Contractor unless the trenching thru the paving was, by previous agreement, part of the general project related construction.

3.9 INSTALLATION OF EQUIPMENT

A. General:

1. All equipment shall be installed to meet all installation requirements of the product manufacturer. In the event that the manufactures requirements cannot be implemented due to particular condition at the site or with other parts of the design, obtain the Owner’s Representative’s written authorization and approval for any modifications.
2. Install all valves within a valve box of sufficient size to accommodate the installation and servicing of the equipment. Group valves together where practical and verify intended locations with owner’s representative prior to installation.
3. All sprinkler irrigation systems that are using water from potable water systems shall require backflow prevention. All backflow prevention devices shall meet and be installed in accordance with requirements set forth by local codes and the health department.

B. Irrigation controllers:

1. The electrical Contractor shall be responsible for installing all wiring to the controller, in order to complete this installation. A disconnect switch shall be included.
2. High Voltage
   a. All electrical work shall conform to local codes, ordinances and any authorities having jurisdiction. All high voltage electrical work to be performed by licensed electrician.
   b. The Contractor shall provide 120-volt power connection to the automatic controller unless noted otherwise on drawings.

C. Drip Installation:

1. Cap or plug all openings as soon as lines have been installed to prevent the intrusion of materials that would obstruct the pipe. Leave in place until removal is necessary for completion of installation.
2. Thoroughly flush all water lines before installing valves and other hydrants.

3.10 ADJUSTMENT AND COVERAGE TEST

A. Adjustment:

1. The Contractor shall flush and adjust all sprinkler heads, valves and all other equipment to ascertain that they function according to the manufacturer's data.

2. Adjust all sprinkler heads not to overspray onto walks, roadways and buildings when under maximum operating pressure and during times of normal prevailing winds.

B. Coverage test:

1. The Contractor shall perform a coverage test.

2. The entire irrigation system shall be operating properly with written approval of the installation by the Owner’s representative prior to beginning any planting operations.

3.11 REPAIR OF PLANTING SOIL

A. Any areas of planting soil including imported or existing soils or modified planting soil which become compacted or disturbed or degraded as a result of the installation of the irrigation system shall be restored to the specified quality and compaction prior to beginning planting operations at no additional expense to the Owner. Restoration methods and depth of compaction remediation shall be approved by the Owner’s Representative.

3.12 CLEAN-UP

A. During installation, keep the site free of trash, pavements reasonably clean and work area in an orderly condition at the end of each day. Remove trash and debris in containers from the site no less than once a week.

a. Immediately clean up any spilled or tracked soil, fuel, oil, trash or debris deposited by the Contractor from all surfaces within the project or on public right of ways and neighboring property.

B. Once installation is complete, wash all soil from pavements and other structures.

1. Make all repairs to grades ruts, and damage to the work or other work at the site.

2. Remove and dispose of all excess soil, packaging, and other material brought to the site by the Contractor.

3.13 PROTECTION

A. The Contractor shall protect installed irrigation work from damage due to operations by other Contractors or trespassers.

1. Maintain protection during installation until Acceptance. Treat, repair or replace damaged work immediately. The Owner’s Representative shall determine when such treatment, replacement or repair is satisfactory.

3.14 PRE-MAINTENANCE OBSERVATION:

A. Once the entire system shall be completely installed and operational and all planting is installed, the Owner’s Representative shall observe the system and prepare a written punch list indicating all items to be corrected and the beginning date of the maintenance period.

B. This is not final acceptance and does not relieve the Contractor from any of the responsibilities in the contract documents.

3.15 GENERAL MAINTENANCE AND THE MAINTENANCE PERIOD

1. The Contractor shall keep the irrigation system in good running order and make observations on the entire system for proper operation and coverage. Repair and cleaning shall be done to keep the system in full operation.

3.16 REMOVAL OF TEMPORARY IRRIGATION SYSTEM AFTER ESTABLISHMENT / COMPLIANCE IS REACHED.

A. At the end of the Plant Establishment Period , (See specification section “Planting”) the Owner’s Representative shall inspect the irrigation work and establish that all provisions of the irrigation system are complete and the system is working correctly.

1. Confirm with Owner’s Representative timing for the removal of the irrigation system, and whether any components (such as backflow preventor and mainline) should remain in place for future use.
2. Remove all above-ground temporary components of the irrigation system.
3. Restore any soil settlement over trenches and other parts of the irrigation system that were disturbed by removal of the system components.

END OF SECTION 32 8400

SECTION 32 9100
PLANTING SOIL

PART 1 – GENERAL

1.1 SUMMARY

A. The scope of work includes all labor, materials, tools, supplies, equipment, facilities, transportation and services necessary for, and incidental to performing all operations in connection with furnishing, delivery, and installation of Planting Soil and /or the modification of existing site soil for use as Planting Soil, complete as shown on the drawings and as specified herein.

B. The scope of work in this section includes, but is not limited to, the following:

1. Locate, purchase, deliver and install Imported Planting Soil and soil amendments.
2. Harvest and stockpile existing site soils suitable for Planting Soil.
3. Modify existing stockpiled site soil, or modification of existing soil.
4. Fine grade Planting Soil.
5. Install Compost into Planting Soil.
6. Clean up and disposal of all excess and surplus material.

1.2 CONTRACT DOCUMENTS

A. Shall consist of specifications, general conditions, and the drawings. The intent of these documents is to include all labor, materials, and services necessary for the proper execution of the work. The documents are to be considered as one. Whatever is called for by any parts shall be as binding as if called for in all parts.

1.3 RELATED DOCUMENTS AND REFERENCES

A. Related Documents:

1. Drawings and general provisions of contract, including general and supplementary conditions and Division I specifications, apply to work of this section.

L-101 Chase Brook Park Master Plan (Planting Overview)
L-201 Chase Brook Parcel Demolition / Removal Plan
L-202 Yankee Village Parcel Demolition / Removal Plan
L-203 Mill Creek Parcel Demolition / Removal Plan
L-301 Chase Brook Parcel Restoration Planting Plan
L-302 Yankee Village Parcel Restoration Planting Plan
L-303 Mill Creek Parcel Restoration Planting Plan
L-401 Site Feature Details
L-402 Planting Installation Details
L-403 Plant Correction Details

Land Management Plan by Crawford Land Management
Meadow Installation Protocol by Crawford Land Management

2. Related Specification Sections
   a. 32 8400 – Irrigation Specifications
   b. 32 9300 – Planting Specifications
   c. 32 9200 – Lawn and Grasses

B. References: The following specifications and standards of the organizations and documents listed in this paragraph form a part of the Specification to the extent required by the references thereto. In the event that the requirements of the following referenced standards and specification conflict with this

specification section the requirements of this specification shall prevail. In the event that the requirements of any of the following referenced standards and specifications conflict with each other the more stringent requirement shall prevail.

1. ASTM: American Society of Testing Materials cited section numbers.
2. U.S. Department of Agriculture, Natural Resources Conservation Service, 2003. National Soil Survey Handbook, title 430-VI. Available Online.
3. US Composting Council *www.compostingcouncil.org and* http://compostingcouncil.org/admin/wp-content/plugins/wp-*pdfupload/pdf/191/LandscapeArch_Specs.pdf.*
4. *Methods of Soil Analysis*, as published by the Soil Science Society of America (http://www.soils.org/).
5. Up by Roots: healthy soils and trees in the built environment. 2008. J. Urban. International Society of Arboriculture, Champaign, IL.

1.4 VERIFICATION

A. All scaled dimensions on the drawings are approximate. Before proceeding with any work, the Contractor shall carefully check and verify all dimensions and quantities, and shall immediately inform the Owner's Representative of any discrepancies between the information on the drawings and the actual conditions, refraining from doing any work in said areas until given approval to do so by the Owner's Representative.

1.5 PROTECTION OF WORK, PROPERTY AND PERSON

A. The Contractor shall adequately protect the work, adjacent property, and the public, and shall be responsible for any damages or injury due to the Contractor's actions.

1.6 CHANGES IN WORK

A. The Owner's Representative may order changes in the work, and the contract sum adjusted accordingly. All such orders and adjustments plus claims by the Contractor for extra compensation must be made and approved in writing before executing the work involved.

B. All changes in the work, notifications and contractor's request for information (RFI) shall conform to the contract general condition requirements.

1.7 CORRECTION OF WORK

A. The Contractor shall re-execute any work that fails to conform to the requirements of the contract and shall remedy defects due to faulty materials or workmanship upon written notice from the Owner's Representative, at the soonest possible time that can be coordinated with other work and seasonal weather demands but not more than 180 (one hundred and eighty) days after notification**.**

1.8 DEFINITIONS

A. Acceptable drainage: Drainage rate is sufficient for the plants to be grown. Not too fast and not too slow. Typical rates for installed Planting Soil are between 1 - 5 inches per hour. Turf soils are often higher, but drainage rates above 2 - 3 inches per hour will dry out very fast. In natural undisturbed soil a much lower drainage rate, as low as 1/8th inch per hour can still support good plant growth. Wetland plants can grow on top of perched water layers or even within seasonal perched water layers, but could become unstable in high wind events.

B. Amendment: material added to Topsoil to produce Planting Soil Mix. Amendments are classified as general soil amendments, fertilizers, biological, and pH amendments.

C. Biological Amendment: Amendments such as Mycorrhizal additives, compost tea or other products intended to change the soil biology.

D. Compacted soil: soil where the density of the soil is greater that the threshold for root limiting, and further defined in this specification.

E. Compost: well decomposed stable organic material as defined by the US Composting Council and further defined in this specification.

F. Drainage: The rate at which soil water moves through the soil transitioning the soil from saturated condition to field capacity. Most often expressed as saturated hydraulic conductivity (Ksat; units are inches per hour).

G. End of Warranty Acceptance: The date when the Owner's Representative accepts that the plants and work in this section meet all the requirements of the warranty. It is intended that the materials and workmanship warranty for Planting, Planting Soil, and Irrigation (if applicable) work run concurrent with each other, and further defined in this specification.

H. Existing Soil: Mineral soil existing at the locations of proposed planting after the majority of the construction within and around the planting site is completed and just prior to the start of work to prepare the planting area for soil modification and/or planting, and further defined in this specification.

I. Fertilizer: amendment used for the purpose of adjusting soil nutrient composition and balance.

J. Fine grading: The final grading of the soil to achieve exact contours and positive drainage, often accomplished by hand rakes or drag rakes other suitable devices, and further defined in this specification, and further defined in this specification.

K. Finished grade: surface or elevation of Planting Soil after final grading and 12 months of settlement of the soil, and further defined in this specification.

L. Graded soil: Soil where the A horizon has been stripped and relocated or re-spread; cuts and fills deeper than 12 inches, and further defined in this specification.

M. Installed soil: Planting soil and existing site soil that is spread and or graded to form a planting soil, and further defined in this specification.

N. Minor disturbance: Minor grading as part of agricultural work that only adjusts the A horizon soil, minor surface compaction in the top 6 inches of the soil, applications of fertilizers, installation of utility pipes smaller than 18 inches in diameter thru the soil zone.

O. Owner's Representative: The person or entity, appointed by the Owner to represent their interest in the review and approval of the work and to serve as the contracting authority with the Contractor. The Owner's Representative may appoint other persons to review and approve any aspects of the work.

P. Ped: a clump or clod of soil held together by a combination of clay, organic matter, and fungal hyphae, retaining the original structure of the harvested soil.

Q. Planting Soil: Topsoil, or Planting Soil Mixes which are imported or existing at the site, or made from components that exist at the site, or are imported to the site; and further defined in this specification.

R. *Poor drainage: Soil drainage that is slower than that to which the plants can adapt. This is a wide range of metrics, but generally if the soil is turning grey in color it is reasonable preferable to either to plant moisture adaptive plants at smaller sizes that are young in age with shallow root balls or look at options to improve the drainage*

S. Scarify: Loosening and roughening the surface of soil and sub soil prior to adding additional soil on top, and further defined in this specification.

T. Soil Fracturing: Deep loosening the soil to the depths specified by using a back hoe, and further defined in this specification.

U. Soil Horizons: as defined in the USDA National Soil Survey Handbook

http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242.

V. Soil Ripping: Loosening the soil by dragging a ripping shank or chisel thru the soil to the depths and spacing specified, and further defined in this specification.

W. Soil Tilling: Loosening the surface of the soil to the depths specified with a rotary tine tilling machine,

roto tiller, (or spade tiller), and further defined in this specification.

X. Subgrade: surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill, before placing Planting Soil.

Y. Substantial Completion Acceptance: The date at the end of the Planting, Planting Soil, and Irrigation installation (if applicable) where the Owner's Representative accepts that all work in these sections is complete and the Warranty period has begun. This date may be different than the date of substantial completion for the other sections of the project, and further defined in this specification.

Z. Topsoil: naturally produced and harvested soil from the A horizon or upper layers or the soil as further defined in this specification.

AA. Undisturbed soil: Soils with the original A horizon intact that have not been graded or compacted. Soils that have been farmed, subjected to fire or logged but not graded, and natural forested land will be considered as undisturbed.

1.9 SUBMITTALS

A. See the contract General Conditions for policy and procedures related to submittals.

B. Submit all product submittals eight weeks prior to the start of the soil work.

C. Product data and certificates: For each type of manufactured product, submit data and certificates that the product meets the specification requirements, signed by the product manufacturer, and complying with the following:

1. Submit manufacturers or supplier's product data and literature certified analysis for standard products and bulk materials, complying with testing requirements and referenced standards and specific requested testing.

a. For each Compost product submit the following analysis by a recognized laboratory:
1.) pH
2.) Salt concentration (electrical conductivity)
3.) Moisture content %, wet weight basis
4.) Particle size % passing a selected mesh size, dry weight basis
5.) Stability carbon dioxide evolution rate mg CO2-C per g OM per day
6.) Solvita maturity test
7.) Physical contaminants (inerts) %, dry weight basis
8.) US EPA Class A standard, 40CFR § 503.13, Tables 1 and 3 levels Chemical Contaminants mg/kg (ppm)

b. For Coarse Sand product submit the following analysis by a recognized laboratory:
1.) pH
2.) Particle size distribution (percent passing the following sieve sizes):
3/8 inch (9.5 mm)
No 4 (4.75 mm)
No 8 (2.36 mm)
No 16(1.18 mm)
No 30 (.60 mm)
No 50 (.30 mm)
No 100 (.15 mm)
No 200 (.075 mm)

D. Samples: Submit samples of each product and material, where required by Part 2 of the specification, to the Owner's Representative for approval. Label samples to indicate product, characteristics, and locations in the work. Samples will be reviewed for appearance only.

1. Submit samples a minimum of 8 weeks prior to the anticipated date of the start of soil installation.

2. Samples of all Topsoil, Coarse Sand, Compost and Planting Soil shall be submitted at the same

time as the particle size and physical analysis of that material.

E. Soil testing for Imported and Existing Topsoil, existing site soil to be modified as Planting Soil and Planting Soil Mixes.

1. Topsoil, existing site soil and Planting Soil Mix testing: Submit soil test analysis report for each sample of Topsoil, existing site soil and Planting Soil from an approved soil-testing laboratory and where indicated in Part 2 of the specification as follows:
   a. Submit Topsoil, Planting Soil, Compost, and Coarse Sand for testing at least 8 weeks before scheduled installation of Planting Soil Mixes. Submit Planting Soil Mix test no more than 2 weeks after the approval of the Topsoil, Compost and Coarse Sand. Do not submit to the testing laboratory, Planting Soil Mixes, for testing until all Topsoil, Compost and Coarse Sand have been approved.
   b. If tests fail to meet the specifications, obtain other sources of material, retest and resubmit until accepted by the Owner's Representative.
   c. All soil testing will be at the expense of the Contractor.
2. Provide a particle size analysis (% dry weight) and USDA soil texture analysis. Soil testing of Planting Soil Mixes shall also include USDA gradation (percentage) of gravel, coarse sand, medium sand, and fine sand in addition to silt and clay.
3. Provide the following other soil properties:
   a. pH and buffer pH.
   b. Percent organic content by oven dried weight.
   c. Nutrient levels by parts per million including: phosphorus, potassium, magnesium, manganese, iron, zinc and calcium. Nutrient test shall include the testing laboratory recommendations for supplemental additions to the soil for optimum growth of the plantings specified.
   d. Soluble salt by electrical conductivity of a 1:2 soil water sample measured in Milliohm per cm.
   e. Cation Exchange Capacity (CEC).

1.10 EXPLORATORY SOIL TESTING AND EVALUATION

1. Within heavily disturbed areas, construction access routes, construction staging areas, or any other area traversed by equipment, soils MUST be evaluated for compaction and the appropriate modifications completed in accordance with the specifications and with the Owner's Representative's approval.
   a. Compaction in the test areas shall be tested using the penetrometer. A minimum of four penetrometer readings from each Planting Soil shall be taken at the specified depths of the soil profile. Record the soil moisture at each penetrometer test site. In the event that the penetrometer readings exceed the specified densities, reconstruct the mockup, adjusting the soil density to achieve the desired results. Where the modification requires ripping, tilling or fracturing soils that are over compacted, start the procedure in a new location so that the process is working on soil that is similar to the density of the expected soil.

B. The 'Yankee Village' parcel previously received mulch over much of the site. Exploratory soil evaluation must be completed prior to installation of any project component. Dig a minimum of 10 test pits with a small excavator approximately 36" deep to evaluate the subsoil and presence of existing, suitable planting medium using the means, methods, and equipment proposed by the Contractor to complete the work. Test pit locations will be decided on in the field with the Owner's Representative and Contractor. Test pits shall be dug in the presence of the Owner's Representative. Modification to areas of the parcel may be needed to create suitable planting soils, depending on test pit evaluations.

1.11 OBSERVATION OF THE WORK

A. The Owner's Representative may observe the work at any time. They may remove samples of materials for conformity to specifications. Rejected materials shall be immediately removed from the site and replaced at the Contractor's expense. The cost of testing materials not meeting specifications

shall be paid by the Contractor.

1. The Owner's Representative may utilize the Contractor's penetrometer and moisture meter at any time to check soil compaction and moisture.

B. The Owner's Representative shall be informed of the progress of the work so the work may be observed at the following key times in the construction process. The Owner's Representative shall be afforded sufficient time to schedule visit to the site. Failure of the Owner's Representative to make field observations shall not relieve the Contractor from meeting all the requirements of this specification.

1. EXPOLORATORY SOIL TESTING AND EVALUATION:
2. EXISTING SOIL CONDITIONS REVIEW: Prior to the start of any soil modification that will utilize or modify the existing soil.
3. COMPLETION of SOIL MODIFICATIONS REVIEW: Upon completion of all soil modification and installation of planting soil.
4. COMPLETION OF FINE GRADING AND SURFACE SOIL MODIFICATIONS REVIEW: Upon completion of all surface soil modifications and fine grading but prior to the installation of shrubs, ground covers, or lawns.

1.12 PRE-CONSTRUCTION CONFERENCE

A. Schedule a pre-construction meeting with the Owner's Representative at least seven (7) days before beginning work to review any questions the Contractor may have regarding the work, administrative procedures during construction and project work schedule.

1.13 QUALITY ASSURANCE

A. Installer Qualifications: The installer shall be a firm having at least 5 years of experience of a scope similar to that required for the work, including the preparation, mixing and installation of soil mixes to support planting. The installer of the work in Section: Planting, shall be the same firm installing the work in this section.

1. The bidders list for work under this section shall be approved by the Owner's Representative.
2. Installer Field Supervision: When any Planting Soil work is in progress, installer shall maintain, on site, an experienced full-time supervisor who can communicate in English with the Owner's Representative.
3. Installer's field supervisor shall have a minimum of five years experience as a field supervisor installing soil, shall be trained and proficient in the use of field surveying equipment to establish grades and can communicate in English with the Owner's Representative.
4. The installer's crew shall be experienced in the installation of Planting Soil, plantings, and irrigation (where applicable) and interpretation of planting plans, soil installation plans, and irrigation plans (where applicable).

B. Soil testing laboratory qualifications: an independent laboratory, with the experience and capability to conduct the testing indicated and that specializes in USDA agricultural soil testing, Planting Soil Mixes, and the types of tests to be performed.

C. All delivered and installed Planting Soil shall conform to the approved submittals sample color, texture and approved test analysis.

1. Any Planting Soil that fails to meet the above criteria, if requested by the Owner's Representative, shall be removed and new soil installed.

D. Soil compaction testing: following installation or modification of soil, test soil compaction with a penetrometer.

1. Maintain at the site at all times a soil penetrometer with pressure dial and a soil moisture meter to

check soil compaction and soil moisture.
   a. Penetrometer shall be AgraTronix Soil Compaction Meter distributed by Ben Meadows, www.benmeadows.com or approved equal.
   b. Moisture meter shall be “general digital soil moisture meter” distributed by Ben Meadows, www.benmeadows.com or approved equal.

2. Prior to testing the soil with the penetrometer check the soil moisture and penetrometer readings in the mockup soils. Penetrometer readings are impacted by soil moisture and excessively wet or dry soils will read significantly lower or higher than soils at optimum moisture.

3. The penetrometer readings shall be within 20% plus or minus of the readings in the approved mockup when at similar moisture levels.

4. The following are threshold levels of compaction as determined by each method.

   a. Acceptable Compaction: Good rooting anticipated, but increasing settlement expected as compaction is reduced and/or in soil with a high organic matter content.
      1.) Penetration Resistance Method – about 75-250 psi, below 75 psi soil becomes increasingly unstable and will settle excessively.

   b. Root limiting Compaction: Root growth is limited with fewer, shorter and slower growing roots.
      1.) Penetration Resistance Method – about 300 psi.

   c. Excessive Compaction: Roots not likely to grow but can penetrate soil when soil is above field capacity.
      1.) Penetration Resistance Method – Approximately above 400 psi

1.14 SITE CONDITIONS

A. It is the responsibility of the Contractor to be aware of all surface and subsurface conditions, and to notify the Owner’s Representative, in writing, of any circumstances that would negatively impact the health of plantings. Do not proceed with work until unsatisfactory conditions have been corrected.

   1. Should subsurface drainage or soil conditions be encountered which would be detrimental to growth or survival of plant material, the Contractor shall notify the Owner’s Representative in writing, stating the conditions and submit a proposal covering cost of corrections. If the Contractor fails to notify the Owner’s Representative of such conditions, they shall remain responsible for plant material under the warrantee clause of the specifications.

   2. This specification requires that all Planting Soil work be completed and accepted prior to the installation of any plants.

1.15 DELIVERY, STORAGE, AND HANDLING

A. Weather: Do not mix, deliver, place or grade soils when frozen or with moisture above field capacity.

B. Protect soil and soil stockpiles, including the stockpiles at the soil blender’s yard, from wind, rain and washing that can erode soil or separate fines and coarse material, and contamination by chemicals, dust and debris that may be detrimental to plants or soil drainage. Cover stockpiles with plastic sheeting or fabric at the end of each workday.

C. All manufactured packaged products and material shall be delivered to the site in unopened containers and stored in a dry enclosed space suitable for the material and meeting all environmental regulations. Biological additives shall be protected from extreme cold and heat. All products shall be freshly manufactured and dated for the year in which the products are to be used.

D. Deliver all chemical amendments in original, unopened containers with original labels intact and legible, which state the guaranteed chemical analysis. Store all chemicals in a weather protected enclosure.

E. Bulk material: Coordinate delivery and storage with Owner's Representative and confine materials to neat piles in areas acceptable to Owner's Representative.

1.16 EXCAVATING AND GRADING AROUND UTILITIES

A. Contractor shall carefully examine the civil, record, and survey drawings to become familiar with the existing underground conditions before digging.

B. Determine location of underground utilities and perform work in a manner that will avoid damage. Hand excavate as required. Maintain grade stakes set by others until parties concerned mutually agree upon removal.

C. Notification of Dig Safe (811) or (888-344-7233). The Contractor is responsible for knowing the location and avoiding utilities that are not covered by Dig Safe.

PART 2 – PRODUCTS

2.1 IMPORTED TOPSOIL

A. Imported Topsoil definition: Fertile, friable soil containing less than 5% total volume of the combination of subsoil, refuse, roots larger than 1 inch diameter, heavy, sticky or stiff clay, stones larger than 2 inches in diameter, noxious seeds, sticks, brush, litter, or any substances deleterious to plant growth. The percent (%) of the above objects shall be controlled by source selection not by screening the soil. Topsoil shall be suitable for the germination of seeds and the support of vegetative growth. Imported Topsoil shall not contain weed seeds in quantities that cause noticeable weed infestations in the final planting beds. Imported Topsoil shall meet the following physical and chemical criteria:

1. Soil texture: USDA loam, sandy clay loam or sandy loam with clay content between 15 and 25%. And a combined clay/silt content of no more than 55%.
2. pH value shall be between 5.5 and 7.0.
3. Percent organic matter (OM): 2.0-5.0%, by dry weight.
4. Soluble salt level: Less than 2 mmho/cm.
5. Soil chemistry suitable for growing the plants specified.

B. Imported Topsoil shall be a harvested soil from fields or development sites. The organic content and particle size distribution shall be the result of natural soil formation. Manufactured soils where Coarse Sand, Composted organic material or chemical additives has been added to the soil to meet the requirements of this specification section shall not be acceptable. Retained soil peds shall be the same color on the inside as is visible on the outside.

C. Imported Topsoil for Planting Soil shall NOT have been screened and shall retain soil peds or clods larger than 2 inches in diameter throughout the stockpile after harvesting.

D. Stockpiled Existing Topsoil at the site meeting the above criteria may be acceptable.

E. Provide a two gallon sample from each Imported Topsoil source with required soil testing results. The sample shall be a mixture of the random samples taken around the source stockpile or field. The soil sample shall be delivered with soil peds intact that represent the size and quantity of expected peds in the final delivered soil.

2.2 COMPOST

A. Compost: Blended and ground leaf, wood and other plant based material, composted for a minimum of 9 months and at temperatures sufficient to break down all woody fibers, seeds and leaf structures, free of toxic material at levels that are harmful to plants or humans. Source material shall be yard waste trimmings blended with other plant or manure based material designed to produce Compost high in fungal material.

1. Compost shall be commercially prepared Compost and meet US Compost Council STA/TMECC

criteria or as modified in this section for “Compost as a Landscape Backfill Mix Component”.

http://compostingcouncil.org/admin/wp-content/plugins/wp-pdfupload/pdf/191/LandscapeArch_Specs.pdf

2. Compost shall comply with the following parameters:
   a. pH: 5.5 - 8.0.
   b. Soil salt (electrical conductivity): maximum 5 dS/m (mmhos/cm).
   c. Moisture content %, wet weight basis: 30 – 60.
   d. Particle size, dry weight basis: 98% pass through 3/4 inch screen or smear.
   e. Stability carbon dioxide evolution rate: mg CO_2-C/ g OM/ day < 2.
   f. Solvita maturity test: > 6.
   g. Physical contaminants (inerts), %, dry weight basis: <1%.
   h. Chemical contaminants, mg/kg (ppm): meet or exceed US EPA Class A standard, 40CFR § 503.13, Tables 1 and 3 levels.
   i. Biological contaminants select pathogens fecal coliform bacteria, or salmonella, meet or exceed US EPA Class A standard, 40 CFR § 503.32(a) level requirements.

B. Provide a two gallon sample with manufacturer’s literature and material certification that the product meets the requirements.

2.3 COARSE SAND

A. Clean, washed, sand, free of toxic materials

1. Coarse concrete sand, ASTM C-33 Fine Aggregate, with a Fines Modulus Index of 2.8 and 3.2.

2. Coarse Sands shall be clean, sharp, natural Coarse Sands free of limestone, shale and slate particles. Manufactured Coarse Sand shall not be permitted.

3. pH shall be lower than 7.0.

4. Provide Coarse Sand with the following particle size distribution:

Sieve	Percent passing
3/8 inch (9.5 mm)	100
No 4 (4.75 mm)	95-100
No 8 (2.36 mm)	80-100
No 16 (1.18 mm)	50-85
No 30 (.60 mm)	25-60
No 50 (.30 mm)	10-30
No 100 (.15 mm)	2-10
No 200 (0.75 mm	2-5

B. Provide a two gallon sample with manufacturer’s literature and material certification that the product meets the requirements.

2.4 EXISTING SOIL (Acceptable for planting with minimum modifications)

A. General definition of existing soil: Surface soil in the areas designated on the soils plan as existing soil, that is not altered, compacted to root limiting density, graded or contaminated before or during the construction process and considered acceptable for planting and long term health of the plants specified either as it exists or with only minor modification.

1. The Owner’s Representative shall verify that the soil in the designated areas is suitable at the beginning of planting bed preparation work in that area. In the event that the work of this project construction has damaged the existing soil in areas designated for use as Planting Soil to the point where the soil is no longer suitable to support the plants specified, the Owner’s Representative may require modification of the damaged soil up to and including removal and replacement with soil of equal quality to the soil that existed prior to construction. Examples of damage include further compaction, contamination, grading, creation of hard pan or drainage

problems, and loss of the O, and or A horizon.

B. Protect existing soil from compaction, contamination, and degradation during the construction process.

C. Where instructed, remove all existing plants, root thatch, and non-soil debris from the surface of the soil using equipment that does not increase compaction of soil to root limiting levels.

D. Modifications:

1. If existing soils require modifications due to any of the reasons listed in 2.4 (A) (1.), or any other reason, Contractor should refer to the following section for Modified Existing Soil.

2.5 MODIFIED EXISTING SOIL (SOIL SUITABLE FOR PLANTING WITH INDICATED MODIFICATION)

1. General definition: Any surface soil in the Project Area that has been altered and or graded before or during the construction process but is still considered acceptable for planting and long term health of the plants specified with the proposed modifications. Modifications respond to the soil problems expected or encountered and include, but are not limited to, unacceptable compaction, contamination, grading, creation of hard pan or drainage problem, and/or loss of the O, and or A horizon.

B. The Owner's Representative shall verify that the soil in the designated areas is suitable for modification at the beginning of planting bed preparation work in that area. The Owner's Representative will determine the appropriate modification of the damaged soil up to an including removal and replacement with soil of equal quality to the soil that would have resulted from the modification.

1. General requirements for all soil modifications:
   a. Take soil samples, test for chemical properties, and make appropriate adjustments.
   b. Unless otherwise instructed, remove all existing plants, root thatch, and non-soil debris from the surface of the soil using equipment that does not add to the compaction in the soil.
   c. All soil grading, tilling and loosening must be completed at times when the soil moisture is below field capacity. Allow soil to drain for at least two days after any rain event more than 1 inch in 24 hours, or long enough so that the soil does not make the hand muddy when squeezed.

C. Modified existing soil – soil removed, stockpiled, and spread

1. Description of condition to be modified: Existing soil that is suitable for reuse as Planting Soil but is in the wrong place of elevation, or cannot be adequately protected during construction. Soil is to be harvested, stockpiled and re-spread with or without further modifications as indicated.

2. Modifications:
   a. Excavate existing soil from the areas and to depths designated on the drawings. Stockpile in zones noted on the drawings or in areas proposed by the Contractor.
      1.) Prepare a soil stock pile plan for approval.
   b. Excavate soil using equipment and methods to preserve the clumps and peds in the soil. All equipment must be tracked equipment. Generally this means using the largest piece of equipment that is practical for the project size and scope.
   c. Protect stock piles from erosion by compacting or tracking the soil surface, covering with breathable fabric or planting with annual grasses as appropriate for the season, location, and length of expected time of storage.
   d. Re-spread soil as required in Part 3 of this specification.

D. Modified existing soil – compacted surface soil (to drawing details)

1. Description of condition to be modified: Surface soil compaction to a maximum of 6 inches deep from traffic or light grading. Original A horizon may be previously removed or graded but lower

profile intact with acceptable compaction levels and limited grading. The soil organic matter, pH and chemistry in the A horizon may not be suitable for the proposed plants and may need to be modified as required.

2. Modifications:

    a. Till top 6 inches or deeper of the soil surface, with a *roto tiller, spade tiller,* ripper or agricultural plow. Spread 2 - 3 inches of Compost on the surface of the tilled soil and make any chemical adjustment as recommended by the soil test.
    b. Till or disk the Compost into the loosened soil. Smooth out grades with a drag rake or drag slip.

E. Modified existing soil – compacted subsoil

1. Description of condition to be modified: Deep soil compaction the result of previous grading, filling and dynamic or static compaction forces. Original A horizon likely removed or buried. The soil organic matter, pH and chemistry in the A horizon is likely not suitable for the proposed plants and should be modified as required.

2. Soil Ripping:
    a. Step one: After grading and removing all plants and debris from the surface, using a tracked dozer or similar large grading equipment, loosen the soil by dragging a ripping shank or chisel thru the soil to depths of 24 inches with ripping shanks spaced 18 inches or less apart in two directions. The number of shanks per pull is dependent on the degree of soil compaction and the size of the dozer.
    b. Step 2: Spread 3-4 inches of Compost over the ripped area and till into the top 6 inches of the soil surface.

3. Soil Fracturing (refer to drawing detail):
    a. Step one: After grading and removing all plants and debris from the surface, spread 2 – 3 inches of Compost over the surface of the soil. Loosen the soil to depth of 18 - 24 inches, using a backhoe to dig into the soil through the Compost. Lift and then drop the loosened soil immediately back into the hole. The bucket then moves to the adjacent soil and repeats the process until the entire area indicated has been loosened.
    b. Step 2: Spread 3-4 inches of Compost over the ripped area and till into the top 6 inches of the soil surface.

4. Following soil ripping or fracturing the average penetration resistance should be less than 250 psi to the depth of the ripping or fracturing.

5. Do not start planting into ripped or fractured soil until soil has been settled or leave grades sufficiently high to anticipate settlement of 10 – 15% of ripped soil depth.

F. Modified existing soil – low organic matter

1. Description of condition to be modified: Low soil organic matter and/or missing A horizon but soil is not compacted except for some minor surface compaction. The soil organic matter, pH and/or chemistry are likely not suitable for the proposed plants and should be modified as required.

2. Modifications:
    a. Spread 3 - 4 inches of Compost over the surface of the soil and make chemical adjustment as recommended by the soil test.
    b. Till Compost into the top 6 inches of the soil.

G. Modified existing soil – soil within the root zone of existing established trees

1. Description of condition to be modified: Surface compaction near or above root limited levels in the upper soil horizon the result of traffic or other mechanical compaction.

2. Modifications:
    a. Remove the tops of all plants to be removed from the root zone. Remove sod with a walk

behind sod cutter. Do not grub out the roots of plants to be removed.

b. Use a pneumatic air knife to loosen the top 9 – 12 inches of the soil. Surface roots may move and separate from soil during this process but the bark on roots should not be broken
   1.) Pneumatic air knife shall be as manufactured by:
   Concept Engineering Group, Inc., Verona, PA (412) 826-8800
   Or Supersonic Air Knife, Inc., Allison Park, PA (866) 328 5723
c. Make chemical adjustment as recommended by the soil test and add 2 - 3 inches of Compost over the soil.
d. Using the pneumatic air knife, mix the Compost into the top 6 – 8 inches of the loosened soil.
e. Work in sections such that the entire process - including irrigation - can be completed in one day. Apply approximately one inch of water over the loosened soil at the completion of each day's work. Apply mulch or turf as indicated on the drawings within one week of the completion of work.

2.6 PLANTING SOIL MIXES

A. General definition: Mixes of Existing Soil or Imported Topsoil, Coarse Sand, and or Compost to make a new soil that meets the project goals for the indicated planting area. These may be mixed off site or onsite, and will vary in Mix components and proportions as indicated.

B. Planting Mix - moderately slow draining soil for trees and shrub beds

1. A Mix of Imported Topsoil, Coarse Sand and Compost. The approximate Mix ratio shall be:

Mix component	% by moist volume
Imported Topsoil unscreened	45-50%
Coarse sand	40-45%
Compost	10%

2. Final tested organic matter between 2.75 and 4% (by dry weight).

3. Mix the Coarse Sand and Compost together first and then add to the Topsoil. Mix with a loader bucket to loosely incorporate the Topsoil into the Coarse Sand/Compost Mix. DO NOT OVER MIX! Do not mix with a soil blending machine. Do not screen the soil. Clumps of Soil, Compost and Coarse Sand will be permitted in the overall Mix.

4. At the time of final grading, add fertilizer if required to the Planting Soil at rates recommended by the testing results for the plants to be grown.

5. Provide a two gallon sample with testing data that includes recommendations for chemical additives for the types of plants to be grown. Samples and testing data shall be submitted at the same time.

PART 3 – EXECUTION

3.1 SITE EXAMINATION

A. Prior to installation of new Planting Soil, examine site to confirm that existing conditions are satisfactory for the work of this section to proceed.

1. Confirm that surface all areas to be filled with Planting Soil are free of construction debris, refuse, compressible or biodegradable materials, stones greater than 2 inches diameter, soil crusting films of silt or clay that reduces or stops drainage from the Planting Soil into the subsoil; and/or standing water. Remove unsuitable material from the site.

2. Confirm that no adverse drainage conditions are present.

3. Confirm that no conditions are present which are detrimental to plant growth.

4. Confirm that utility work has been completed per the drawings.

B. If unsatisfactory conditions are encountered, notify the Owner's Representative immediately to determine corrective action before proceeding.

3.2 COORDINATION WITH PROJECT WORK

A. The Contractor shall coordinate with all other work that may impact the completion of the work.

B. Prior to the start of work, prepare a detailed schedule of the work for coordination with other trades.

C. Coordinate the relocation of any irrigation lines, heads or the conduits of other utility lines that are in conflict with tree locations. Root balls shall not be altered to fit around lines. Notify the Owner's Representative of any conflicts encountered.

3.3 GRADE AND ELEVATION CONTROL

A. Provide grade and elevation control during installation of Planting Soil or any soil modification processes. Utilize grade stakes, surveying equipment, and other means and methods to assure that grades and contours conform to the grades indicated on the plans.

3.4 SITE PREPARATION

A. In areas where Planting Soil is to be spread, confirm subgrade has been scarified.

B. Protect adjacent walls, walks and utilities from damage or staining by the soil. Use 1/2 inch plywood and or plastic sheeting as directed to cover existing concrete, metal and masonry work and other items as directed during the progress of the work.

1. At the end of each working day, clean up any soil or dirt spilled on any paved surface.

2. Any damage to the paving or site features or work shall be repaired at the Contractor's expense.

3.5 SOIL MOISTURE

A. Volumetric soil moisture level, in both the Planting Soil and the root balls of all plants, prior to, during and after planting shall be above permanent wilt point and below field capacity for each type of soil texture within the following ranges.

Soil texture	**Permanent wilting point**	**Field capacity**
Sand, Loamy sand, Sandy loam	5-8%	12-18%
Loam, Sandy clay, Sandy clay loam	14-25%	27-36%
Clay loam, Silt loam	11-22%	31-36%
Silty clay, Silty clay loam	22-27%	38-41%

B. The Contractor shall confirm the soil moisture levels with a moisture meter (Digital Soil Moisture Meter, DSMM500 by General Specialty Tools and Instruments, or approved equivalent). If moisture is found to be too low, the planting holes shall be filled with water and allowed to drain before starting any planting operations. If the moisture is too high, suspend planting operations until the soil moisture drains to below field capacity.

3.6 EXISTING SOIL MODIFICATION

A. Follow the requirements for modifying existing soil as indicated in Part 2 for the different types of soil modifications. The extent of the areas of different soil modification types are as directed by the Owner's Representative.

3.7 PLANTING SOIL AND PLANTING SOIL MIX INSTALLATION

A. Prior to installing any Planting Soil from stockpiles or Planting Soil Mixes blended off site, the Owner's Representative shall approve the condition of the subgrade and the previously installed subgrade preparation and the installation of subsurface drainage.

B. All equipment utilized to install or grade Planting Soils shall be wide track or balloon tire machines rated with a ground pressure of 4 psi or less. All grading and soil delivery equipment shall have buckets equipped with 6 inch long teeth to scarify any soil that becomes compacted.

C. In areas of soil installation above existing subsoil, scarify the subgrade material prior to installing Planting Soil.

   1. Scarify the subsoil of the subgrade to a depth of 3 – 6 inches with the teeth of the back hoe or loader bucket, tiller or other suitable device.

   2. Immediately install the Planting Soil. Protect the loosened area from traffic. DO NOT allow the loosened subgrade to become compacted.

   3. In the event that the loosened area becomes overly compacted, loosen the area again prior to installing the Planting Soil.

D. Install the Planting Soil in 12 - 18 inch lifts to the required depths. Apply compacting forces to each lift as required to attain the required compaction. Scarify the top of each lift prior to adding more Planting Soil by dragging the teeth of a loader bucket or backhoe across the soil surface to roughen the surface.

E. Phase work such that equipment to deliver or grade soil does not have to operate over previously installed Planting Soil. Work in rows of lifts the width of the extension of the bucket on the loader. Install all lifts in one row before proceeding to the next. Work out from the furthest part of each area from the soil delivery point to the edge of each area.

F. Where possible place large trees first and fill Planting Soil around the root ball.

G. Installing soil with soil or mulch blowers or soil slingers shall not be permitted due to the over mixing and soil ped breakdown cause by this type of equipment.

H. Where travel over installed soil is unavoidable, limit paths of traffic to reduce the impact of compaction in Planting Soil. Each time equipment passes over the installed soil it shall reverse out of the area along the same path with the teeth of the bucket dropped to scarify the soil. Comply with the paragraph "Compaction Reduction" (section 3.9) in the event that soil becomes over compacted.

3.8 COMPACTION REQUIREMENTS FOR INSTALLED OR MODIFIED PLANTING SOIL

A. Compact installed Planting Soil to the compaction rates indicated and using the methods approved for the soil mockup. Compact each soil lift as the soil is installed.

B. Existing soil that is modified by tilling, ripping or fracturing shall have a density to the depth of the modification, after completion of the loosening, such that the penetrometer reads approximately 75 to 250 psi at soil moisture approximately the mid-point between wilting point and field capacity. This will be approximately between 75 and 82% of maximum dry density standard proctor.

C. Installed Planting Soil Mix and re-spread existing soil shall have a soil density through the required depth of the installed layers of soil, such that the penetrometer reads approximately 75 to 250 psi at soil moisture approximately the mid-point between wilt point and field capacity. This will be approximately between 75 and 82% of maximum dry density standard proctor.

D. Planting Soil compaction shall be tested at each lift using a penetrometer calibrated to the mockup soil and its moisture level. The same penetrometer and moisture meter used for the testing of the mockup shall be used to test installed soil throughout the work.

E. Maintain moisture conditions within the Planting Soil during installation or modification to allow for satisfactory compaction. Suspend operations if the Planting Soil becomes wet. Apply water if the soil is overly dry.

F. Provide adequate equipment to achieve consistent and uniform compaction of the Planting Soils. Use the smallest equipment that can reasonably perform the task of spreading and compaction.

G. Do not pass motorized equipment over previously installed and compacted soil except as authorized below.

1. Light weight equipment such as trenching machines or motorized wheel barrows is permitted to pass over finished soil work.

2. If work after the installation and compaction of soil compacts the soil to levels greater than the above requirements, follow the requirements of the paragraph "Over Compaction Reduction" below.

3.9 OVER COMPACTION REDUCTION

A. Any soil that becomes compacted to a density greater than the specified density and/or the density in the approved mockup shall be dug up and reinstalled. This requirement includes compaction caused by other sub-contractors after the Planting Soil is installed and approved.

B. Surface roto tilling shall not be considered adequate to reduce over compaction at levels 6 inches or greater below finished grade.

3.10 FINE GRADING

A. The Owner’s Representative shall approve all rough grading prior to the installation of Compost, fine grading, planting, and mulching.

B. Grade the finish surface of all planted areas to meet the grades shown on the drawings, allowing the finished grades to remain higher (10 – 15% of depth of soil modification) than the grades on the grading plan, as defined in paragraph Planting Soil Installation, to anticipate settlement over the first year.

C. Utilize hand equipment, small garden tractors with rakes, or small garden tractors with buckets with teeth for fine grading to keep surface rough without further compaction. Do not use the flat bottom of a loader bucket to fine grade, as it will cause the finished grade to become overly smooth and or slightly compressed.

D. Provide for positive drainage from all areas toward the existing inlets, drainage structures and or the edges of planting beds. Adjust grades as directed to reflect actual constructed field conditions of paving, wall and inlet elevations. Notify the Owner’s Representative in the event that conditions make it impossible to achieve positive drainage.

E. Provide smooth, rounded transitions between slopes of different gradients and direction.

F. Fill all dips and remove any bumps in the overall plane of the slope. The tolerance for dips and bumps in shrub and ground cover planting areas shall be a 2 inch deviation from the plane in 10 feet. The tolerance for dips and bumps in lawn areas shall be a 1 inch deviation from the plane in 10 feet.

3.11 CLEAN-UP

A. During installation, keep the site free of trash, pavements reasonably clean and work area in an orderly condition at the end of each day. Remove trash and debris in containers from the site no less than once a week.

1. Immediately clean up any spilled or tracked soil, fuel, oil, trash or debris deposited by the Contractor from all surfaces within the project or on public right of ways and neighboring property.

B. Once installation is complete, wash all soil from pavements and other structures. Ensure that mulch is confined to planting beds and that all tags and flagging tape are removed from the site.

1. Make all repairs to grades, ruts, and damage to the work or other work at the site.

2. Remove and dispose of all excess Planting Soil, subsoil, mulch, plants, packaging, and other material brought to the site by the Contractor.

3.12 PROTECTION DURING CONSTRUCTION

A. The Contractor shall protect planting and related work and other site work from damage due to planting operations, operations by other Contractors or trespassers.

1. Maintain protection during installation until the date of plant acceptance (see specifications section – Planting). Treat, repair or replace damaged work immediately.

2. Provide temporary erosion control as needed to stop soil erosion until the site is stabilized with mulch, plantings or turf.

B. Damage done by the Contractor, or any of their sub-contractors to existing or installed plants, or any other parts of the work or existing features to remain, including large existing trees, soil, paving, utilities, lighting, irrigation, other finished work and surfaces including those on adjacent property, shall be cleaned, repaired or replaced by the Contractor at no expense to the Owner. The Owner's Representative shall determine when such cleaning, replacement or repair is satisfactory. Damage to existing trees shall be assessed by a certified arborist.

3.13 SUBSTANTIAL COMPLETION ACCEPTANCE

A. Upon written notice from the Contractor, the Owners Representative shall review the work and make a determination if the work is substantially complete.

B. The date of substantial completion of the planting soil shall be the date when the Owner's Representative accepts that all work in Planting, Planting Soil, and Irrigation installation sections is complete.

3.14 FINAL ACCEPTANCE / SOIL SETTLEMENT

A. At the end of the plant warrantee and maintenance period, (see Specification section - Planting) the Owner's Representative shall observe the soil installation work and establish that all provisions of the contract are complete and the work is satisfactory.

1. Restore any soil settlement and or erosion areas to the grades shown on the drawings. When restoring soil grades remove plants and mulch and add soil before restoring the planting. Do not add soil over the root balls of plants or on top of mulch.

B. Failure to pass acceptance: If the work fails to pass final acceptance, any subsequent observations must be rescheduled as per above. The cost to the Owner for additional observations will be charged to the Contractor at the prevailing hourly rate of the Owner's Representative.

END OF SECTION 32 9100

SECTION 32 9200
LAWNS AND GRASSES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. All of the Contract Documents, including General and Supplementary Conditions and Division 1 General Requirements, apply to the work of this section.
B. Restoration Planting Plans and Details:
L-101 Master Plan (Overview)
L-201 Chase Brook Parcel Planting Plan
L-202 Yankee Village Parcel Demolition / Removal Plan
L-203 Mill Creek Parcel Demolition / Removal Plan
L-301 Chase Brook Parcel Planting Plan
L-302 Yankee Village Parcel Planting Plan
L-303 Mill Creek Parcel Planting Plan
L-401 Site Feature Details
L-402 Plant Installation Details

1.02 DESCRIPTION OF WORK

A. The work of this Section consists of installing all materials furnished under this Section, including all equipment, labor, services, and incidental items required to complete work as shown on Drawings and specified in this Section.

1. "No-Mow" Fescue Lawn development, consisting of seeding.
2. Existing lawn renovation, consisting of:
    a. Removal of turf grasses, weeds, and debris from existing lawn before reseeding.
    b. Tilling bare and compacted areas.
    c. Applying soil amendments.
    d. Reseeding existing lawn areas with no mow lawn seed mix.
3. Lawn maintenance of newly-placed no-mow lawn

C. Sustainable Design Intent: Comply with project requirements intended to achieve a low maintenance and drought tolerant fescue lawn area to be used as open space for the public.
D. This section does not apply to Bluestem Meadow or Switchgrass Meadow Grasses. For Meadow Grass Installation and Maintenance, refer to Meadow Installation Protocol.

1.03 RELATED SECTIONS

A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that relate directly to work of this Section include, but are not limited to:

32 8400 Irrigation Specifications

1.04 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Certification of Grass Seed:

1. From seed vendor for each grass-seed monostand or mixture stating botanical and common name and percentage by weight of each species and variety, and percentage of purity, germination, and weed seed.
2. Include year of production and date of packaging.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Seed: Deliver seed in original sealed, labeled, and undamaged containers.

1.06 SCHEDULING

A. Seeding Restrictions:
1. Coordinate seeding periods with maintenance periods to provide required maintenance from Substantial Completion. Fall seeding is strongly recommended, ideally when daytime highs drop below 80 degrees. Most weeds germinate in spring, so fall plantings typically have far fewer weeds than spring seedings.
2. Fall Seeding: (Recommended) August 20 to October 20
3. Spring Seeding: March 15 to May 15.
4. Summer Seeding: *Seeding between June 1 and August 15 is* ***not recommended****,* except in cool climates that do not experience hot summers. Fescue grasses do not generally germinate well in the heat of summer, and drought is always a concern during this time.

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit.

1.07 NO MOW LAWN MAINTENANCE

A. Begin maintenance immediately after each area is planted and continue until acceptable lawn is established, but for not less than following periods:

1. Seeded Lawns:
a. 60 days from Substantial Completion.
b. When full maintenance period has not elapsed before end of planting season, or if lawn is not fully established, continue maintenance during next planting season.

B. Maintain and establish lawn by watering, weeding, mowing, trimming, overseeding, and other operations per recommendations of vendor (Prairie Nursery).

C. Roll, regrade, and re-seed bare or eroded areas to produce uniformly smooth lawn.

E. Watering:

1. Provide and maintain temporary piping, hoses, and lawn-watering equipment to convey water from sources and to keep lawn uniformly moist during establishment.
2. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch.
3. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
4. Water lawn every other morning for 15 to 30 minutes during the first four to six weeks after planting. Once Established, the grass should be watered only during dry periods. Occasional, deep soakings are preferable to frequent, light watering.
5. During periods of hot, dry weather, the lawn may receive two inches of water per

week if local regulations allow.

F. Mowing: No Mow Lawn does not require mowing as often as a traditional turf lawn does, and frequent mowing is not recommended.

1. No Mow Lawn should not be mowed any shorter than 3.5 or 4 inches. Close mowing will eventually damage the roots and weaken the turf.
2. To maintain a more manicured appearance, mow at four inches when the seed heads appear. This is usually the only mowing that will be required.
3. Mow once a month at a height of four inches, starting in spring and continuing throughout the growing season. Never remove more than the top one-third of the leafy growth. This will scalp the lawn, severely harming the grass and creating an unsightly appearance.
4. Do not delay mowing until grass blades bend over and become matted.
5. Do not mow when grass is wet.
6. No Mow turf should be mowed closely (two inches) in late fall at the end of the growing season – mid to late November. Close mowing at this time will remove old, dead leaves, helping reduce thatch buildup, and promoting a denser, thicker lawn the following year.
7. In fall, leaves may be mowed with a mulching mower after all the leaves have dropped. This shreds the leaves and encourages decomposition over winter. The nutrients from the mulched leaves are all the fertilizer your No Mow Lawn should need!

F. Fertilization:
Synthetic fertilizers or chemical treatments are not required and not recommended for No Mow Lawn areas. Use of fertilizers within conservation areas is prohibited.

PART 2 PRODUCTS

2.01 MATERIALS

A. Grass Seed:

1. Fresh, clean, dry, new-crop seed complying with AOSA Journal of Seed Technology; Rules for Testing Seeds for purity and germination tolerances.
2. Species:
   a. Provide seed of grass species and varieties, proportions by weight, and minimum percentages of purity, germination, and maximum percentage of weed seed for application.

      <u>Type 1 – No Mow Lawn Seed Mix (by Prairie Nursery)</u>
      Prairie Nursery, Inc. P.O. Box 306
      Westfield, WI 53964
      Toll Free Customer Service
      1-800-476-9453

      To be seeded at the following rates:

      - 5 Lbs per 800 sq ft;
      - 6 Lbs per 1000 sq ft;
      - 260 Lbs per acre.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine areas to receive lawns and grass for compliance with requirements and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. General:

1. Protect structures, utilities, sidewalks, pavements, and other facilities, as well as existing trees, shrubs, and plantings that are to remain, from damage caused by fescue lawn installation operations.
2. Protect adjacent and adjoining areas from seeding overspray.
3. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
4. All existing vegetation within the proposed no mow fescue areas to be removed unless otherwise specified on the planting plan(s).

5. Prepare Subgrade and Surface Soils for Seeding:
   Disturbed / Compacted Subgrades:
   a. Loosen subgrade to min. 6 in.
   b. Remove stones larger than 1 in. in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
   d. If additional topsoil is required, thoroughly blend planting soil mix off-site before spreading or spread topsoil, apply soil amendments if required on surface, and thoroughly blend planting soil mix.
   f. Mix lime with dry soil if required.
   g. Spread planting soil mix to 6 in. depth, but not less than required to meet finish grades after light rolling and natural settlement.
   h. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.
3. Undisturbed Areas:
   a. If lawns are to be planted in areas unaltered or undisturbed by excavating, grading, or surface soil stripping operations, remove existing grass, vegetation, and turf.
   b. Do not mix into surface soil.
   c. Loosen surface soil to min. 6 in. depth.
   d. Apply soil amendments according to planting soil mix proportions and mix thoroughly into top 6 in. of soil.
   e. Till soil to homogeneous mixture of fine texture.
   g. Remove stones larger than 1 in. in any dimension and sticks, roots, trash, and other extraneous matter.
   h. Legally dispose of waste material, including grass, vegetation, and turf, off Owner's property.
4. Finish Grading:
   a. Grade planting areas to smooth, uniform surface plane with loose, uniformly fine texture.
   b. Grade to within +/-1/2 in. of finish elevation.
   c. Roll and rake, remove ridges, and fill depressions to meet finish grades.
   d. Limit fine grading to areas that can be planted in immediate future.

5. Ensure area is free of annual and perennial weeds before seeding.
6. Moisten prepared lawn areas before seeding if soil is dry.
7. Water thoroughly and allow surface to dry before planting.
8. Do not create muddy soil.
9. Restore areas if eroded or otherwise disturbed after finish grading and before planting.

3.03 SEEDING

A. General:

1. Sow seed with spreader or seeding machine.
2. Do not broadcast or drop seed when wind velocity exceeds 5 mph.
3. Fill broadcast spreader or drop seeder. Some seeders list the seeding rates for fescue grasses. If no listing is provided, experiment with setting the opening, so that the seed is distributed at the recommended rate of 5 lbs. per 800 square feet (or 6 lbs per 1000 sq ft).

3. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
4. Do not use wet seed or seed that is moldy or otherwise damaged.
5. Cover the seed with one eighth to one quarter inch of soil. Use a rake, or drag the planted area with seeding drag, or piece of chain link fence.
6. Firm the seed into the soil by rolling with a roller, cultipacker, or similar implement.
7. Mulch the planting with a light covering of straw such as oats, winter wheat or marsh hay. Approximately 50% of the soil should be visible through the straw. The mulch helps control erosion on gentle slopes, and retains moisture in sandy and clay soils.
8. If working on steep slopes, it is recommended that the area be covered with an erosion-control blanket immediately after seeding. The grass will come up through the erosion blanket, and the soil will be protected from washing away during heavy rains.

3.04 CONSTRUCTION WASTE MANAGEMENT: Comply with the specified requirements, for removal and disposal of construction debris and waste.

END OF SECTION

SECTION 32 9300
PLANTING

PART 1 – GENERAL

1.1 SUMMARY

A. The scope of work includes all labor, materials, appliances, tools, equipment, facilities, transportation and services necessary for, and incidental to performing all operations in connection with furnishing, delivery, and installation of restoration planting complete as shown on the drawings and as specified herein.

B. The scope of work in this section includes, but is not limited to, the following:

1. Locate, purchase, deliver and install all specified plants.
2. Water all specified plants.
3. Mulch, fertilize, stake, and prune all specified plants.
4. Maintenance of all specified plants until the beginning of the warranty period.
5. Plant warranty.
6. Clean up and disposal of all excess and surplus material.
7. Maintenance of all specified plants during the warranty period.

1.2 CONTRACT DOCUMENTS

A. Shall consist of specifications and general conditions and the construction drawings. The intent of these documents is to include all labor, materials, and services necessary for the proper execution of the work. The documents are to be considered as one. Whatever is called for by any parts shall be as binding as if called for in all parts.

1.3 RELATED DOCUMENTS AND REFERENCES

A. Related Documents:

1. Drawings and general provisions of contract including general and supplementary conditions and Division I specifications that apply to work of this section

L-101 Chase Brook Park Master Plan (Planting Overview)
L-201 Chase Brook Parcel Demolition / Removal Plan
L-202 Yankee Village Parcel Demolition / Removal Plan
L-203 Mill Creek Parcel Demolition / Removal Plan
L-301 Chase Brook Parcel Restoration Planting Plan
L-302 Yankee Village Parcel Restoration Planting Plan
L-303 Mill Creek Parcel Restoration Planting Plan
L-401 Site Feature Details
L-402 Planting Installation Details
L-403 Plant Correction Details
Land Management Plan by Crawford Land Management
Meadow Installation Protocol by Crawford Land Management

2. Related Specification Sections

a. 32-8400 - Irrigation
b. 32 9100 - Planting Soil
c. 32 9200 - Lawn and Grasses

B. References: The following specifications and standards of the organizations and documents listed in this paragraph form a part of the specification to the extent required by the references thereto. In the event that the requirements of the following referenced standards and specification conflict with this specification section the requirements of this specification shall prevail. In the event that the requirements of any of the following referenced standards and specifications conflict with each other the more stringent requirement shall prevail or as determined by the Owners Representative.

1. ANSI Z60.1 American Standard for Nursery Stock, most current edition.
2. ANSI A 300 – Standard Practices for Tree, Shrub and other Woody Plant Maintenance, most current edition and parts.
3. Interpretation of plant names and descriptions shall reference the following documents. Where the names or plant descriptions disagree between the several documents, the most current document shall prevail.
   a. USDA - The Germplasm Resources Information Network (GRIN) http://www.ars-grin.gov/npgs/searchgrin.html
   b. Manual of Woody Landscape Plants; Michael Dirr; Stipes Publishing, Champaign, Illinois; Most Current Edition.
   c. The New Sunset Western Garden Book, Oxmoor House, most current edition.
4. Pruning practices shall conform to recommendations “Structural Pruning: A Guide For The Green Industry” most current edition; published by Urban Tree Foundation, Visalia, California.
5. Glossary of Arboricultural Terms, International Society of Arboriculture, Champaign IL, most current edition.

1.4 VERIFICATION

A. All scaled dimensions on the drawings are approximate. Before proceeding with any work, the Contractor shall carefully check and verify all dimensions and quantities, and shall immediately inform the Owner’s Representative of any discrepancies between the information on the drawings and the actual conditions, refraining from doing any work in said areas until given approval to do so by the Owner’s Representative.

B. In the case of a discrepancy in the plant quantities between the plan drawings and the plant call outs, list or plant schedule, the number of plants or square footage of the planting bed actually drawn on the plan drawings shall be deemed correct and prevail.

1.5 PERMITS AND REGULATIONS

A. The Contractor shall obtain and pay for all permits related to this section of the work unless previously excluded under provision of the contract or general conditions. The Contractor shall comply with all laws and ordinances bearing on the operation or conduct of the work as drawn and specified. If the Contractor observes that a conflict exists between permit requirements and the work outlined in the contract documents, the Contractor shall promptly notify the Owner’s Representative in writing including a description of any necessary changes and changes to the contract price resulting from changes in the work.

B. Wherever references are made to standards or codes in accordance with which work is to be performed or tested, the edition or revision of the standards and codes current on the effective date of this contract shall apply, unless otherwise expressly set forth.

C. In case of conflict among any referenced standards or codes or between any referenced standards and codes and the specifications, the more restrictive standard shall apply or Owner’s Representative shall determine which shall govern.

1.6 PROTECTION OF WORK, PROPERTY AND PERSON

A. The Contractor shall adequately protect the work, adjacent property, and the public, and shall be

responsible for any damages or injury due to his/her actions.

1.7 CHANGES IN THE WORK

A. The Owner's Representative may order changes in the work, and the contract sum should be adjusted accordingly. All such orders and adjustments plus claims by the Contractor for extra compensation must be made and approved in writing before executing the work involved.

B. All changes in the work, notifications and contractor's request for information (RFI) shall conform to the contract general condition requirements.

1.8 CORRECTION OF WORK

A. The Contractor, at their own cost, shall re-execute any work that fails to conform to the requirements of the contract and shall remedy defects due to faulty materials or workmanship upon written notice from the Owner's Representative, at the soonest as possible time that can be coordinated with other work and seasonal weather demands**.**

1.9 DEFINITIONS

All terms in this specification shall be as defined in the "Glossary of Arboricultural Terms" or as modified below.

A. Boxed trees: A container root ball package made of wood in the shape of a four-sided box.

B. Container plant: Plants that are grown in and/or are currently in a container including boxed trees.

C. Defective plant: Any plant that fails to meet the plant quality requirement of this specification.

D. End of Warranty Final Acceptance: The date when the Owner's Representative accepts that the plants and work in this section meet all the requirements of the warranty. It is intended that the materials and workmanship warranty for Planting, Planting Soil, and Irrigation work run concurrent with each other.

E. Field grown trees (B&B): Trees growing in field soil for at least 12 months prior to harvest.

F. Healthy: Plants that are growing in a condition that expresses leaf size, crown density, color; and with annual growth rates typical of the species and cultivar's horticultural description, adjusted for the planting site soil, drainage and weather conditions.

G. Kinked root: A root within the root package that bends more than 90 degrees.

H. Maintenance: Actions that preserve the health of plants after installation and as defined in this specification.

I. Maintenance period: The time period, as defined in this specification, which the Contractor is to provide maintenance.

J. Normal: the prevailing protocol of industry standard(s).

K. Owner's Representative: The person appointed by the Owner to represent their interest in the review and approval of the work and to serve as the contracting authority with the Contractor. The Owner's Representative may appoint other persons to review and approve any aspects of the work.

L. Reasonable and reasonably: When used in this specification relative to plant quality, it is intended to mean that the conditions cited will not affect the establishment or long term stability, health or growth of the plant. This specification recognizes that it is not possible to produce plants free of all defects, but that some accepted industry protocols and standards result in plants unacceptable to this project.

When reasonable or reasonably is used in relation to other issues such as weeds, diseased, insects, it shall mean at levels low enough that no treatment would be required when applying recognized Integrated Plant Management practices.

This specification recognizes that some decisions cannot be totally based on measured findings and that professional judgment is required. In cases of differing opinion, the Owner's Representative's

expert shall determine when conditions are judged as reasonable.

M. Root ball: The mass of roots including any soil or substrate that is shipped with the tree within the root ball package.

N. Root ball package. The material that surrounds the root ball during shipping. The root package may include the material in which the plant was grown, or new packaging placed around the root ball for shipping.

O. Root collar (root crown, root flare, trunk flare, flare): The region at the base of the trunk where the majority of the structural roots join the plant stem, usually at or near ground level.

P. Shrub: Woody plants with mature height approximately less than 15 feet.

Q. Spade harvested and transplanted: Field grown trees that are mechanically harvested and immediately transplanted to the final growing site without being removed from the digging machine.

R. Stem: The trunk of the tree.

S. Substantial Completion Acceptance: The date at the end of the Planting, Planting Soil, and Irrigation installation where the Owner's Representative accepts that all work in these sections is complete and the Warranty period has begun. This date may be different than the date of substantial completion for the other sections of the project.

T. Stem girdling root: Any root more than ¼ inch diameter currently touching the trunk, or with the potential to touch the trunk, above the root collar approximately tangent to the trunk circumference or circling the trunk. Roots shall be considered as Stem Girdling that have, or are likely to have in the future, root to trunk bark contact.

U. Structural root: One of the largest roots emerging from the root collar.

V. Tree: Single and multi-stemmed plants with mature height approximately greater than 15 feet.

1.10 SUBMITTALS

A. See contract general conditions for policy and procedure related to submittals.

B. Submit all product submittals 8 weeks prior to installation of plantings.

C. Product data: Submit manufacturer product data and literature describing all products required by this section to the Owner's Representative for approval. Provide submittal eight weeks before the installation of plants.

D. Plant growers' certificates: Submit plant growers' certificates for all plants indicating that each meets the requirements of the specification, including the requirements of tree quality, to the Owner's Representative for approval. Provide submittal eight weeks before the installation of plants.

E. Samples: Submit samples of each product and material where required by the specification to the Owner's Representative for approval. Label samples to indicate product, characteristics, and locations in the work. Samples will be reviewed for appearance only. Compliance with all other requirements is the exclusive responsibility of the Contractor.

F. Plant sources: Submit sources of all plants as required by Article – "Selection of Plants" to the Owner's Representative for approval.

G. Close out submittals: Submit to the Owner's Representative for approval.

1. Plant maintenance data and requirements.

H. Warranty period site visit record: If there is no maintenance during the warranty period, after each site visit during the warranty period, by the Contractor, as required by this specification, submit a written record of the visit, including any problems, potential problems, and any recommended corrective action to the Owner's Representative for approval.

1.11 OBSERVATION OF THE WORK

A. The Owner’s Representative may observe the work at any time. They may remove samples of materials for conformity to specifications. Rejected materials shall be immediately removed from the site and replaced at the Contractor's expense. The cost of testing materials not meeting specifications shall be paid by the Contractor.

B. The Owner’s Representative shall be informed of the progress of the work so the work may be observed at the following key times in the construction process. The Owner’s Representative shall be afforded sufficient time to schedule visit to the site. Failure of the Owner’s Representative to make field observations shall not relieve the Contractor from meeting all the requirements of this specification.

1. SITE CONDITIONS PRIOR TO THE START OF PLANTING: review the soil and drainage conditions.
2. COMPLETION OF THE PLANT LAYOUT STAKING: Review of the plant layout.
3. PLANT QUALITY: Review of plant quality at the time of delivery and prior to installation. Review tree quality prior to unloading where possible, but in all cases prior to planting.
4. COMPLETION OF THE PLANTING: Review the completed planting.

1.12 PRE-CONSTRUCTION CONFERENCE

A. Schedule a pre-construction meeting with the Owner’s Representative at least seven (7) days before beginning work to review any questions the Contractor may have regarding the work, administrative procedures during construction and project work schedule.

1.13 QUALITY ASSURANCE

A. Substantial Completion Acceptance - Acceptance of the work prior to the start of the warranty period:

1. Once the Contractor completes the installation of all items in this section, the Owner’s Representative will observe all work for Substantial Completion Acceptance upon written request of the Contractor. The request shall be received at least ten calendar days before the anticipated date of the observation.
2. Substantial Completion Acceptance by the Owner’s Representative shall be for general conformance to specified size, character and quality and not relieve the Contractor of responsibility for full conformance to the contract documents, including correct species.
3. Any plants that are deemed defective as defined under the provisions below shall not be accepted.

B. The Owner’s Representative will provide the Contractor with written acknowledgment of the date of Substantial Completion Acceptance and the beginning of the warranty period and plant maintenance period (if plant maintenance is included).

C. Contractor’s Quality Assurance Responsibilities: The Contractor is solely responsible for quality control of the work.

Installer Qualifications: Planting Restoration work including the installation of plants should only be completed by a company that specializes in natural resource management/ecological restoration work with a proven track record of successful invasive species management and restoration projects. The same firm shall remove invasive plant material, install erosion control and planting soil (where applicable) and plant material.

D. All work should be overseen by a Certified Ecological Restoration Practitioner as certified by the Society for Ecological Restoration.

E. All tree work should be completed or overseen by a licensed arborist.

F. All machine work should be completed by an insured operator with the appropriate hoisting and

hydraulics licenses.

G. The bidders list for work under this section shall be approved by the Owner's Representative.

H. Installer Field Supervision: When any planting work is in progress, installer shall maintain, on site, a full-time supervisor who can communicate in English with the Owner's Representative.

1. Installer's field supervisor shall have a minimum of five years experience as a field supervisor installing plants and trees of the quality and scale of the proposed project, and can communicate in English with the Owner's Representative.

2. The installer's crew shall have a minimum of 3 years experienced in the installation of Planting Soil, Plantings, and Irrigation (where applicable) and interpretation of soil plans, planting plans and irrigation plans.

3. Submit references of past projects, employee training certifications that support that the Contractors meets all of the above installer qualifications and applicable licensures.

1.14 PLANT WARRANTY

A. Plant Warranty:

1. The Contractor agrees to replace defective work and defective plants. The Owner's Representative shall make the final determination if plants meet these specifications or that plants are defective.

   Plants warranty shall begin on the date of Substantial Completion Acceptance and continue for the following periods, classed by plant type:

   a. Trees – 1 Year.
   b. Shrubs – 1 Year.
   c. Ground cover and perennials – 90 days.

2. When the work is accepted in parts, the warranty periods shall extend from each of the partial Substantial Completion Acceptances to the terminal date of the last warranty period. Thus, all warranty periods for each class of plant warranty, shall terminate at one time.

3. All plants shall be warrantied to meet all the requirements for plant quality at installation in this specification. Defective plants shall be defined as plants not meeting these requirements. The Owner's representative shall make the final determination that plants are defective.

4. Plants determined to be defective shall be removed immediately upon notification by the Owner's Representative and replaced without cost to the Owner, as soon as weather conditions permit and within the specified planting period.

5. Any work required by this specification or the Owner's Representative during the progress of the work, to correct plant defects including the removal of roots or branches, or planting plants that have been bare rooted during installation to observe for or correct root defects shall not be considered as grounds to void any conditions of the warranty. In the event that the Contractor decides that such remediation work may compromise the future health of the plant, the plant or plants in question shall be rejected and replaced with plants that do not contain defects that require remediation or correction.

6. The Contractor is exempt from replacing plants, after Substantial Completion Acceptance and during the warranty period, that are removed by others, lost or damaged due to occupancy of project, lost or damaged by a third party, vandalism, or any natural disaster.

7. Replacements shall closely match adjacent specimens of the same species. Replacements shall be subject to all requirements stated in this specification. Make all necessary repairs due to plant replacements. Such repairs shall be done at no extra cost to the Owner.

8. The warranty of all replacement plants shall extend for the periods, classed by plant type, from

the date of their acceptance after replacement. In the event that a replacement plant is not acceptable during or at the end of the said extended warranty period, the Owner's Representative may elect one more replacement items or credit for each item. These tertiary replacement items are not protected under a warranty period.

9. During and by the end of the warranty period, remove all tree wrap, ties, and guying unless agreed to by the Owner's Representative to remain in place. All trees that do not have sufficient caliper to remain upright, or those requiring additional anchorage in windy locations, shall be staked or remain staked, if required by the Owner's Representative.

B. End of Warranty Final Acceptance - Acceptance of plants at the end of the warranty period.

1. At the end of the warranty period, the Owner's Representative shall observe all warranted work, upon written request of the Contractor. The request shall be received at least ten calendar days before the anticipated date for final observation.

2. End of Warranty Final Acceptance will be given only when all the requirements of the work under this specification and in specification sections Planting Soil and Irrigation have been met.

1.15 SELECTION AND OBSERVATION OF PLANTS

A. The Owner's Representative may review all plants subject to approval of size, health, quality, character, etc. Review or approval of any plant during the process of selection, delivery, installation and establishment period shall not prevent that plant from later rejection in the event that the plant quality changes or previously existing defects become apparent that were not observed.

B. Plant Selection: The Owner's Representative reserves the right to observe all plants at the nursery prior to delivery and to reject plants that do not meet specifications as set forth in this specification. If a particular defect or substandard element can be corrected at the nursery, as determined by the Owner's Representative, the agreed upon remedy may be applied by the nursery or the Contractor provided that the correction allows the plant to meet the requirements set forth in this specification.

C. The Contractor shall bear all cost related to plant corrections.

D. All plants that are rejected shall be immediately removed from the site and acceptable replacement plants provided at no cost to the Owner.

E. Submit to the Owner's Representative, for approval, plant sources including the names and locations of nurseries proposed as sources of acceptable plants, and a list of the plants they will provide. The plant list shall include the botanical and common name and the size at the time of selection. Observe all nursery materials to determine that the materials meet the requirements of this section.

1. The following nurseries are pre-approved to supply plants for this project:
   a. Cape Coastal Nursery (Dennis, MA)
   b. Bigelow Nursery (Northborough, MA)
   c. Sylvan Nursery (Westport, MA)
   d. Weston Wholesale (Hopkinton, MA)
   e. Van Berkum Nursery (Deerfield, NH)
   f. New England Wetland Plants (South Hadley, MA)
   g. New Moon Nursery (Woodstown, NJ)
   h. North Creek Nurseries (Landenberg, PA)
   i. Pinelands Nursery (Columbus, NJ)

F. Where requested by the Owner's Representative, submit photographs of plants or representative samples of plants. Photographs shall be legible and clearly depict the plant specimen. Each submitted image shall contain a height reference, such as a measuring stick. The approval of plants by the Owner's Representative via photograph does not preclude the Owner's Representative's right to reject material while on site.

1.16 PLANT SUBSTITUTIONS FOR PLANTS NOT AVAILABLE

A. Submit all requests for substitutions of plant species, or size to the Owner's Representative, for approval, prior to purchasing the proposed substitution. Request for substitution shall be accompanied with a list of nurseries contacted in the search for the required plant and a record of other attempts to locate the required material. Requests shall also include sources of plants found that may be of a smaller or larger size, or a different shape or habit than specified, or plants of the same genus and species but different cultivar origin, or which may otherwise not meet the requirements of the specifications, but which may be available for substitution.

1.17 SITE CONDITIONS

A. It is the responsibility of the Contractor to be aware of all surface and sub-surface conditions, and to notify the Owner's Representative, in writing, of any circumstances that would negatively impact the health of plantings. Do not proceed with work until unsatisfactory conditions have been corrected.

1. Should subsurface drainage or soil conditions be encountered which would be detrimental to growth or survival of plant material, the Contractor shall notify the Owner's Representative in writing, stating the conditions and submit a proposal covering cost of corrections. If the Contractor fails to notify the Owner's Representative of such conditions, he/she shall remain responsible for plant material under the warranty clause of the specifications.

B. It is the responsibility of the Contractor to be familiar with the local growing conditions, and if any specified plants will be in conflict with these conditions. Report any potential conflicts, in writing, to the Owner's Representative.

C. This specification requires that invasive vegetation removal, Planting Soil preparation work be completed and accepted prior to the installation of any plants.

1. Planting operations shall not begin until such time that the irrigation system infrastructure is completely in place for the area(s) to be planted and ready to be connected to upon completion of planting an area. Under no circumstance should any plants be installed and left without water for more than 24 hours. All installed plants MUST be completely watered in at the time of planting. Owner's Representative has the right to inspect the irrigation system and require adjustments or additions to the system at any time during the plant installation phase.

D. Actual planting shall be performed during those periods when weather and soil conditions are suitable in accordance with locally accepted horticultural practices.
1. Do not install plants into saturated or frozen soils. Do not install plants during inclement weather, such as rain or snow or during extremely hot, cold or windy conditions.

1.18 PLANTING AROUND UTILITIES

A. Contractor shall carefully examine the civil, record, and survey drawings to become familiar with the existing underground conditions before digging.

B. Determine location of underground utilities and perform work in a manner that will avoid possible damage. Hand excavate, as required. Maintain grade stakes set by others until parties concerned mutually agree upon removal.

C. Notification of Dig Safe (1-888-344-7233) is required for all planting areas.

PART 2 – PRODUCTS

2.1 PLANTS: GENERAL

A. Standards and measurement: Provide plants of quantity, size, genus, species, and variety or cultivars as shown and scheduled in contract documents.

1. All plants including the root ball dimensions or container size to trunk caliper ratio shall conform to ANSI Z60.1 "American Standard for Nursery Stock" latest edition, unless modified by provisions in this specification. When there is a conflict between this specification and ANSI Z60.1, this

specification section shall be considered correct.

2. Plants larger than specified may be used if acceptable to the Owner's Representative. Use of such plants shall not increase the contract price. If larger plants are accepted the root ball size shall be in accordance with ANSI Z-60.1. Larger plants may not be acceptable if the resulting root ball cannot be fit into the required planting space or will compromise the stability of slopes.

3. If a range of size is given, no plant shall be less than the minimum size and not less than 50 percent of the plants shall be as large as the maximum size specified. The measurements specified are the minimum and maximum size acceptable and are the measurements after pruning, where pruning is required.

B. Proper Identification: All trees shall be true to name as ordered or shown on planting plans and shall be labeled individually or in groups by genus, species, variety and cultivar.

C. Compliance: All trees shall comply with federal and state laws and regulations requiring observation for plant disease, pests, and weeds. Any observation certificates required by law shall accompany each shipment of plants.

D. Plant Quality:

1. **General**: Provide healthy stock, grown in a nursery and reasonably free of die-back, disease, insects, eggs, bores, and larvae. At the time of planting all plants shall have a root system, stem, and branch form that will not restrict normal growth, stability and health for the expected life of the plant.

2. **Plant quality above the soil line:**

a. Plants shall be healthy with the color, shape, size and distribution of trunk, stems, branches, buds and leaves normal to the plant type specified. Plant quality above the soil line shall comply with the following:
   1.) Crown: The form and density of the crown shall be typical for a young specimen of the species or cultivar pruned to a central and dominant leader.
   2.) Leaves: The size, color, and appearance of leaves shall be typical for the time of year and stage of growth of the species or cultivar. Trees shall not show signs of prolonged moisture stress or over watering as indicated by wilted, shriveled, or dead leaves.
   3.) Branches: Shoot growth (length and diameter) throughout the crown should be appropriate for the age and size of the species or cultivar. Trees shall not have dead, diseased, broken, distorted, or otherwise injured branches.
      a.) Main branches shall be distributed along the central leader not clustered together. They shall form a balanced crown appropriate for the cultivar/species.
      b.) Branch diameter shall be no larger than two-thirds (one-half is preferred) the diameter of the central leader measured 1 inch above the branch union.
      c.) The attachment of the largest branches (scaffold branches) shall be free of included bark.
   4.) Trunk: The tree trunk shall be relatively straight, vertical, and free of wounds that penetrate to the wood (properly made pruning cuts, closed or not, are acceptable and are not considered wounds), sunburned areas, conks (fungal fruiting bodies), wood cracks, sap leakage, signs of boring insects, galls, cankers, girdling ties, or lesions (mechanical injury).
   5.) Temporary branches, unless otherwise specified, can be present along the lower trunk below the lowest main (scaffold) branch, particularly for trees less than 1 inch in caliper. These branches should be no greater than 3/8-inch diameter. Clear trunk should be no more than 40% of the total height of the tree.

b. Trees shall have one central leader. If the leader was headed, a new leader (with a live terminal bud) at least one-half the diameter of the pruning cut shall be present.
   1.) All trees are assumed to have one central leader unless a different form is specified in

the plant list or drawings.

c. Trunk caliper and taper shall be sufficient so that the lower five feet of the trunk remains vertical without a stake. Auxiliary stake may be used to maintain a straight leader in the upper half of the tree.

3. Plant quality at or below the soil line:

a. Plant roots shall be normal to the plant type specified. Root observations shall take place without impacting tree health. Root quality at or below the soil line shall comply with the project Root Acceptance details and the following:

1.) The roots shall be reasonably free of scrapes, broken or split wood.
2.) The root system shall be reasonably free of injury from biotic (e.g., insects and pathogens) and abiotic (e.g., herbicide toxicity and salt injury) agents. Wounds resulting from root pruning used to produce a high quality root system are not considered injuries.
3.) A minimum of three structural roots reasonably distributed around the trunk (not clustered on one side) shall be found in each plant. Root distribution shall be uniform throughout the root ball, and growth shall be appropriate for the species.
4.) The root collar shall be within the upper 2 inches of the substrate/soil. Two structural roots shall reach the side of the root ball near the top surface of the root ball. The grower may request a modification to this requirement for species with roots that rapidly descend, provided that the grower removes all stem girdling roots above the structural roots across the top of the root ball.
5.) The root system shall be reasonably free of stem girdling roots over the root collar or kinked roots from nursery production practices.
6.) At time of observations and delivery, the root ball shall be moist throughout. Roots shall not show signs of excess soil moisture conditions as indicated by stunted, discolored, distorted, or dead roots.

E. Submittals: Submit for approval the required plant quality certifications from the grower where plants are to be purchased, for each plant type. The certification must state that each plant meets all the above plant quality requirements.
1. The grower's certification of plant quality does not prohibit the Owner's Representative from observing any plant or rejecting the plant if it is found to not meet the specification requirements.

2.2 ROOT BALL PACKAGE OPTIONS: The following root ball packages are permitted. Any type of root ball packages that is not specifically defined in this specification shall not be permitted.

A. BALLED AND BURLAPPED PLANTS

1. All Balled and Burlapped Plants shall be field grown, and the root ball packaged in a burlap and twine and/or burlap and wire basket package.

2. Plants shall be harvested with the following modifications to standard nursery practices.

a. Prior to digging any tree that fails to meet the requirement for maximum soil and roots above the root collar, carefully removed the soil from the top of the root ball of each plant, using hand tools, water or an air spade, to locate the root collar and attain the soil depth over the structural roots requirements. Remove all stem girdling roots above the root collar. Care must be exercised not to damage the surface of the root collar and the top of the structural roots.

b. Trees shall be dug for a minimum of 4 weeks and a maximum of 52 weeks prior to shipping. Trees dug 4 to 52 weeks prior to shipping are defined as hardened-off.

c. Twine and burlap used for wrapping the root ball package shall be natural, biodegradable material. If the burlap decomposes after digging the tree then the root ball shall be re-wrapped prior to shipping if roots have not yet grown to keep root ball intact during shipping.

B. SPADE HARVESTED AND TRANSPLANTED
1. Spade Harvested and Transplanted Plants shall meet all the requirements for field grown trees.

Root ball diameters shall be of similar size as the ANSI Z60.1 requirements for Balled and Burlapped plants.

2. Trees shall be harvested prior to leafing out (bud break) in the spring or during the fall planting period except for plants know to be considered as fall planting hazards. Plants that are fall planting hazards shall only be harvested prior to leafing out in the spring.
3. Trees shall be moved and planted within 48 hours of the initial harvesting and shall remain in the spade machine until planted.

C. CONTAINER (INCLUDING ABOVE-GROUND FABRIC CONTAINERS AND BOXES) PLANTS

1. Container plants may be permitted only when indicated on the drawing, in this specification, or approved by the Owner's Representative.
2. Provide plants shall be established and well rooted in removable containers.
3. Container class size shall conform to ANSI Z60.1 for container plants for each size and type of plant.

2.3 PLANTING SOIL

A. Planting Soil as used in this specification means the soil at the planting site, or imported as modified and defined in specification Section Planting Soil.

2.4 MULCH

A. Mulch shall be "Walk on" grade, coarse, ground, from tree and woody brush sources, and free of dyes and added pigments. The size range shall be a minimum (less than 25% or less of volume) fine particles 3/8 inch or less in size, and a maximum size of individual pieces (largest 20% or less of volume) shall be approximately 1 to 1-1/2 inch in diameter and maximum length approximately 4 to 8". Pieces larger than 8 inch long that are visible on the surface of the mulch after installation shall be removed.

1. It is understood that mulch quality will vary significantly from supplier to supplier and region to region. The above requirements may be modified to conform to the source material from locally reliable suppliers as approved by the Owner's Representative.

B. Submit supplier's product specification data sheet and a one gallon sample for approval.

2.5 TREE STAKING AND GUYING MATERIAL

A. Tree guying to be flat woven polypropylene material, 3/4 inch wide, and 900 lb. break strength. Color to be Green. Product to be ArborTie manufactured by Deep Root Partners, L.P. or approved equal.

B. Refer to detail in drawing for staking & guying.

PART 3 – EXECUTION

3.1 SITE EXAMINATION

A. Examine the surface grades and soil conditions to confirm that the requirements of the Specification Section – Planting Soil - and the soil and drainage modifications have been completed. Notify the Owner's Representative in writing of any unsatisfactory conditions.

3.2 DELIVERY, STORAGE AND HANDLING

A. Protect materials from deterioration during delivery and storage. Adequately protect plants from drying out, exposure of roots to sun, wind or extremes of heat and cold temperatures. If planting is delayed more than 24 hours after delivery, set plants in a location protected from sun and wind. Provide adequate water to the root ball package during the shipping and storage period.

1. All plant materials must be available for observation prior to planting.

2. Using a soil moisture meter, periodically check the soil moisture in the root balls of all plants to assure that the plants are being adequately watered. Volumetric soil moisture shall be maintained above wilting point and below field capacity for the root ball substrate or soil.

B. Do not deliver more plants to the site than there is space with adequate storage conditions. Provide a suitable remote staging area for plants and other supplies.

1. The Owner's Representative or Contractor shall approve the duration, method and location of storage of plants.

C. Provide protective covering over all plants during transporting.

3.3 PLANTING SEASON

A. Planting shall only be performed when weather and soil conditions are suitable for planting the materials specified in accordance with locally accepted practice. Install plants during the planting time as described below unless otherwise approved in writing by the Owner's Representative. In the event that the Contractor request planting outside the dates of the planting season, approval of the request does not change the requirements of the warranty.

1. Acceptable planting dates: April 15 – June 30 and September 1 – November 15

3.4 ADVERSE WEATHER CONDITIONS

A. No planting shall take place during extremely hot, dry, windy or freezing weather.

3.5 COORDINATION WITH PROJECT WORK

A. The Contractor shall coordinate with all other work that may impact the completion of the work.

B. Prior to the start of work, prepare a detailed schedule of the work for coordination with other trades.

C. Coordinate the relocation of any irrigation lines, heads or the conduits of other utility lines that are in conflict with tree locations. Root balls shall not be altered to fit around lines. Notify the Owner's Representative of any conflicts encountered.

3.6 LAYOUT AND PLANTING SEQUENCE

A. Relative positions of all plants and trees are subject to approval of the Owner's Representative.

B. Notify the Owner's Representative, one (1) week prior to layout. Layout all individual tree and shrub locations. Place plants above surface at planting location or place a labeled stake at planting location. Layout bed lines with paint for the Owner's Representative's approval. Secure the Owner's Representative's acceptance before digging and start of planting work.

C. When applicable, plant trees before other plants are installed.

D. It is understood that plants are not precise objects and that minor adjustments in the layout will be required as the planting plan is constructed. These adjustments may not be apparent until some or all of the plants are installed. Make adjustments as required by the Owner's Representative including relocating previously installed plants.

3.7 SOIL PROTECTION DURING PLANT DELIVERY AND INSTALLATION

A. Protect soil from compaction during the delivery of plants to the planting locations, digging of planting holes and installing plants.

1. Where possible deliver and plant trees that require the use of heavy mechanized equipment prior to final soil preparation and tilling. Where possible, restrict the driving lanes to one area instead of driving over and compacting a large area of soil.

2. Modify any soils compacted from delivery or installation of plant materials to the site or specific planting areas in accordance with the Planting Soil specifications.

3.8 SOIL MOISTURE

A. Volumetric soil moisture level, in both the planting soil and the root balls of all plants, prior to, during and after planting shall be above permanent wilting point and below field capacity for each type of soil texture within the following ranges.

Soil type	Permanent wilting point	Field capacity
Sand, Loamy sand, Sandy loam	5-8%	12-18%
Loam, Sandy clay, Sandy clay loam	14-25%	27-36%
Clay loam, Silt loam	11-22%	31-36%
Silty clay, Silty clay loam	22-27%	38-41%

1. Volumetric soil moisture shall be measured with a digital moisture meter. The meter shall be the Digital Soil Moisture Meter, DSMM500 by General Specialty Tools and Instruments, or approved equivalent.

B. The Contractor shall confirm the soil moisture levels with a moisture meter. If the moisture is too high, suspend planting operations until the soil moisture drains to below field capacity.

3.9 INSTALLATION OF PLANTS: GENERAL

A. Observe each plant after delivery and prior to installation for damage of other characteristics that may cause rejection of the plant. Notify the Owner's Representative of any condition observed.

B. No more plants shall be distributed about the planting bed area than can be planted and watered on the same day.

C. The root system of each plant, regardless of root ball package type, shall be observed by the Contractor, at the time of planting to confirm that the roots meet the requirements for plant root quality in Part 2 Products: Plants General: Plant Quality. The Contractor shall undertake at the time of planting, all modifications to the root system required by the Owner's Representative to meet these quality standards.

D. Container and Boxed Root Ball Shaving: The outer surfaces of ALL plants in containers and boxes, including the top, sides and bottom of the root ball shall be shaved to remove all circling, descending, and matted roots. Shaving shall be performed using saws, knives, sharp shovels or other suitable equipment that is capable of making clean cuts on the roots. Shaving shall remove a minimum of one inch of root mat or up to 2 inches as required to remove all root segments that are not growing reasonably radial to the trunk.

E. Excavation of the Planting Space: Using hand tools or tracked mini-excavator, excavate the planting hole into the Planting Soil to the depth of the root ball measured after any root ball modification to correct root problems, and wide enough for working room around the root ball or to the size indicated on the drawing or as noted below.

1. For trees and shrubs planted in areas that were compacted due to construction equipment or previous vehicular / pedestrian activity, the soil around the root ball shall be loosened as defined below or as indicated on the drawings. (This does not apply to sloping areas where stabilization of soils is a high priority)

    a. The area of loosening shall be a minimum of 3 times the diameter of the root ball at the surface sloping to 2 times the diameter of the root ball at the depth of the root ball.
    b. Loosening is defined as digging into the soil and turning the soil to reduce the compaction. The soil does not have to be removed from the hole, just dug, lifted and turned. Lifting and turning may be accomplished with a tracked mini excavator, or hand shovels.

2. If an auger is used to dig the initial planting hole, the soil around the auger hole shall be loosened as defined above for trees and shrubs planted in soil areas that are NOT tilled or otherwise

modified.

3. The measuring point for root ball depth shall be the average height of the outer edge of the root ball after any required root ball modification.

4. If motorized equipment is used to deliver plants to the planting area over exposed planting beds, or used to loosen the soil or dig the planting holes, all soil that has been driven over shall be tilled to a depth of 6 inches.

F. For trees to be planted in prepared Planting Soil that is deeper than the root ball depth, compact the soil under the root ball using a mechanical tamper to assure a firm bedding for the root ball. If there is more than 12 inches of planting soil under the root ball excavate and tamp the planting soil in lifts not to exceed 12 inches.

G. Set top outer edge of the root ball at the average elevation of the proposed finish. Set the plant plumb and upright in the center of the planting hole. Do not place soil on top of the root ball.

H. The Owner's Representative may request that plants orientation be rotated when planted based on the form of the plant.

I. Backfill the space around the root ball with the same planting soil or existing soil that was excavated for the planting space. See Specification Section Planting Soil, for requirements to modify the soil within the planting bed.

J. Brace root ball by tamping Planting Soil around the lower portion of the root ball. Place additional Planting Soil around base and sides of ball in six-inch (6") lifts. Lightly tamp each lift using foot pressure or hand tools to settle backfill, support the tree and eliminate voids. DO NOT over compact the backfill or use mechanical or pneumatic tamping equipment.

1. When the planting hole has been backfilled to three quarters of its depth, water shall be poured around the root ball and allowed to soak into the soil to settle the soil. Do not flood the planting space. If the soil is above field capacity, allow the soil to drain to below field capacity before finishing the planting. Air pockets shall be eliminated and backfill continued until the planting soil is brought to grade level.

K. Where indicated on the drawings, build a 4 inch high, level berm of Planting Soil around the outside of the root ball to retain water. Tamp the berm to reduce leaking and erosion of the saucer.

L. Thoroughly water the Planting Soil and root ball immediately after planting.

M. Remove all nursery plant identification tags and ribbons as per Owner's Representative instructions, after conservation agent approval is granted.

N. Remove corrugated cardboard trunk protection after planting.

O. Follow additional requirements for the permitted root ball packages.

3.10 PERMITTED ROOT BALL PACKAGES AND SPECIAL PLANTING REQUIREMENTS

A. The following are permitted root ball packages and special planting requirements that shall be followed during the planting process in addition to the above General planting requirements.

B. BALLED AND BURLAPPED PLANTS

1. After the root ball has been backfilled, remove all twine and burlap from the top of the root ball. Cut the burlap away; do not fold down onto the Planting Soil.

2. If the plant is shipped with a wire basket that does not meet the requirements of a "Low Rise" basket, remove the top 6 - 8 inches of the basket wires just before the final backfilling of the tree.

3. Earth root balls shall be kept intact except for any modifications required by the Owner's Representative to make root package comply with the requirement in Part 2 Products.

4. Add 2-3 inches of composted bark mulch free of dyes or artificial ingredients to dripline of new

trees and shrubs.

C. SPADE HARVESTED AND TRANSPLANTED PLANTS
   1. After installing the tree, loosen the soil along the seam between the root ball and the surrounding soil out to a radius from the root ball edge equal to the diameter of the root ball to a depth of 8 - 10 inches by hand digging to disturb the soil interface.

   2. Fill any gaps below this level with loose soil.

   3. Add 2-3 inches of composted bark mulch free of dyes or artificial ingredients at base of transplanted trees and shrubs. (approx. 2' radius)

3.11 GROUND COVER, PERENNIAL AND ANNUAL PLANTS

A. Assure that soil moisture is within the required levels prior to planting.

B. Assure that soil grades in the beds are smooth and as shown on the plans.

C. Plants shall be planted in even, triangularly spaced rows, at the intervals called out for on the drawings, unless otherwise noted.

D. Dig planting holes sufficiently large enough to insert the root system without deforming the roots. Set the top of the root system at the grade of the soil.

E. Press soil to bring the root system in contact with the soil.

F. Spread any excess soil around in the spaces between plants.

G. Water each planting area as soon as the planting is completed. Apply additional water to keep the soil moisture at the required levels. Do not over water.

3.12 STAKING AND GUYING

A. Do not stake or guy trees unless specifically required by the Contract Documents, or in the event that the Contractor feels that staking is the only alternative way to keep particular trees plumb.

   1. The Owner's Representative shall have the authority to require that trees are staked or to reject staking as an alternative way to stabilize the tree.

   2. Trees that required heavily modified root balls to meet the root quality standards may become unstable. The Owner's Representative may choose to reject these trees rather than utilize staking to temporarily support the tree.

B. Trees that are guyed shall have their guys and stakes removed after one full growing season or at other times as required by the Owner's Representative.

3.13 STRAIGHTENING PLANTS

A. Maintain all plants in a plumb position throughout the warranty period. Straighten all trees that move out of plumb including those not staked. Plants to be straightened shall be excavated and the root ball moved to a plumb position, and then re-backfilled.

B. Do not straighten plants by pulling the trunk with guys.

3.14 PRUNING OF TREES AND SHRUBS

A. Prune plants as directed by the Owner's Representative. Pruning trees shall be limited to addressing structural defects as shown in details; follow recommendations in "Structural Pruning: A Guide For The Green Industry" published by Urban Tree Foundation, Visalia CA.

B. All pruning shall be performed by a person experienced in structural tree pruning.

C. Except for plants specified as multi-stemmed or as otherwise instructed by the Owner's

Representative, preserve or create a central leader.

D. Remove and replace excessively pruned or malformed stock resulting from improper pruning that occurred in the nursery or after.

E. Pruning shall be done with clean, sharp tools.

F. No tree paint or sealants shall be used.

3.15 PLANTING BED FINISHING

A. After planting, smooth out all grades between plants.

3.16 WATERING

A. The Contractor shall be fully responsible to ensure that adequate water is provided to all plants from the point of installation until the date of Substantial Completion Acceptance. The Contractor shall adjust the automatic irrigation system, if available, and apply additional or adjust for less water using hoses as required.

B. Hand water root balls of all plants to assure that the root balls have moisture above wilt point and below field capacity. Test the moisture content in each root ball and the soil outside the root ball to determine the water content.

C. The Contractor shall install temporary drip irrigation for each new tree and shrub to be maintained and used for watering woody plants during the establishment period. The contractor shall remove the temporary drip irrigation when plants are established (typically 2-3 years after installation).

3.17 CLEAN-UP

A. During installation, keep the site free of trash, pavements reasonably clean and work area in an orderly condition at the end of each day. Remove trash and debris in containers from the site no less than once a week.
   1. Immediately clean up any spilled or tracked soil, fuel, oil, trash or debris deposited by the Contractor from all surfaces within the project or on public right of ways and neighboring property.

B. Once installation is complete, wash all soil from pavements and other structures. Ensure that mulch is confined to planting beds and that all tags and flagging tape are removed from the site. The Owner's Representative's seals are to remain on the trees and removed at the end of the warranty period.

C. Make all repairs to grades, ruts, and damage by the plant installer to the work or other work at the site.

D. Remove and dispose of all excess planting soil, subsoil, mulch, plants, packaging, and other material brought to the site by the Contractor.

3.18 PROTECTION DURING CONSTRUCTION

A. The Contractor shall protect planting and related work and other site work from damage due to planting operations, operations by other Contractors or trespassers. Maintain protection during installation until Substantial Completion Acceptance. Treat, repair or replace damaged work immediately.

B. Damage done by the Contractor, or any of their sub-contractors to existing or installed plants, or any other parts of the work or existing features to remain, including roots, trunk or branches of large existing trees, soil, paving, utilities, lighting, irrigation, other finished work and surfaces including those on adjacent property, shall be cleaned, repaired or replaced by the Contractor at no expense to the Owner. The Owner's Representative shall determine when such cleaning, replacement or repair is satisfactory.

3.19 PLANT MAINTENANCE PRIOR TO SUBSTANTIAL COMPLETION ACCEPTANCE

A. During the project work period and prior to Substantial Completion Acceptance, the Contractor shall

maintain all plants.

B. Maintenance during the period prior to Substantial Completion Acceptance shall consist of pruning, watering, cultivating, weeding, mulching, removal of dead material, repairing and replacing of tree stakes, tightening and repairing of guys, repairing and replacing of damaged tree wrap material, resetting plants to proper grades and upright position, and furnishing and applying such sprays as are necessary to keep plantings reasonably free of damaging insects and disease, and in healthy condition. The threshold for applying insecticides and herbicide shall follow established Integrated Pest Management (IPM) procedures. Mulch areas shall be kept reasonably free of weeds, grass.

3.20 SUBSTANTIAL COMPLETION ACCEPTANCE

A. Upon written notice from the Contractor, the Owners Representative shall review the work and make a determination if the work is substantially complete.
   1. Notification shall be at least 7 days prior to the date the contractor is requesting the review.

B. The date of substantial completion of the planting shall be the date when the Owner's Representative accepts that all work in Planting, Planting Soil, and Irrigation installation sections is complete.

C. The Plant Warranty period begins at date of written notification of substantial completion from the Owner's Representative. The date of substantial completion may be different than the date of substantial completion for the other sections of the project.

3.21 MAINTENANCE DURING THE WARRANTY PERIOD BY OTHERS

A. After Substantial Completion Acceptance, the Contractor shall make sufficient site visits to observe the Owner's maintenance and become aware of problems with the maintenance in time to request changes, until the date of End of Warranty Final Acceptance.

   1. Notify the Owner's Representative in writing if maintenance, including watering, is not sufficient to maintain plants in a healthy condition. Such notification must be made in a timely period so that the Owner's Representative may take corrective action.

      a. Notification must define the maintenance needs and describe any corrective action required.

   2. In the event that the Contractor fails to visit the site and or notify, in writing, the Owner's Representative of maintenance needs, lack of maintenance shall not be used as grounds for voiding or modifying the provisions of the warranty.

3.22 MAINTENANCE DURING THE WARRANTY PERIOD BY THE PLANT INSTALLER

A. During the warranty period, provide all maintenance for all plantings to keep the plants in a healthy state and the planting areas clean and neat.

B. General requirements:
   1. All work shall be undertaken by trained planting crews under the supervision of a foreman with a minimum of 5 years experience supervising commercial plant maintenance crews.
   2. All chemical and fertilizer applications shall be made by licensed applicators for the type of chemicals to be used. All work and chemical use shall comply with all applicable local, provincial and federal requirements.
   3. Assure that hoses and watering equipment and other maintenance equipment does not block paths or be placed in a manner that may create tripping hazards. Use standard safety warning barriers and other procedures to maintain the site in a safe manner for visitors at all times.
   4. All workers shall wear required safety equipment and apparel appropriate for the tasks being undertaken.
   5. The Contractor shall not store maintenance equipment at the site at times when they are not in use unless authorized in writing by the Owner's Representative.
   6. Maintenance vehicles shall not park on the site including walks and lawn areas at any time without the Owner's Representative's written permission.
   7. Maintain a detailed log of all maintenance activities including types of tasks, date of task, types

and quantities of materials and products used, watering times and amounts, and number of each crew. Periodically review the logs with the Owner's Representative, and submit a copy of the logs at the end of each year of the maintenance agreement.

8. Meet with the Owner's Representative a minimum of three times a year to review the progress and discuss any changes that are needed in the maintenance program.

C. Provide the following maintenance tasks:
   1. Watering; Provide all water required to keep soil within and around the root balls at optimum moisture content for plant growth.
      a. Maintain all watering systems and equipment and keep them operational.
      b. Monitor soil moisture to provide sufficient water. Check soil moisture and root ball moisture with a soil moisture meter on a regular basis and record moisture readings. Do not over water.
   2. Plant pruning: Remove cross over branching, shorten or remove developing co dominant leaders, dead wood and winter-damaged branches. Unless directed by the Owner's Representative, do not shear plants or make heading cuts.
   3. Restore plants: Reset any plants that have settled or are leaning as soon as the condition is noticed.
   4. Guying and staking: Maintain plant guys in a taught position. Remove tree guys and staking after the first full growing season unless directed by Owner's Representative.
   5. Weed control: Keep all beds free of invasive species and aggressive weeds. Hand-remove or use chemical weed control only as outlined in the Land Management Plan by Crawford Land Management and the Order of Conditions.
   6. Trash removal: Remove all trash and debris from all planting beds and maintain the beds in a neat and tidy appearance.
   7. Plant pest control: Maintain disease, insects and other pests at manageable levels. Manageable levels shall be defined as damage to plants that may be noticeable to a professional but not to the average person. Use least invasive methods to control plant disease and insect outbreaks.
      a. The Owner's Representative must approve in advance the use of all chemical pesticide applications.
   8. Plant replacement: Replace all plants that are defective as defined in the warranty provisions, as soon as the plant decline is obvious and in suitable weather and season for planting as outlined in above sections. Plants that become defective during the maintenance period shall be covered and replaced under the warranty provisions.
   9. Damage from site use: Repair of damage by site visitors and events, beyond normal wear, are not part of this maintenance. The Owner's Representative may request that the Contractor repair damage beds or plantings for an additional cost. All additional work shall be approved in advance by the Owner's Representative.

3.23 END OF WARRANTY FINAL ACCEPTANCE / MAINTENANCE OBSERVATION

A. At the end of the Warranty and Maintenance period the Owner's Representative shall observe the work and establish that all provisions of the contract are complete and the work is satisfactory.
   1. If the work is satisfactory, the maintenance period will end on the date of the final observation.
   2. If the work is deemed unsatisfactory, the maintenance period will continue at no additional expense to the Owner until the work has been completed, observed, and approved by the Owner's Representative.

B. FAILURE TO PASS OBSERVATION: If the work fails to pass final observation, any subsequent observations must be rescheduled as per above. The cost to the Owner for additional observations will be charged to the Contractor at the prevailing hourly rate of the Owners Representative.

END OF SECTION 32 9300

Tighe&Bond

EXHIBIT 3

TOWN OF YARMOUTH

CONTRACT # 1418

CONTRACT NAME: CHASE BROOK PARK RESTORATION & PEDESTRIAN BRIDGE

This Contract is entered into on, or as of this date by and between the Town of Yarmouth and the Contractor, as indicated below:

Town of Yarmouth, Massachusetts			Contractor Name & Address	
Business Address for Notice				
Town Administrator			BUSINESS NAME	
1146 Route 28			ADDRESS	
South Yarmouth, MA 02664			CITY, STATE, ZIP	
			ADDL.	
Contract Manager			Contact Person	
NAME	Laura Hayden		NAME	
DEPT.	Yarmouth DPW Engineering			
ADDRESS	74 Town Brook Road		ADDRESS	
CITY, STATE, ZIP	West Yarmouth, MA 02673		CITY, STATE, ZIP	
PHONE	508-398-2231 ext. 1252		PHONE	
EMAIL	lhayden@yarmouth.ma.us		EMAIL	

1. This is a Contract for procurement of the Chase Brook Park Restoration & Pedestrian Bridge. Contract attachments hereby incorporated into this Contract are as follows:
a. The Invitation for bids – Attachment A; and
b. Respondent's Response Submittal dated December 19, 2025 – Attachment B

2. The Contract price to be paid to the Contractor by the Town is:

3. Payment will be made as follows:

3.1 If any portion of the contract price is to be paid by a private citizen(s) no work shall be performed until a sum has been deposited with the Town Treasurer, upon an estimate made by the board, committee or officer having charge of the work, sufficient to cover the payment for the portion of the said work

chargeable to the private citizen(s).
3.2 Fees and Reimbursable Costs combined shall not exceed $_____as more fully set forth in the Contractor Documents.
3.3 There shall be no further costs, fees or reimbursable charges due the Contractor under this Contract unless said fees and/or costs are so set forth in writing. The Town will not pay any surcharge or premium on top of the direct out of pocket expenses, if any.
3.4. Payments will be made by electronic methods either by credit card or ACH / direct bank deposit to the Contractor's account. The Contractor must provide a completed and signed ACH / direct deposit form. The Contractor must provide the Town an updated form if the bank account used for the deposit is changed during the term of this Contract.

4. Security:

4.1 In the event the contract price exceeds the sum of $10,000.00, the Contractor must provide security in the form of a bond or otherwise, conditioned upon the faithful performance of this Contract.

4.2 If this Contract is to be used for either Building Construction subject to MGL c. 149 or Public Works Construction subject to MGL. c. 30, § 39M or MGL. c. 30B, § 5 the following chart and notes are provided for clarification on the minimum required security subject to the Town requiring additional security:

Contract Price	Performance Bond	Payment Bond	Bid Deposit
Under $10,000	No	No	No
$10,000 - $25,000	No	No	No
$25,001 - $50,000	No	50% of total contract price[1]	No
$50,001 - $150,000[2]	No	50% of total contract price	5% of total bid
Over $150,000[3]	100% of contract price	100% of contract price	5% of total bid

5. Definitions:

5.1 Acceptance: All Contracts require proper acceptance of the described goods or services by the Town. Proper acceptance shall be understood to include inspection of goods and certification of acceptable performance for services by authorized representatives of the Town to ensure that the goods

[1] As required by MGL c. 149, § 29 for Building Construction Contracts as well as Public Works (Non-Building) Construction Contracts (with Labor) subject to MGL c. 30, § 39M, or MGL c. 30B, § 5.
[2] This $150,000 threshold is applicable to only Building Construction Contracts subject to MGL c. 149, but not to Public Works (Non-Building) Construction Contracts (with Labor) subject to MGL c. 30, § 39M, that are more than $50,000. This row applies to all Public Works Contracts subject to MGL c. 30, § 39M, that are greater than $50,000.
[3] The requirements of this row only apply to for Building Construction Contracts subject MGL c. 149, but not for Public Works (Non-Building) Construction Contracts (with Labor) subject to MGL c. 30, § 39M, or MGL c. 30B, § 5.

or services are complete and are as specified in the Contract.

5.2 Contract Documents: All documents relative to the Contract including (where used) Invitation for Bids and all attachments thereto, Instructions to Bidders, Proposal Form, General Conditions, Supplementary General Conditions, General Specifications, Other Specifications included in Project Manual, Drawings, all Addenda issued during the bidding period and Contractor's Response to the Invitation for Bids. The Contract Documents are complementary, and what is called for by any one shall be as binding as if called for by all. The purpose of the Contract Documents is to include all labor and materials, equipment and transportation necessary for the proper performance of the Contract.

5.3 The Contractor:The "other party" to any Contract with the Town. This term shall (as the sense and particular Contract so require) include Vendor, Contractor, Engineer, or other label used to identify the other party in the particular Contract. Use of the term "Contractor" shall be understood to refer to any other such label used.

5.4 Date of Substantial Performance: The date when the work is sufficiently complete, the services are performed, or the goods delivered, in accordance with Contract Documents, as modified by approved Amendments and Change Orders.

5.5 Goods: Goods, Supplies, Services or Materials.

5.6 Subcontractor: Those having a direct Contract with the Contractor. The term includes one who furnished material worked to a special design according to the Drawings or Specifications of this work, but does not include one who merely furnishes material not so worked.

5.7 Work: The services or materials contracted for, or both.

6. Term of Contract and Time for Performance:

This Contract shall be fully performed by the Contractor in accordance with the provisions of the Contract Documents on or before December 31, 2026, due to funding deadlines, unless extended, in writing, at the sole discretion of the Town, and not subject to assent by the Contractor, and subject to the availability and appropriation of funds as certified by the Town Accountant. Time is of the essence for the completion of the Contract.

7. Subject to Appropriation:

Notwithstanding anything in the Contract Documents to the contrary, any and all payments which the Town is required to make under this Contract shall be subject to appropriation or other availability of funds as certified by the Town Accountant. In the absence of appropriation or availability as certified herein, this Contract shall be immediately terminated without liability for damages, penalties or other charges to the Town. In the event this is a multi-year contract, this Contract shall be subject to annual appropriation and in the event funds are not so appropriated, this Contract shall terminate immediately without liability for damages, penalties or charges to the Town.

8. Permits and Approvals:

Permits, Licenses, Approvals and all other legal or administrative prerequisites to its performance of the Contract shall be secured and paid for by the Contractor.

9. Termination and Default:

9.1 Without Cause. The Town may terminate this Contract on seven (7) calendar days' notice when in the Town's sole discretion it determines it is in the best interests of the Town to do so, by providing notice to the Contractor, which shall be in writing and shall be deemed delivered and received when given in person to the Contractor, or when received by fax, express mail, certified mail return receipt requested, regular mail postage prepaid or delivered by any other appropriate method evidencing actual receipt by the Contractor. Upon termination without cause, Contractor will be paid for services rendered to the date of termination.

9.2 For Cause. If the Contractor is determined by the Town to be in default of any term or condition of this Contract, the Town may terminate this Contract on seven (7) days' notice by providing notice to the Contractor, which shall be in writing and shall be deemed delivered and received when given in person to the Contractor, or when received by fax, express mail, certified mail return receipt requested, regular mail postage prepaid or delivered by any other appropriate method evidencing actual receipt by the Contractor.

9.3 Default. The following shall constitute events of a default under the Contract:
(1) any material misrepresentation made by the Contractor to the Town; 2) any failure to perform any of its obligations under this Contract including, but not limited to the following: (i) failure to commence performance of this Contract at the time specified in this Contract due to a reason or circumstance within the Contractor's reasonable control, (ii) failure to perform this Contract with sufficient personnel and equipment or with sufficient material to ensure the completion of this Contract within the specified time due to a reason or circumstance within the Contractor's reasonable control, (iii) failure to perform this Contract in a manner reasonably satisfactory to the Town, (iv) failure to promptly re-perform within a reasonable time the services that were rejected by the Town as unsatisfactory, or erroneous, (v) discontinuance of the services for reasons not beyond the Contractor's reasonable control, (vi) failure to comply with a material term of this Contract, including, but not limited to, the provision of insurance and non-discrimination, (vii) any other acts specifically and expressly stated in this Contract as constituting a basis for termination of this Contact, and (viii) failure to comply with any and all requirements of state law and/or regulations, and Town bylaw and/or regulations.

10. Suspension or Delay
The Town may order the Contractor, in writing, to suspend, delay or interrupt all or any part of the Services without cause for such period of time as the Town may determine to be appropriate for its convenience. In the event of any such suspension, delay or interruption, the Contractor's time for performance may be equitably adjusted. No adjustment shall be made if the Contractor is or otherwise would have been responsible for the suspension, delay or interruption of the Services, or if another provision of this Contract is applied to render an equitable adjustment.

11. The Contractor's Breach and the Town's Remedies:

Failure of the Contractor to comply with any of the terms or conditions of this Contract shall be a material breach of this Contract, and the Town of Yarmouth shall have all the rights and remedies provided in the Contract Documents, the right to cancel, terminate, or suspend the Contract in whole or in part, the right to maintain any and all actions at law or in equity or other proceedings with respect to a breach of this Contract, including "Damages" including but not limited to costs, attorney's fees or other damages resulting form said breach ("Damages") as well as specific performance, and the right to select among the remedies available to it by all of the above.

From any sums due to the Contractor for services, the Town may keep the whole or any part of the amount for expenses, losses and Damages incurred by the Town as a consequence of procuring services as a result of any failure, omission or mistake of the Contractor in providing services as provided in this Contract.

12. Statutory Compliance:

12.1 This Contract will be construed and governed by the provisions of applicable federal, state and local laws and regulations; and wherever any provision of the Contract or Contract Documents shall conflict with any provision or requirement of federal, state or local law or regulation, then the provisions of law and regulation shall control. Where applicable to the Contract, the provisions of the General Laws are incorporated by reference into this Contract, including, but not limited to, the following:

General Laws Chapter 30B – Procurement of Goods and Services.
General Laws Chapter 30, Sec. 39, *et seq*: - Public Works Contracts.
General Laws Chapter 149, Section 44A, *et seq*: Public Buildings Contracts.

12.2 Wherever applicable law mandates the inclusion of any term and provision into a municipal contract, this Section shall be understood to import such term or provision into this Contract. To whatever extent any provision of this Contract shall be inconsistent with any law or regulation limiting the power or liability of cities and towns, such law or regulation shall control.

12.3 The Contractor shall comply with all Federal, State and local laws, rules, wage regulations, policies and orders applicable to the Work provided pursuant to this Contract, such provisions being incorporated herein by reference, and shall be responsible for obtaining all necessary licenses, permits, and approvals required for the supply of such Work.

The Contractor hereby agrees to indemnify and hold the Town harmless for and against any and all fines, penalties or monetary liabilities incurred by the Town as a result of the failure of the Contractor to comply with the previous sentence. If any discrepancy or inconsistency is discovered in the Drawings, Specifications or Contract for this work in violation of any such law, by-law, regulation, order or decree, it shall forthwith report the same in writing to the Town. The Contractor hereby agrees to, at all times, itself observe and comply with all such existing and future laws, by-laws, regulations, orders and decrees; and hereby agrees to protect and indemnify the Town, and its duly appointed agents against any claim or liability arising from or based on any violation whether by him or its agents,

employees or subcontractors of any such law, by-law, regulation or decree. The Town agrees to make reasonable effort to notify the Contractor of any duty arising out of this paragraph, but failure to make timely notice will not relieve the Contractor of any duty under this paragraph.

13. Conflict of Interest:

Both the Town and the Contractor acknowledge the provisions of the State Conflict of Interest Law (General Laws Chapter 268A), and this Contract expressly prohibits any activity which shall constitute a violation of that law. The Contractor shall be deemed to have investigated the application of M.G.L. c. 268A to the performance of this Contract; and by executing the Contract Documents the Contractor certifies to the Town that neither it nor its agents, employees, or subcontractors are thereby in violation of General Laws Chapter 268A.

14. Certification of Tax Compliance

This Contract must include a certification of tax compliance by the Contractor, as required by General Laws Chapter 62C, Section 49A (Requirement of Tax Compliance by All Contractors Providing Goods, Services, or Real Estate Space to the Commonwealth or Subdivision).

15. Non-Discrimination/Affirmative Action

The Contractor shall carry out the obligations of this Contract in compliance with all requirements imposed by or pursuant to federal, State and local ordinances, statutes, rules and regulations and policies prohibiting discrimination in employment, including but not limited to, Title VII of the Civil Rights Act of 1964; the Age Discrimination in Employment Act of 1967; Section 504 of the Rehabilitation Act of 1973 and Mass. G. L. c. 151B, and any other executive orders, rules, regulations, requirements and policies relating thereto enacted by the Commonwealth of Massachusetts and the Town as they may be amended from time to time. Contractor shall not discriminate against any qualified employee or applicant for employment because of race, color, national origin, ancestry, age, sex, religion, physical or mental handicap or sexual orientation.

15.1 As used in this section "affirmative action" means positive steps to ensure all qualified persons equal employment opportunity without regard to race, color, religion, sex or national origin at all stages of the employment process: recruitment, section, placement, promotion, training, layoff and termination. It may include, but is not limited to, the following:

(a) Inclusion in all solicitation and advertisements for employees of a statement that the Contractor is an "Equal Opportunity Employer";
(b) Placement of solicitations and advertisements for employees in media that reaches minority groups;
(c) Notification in writing of all recruitment sources that the Contractor solicits the referral of applicants without regard to race, color, religion, sex or national origin;
(d) Direct solicitation of the support of responsible and appropriate community, state and federal agencies to assist recruitment efforts;
(e) Participation in, or establishment of, apprenticeship or training programs where outside programs are inadequate or unavailable to minority groups;
(f) Modification of collective bargaining agreements to eliminate restrictive barriers established by dual lines of seniority, dual rates of pay or dual lines of promotion or progression which are based on race, color, religion, sex or national origin; and

(g) Review selection, placement, promotion, training, layoff and termination procedures and requirements to ensure that they do not intentionally or unintentionally discriminate against qualified persons because of race, color, religion, sex or national origin.

15.2 The Contractor, if applicable, shall include in all compliance and progress reports submitted to the town a report which shall include: (a) A certificate stating that he or she is currently in compliance with the provisions of G.L. c. 152B and setting forth the Affirmative Action he or she is currently undertaking and will undertake during the contract period to provide equal employment opportunity for all qualified persons without regard to race, color, religion, sex or national origin; and (b) A statement in writing supporting information signed by an authorized officer or agent on behalf of any labor union or other agency which refers workers or provides or supervises apprenticeship or other training programs which the Contractor deals, to the effect that the union or other agency's practices and policies do not discriminate on the basis of race, color, religion, sex or national origin; provided, in the event that the union or other agency shall refuse to execute such a statement, the Contractor need only so certify in writing.

15.3 A copy of any such report as described above, shall be filed in the office of the Town Clerk and shall upon said filing become a public record.

15.4 The Contractor will take Affirmative Action to ensure that employees are solicited and employed, and that employees are treated during employment, without regard to race, color, religion, sex or national origin.

15.5 The Contractor will in all solicitation or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex or national origin.

15.6 In determining whether steps taken by the Contractor constitute Affirmative Action, the Town shall take into account the relevant characteristics of the Contractor including, but not limited to, the number of employees and the location of the principal and branch offices.

16. Assignment:

The Contractor shall not assign, sublet or otherwise transfer this Contract, in whole or in part, without the prior written consent of the Town, and shall not assign any of the moneys payable under this Contract, except by and with the written consent of the Town.

17. Condition of Enforceability Against the Town:

This Contract is only binding upon, and enforceable against, the Town if: (1) the Contract is signed by the Board of Selectmen or its designee; and (2) endorsed with approval by the Town Accountant as to appropriation or availability of funds; and (3) endorsed with approval by the Town Counsel as to form.

18. Corporate Contractor:

If the Contractor is a corporation, it shall endorse upon this Contract (or attach hereto) its Clerk's Certificate certifying the corporate capacity and authority of the party signing this Contract for the corporation. Such certificate shall be accompanied by a letter or other instrument stating that such authority continues in full force and effect as of the date the Contract is executed by the Contractor. This

Contract shall not be enforceable against the Town of Yarmouth unless and until the Contractor complies with this section.

The Contractor, if a foreign corporation, shall file with the Commissioner of Corporations a Power of Attorney and duly authenticated copies of its Charter or Certificate of Incorporation; and said Contractor shall comply with all the laws of the Commonwealth of Massachusetts.

19. Contractor's Personnel:

The Contractor shall utilize only its employees and shall not utilize any third-party contractors without prior written approval of the Town.

20. Liability of Public Officials:

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

21. Indemnification:

The Contractor hereby agrees to indemnify, defend and save harmless the Town, the Town's officers, agents and employees, from and against any and all damages, liabilities, actions, suits, proceedings, claims, demands, losses, costs, expenses, recoveries and judgments of every nature and description (including attorneys' fees) that may arise in whole or in part out of or in connection with the work being performed or to be performed, or out of any act or omission by the Contractor, its employees, agents, subcontractors, material men, and anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by any party indemnified hereunder. The Contractor hereby agrees to reimburse the Town for damage to its property caused by the Contractor, its employees, agents, subcontractors or material men, and anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, including damages caused by his, its or their use of faulty, defective, or unsuitable material or equipment, unless the damage is caused by the Town's gross negligence or willful misconduct.

21.1 The Contractor hereby agrees to indemnify and hold harmless the Town, including the agents, employees and representatives of either, from and against all claims, damages, losses and expenses, including attorney's fees, arising out of or resulting from the performance of the work, provided that any such claim, damage, loss or expense (a) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property including the loss of use resulting therefrom and (b) is caused in whole or in part by any negligent act or omission of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder.

21.2 The Contractor shall be responsible for all damage or injury to property of any character during the prosecution of the work resulting from any act, omission, neglect, or misconduct in the manner or method of executing the work or due to the non-execution of the work or at any time due to defective work or materials.

21.3 In any and all claims against the town or any of their agents or employees by any employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under this paragraph shall not

be limited in anyway by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under workmen's Compensation Acts, disability benefit acts or other employee benefit acts.

21.4 The Contractor hereby assumes the entire responsibility and liability for any and all injury to or death of any or all persons, including the Contractor's employees, and for any and all damage to property caused by, resulting from or arising in whole or in part out of any act, omission, or neglect on the part of the Contractor or of any Subcontractor or of anyone directly or indirectly employed by any of them, or of anyone for whose acts any of them may be liable in connection with operations under the Contract.

21.5 The Town agrees to make reasonable effort to notify the Contractor of any duty arising out of this paragraph, but failure to make timely notice will not relieve the Contractor of any duty under this paragraph.

The foregoing provisions shall not be deemed to be released, waived, limit or modified in any respect by reason of any surety or insurance provided by the Contractor under the Contract.

22. Insurance

22.1 Workers Compensation Insurance:

The Contractor shall provide by insurance for the payment of compensation and the furnishing of other benefits under Chapter 152 of the General Laws of Massachusetts (The Worker's Compensation Act) to all employees of the Contractor who are subject to the provisions of Chapter 152 of the General Laws of Massachusetts.

Failure to provide and continue in force such insurance during the period of this Contract shall be a material breach of this Contract, shall operate as an immediate termination thereof, and Contractor hereby agrees to indemnify the Town for all losses, claims, and actions resulting from the failure to provide the insurance required by this Article. The Town agrees to make reasonable effort to notify the Contractor of any duty arising out of this paragraph, but failure to make timely notice will not relieve the Contractor of any duty under this paragraph.

The Contractor shall furnish to the Town a certificate evidencing such insurance prior to the execution of this Contract before the same shall be binding on the parties thereto, except if specifically waived by the Town.

22.2 Professional Liability Insurance

Liability of $1 million per claim and $3 million aggregate.

Failure to provide and continue in force such insurance during the period of this Contract shall be a material breach of this Contract, shall operate as an immediate termination thereof, and Contractor hereby agrees to indemnify the Town for all losses, claims, and actions resulting from the failure to provide the insurance required by this Article. The Town agrees to make reasonable effort to notify the Contractor of any duty arising out of this paragraph, but failure to make timely notice will not relieve the Contractor of

any duty under this paragraph.

22.3 Other Insurance Requirements

a. 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 include the Town of Yarmouth as an additional insured, and 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.

b. 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.

c. The intent of the Specifications regarding insurance is to specify minimum coverage and minimum limits of liability acceptable under the Contract. However, it shall be the Contractor's responsibility to purchase and maintain insurance of such character and in such amounts as will adequately protect it and the Town from and against all claims, damages, losses and expenses resulting from exposure to any casualty liability in the performance of the work, including and not limited to Professional liability insurance where applicable.

d. All policies shall identify the Town as an additional insured (except Workers' Compensation and Professional Liability). The Contractor shall notify the Town immediately upon the cancellation or amendment to any policy. Renewal Certificates shall be filed with the Town at least ten (10) days prior to the expiration of the required policies. Certificates evidencing all such coverage shall be provided to the Town upon the execution of this Contract, and upon the renewal of any such coverage. Each such certificate shall specifically refer to this Contract and shall state that such insurance is as required by this Contract. **Failure to provide the notices required in this Section or to continue in force such insurance shall be a material breach of this Contract and shall be grounds for immediate termination**. Said insurance shall include: Workers Compensation/Employers' Liability Insurance, Business Automobile Liability Insurance, and Commercial General Liability Insurance (CGL). The CGL policy shall include coverage for liability arising from premises, operations, independent Contractors, personal injury, contractual liability. All Certificates of Insurance shall be on the "MIIA" or "ACORD" Certificate of Insurance form, shall contain true transcripts from the policies, authenticated by the proper officer of the Insurer, evidencing in particular those insured, the extent of coverage, the location and operations to which the insurance applies, the expiration date and the above-mentioned notice clauses. All insurance shall be written on an occurrence basis. Coverage shall be maintained without interruption from date of the Contract until date of final payment and termination of any coverage required to be maintained after payment.

e. The Contractor shall obtain and maintain during the term of this Contract the insurance coverage in companies licensed to do business in the Commonwealth of Massachusetts and acceptable to the Town.

23. Documents, Materials, Etc.

Any materials, reports, information, data, etc. given to or prepared or assembled by the Contractor under this Contract are to be kept confidential and shall not be made available to any individual or organization

by the Contractor (except agents, servants, or employees of the Contractor) without the prior written approval of the Town, except as otherwise required by law. The Contractor shall comply with the provisions Chapter 66A of the General Laws of Massachusetts as it relates to public documents, and all other state and federal laws and regulations relating to confidentiality, security, privacy and use of confidential data.

Any materials produced in whole or in part under this Contract shall not be subject to copyright, except by the Town, in the United States or any other country. The Town shall have unrestricted authority to, without payment of any royalty, commission, or additional fee of any type or nature, publicly disclose, reproduce, distribute and otherwise use, and authorize others to use, in whole or in part, any reports, data or other materials prepared under this Contract.

All data, reports, programs, software, equipment, furnishings, and any other documentation or product paid for by the Town shall vest in the Town at the termination of this Contract. The Contractor shall at all times, during or after termination of this Contract, obtain the prior written approval of the Town before making any statement bearing on the work performed or data collected under this Contract to the press or issuing any material for publication through any medium.

24. No Employment

The Contractor acknowledges and agrees that it is acting as an independent Contractor for all services rendered pursuant to this Contract, and neither the Contractor, nor its employees, agents, servants nor any person for whose conduct the Contractor is responsible shall be considered an employee or agent of the Town for any purpose and shall not file any claim or bring any action for any worker's compensation unemployment benefits and compensation for which they may otherwise be eligible as a Town employee as a result of work performed pursuant to the terms of this Contract.

25. Audit, Inspection and Recordkeeping

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

26. Payment

The Town agrees to make all reasonable efforts to pay to the Contractor the sum set forth in the Contractor's bid or proposal within thirty (30) days of receipt of an invoice detailing the work completed and acceptance from the Town of the work completed.

27. Waiver and Amendment

Amendments, or waivers of any additional term, condition, covenant, duty or obligation contained in this Contract may be made only by written amendment executed by all signatories to the original Contract, prior to the effective date of the amendment.

To the extent allowed by law, any conditions, duties, and obligations contained in this Contract may be waived only by written agreement by both parties.

Forbearance or indulgence in any form or manner by a party shall not be construed as a waiver, nor in any manner limit the legal or equitable remedies available to that party. No waiver by either party of any default or breach shall constitute a waiver of any subsequent default or breach of a similar or different matter.

28. Severability

If any term or condition of this Contract or any application thereof shall to any extent be held invalid, illegal or unenforceable by a court of competent jurisdiction, the validity, legality, and enforceability of the remaining terms and conditions of this Contract shall not be deemed affected thereby unless one or both parties would be substantially or materially prejudiced.

29. Forum and Choice of Law

This Contract and any performance herein shall be governed by and be construed in accordance with the laws of the Commonwealth of Massachusetts. Any and all proceedings or actions relating to subject matter herein shall be brought and maintained in the courts of the Commonwealth of Massachusetts or the federal district court sitting in the Commonwealth of Massachusetts, which shall have exclusive jurisdiction thereof. This paragraph shall not be construed to limit any other legal rights of the parties.

30. Notices

Any notice permitted or required under the provisions of this Contract to be given or served by either of the parties hereto upon the other party hereto shall be in writing and signed in the name or on the behalf of the party giving or serving the same. Notice shall be deemed to have been received at the time of actual service or three (3) business days after the date of a certified or registered mailing properly addressed. Notice to the Contractor shall be deemed sufficient if sent to the address set forth on page 1 or furnished from time to time in writing hereafter.

31. Binding on Successors:

This Contract is binding upon the parties hereto, their successors, assigns and legal representatives (and where not corporate, the heirs and estate of the Contractor). Neither the Town nor the Contractor shall assign or transfer any interest in the Contract without the written consent of the other.

32. Entire Agreement:

This Contract, including all documents incorporated herein by reference, constitutes the entire integrated agreement between the parties with respect to the matters described. This Contract supersedes all prior agreements, negotiations and representations, either written or oral, and it shall not be modified or amended except by a written document executed by the parties hereto.

DRAFT

IN WITNESS WHEREOF the parties have hereto and to two other identical instruments set forth their hands and executed this as an instrument under seal this the day and year first above written.

FOR THE TOWN OF YARMOUTH Acknowledged:		FOR THE CONTRACTOR	
Department/Division Head	Date	Name of Company	
Approved as to Procurement:			
Chief Procurement Officer	Date	Authorized Signature	Date
Approved as to Availability of Funds:			
Town Accountant	Date	Print Name & Title	
Contract Approval:			
Town Administrator	Date		

DRAFT

Tighe&Bond

EXHIBIT 4

INCLUDE THE PREVAILING WAGE RATES HERE

Tighe&Bond

EXHIBIT 5

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 #:083-2410
eDEP Transaction #:1653441
City/Town:YARMOUTH

A. General Information

1. Conservation Commission: YARMOUTH
2. Issuance: a. ☑ OOC b. ☐ Amended OOC
3. Applicant Details
   a. First Name: b. Last Name:
   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: b. Last Name:
   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	261, 275, & 281 ROUTE 28**		
b.City/Town	YARMOUTH	c. Zip Code	02664
d. Assessors Map/Plat#	37, 37, 38	e. Parcel/Lot#	61, 60, 1
f. Latitude	41.65315N	g. Longitude	70.25352W

6. Property recorded at the Registry of Deed for:

a. County	b. Certificate	c. Book	d. Page
		12816, 32664, 22511	132, 305, 319

7.Dates

a. Date NOI Filed : 12/7/2023 b. Date Public Hearing Closed: 12/21/2023 c. Date Of Issuance: 1/8/2024

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:
CHASE BROOK PARK RESTORATION & PEDESTRIAN BRIDGE CONSTRUCTION SHEETS G-001, 002, 003, C-101, 102, AND 201	CATHERINE RICKS, P.E.	COASTAL ENGINEERING CO.	12/7/2023	AS NOTED

CHASE BROOK PARK RESTORATION & PEDESTRIAN BRIDGE CONSTRUCTION SHEETS L-100, 201, 202, 203, 301, 302, 303	COASTAL ENGINEERING	CRAWFORD LAND MANAGEMENT	12/7/2023	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	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	10425 a. total sq. feet	10425 b. total sq. feet		
Sq ft within 100 ft	c. square feet	d. square feet	e. square feet	f. square feet
Sq ft between 100-200 ft	g. square feet	h. square feet	i. square feet	j. square feet

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	28 a. linear feet	28 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 11773 b. square feet 11773

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.

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 :"083-2410"

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 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:
SEE ATTACHED SPECIAL CONDITIONS PAGES 8A AND 8B

WPA FORM 5-ORDER OF CONDITIONS
SPECIAL CONDITIONS-PAGE 8A OF 10
SE83-2410 Town of Yarmouth
261, 275, and 281 Route 28

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. A "work limit " line shall be established with Erosion Controls (i.e. straw bales, staked filter fabric, bark mulch, "silt sacks", products made with r ice 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.
9. 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.
10. 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.
11. 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.
12. Washing of equipment/tools shall be done OFF -SITE or handled in a manner appropriate by the Conservation Administrator.
13. No equipment shall be refueled, nor shall fuel be stored within 100 feet of a resource area.
14. Any area that is disturbed during construction shall be revegetated immediately or as soon after the growing season commences, with appropriate native plantings. Permanent stabilization shall be carried out in order to minimize erosion.
15. Native vegetation shall be planted per the approved plan. The 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.

16. 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.
17. 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.
18. 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.
19. Nourishment material shall be of equal grain size and appropriate slope to avoid premature loss from the beach and impacts to near shore bottom habitat. Grain size analysis shall be provided prior to nourishment activity. All beach nourishment material shall be placed above the MHW line to facilitate a more gradual distribution of sediment, allowing mobile organisms to avoid the area of impact and burrowing organisms to respond to a smaller sediment load.
20. The project shall consist of using only non -leaching types of treated lumber. CCA or creosote lumber is prohibited.
21. No heavy construction equipment, vehicles or barges shall be permitted on a bordering vegetated wetland, saltmarsh or tidal flat during the construction.
22. A copy of the Chapter 91 license from DEP Waterways shall be submitted to the Conservation Commission.
23. A time-of-year (TOY) restriction shall be observed on all herbicide treatments to protect sensitive life stages of river herring. No herbicide treatment within the intertidal or wetland areas shall take place from April 1 – June 30 of any year.
24. 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.

Findings: The use of lawn, even in the form of drought tolerant no-mow fescue is generally not allowed within the 35-foot no disturb zone in the Town of Yarmouth. Due to the importance of close interaction with nature for public benefit and education, the commission decided to allow a small amount of no-mow fescue lawn within this area for public benefit and enjoyment of the resource areas. It was also taken under consideration that this area was formerly developed with the Yankee Village hotel, and the restoration plan overall is a vast improvement over the previously developed lot.

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.

1/8/2024
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:

John Frost

☑ by hand delivery on

Date 1/8/2024

☐ 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

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 #:083-2410
eDEP Transaction #:1653441
City/Town:YARMOUTH

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:

261, 275, & 281 ROUTE 28**
Project Location

083-2410
MassDEP File Number

Has been recorded at the Registry of Deeds of:

County | Book | Page

for:

Property Owner

and has been noted in the chain of title of the affected property in:

Book | Page

In accordance with the Order of Conditions issued on:

Date

If recorded land, the instrument number identifying this transaction is:

Instrument Number

If registered land, the document number identifying this transaction is:

Document Number

Signature of Applicant

Rev. 4/1/2010

Tighe&Bond

EXHIBIT 6

Bk 37205 Pg77 #39170
09-26-2025 @ 10:26a

NOT NOT
OFFICIAL OFFICIAL
COPY COPY

The Commonwealth of Massachusetts

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OFFICIAL OFFICIAL
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WW01-0000665

~~Whereas~~, Town of Yarmouth

of -- Yarmouth -- in the County of -- Barnstable -- and Commonwealth aforesaid, has applied to the Department of Environmental Protection for license to -- construct and maintain a pedestrian bridge and walkway --

and has submitted plans of the same; and whereas due notice of said application, ~~and of the time and place fixed for a hearing thereon~~, has been given, as required by law, to the -- Select Board -- of the -- Town of Yarmouth. --

NOW, said Department, having heard all parties desiring to be heard, and having fully considered said application, hereby, subject to the approval of the governor, authorizes and licenses the said

-- Town of Yarmouth --, subject to the provisions of the ninety-first chapter of the General Laws, and of all laws which are or may be in force applicable thereto, to -- construct and maintain a pedestrian bridge and walkway --

in and over the waters of the -- Chase Brook / Mill Creek -- at -- 261, 275, 281 Route 28 -- in the -- Town of Yarmouth -- and in accordance with the locations shown and details indicated on the accompanying DEP License Plan No. WW01-0000665 (5 sheets).

Plan Bk 713 Pg 69-73

261 Rt 28 Bk 12301 Pg 348; 275 Rt 28 Bk 32464 Pg 305; 281 Rt 28 Bk 21870 Pg 326

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The structures hereby authorized shall be limited to the following use(s): access to waterfront open space for passive recreation purposes.

Existing structures previously authorized under the Department of Environmental Protection License No 13479 issued on June 24, 2013, to the Town of Yarmouth, shall be maintained in accordance with the terms and conditions of said License and plans, or as modified herein.

This license is issued for an unlimited term in accordance with 310 CMR 9 .15(1)(c).

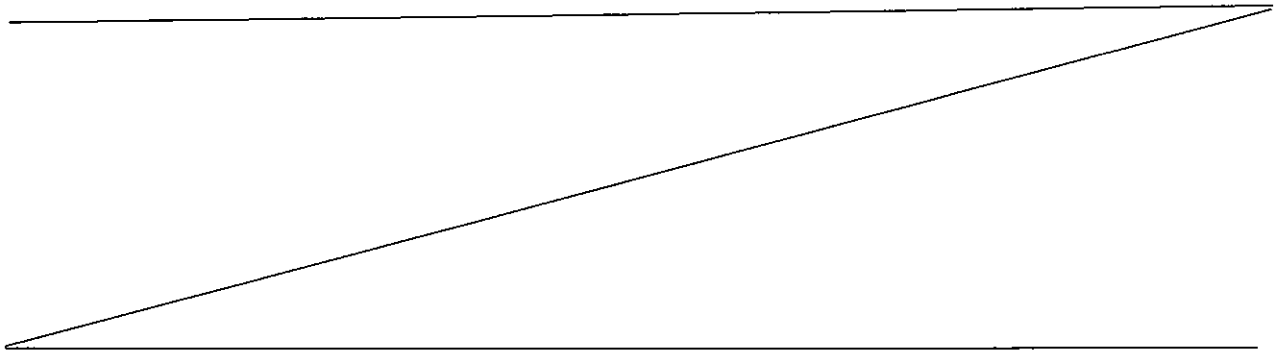
Special Waterways Conditions:

1. In accordance with any license condition, easement, or other public right of lateral passage that exists in the area of the subject property lying between the high and low water marks, the Licensee shall allow the public in the exercise of such rights to pass freely around all structures within such intertidal area. Nothing in this condition shall be construed as preventing the Licensee from excluding the public from portions of said structure(s) or property not intended for lateral passage.

2. No herbicide activities shall be conducted during the MA Division of Marine Fisheries (DMF) recommended time-of-year (TOY) restriction of April 1st to June 30th of any year to protect the sensitive life stages of the river herring.

3. All work authorized herein shall be completed within five (5) years of the date of license issuance. Said construction period may be extended by the Department for one or more one-year periods without public notice, provided that the Applicant submits to the Department, thirty (30) days prior to the expiration of said construction period, a written request to extend the period and provides an adequate justification for said extension.

4. Within sixty (60) days of completion of the licensed project, the Licensee shall request, in writing, that the Department issue a Certificate of Compliance in accordance with 310 CMR 9.19. The request shall be accompanied by a certification by a registered professional engineer licensed in the Commonwealth that the project was completed in accordance with the License.



Duplicate of said plan, number WW01-0000665 is on file in the office of said Department, and original of said plan accompanies this License, and is to be referred to as a part hereof.

STANDARD WATERWAYS LICENSE CONDITIONS

NOT AN OFFICIAL COPY

1. Acceptance of this Waterways License shall constitute an agreement by the Licensee to conform with all terms and conditions stated herein.

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2. This License is granted upon the express condition that any and all other applicable authorizations necessitated due to the provisions hereof shall be secured by the Licensee prior to the commencement of any activity or use authorized pursuant to this License.

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3. Any change in use or any substantial structural alteration of any structure or fill authorized herein shall require the issuance by the Department of a new Waterways License in accordance with the provisions and procedures established in Chapter 91 of the Massachusetts General Laws. Any unauthorized substantial change in use or unauthorized substantial structural alteration of any structure or fill authorized herein shall render this Waterways License void.

4. This Waterways License shall be revocable by the Department for noncompliance with the terms and conditions set forth herein. This license may be revoked after the Department has given written notice of the alleged noncompliance to the Licensee and those persons who have filed a written request for such notice with the Department and afforded them a reasonable opportunity to correct said noncompliance. Failure to correct said noncompliance after the issuance of a written notice by the Department shall render this Waterways License void and the Commonwealth may proceed to remove or cause removal of any structure or fill authorized herein at the expense of the Licensee, its successors and assigns as an unauthorized and unlawful structure and/or fill.

5. The structures and/or fill authorized herein shall be maintained in good repair and in accordance with the terms and conditions stated herein and the details indicated on the accompanying license plans.

6. Nothing in this Waterways License shall be construed as authorizing encroachment in, on or over property not owned or controlled by the Licensee, except with the written consent of the owner or owners thereof.

7. This Waterways License is granted subject to all applicable Federal, State, County, and Municipal laws, ordinances and regulations including but not limited to a valid final Order of Conditions issued pursuant to the Wetlands Protection Act, G.L. Chapter 131, s.40.

8. This Waterways License is granted upon the express condition that the use of the structures and/or fill authorized hereby shall be in strict conformance with all applicable requirements and authorizations of the MassDEP.

9. This License authorizes structure(s) and/or fill on:

__ Private Tidelands. In accordance with the public easement that exists by law on private tidelands, the licensee shall allow the public to use and to pass freely upon the area of the subject property lying between the high and low water marks, for the purposes of fishing, fowling, navigation, and the natural derivatives thereof.

_X_ Commonwealth Tidelands. The Licensee shall not restrict the public's right to use and to pass freely, for any lawful purpose, upon lands lying seaward of the low water mark. Said lands are held in trust by the Commonwealth for the benefit of the public.

__ a Great Pond of the Commonwealth. The Licensee shall not restrict the public's right to use and to pass freely upon lands lying seaward of the high-water mark for any lawful purpose.

__ Navigable River and Streams. The Licensee shall not restrict the public's right to use and to pass freely, for any lawful purpose, in the waterway.

No restriction on the exercise of these public rights shall be imposed unless otherwise expressly provided in this license.

10. Unless otherwise expressly provided by this license, the licensee shall not limit the hours of availability of any areas of the subject property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.

The amount of tide-water displaced by the work hereby authorized has been ascertained by said Department, and compensation thereof has been made by the said -- Town of Yarmouth -- by paying into the Treasury of the Commonwealth -- zero dollars and zero cents ($ 0.00) -- for each cubic yard so displaced, being the amount hereby assessed by said Department (0 cy = $ 0.00)

NOT A COPY NOT A COPY NOT A COPY NOT A COPY

Nothing in this License shall be so construed as to impair the legal rights of any person.

This License shall be void unless the same and the accompanying plan are recorded within 60 days from the date hereof, in the Registry of Deeds for the County of Barnstable.

IN WITNESS WHEREAS, said Department of Environmental Protection have hereunto set their hands this 6th day of August in the year two thousand twenty-five.

Program Chief _____

Department of Environmental Protection

Commissioner _____

THE COMMONWEALTH OF MASSACHUSETTS

This license is approved in consideration of the payment into the treasury of the Commonwealth by the said -- Town of Yarmouth --

of the further sum of -- zero dollars and zero cents ($0.00) --

the amount determined by the Governor as a just and equitable charge for rights and privileges hereby granted in the land of the Commonwealth.

BOSTON,

Approved by the Governor.

Bk 37205 Pg81 #39170

BARNSTABLE REGISTRY OF DEEDS
John F. Meade, Register

SIGNAGE SPECIFICATIONS - MassDEP Waterways Regulation Program (Updated September 20, 2012)

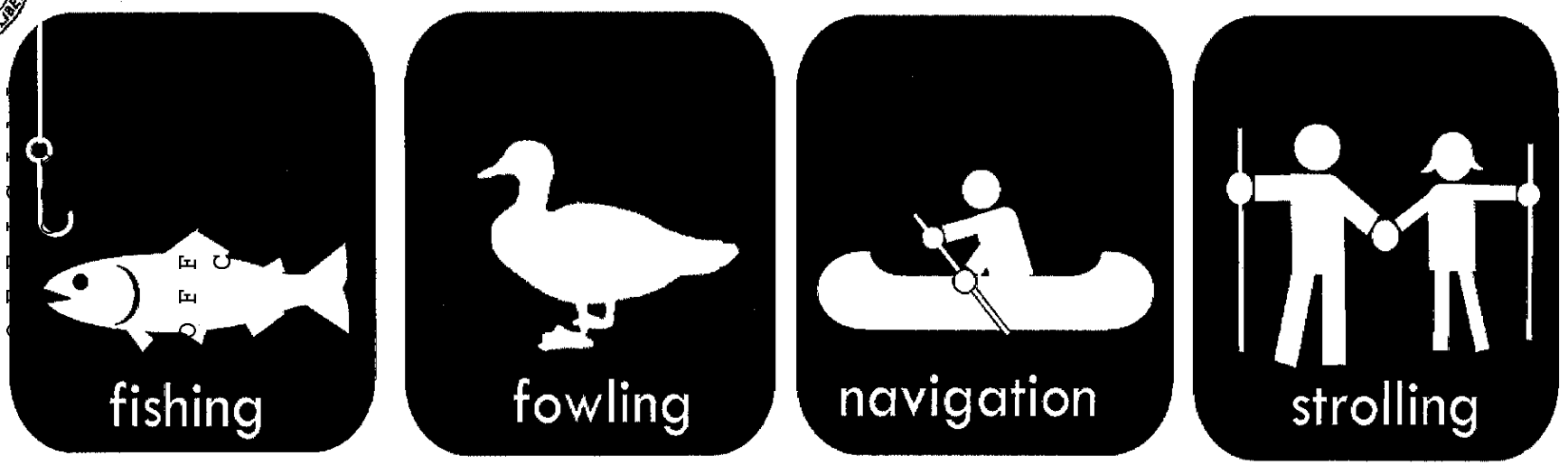
- Signs shall utilize durable materials and methods of construction and maintained in good condition.
- Signs shall be a minimum of 5" x 10" (or 50 square inches) in size. Letter height shall be a minimum of ½".
- The MassDEP Chapter 91 License number shall be displayed on all signs (as applicable).
- Each sign shall indicate that public passage is allowed for on-foot lateral access along the shoreline for the purpose of fishing, fowling, navigation and strolling.
- Signs shall be posted on both sides of the pier or structure, at the mean high water shoreline, or as directed by the Chapter 91 License (see Special Waterways Conditions, Page #2 or Page #3 for Simplified Licenses).

An example of an acceptable sign is provided below.

OFFICIAL COPY

PUBLIC PASSAGE

FOR



Mass DEP M.G.L. Ch.91 LICENSE # WW01-0000665

RECEIVED AND RECORDED
2025 SEP 26 AM 10:24
BARNSTABLE COUNTY
REGISTRY OF DEEDS
JOHN F. MEADE
REGISTER

713-69

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NOT AN OFFICIAL COPY
NOT AN OFFICIAL COPY

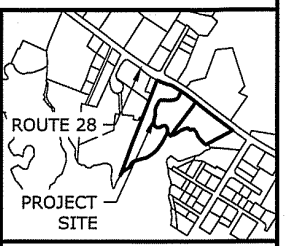
NAME

2117125
DATE

713-69

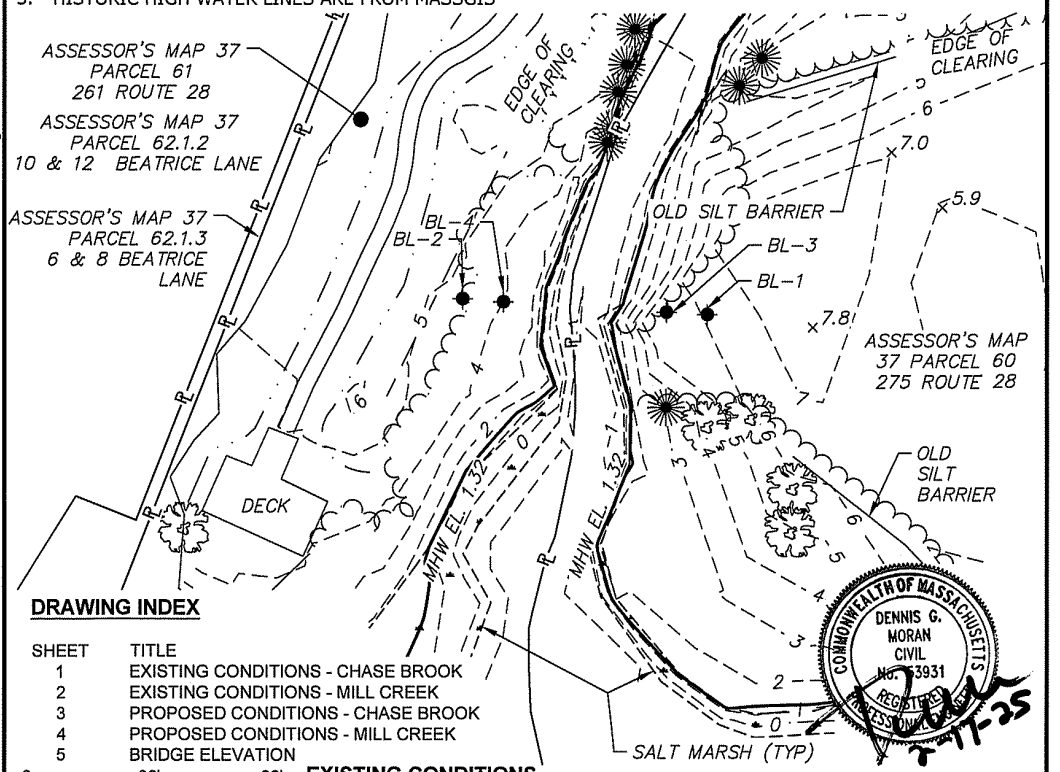
LEGEND

- HISTORIC HIGH WATER
- MEAN HIGH WATER (MHW EL. 1.32)
- MEAN LOW WATER (MLW EL. -2.05)
- FEMA FLOODPLAIN ZONE VE BOUNDARY
- EXISTING CONTOURS
- PROPERTY LINE
- PROJECT SITE



LOCUS MAP
SCALE: 1" = 1000'

NOTES:
1. THE HORIZONTAL DATUM IS THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM NORTH AMERICAN DATUM OF 1983, MAINLAND ZONE (NAD83 (2011) (MYCS2) EPOCH 2010.00). THE VERTICAL DATUM IS IN U.S. SURVEY FEET REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) BASED UPON THE HEXAGON SMARTNET RTK NETWORK.
2. ENTIRE SITE IS WITHIN LAND SUBJECT TO COASTAL STORM FLOWAGE (FLOOD ZONE AE - EL.13) (FIRM 25001C0569J FOR THE COMMUNITY OF BARNSTABLE DATED 07/16/2014).
3. HISTORIC HIGH WATER LINES ARE FROM MASSGIS



DRAWING INDEX

SHEET	TITLE
1	EXISTING CONDITIONS - CHASE BROOK
2	EXISTING CONDITIONS - MILL CREEK
3	PROPOSED CONDITIONS - CHASE BROOK
4	PROPOSED CONDITIONS - MILL CREEK
5	BRIDGE ELEVATION

0 30' 60'
SCALE IN FEET
SCALE: 1"=30'

COMMONWEALTH OF MASSACHUSETTS
DENNIS G. MORAN
CIVIL
No. 53931
REGISTERED PROFESSIONAL ENGINEER
7-17-25

EXISTING CONDITIONS - CHASE BROOK
SHEET 1 OF 5
FEBRUARY 17, 2025

PLAN ACCOMPANYING PETITION OF TOWN OF YARMOUTH TO CONSTRUCT AND MAINTAIN THE BRIDGE AND PEDESTRIAN WALKWAYS WITHIN THE WATERS OF CHASE BROOK AND MILL CREEK AT 261, 275, AND 281 ROUTE 28, YARMOUTH, BARNSTABLE COUNTY, MASSACHUSETTS.

LICENSE PLAN NO. WW8-0000665
Approved by Department of Environmental Protection of Massachusetts
August 6, 2025

RECEIVED AND RECORDED
2025 SEP 26 AM 10:24
BARNSTABLE COUNTY
REGISTRY OF DEEDS
JOHN F. MEADE
REGISTER

713-70

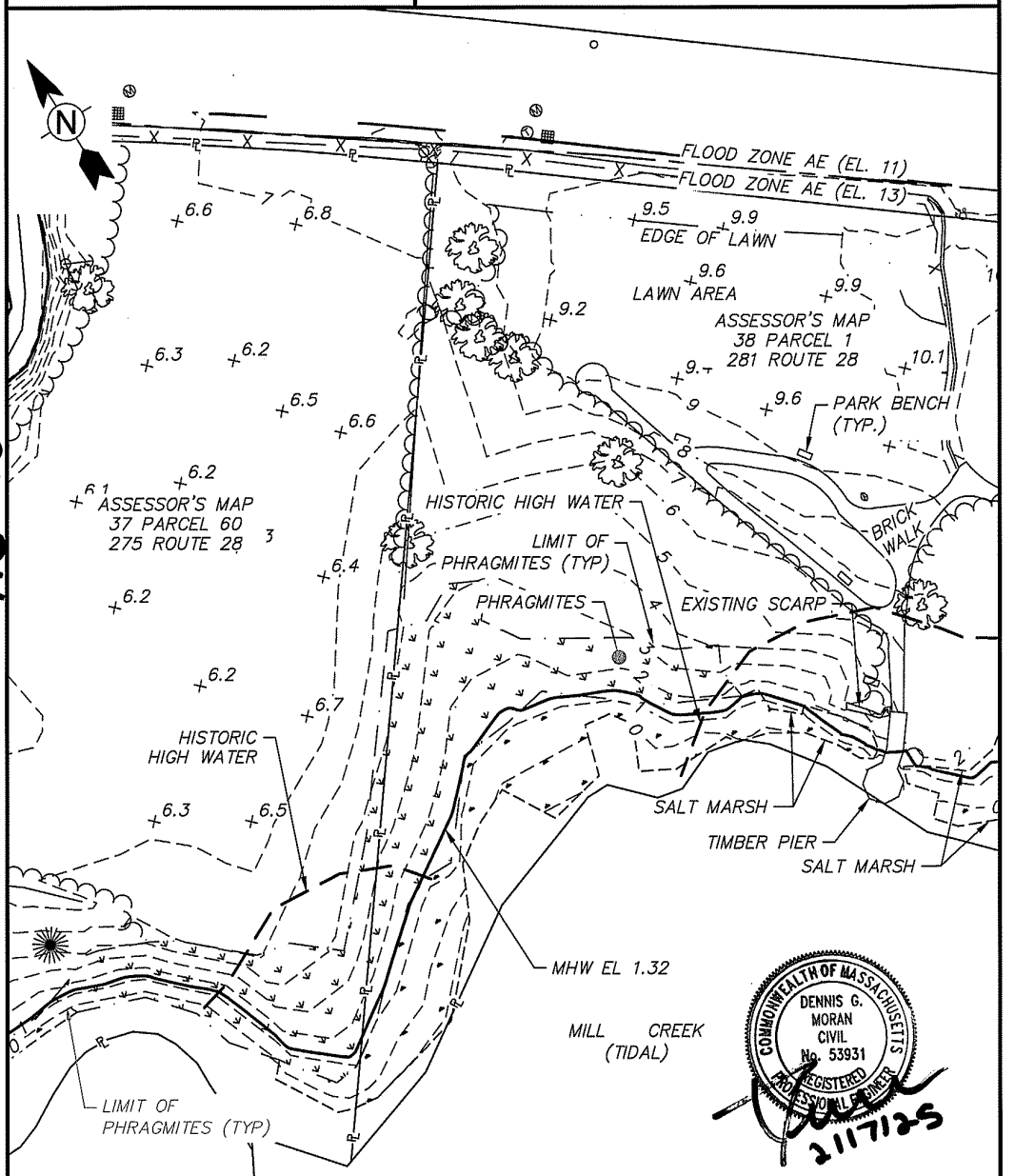
NOT AN OFFICIAL COPY

I CERTIFY THAT THIS PLAN, AS PREPARED, CONFORMS TO THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

NAME

2/17/25
DATE

713-70



COMMONWEALTH OF MASSACHUSETTS
DENNIS G. MORAN
CIVIL
No. 53931
REGISTERED PROFESSIONAL ENGINEER

2/17/25

0 40' 80'
SCALE IN FEET
SCALE: 1"=40'

EXISTING CONDITIONS - MILL CREEK
SHEET 2 OF 5
FEBRUARY 17, 2025

LICENSE PLAN NO. WW01 - 0000665
Approved by Department of Environmental Protection
Date: August 6, 2025

713-71

NOT AN OFFICIAL COPY

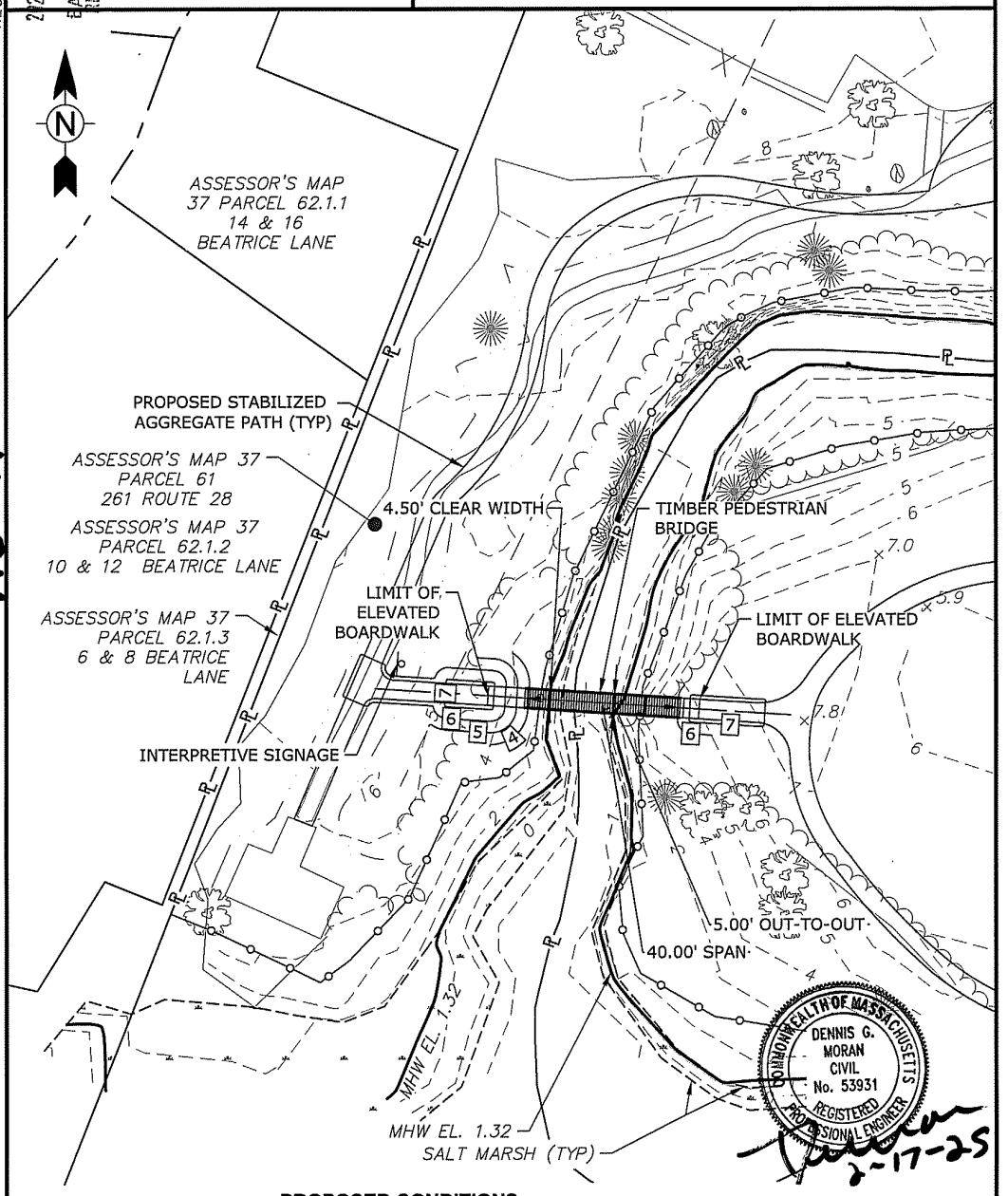
I CERTIFY THAT THIS PLAN, AS PREPARED, CONFORMS TO THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

NAME

2/17/25
DATE

RECEIVED AND RECORDED
2025 SEP 26 AM 10:24
BARNSTABLE COUNTY
REGISTRY OF DEEDS
JOHN F. MEADE
REGISTER

713-71



COMMONWEALTH OF MASSACHUSETTS
DENNIS G. MORAN
CIVIL
No. 53931
REGISTERED PROFESSIONAL ENGINEER

2-17-25

0 30' 60'
SCALE IN FEET
SCALE: 1"=30'

PROPOSED CONDITIONS - CHASE BROOK
SHEET 3 OF 5
FEBRUARY 17, 2025

LICENSE PLAN NO. WW01-0000665
Approved by Department of Environmental Protection
Date: August 6, 2025

RECEIVED AND RECORDED

2025 SEP 26 AM 10: 24

BARNSTABLE COUNTY
REGISTRY OF DEEDS
JOHN F. MEADE
REGISTER

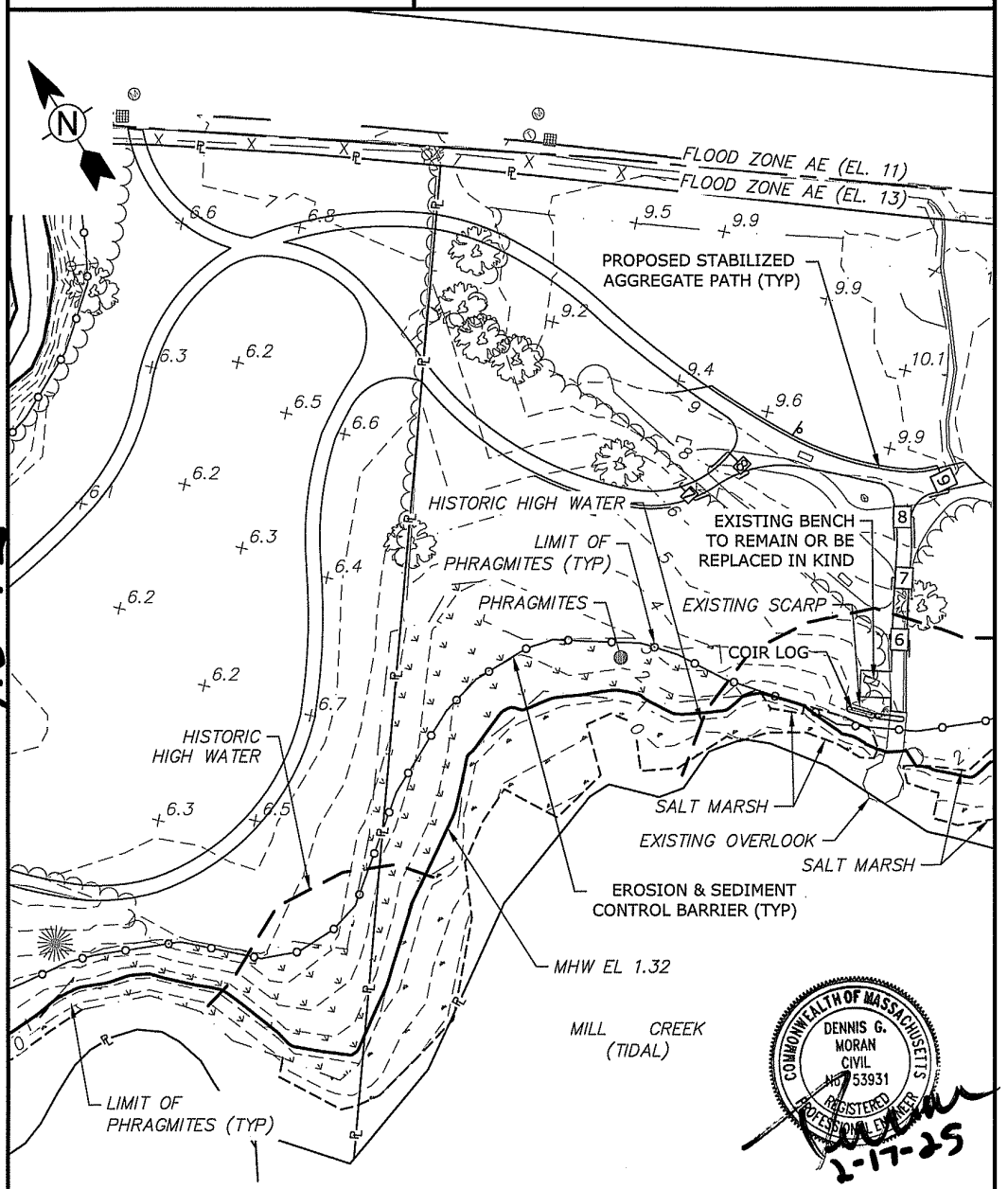
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I CERTIFY THAT THIS PLAN, AS PREPARED, CONFORMS TO THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

NAME

2/17/25
DATE



COMMONWEALTH OF MASSACHUSETTS
DENNIS G. MORAN
CIVIL
NO. 53931
REGISTERED PROFESSIONAL ENGINEER

2-17-25

0 40' 80'
SCALE IN FEET
SCALE: 1"=40'

PROPOSED CONDITIONS - MILL CREEK
SHEET 4 OF 5
FEBRUARY 17, 2025

LICENSE PLAN NO. WW01-0000665
Approved by Department of Environmental Protection
Date: August 6, 2025

RECEIVED AND RECORDED
2025 SEP 26 AM 10:24
BARNSTABLE COUNTY
REGISTRY OF DEEDS
JOHN F. MEADE
REGISTER

713-73

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NAME

2117125
DATE

BRIDGE ELEVATION VIEW
SCALE: 1"=10'

2.74' HIGH TIDE LINE (HTL)
1.32' MEAN HIGH WATER (MHW)
0.00 NAVD88
-2.05' MEAN LOW WATER (MLW)

NAVD 1988 DATUM PROFILE
NO SCALE

REF: NOAA VDATUM 10-06-2023
REF: BUZZARDS BAY NATIONAL ESTUARY PROGRAM

COMMONWEALTH OF MASSACHUSETTS
DENNIS G. MORAN
No. 53931
REGISTERED PROFESSIONAL ENGINEER
CIVIL

2117125

0 10' 20'
SCALE IN FEET
SCALE: 1"=10'

BRIDGE ELEVATION
SHEET 5 OF 5
FEBRUARY 17, 2025

LICENSE PLAN NO. WW01-0000665
Approved by Department of Environmental Protection
Date: August 6, 2025

Tighe&Bond

EXHIBIT 7

New Chase Brook Park

Land Management Plan

—

PREPARED FOR:

Town of Yarmouth
1146 Route 28
West Yarmouth, MA 02673

CONTENTS:

Chase Brook Park Overview
Chase Brook Parcel - 261 Route 28, West Yarmouth
Yankee Village Parcel - 275 Route 28, West Yarmouth
Mill Creek Parcel - 281 Route 28, West Yarmouth
Invasive Species Management Protocol
Stabilized Aggregate Path Detail

DATE: Amended (1/21/2024) with notes regarding Time of Year Restriction on Herbicide application from MA DMF

JENICK STUDIO

CRAWFORD LAND MANAGEMENT

88 Route 6A, Suite 2B
Sandwich MA

508.477.1346
info@crawfordlm.com

WWW.CRAWFORDLM.COM

PROJECT INTRODUCTION & GOALS:

This project encompasses three parcels owned by the Town of Yarmouth. The parcels include Chase Brook Park (261 MA-28), the former Yankee Village Motel property (275 MA-28), and Mill Creek Park (281 MA-28). A Master Plan combining all three parcels into one seamless Park was completed. The Master Plan utilizes the establishment of various native plant communities throughout the Park to create a low-maintenance park with high-value wildlife habitat.

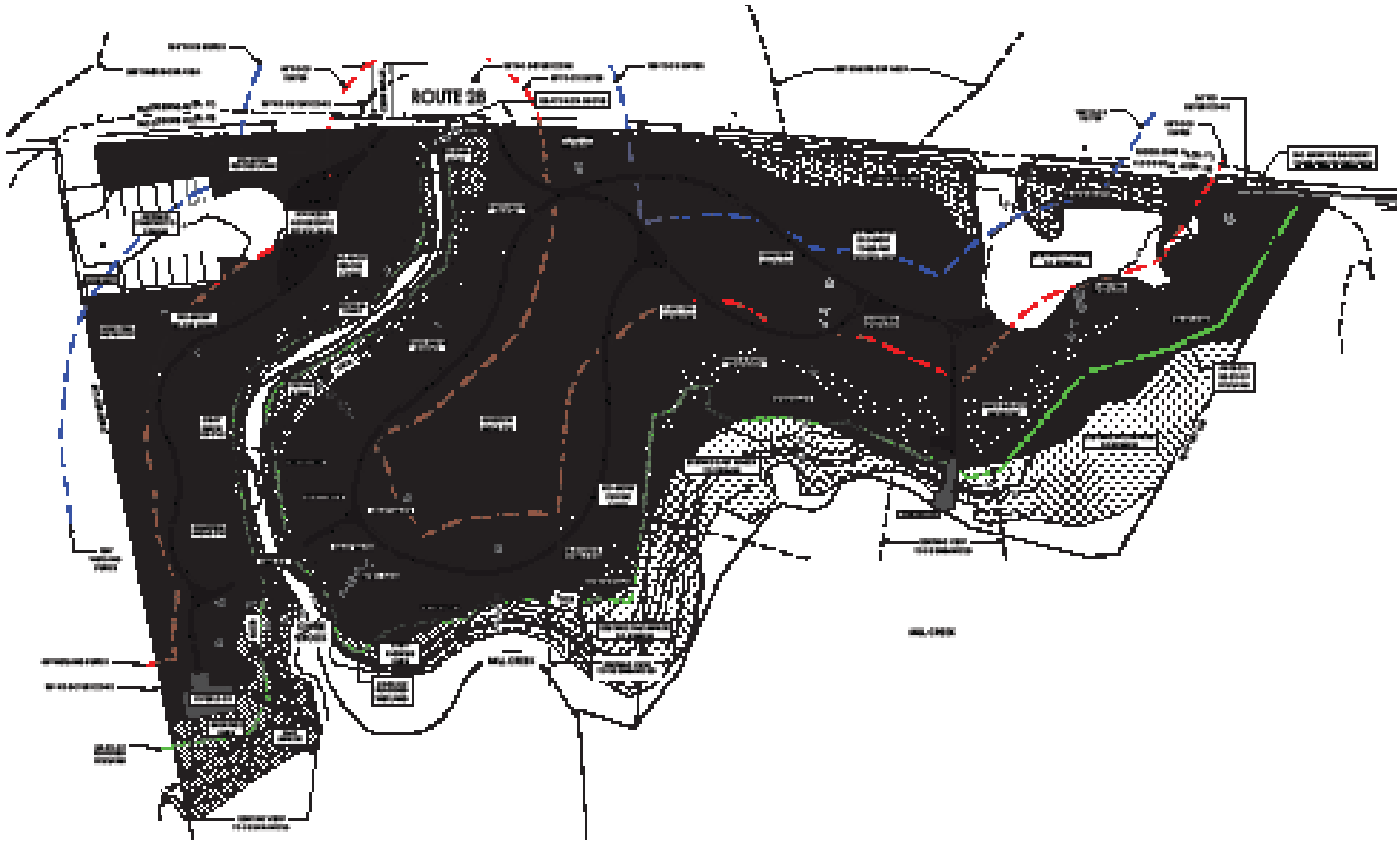
The project includes important renovations to existing trails and picnic areas, as well as the introduction of new walkways, a pedestrian bridge, additional benches, and informal overlook seating areas that offer more opportunities for visitors to engage with the riverfront. The master plan includes ADA accessible walkways and seating opportunities. To fulfill the Master Plan goal of establishing a naturalized park that is intentionally and recognizably planted, the proposed work includes invasive species management and revitalization of existing vegetation. The management work will also enhance and preserve existing vistas for the public to enjoy.

Chase Brook River divides two of the parcels (Chase Brook Park and Yankee Village) and a second river borders Mill Creek Park. The parcels fall within the 100' and 200' riverfront buffer zones. Salt marsh borders portions of the properties as well as various areas of Coastal Bank and BVW. Both resource areas have associated buffer zones, including the 35' NDZ which falls on these parcels, and all three parcels fall with Flood Zone AE (El 13).

The purpose of this Land Management Plan and Narrative is to provide information, methods, and guidelines to eradicate invasive and non-native species, restore native plant communities, manage existing vegetation, remove, replace, and introduce new walkways and seating areas, and preserve and enhance public vistas. The project will increase the quantity and diversity of native species within the park and will connect all three parcels, creating a valuable ecological and recreational resource for wildlife and the local community.



Aerial photo courtesy of Google Earth.



Park Master Plan

PARK MASTER PLAN

Master plan goals for these three parcels include the restoration of native plant communities to provide a high-quality, ecologically beneficial buffer zone to the sensitive natural resources surrounding the parcels. This goal further serves the ability to maintain public vistas by matching low-growing native plant communities with vista windows. Invasive plant species will be managed, and the remaining native plant communities will be augmented and supplemented to create a diverse, aesthetically and ecologically valuable landscape mosaic. A common challenge with naturalized areas is the public perception that they look 'messy'. The Master Plan envisions native plant communities planned and installed with intentional species components to bring a more 'organized' look to the Park. The proposed restoration work utilizes all native plant species and substitutes traditional lawn areas with native meadows and no-mow fescue picnic areas, as well as drought tolerant fescue activity spaces. These areas do not require fertilizers, require less pesticides than lawns, need less irrigation, and provide greater resiliency to storm and flood events. Native landscapes require minimal mowing, which helps reduce the park's carbon footprint and fuel costs. Natural meadows evolve over many years, adapting to environmental conditions and developing intricate associations between plants, animals and microorganisms. The meadows and plant communities within this park will change and adapt, and look different with every season. The Park will also offer ADA compliant amenities and provide opportunities for local residents and visitors to interact with and enjoy the benefits of a healthy riverfront.

EXISTING CONDITIONS - CHASE BROOK PARCEL

Chase Brook Park has a paved parking lot, a scattering of picnic tables and benches, and a narrow asphalt trail that is heaving and cracked in places. The picnic area adjacent to the parking lot is generally shaded but most plantings in this area of the park are non-native landscape plantings in mulched beds. Over the years many plants have died leaving gaps in the plantings and expanses of mulch. The central portion of the Park along both sides of the trail was originally intended to be colonized by American beachgrass (*Ammophila breviligulata*). Over the years the beachgrass has declined leaving gaps and opportunity for non-native, aggressive, and invasive species to establish such as Mugwort (*Artemesia vulgaris*) and Spotted knapweed (*Centaurea stoebe*). Along the western property line is an assortment of invasive species such as Oriental bittersweet (*Celastrus orbiculatus*), Japanese Knotweed (*Fallopia japonica*) and Common Reed (*Phragmites australis*). Along Chase Brook there are a number of native trees like Pitch pine (*Pinus rigida*) and Black oak (*Quercus velutina*) growing among numerous young White poplar (*Populus alba*), an aggressive introduced species. Some of these trees are leaning heavily. At the end of the trail there is an existing viewing platform that offers a nearly open vista over the salt marsh. There is currently no pedestrian connection between this parcel and the adjacent Yankee Village Parcel, except for a narrow sidewalk along busy Route 28.



Existing trail.



Mulched landscape beds at picnic area.



Existing Viewing Platform and Trail along Western Property Line

PROPOSED PROJECT ACTIVITIES - CHASE BROOK PARCEL

This project proposes to remove the existing asphalt trails that are currently in disrepair and replace the trail system with a stabilized aggregate walkway system and introduce a wooden pedestrian bridge that connects the Chase Brook Parcel with the Yankee Village Parcel. Stabilized aggregate is easier to maintain than asphalt, offers more permeability for stormwater, and is ADA compliant. New pathways are in similar locations as existing paths, but are re-aligned in order to connect pedestrians more directly with the existing crosswalk on Route 28 and provide a more efficient picnic / gathering space, as well as a gentler walking experience to the existing overlook and proposed bridge connection.

The proposed bridge as well as a portion of the new pathway system is located within the 35' NDZ zone,. However, the existing walkway system and turf areas already fall within this zone and are being replaced with more pervious materials and drought tolerant grasses. The wooden bridge will allow the public to more fully interact and engage with the riverfront and provide safer pedestrian access between the park parcels.

The project also proposes invasive and non-native species management and re-establishment of native plant communities where existing natives are sparse. The parcel will be re-programmed with seeding and plantings intended to form species specific stands or colonies consistent with the Master Plan.

Where vegetation is to be removed around native trees or other species intended to remain, removal work will be completed by hand. Vegetation will be removed and initially treated using a cut-and-wipe method with an EPA approved herbicide so as to limit soil disturbance and to retain any existing native species within close proximity. Native species remaining may be regeneratively pruned, if necessary. Regenerative pruning encourages new, vigorous growth. It also reduces the potential for branch breakage and storm damage on specimens that are "leggy" after invasive species are removed. Japanese knotweed will be treated during the first season with an injection method. Phragmites reed will be initially treated by mowing and using a bundle-cut-wipe method. Any downed coarse woody debris that has fallen into Chase Brook will be removed and disposed of. Root masses will be left in place.

After the area is clear, the new trail system will be installed. Immediately following this work, all areas will be seeded with the specified seed mixes. The seed will be raked into the soil to promote better seed/soil contact to help improve germination. The seeded areas will be covered with chopped straw to aid in germination. All debris created during the initial restoration process will be removed and disposed of off-site.

Following the initial removal of vegetation, regular maintenance of the project area will be required for a minimum of three growing seasons. The project area will be monitored for newly germinating or re-sprouting invasive and non-native species. Maintenance treatments will be completed using cut-and-wipe, selective

EXISTING CONDITIONS - YANKEE VILLAGE PARCEL

The Yankee Village parcel is mostly an open area, covered in woodchips after the demolition and removal of the former motel and associated parking and amenities. The outer edges of the parcel (along Chase Brook and the salt marsh edge to the south) remain vegetated, but the area is comprised almost entirely of state-listed invasive species such as Japanese knotweed (*Fallopia japonica*), Shrub and Vine honeysuckle (*Lonicera spp.*), and Bittersweet. A small stand of oak trees adjacent to a Bayberry (*Morella pensylvanica*) colony and Hightide bush (*Baccharis halimifolia*) colony persist in the southwest corner. At the southeast corner of the property, adjacent to Mill Creek Park, there is a stand of Phragmites (*Phragmites australis*) occupying the area of salt marsh. The southern and eastern sides of the property offer a wide vista over the marsh. The area is not currently in use as a park, and it acts as a physical and visual barrier between Chase Brook and Mill Creek Parks.



Chase Brook bank w/ invasives.



Recently cleared area covered in woodchips and dominated by invasive plant species

PROPOSED PROJECT ACTIVITIES - YANKEE VILLAGE PARCEL

The majority of the parcel is programmed as a pollinator meadow with various woody plant communities surrounding the edges. Stabilized aggregate walkways are planned to connect the parcel to the adjacent Chase Brook and Mill Creek Park Parcels, and a wooden pedestrian bridge will connect to Chase Brook Park. Stabilized aggregate is easier to maintain than asphalt, offers more permeability for stormwater, and is ADA compliant. The wooden bridge will allow the public to more fully interact and engage with the riverfront and provide safer pedestrian access between the park parcels. Benches and informal stone overlook areas will provide opportunities for visitors to relax and enjoy the enhanced views.

The proposed bridge, a portion of the pathway system, fescue lawn areas and 2 small overlooks fall within the 35' NDZ zone. The pedestrian circulation and overlooks fall within areas that have already been disturbed, and are intended to allow visitors to interact with the landscape, while focussing curious foot traffic activity to specifically designated areas in order to allow the rest of the parcel to be re-vegetated with native plant communities. Overall the proposed conditions are an improvement on the previously disturbed site.

Where vegetation is to be removed around native trees or other species intended to remain, removal work will be completed by hand. Vegetation will be removed and initially treated using a cut-and-wipe method with an EPA approved herbicide so as to limit soil disturbance and to retain any existing native species within close proximity. Native species remaining may be regeneratively pruned, if necessary. Regenerative pruning encourages new, vigorous growth. It also reduces the potential for branch breakage and storm damage on specimens that are "leggy" after invasive species are removed. Japanese knotweed will be treated during the first season with an injection method. Minor regrading work and soil conditioning of the existing wood chips will be necessary to prepare the site for seeding. Phragmites reed will be initially treated by mowing and using a bundle-cut-wipe method. Any downed coarse woody debris that has fallen into Chase Brook will be removed and disposed of. Root masses will be left in place.

After the area is prepared, the new path system will be installed along with any other amenities such as benches and stone overlooks. Immediately following this work, all areas will be seeded with the specified seed mixes. The seed will be raked into the soil to promote better seed/soil contact to help improve germination. The seeded areas will be covered with chopped straw to aid in germination. All debris created during the initial restoration process will be removed and disposed of off-site.

Following the initial removal of vegetation, regular maintenance of the project area will be required for a minimum of three growing seasons. The project area will be monitored for newly germinating or re-sprouting invasive and non-native species. Maintenance treatments will be completed using cut-and-wipe, selective low-volume foliar, and/or hand weeding methods. Cool season grasses may be flail mown in June to promote the establishment of warm season grasses for the first couple of growing seasons. Minimal ongoing management of the naturalized areas will be required.

For project timeline and more detailed descriptions of initial and ongoing invasive species management methodology, refer to Invasive Species Management Notes in this document and on the Proposed Demolition / Removal Plan and Restoration Planting Plan by Jenick Studio / Crawford Land Management.

EXISTING CONDITIONS - MILL CREEK PARK

Mill Creek Park has a small paved parking lot, a scattering of picnic tables and benches, and a narrow asphalt trail that dead-ends at a picnic table. The central area of the park in the upland consists of turf lawn, while the outer edges of the park are naturalized. Mature trees found at this site are almost all Black cherry (*Prunus serotina*) and Maples (*Acer spp.*) in moderately good health. One large Cherry has two dead limbs. Along the western shared property line (with the Yankee Village parcel) there are a mix of native and non-native Austrian pine trees that were planted to provide a visual screen from the motel. Along the southern seaward edge of the property is an expanse of regenerated salt marsh. Three years ago this area was dominated by Phragmites and has largely regenerated with native species after Phragmites management. Some Phragmites still persists on the landward edge of the salt marsh. Also along the landward edge of the marsh are stands of Hightide bush. Further inland is a mix of planted natives with invasive, non-native, and aggressive vegetation. There is an existing overlook structure at the edge of the salt marsh with a vista. Some erosion is occuring in a small area where the overlook structure meets the existing pathway.



Regenerated salt marsh in Phragmites treatment area



Naturalized area at edge of parking





Erosion at path / overlook structure





Existing Picnic Areas with Turf Lawn



Existing Vegetation encroaching on View Corridor

PROPOSED PROJECT ACTIVITIES - MILL CREEK PARK

This project proposes to remove the existing asphalt trails that are currently in disrepair and replace the trail system with stabilized aggregate walkways. Stabilized aggregate is easier to maintain than asphalt, offers more permeability for stormwater, and is ADA compliant. The project also proposes invasive and non-native species management and re-establishment of native plant communities where existing natives are sparse. The parcel will be re-programmed with seeding and plantings intended to form species specific stands or colonies consistent with the Master Plan. The existing "turf" lawn will be repaired and overseeded with a drought tolerant fescue mix. In addition to new pathways and existing picnic areas, new bench seating is planned, as well as the installation of erosion control measures where the existing overlook connects to the pathway, including a fiber roll and associated plantings.

Where vegetation is to be removed around native trees or other species intended to remain, removal work will be completed by hand. Vegetation will be removed and initially treated using a cut-and-wipe method with an EPA approved herbicide so as to limit soil disturbance and to retain any existing native species within close proximity. Native species remaining may be regeneratively pruned, if necessary. Regenerative pruning encourages new, vigorous growth. It also reduces the potential for branch breakage and storm damage on specimens that are "leggy" after invasive species are removed. Japanese knotweed will be treated during the first season with an injection method. Phragmites reed will be initially treated by mowing and using a bundle-cut-wipe method.

After the area is clear, the new trail system will be installed. Immediately following this work, all areas will be seeded with the specified seed mixes. The seed will be raked into the soil to promote better seed/soil contact to help improve germination. The seeded areas will be covered with chopped straw to aid in germination. All debris created during the initial restoration process will be removed and disposed of off-site.

Following the initial removal of vegetation, regular maintenance of the project area will be required for a minimum of three growing seasons. The project area will be monitored for newly germinating or re-sprouting invasive and non-native species. Maintenance treatments will be completed using cut-and-wipe, selective low-volume foliar, and/or hand weeding methods. Cool season grasses may be flail mown in June to promote the establishment of warm season grasses for the first couple of growing seasons. Minimal ongoing management of the naturalized areas will be required.

For project timeline and more detailed descriptions of initial and ongoing invasive species management methodology, refer to Invasive Species Management Notes in this document and on the Proposed Demolition / Removal Plan and Restoration Planting Plan by Jenick Studio / Crawford Land Management.

INVASIVE SPECIES MANAGEMENT PROTOCOL - ALL THREE PARCELS

PROJECT TIMELINE

Note: Per direction by the Division of Marine Fisheries, (MA DMF) a time-of-year (TOY) restriction should be observed on all herbicide treatments to protect sensitive life stages of river herring. No herbicide treatment within the intertidal or wetland areas should take place from April 1-June 30 of any year.

INITIAL WORK - WINTER / EARLY SPRING

1. Install any necessary erosion control barriers, construction fencing, and/or tree protection as noted on the Plans.
2. Demolish and remove all components (unless otherwise noted) within the 'Demolition Area'.
3. In areas outside the Demolition Area, treat and remove all invasive, non-native species and approved vegetation using an appropriate herbicide (Glyphosate-based or Triclopyr-based) using a cut and wipe method or methods explained earlier. Existing root systems to be left in place to maintain soil stability.
4. Install the new trail system and any other amenities.
5. Seed exposed soils resulting from debris removal with custom native seed mix (refer to Restoration plan) to establish native vegetative ground cover. Seed may be hydroseeded with a biotic soil media.
6. If seeding is not being done via hydroseed methods, cover areas with a layer of sterilized chopped straw or 100% biodegradable erosion control blanket to increase seed/soil contact, improve germination, and reduce potential for erosion and runoff.
7. Rejuvenate any native shrub species uncovered in the restoration area, if needed, with regenerative pruning techniques.
8. Complete any approved vista pruning.

MAINTENANCE

1. Monitor restoration areas and perform maintenance treatments or hand weed invasive, non-native, and aggressive species that have germinated from existing seed bank, or re-sprouted from roots remaining in the soil.
2. Mow all grasses in early spring (March or April). Mow/cut cool season grasses in June to encourage establishment of warm-season grasses, if necessary. Additional mowing may be required to establish meadow or No Mow lawn areas and suppress annual weeds.
3. Prune dead, diseased, broken or interfering limbs to maintain health of overstory specimens.

RESTORATION PLANTING & IRRIGATION

1. Restoration plantings will be installed as funding is available.
2. Install a temporary, above ground irrigation system while plantings are being established (2-3 growing seasons).

ON-GOING MAINTENANCE

1. Property will remain under active management to eradicate invasive & non-native species through hand weeding, cut & wipe, and/or selective foliar treatments as necessary.
2. Vista Pruning will be on-going.
3. Trails may need to be periodically repaired or top dressed.
4. Per direction by the Division of Marine Fisheries, a time-of-year (TOY) restriction should be observed on all herbicide treatments to protect sensitive life stages of river herring. No herbicide treatment within the intertidal or wetland areas should take place from April 1-June 30 of any year.

ANNUAL KNOTWEED TREATMENT

- In winter or early spring, remove old/dead stalks from treatment area to ease the treatment process later in the growing season.
- In late summer or early fall, treat Japanese knotweed using a stem injection method with a Glyphosate product between the nodes inside the stem.
- Repeat treatment for several growing seasons to achieve complete eradication. Knotweed which has grown back in a witch-broom-like manner should be treated with a foliar application method on an as-needed basis with a Glyphosate-based product, ideally in the late summer or early fall.
- The project area should be inspected one year after construction is complete to address any discovered Japanese knotweed stands resulting from construction activities.

PHRAGMITES TREATMENT

- Mow dead stalks when dormant (if feasible) and dispose of off-site.
- For the first treatment, bundle, cut, and treat cut ends of stalks w/ wetland approved herbicide during September. If stalks are sparse, cut individually and treat.
- Mow dead stalks during dormant season following initial treatment.
- Manage any Phragmites re-growth in following seasons by using either the same cut and treat method or a swipe method to stalks and leaves during the early spring / late summer / early fall months until Phragmites is eradicated from the project area.

HERBICIDE APPLICATION INFORMATION

All herbicide applications will be performed by a Massachusetts State-Licensed and insured pesticide applicator proficient in plant identification, both in leaf and bare-twig. Herbicide applications will be either

selective spot treatments (low-volume foliar) or direct stem applications (cut and wipe). Using these methods of application safeguards native and desired species from over-spray and minimizes the total volume of herbicide needed to effectively manage the target species. Herbicides used will contain Triclopyr or Glyphosate as their active ingredient.

Triclopyr is a selective herbicide and will be utilized for most invasive and aggressive broad leaved target species to ensure that native grasses are not damaged. Glyphosate will be used to manage vine and shrub honeysuckle as Triclopyr has been observed to have little or no effect. The highly selective herbicide applications will neutralize root materials left in the soil and inhibit new growth. Continual monitoring, maintenance treatments, and hand weeding will be ongoing.

OBSERVED PLANT SPECIES

NATIVE SPECIES OBSERVED

Native to Barnstable County:

Acer rubrum	Red maple
Achillea millefolium	Common yarrow
Amelanchier canadensis	Serviceberry
Ammophila breviligulata	American beachgrass
Baccharis halimifolia	Groundsel bush
Clethra alnifolia	Sweet-pepper bush
Deschampsia flexuosa	Crinkle-hair grass
Ilex glabra	Inkberry
Ilex verticillata	Winterberry
Iva frutescens	High Tide Bush
Juniperus virginiana	Eastern red cedar
Myrica pensylvanica	Bayberry
Nyssa sylvatica	Tupelo
Panicum virgatum	Switch grass
Parthenocissus quinquefolia	Virginia creeper
Pinus rigida	Pitch pine
Prunus maritima	Beachplum
Prunus serotina	Black cherry
Quercus alba	White oak
Quercus velutina	Black oak
Rhus typhina	Staghorn sumac
Rosa spp.	Virginia and/or Carolina rose
Solidago spp.	Goldenrod
Spartina alterniflora	Smooth cordgrass

Spartina patens	Saltmeadow cordgrass
Viburnum dentatum	Arrowwood viburnum

Aggressive species:

Phytolacca americana	Pokeweed
Rubus sp.	Brambles
Smilax rotundifolia	Green briar
Toxicodendron radicans	Poison ivy

NON-NATIVE SPECIES OBSERVED

State-Listed Invasive Species:

Acer platanoides	Norway maple
Allaria petiolata	Garlic mustard
Celastrus orbiculatus	Oriental bittersweet
Elaeagnus umbellata	Autumn olive
Fallopia japonica	Japanese knotweed
Ligustrum obtusifolium	Border privet
Lonicera morrowii & bella	Shrub honeysuckle
Lonicera japonica	Vine honeysuckle
Phragmites australis	Phragmites reed
Robinia pseudoacacia	Black locust
Rosa multiflora	Multi-flora rose

State-Listed Likely Invasive Species:

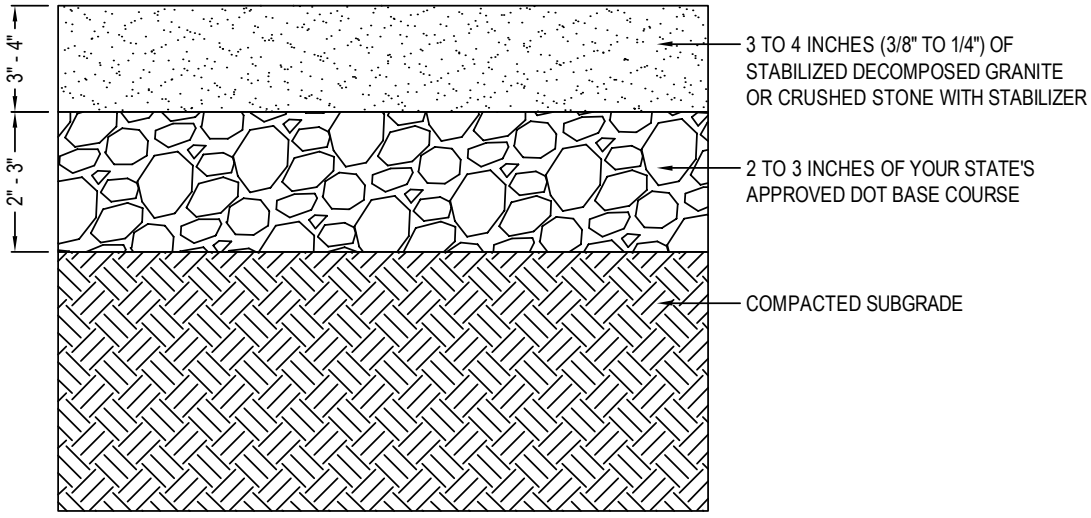
Centaurea biebersteinii	Spotted knapweed
Euphorbia cyparissias	Cypress spurge

Non-native Species (in naturalized areas - does not include landscaped areas):

Rosa rugosa	Rugosa rose
Populus alba	White poplar
Salix cinerea	Grey willow

Typical detail for proposed pathway material for new walkways at all Chase Brook Park Parcels.

STABILIZER SOLUTIONS, INC.
33 S 28TH ST
PHOENIX, AZ 85034
TOLL FREE: 1-800-336-2468
FAX: (602) 225-5902
www.stabilizersolutions.com



SECTION

NOTES:
1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
2. DO NOT SCALE DRAWING.
3. THIS DRAWING IS INTENDED FOR USE BY ARCHITECTS, ENGINEERS, CONTRACTORS, CONSULTANTS AND DESIGN PROFESSIONALS FOR PLANNING PURPOSES ONLY. THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION.
4. ALL INFORMATION CONTAINED HEREIN WAS CURRENT AT THE TIME OF DEVELOPMENT BUT MUST BE REVIEWED AND APPROVED BY THE PRODUCT MANUFACTURER TO BE CONSIDERED ACCURATE.
5. CONTRACTOR'S NOTE: FOR PRODUCT AND COMPANY INFORMATION VISIT www.CADdetails.com/info AND ENTER REFERENCE NUMBER 4934-001.

STABILIZED DECOMPOSED GRANITE

PEDESTRIAN ACCESS DETAIL

4934-001 REVISION DATE 02/05/2015

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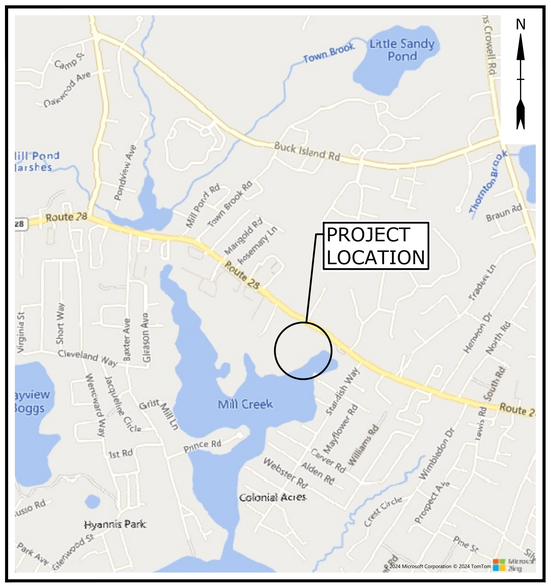
EXHIBIT 8

TOWN OF YARMOUTH, MASSACHUSETTS

CHASE BROOK PARK RESTORATION & BRIDGE CONSTRUCTION

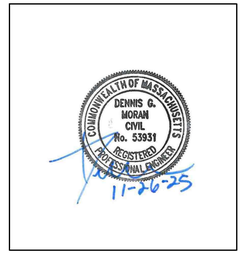
AUGUST 29, 2025
REVISED: NOVEMBER 26, 2025

LIST OF DRAWINGS		
DRAWING NO.	DRAWING TITLE	LAST REVISED
-	COVER SHEET	11/26/2025
G-101	GENERAL NOTES, LEGEND & ABBREVIATIONS/ACRONYMS SHEET	11/26/2025
C-101	EXISTING CONDITIONS, DEMOLITION & ACCESS/STAGING PLAN	11/26/2025
C-201	SITE, GRADING, DRAINAGE & EROSION CONTROL PLAN	11/26/2025
C-301	PEDESTRIAN BRIDGE & BOARDWALK DETAILS	11/26/2025
C-401	CIVIL DETAILS SHEET	11/26/2025
C-402	CIVIL DETAILS SHEET	11/26/2025
C-501	BORING LOCATION PLAN & BORING LOGS SHEET	11/26/2025
L-101	MASTERPLAN (PLANTING OVERVIEW)	11/19/2025
L-201	DEMOLITION / REMOVAL PLAN - CHASE BROOK	11/19/2025
L-202	DEMOLITION / REMOVAL PLAN - YANKEE VILLAGE	11/19/2025
L-203	DEMOLITION / REMOVAL PLAN - MILL CREEK	11/19/2025
L-301	RESTORATION PLANTING PLAN - CHASE BROOK	11/19/2025
L-302	RESTORATION PLANTING PLAN - YANKEE VILLAGE	11/19/2025
L-303	RESTORATION PLANTING PLAN - MILL BROOK	11/19/2025
L-401	SITE FEATURE DETAILS	11/19/2025
L-402	PLANT INSTALLATION DETAILS	11/19/2025
L-403	PLANT CORRECTION DETAILS	11/19/2025



LOCATION MAP
SCALE: 1" = 1000'

PREPARED BY:
Tighe&Bond



DENNIS G. MORAN, PE



BRIAN S. HUNTLEY, PE

PREPARED FOR:

TOWN OF YARMOUTH
MASSACHUSETTS

ISSUED FOR BID
COMPLETE SET 18 SHEETS

NOT FOR CONSTRUCTION

Last Saved: 11/19/2025
Plotted On: Nov 26, 2025 - 10:45am By: CKrecuk
Tighe & Bond: J:_Coastal Projects\C23\C23015.01 - Town of Yarmouth - WPM\Drawings\AutoCAD\Sheet\C23015-01-G-COVR.dwg

BASE PLAN NOTES

1. THE EXISTING CONDITIONS INFORMATION SHOWN ON THE DRAWINGS IS BASED ON THE FOLLOWING:
   - SURVEY DRAWINGS PROVIDED BY COASTAL ENGINEERING CO. TITLED TOWN OF YARMOUTH YANKEE VILLAGE PARK & BRIDGE AND DATED NOVEMBER 22, 2023.
   - LIMITS OF BORDERING LAND SUBJECT TO FLOODING (BLSF), THE 100-YEAR FLOOD ZONE, ARE BASED ON THE FEMA FLOOD INSURANCE STUDY (FIS) FOR BARNSTABLE COUNTY, MAP NUMBER 25001C0569J EFFECTIVE JULY 16, 2014 AND FLOOD INSURANCE RATE MAP (FIRM) COMMUNITY PANEL NUMBER 0569J, EFFECTIVE JULY 16, 2014.
2. THE ACCURACY AND COMPLETENESS OF SUBSURFACE INFORMATION (E.G., EXISTING UTILITIES) SHOWN ON THESE DRAWINGS IS NOT GUARANTEED AND SOME SUBSURFACE INFORMATION MAY NOT BE SHOWN. DETERMINE THE LOCATIONS AND ELEVATIONS OF ALL SUBSURFACE FEATURES WHICH MAY AFFECT CONSTRUCTION OPERATIONS BY TEST PIT OR OTHER METHODS, AS NECESSARY TO PREVENT DAMAGE TO UTILITIES AND OTHER SUBSURFACE FEATURES, AND/OR INTERRUPTIONS IN UTILITY SERVICE. PROVIDE DATA COLLECTED THROUGH THESE INVESTIGATIONS TO THE ENGINEER PRIOR TO CONSTRUCTING THE PROPOSED IMPROVEMENTS.
3. SUB-SURFACE EXPLORATIONS WERE PERFORMED BY GEOLOGIC - EARTH EXPLORATION, INC. ON SEPTEMBER 7, 2023. BORING LOCATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE AND BORING INFORMATION IS NOT GUARANTEED IN ANY WAY TO REPRESENT EXISTING CONDITIONS. BORING LOGS ARE INCLUDED IN THE PROJECT MANUAL FOR THE CONTRACTORS INFORMATION ONLY.
4. THE DRAWINGS ARE BASED ON THE FOLLOWING DATUMS: HORIZONTAL-NAD83; VERTICAL-NAVD88
5. THE EXISTING CONDITIONS SHOWN ARE APPROXIMATE. FIELD VERIFY EXISTING CONDITIONS.
6. THE PROPERTY LINES SHOWN ON THE DRAWINGS ARE APPROXIMATE AND ARE NOT BASED ON DEED OR PLAN RESEARCH. THE WESTERN PROPERTY LIMITS OF THE PARCEL IDENTIFIED AS TAX MAP 37 LOT 60 WERE OBTAINED FROM REFERENCE PLAN #1.

GENERAL NOTES

1. NOTIFY DIGSAFE AT 1-888-344-7233 AND OTHER UTILITY OWNERS IN THE AREA NOT ON THE DIGSAFE LIST AT LEAST 72 HOURS PRIOR TO ANY DIGGING, TRENCHING, ROCK REMOVAL, DEMOLITION, BORING, BACKFILLING, GRADING, LANDSCAPING, OR ANY OTHER EARTH MOVING OPERATIONS.
2. THE CONTRACTOR IS RESPONSIBLE FOR SUPPORT OF EXISTING UTILITIES AND REPAIR OR REPLACEMENT COSTS OF UTILITIES DAMAGED DURING CONSTRUCTION, WHETHER ABOVE OR BELOW GRADE. REPLACE DAMAGED UTILITIES IMMEDIATELY AT NO ADDITIONAL COST TO THE OWNER AND AT NO COST TO THE PROPERTY OWNER
3. NOT ALL OF THE UTILITY SERVICES ON SITE ARE SHOWN. THE CONTRACTOR SHALL ANTICIPATE THAT EACH PROPERTY HAS SERVICE CONNECTIONS FOR THE VARIOUS UTILITIES.
4. BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.
5. TIGHE & BOND ASSUMES NO RESPONSIBILITY FOR ANY ISSUES, LEGAL OR OTHERWISE, RESULTING FROM CHANGES MADE TO THESE DRAWINGS WITHOUT WRITTEN AUTHORIZATION FROM TIGHE & BOND.
6. EXCAVATE ADDITIONAL TEST PITS TO LOCATE EXISTING UTILITIES AS DIRECTED OR APPROVED BY THE ENGINEER.
7. NOTIFY THE ENGINEER OF ANY UTILITIES IDENTIFIED DURING CONSTRUCTION THAT ARE NOT SHOWN ON THE DRAWINGS OR THAT DIFFER IN SIZE OR MATERIAL.
8. THE CONTRACTOR IS RESPONSIBLE FOR SITE SAFETY; COORDINATION WITH THE OWNER, ALL SUBCONTRACTORS, AND WITH OTHER CONTRACTORS WORKING WITHIN THE LIMITS OF WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MEANS AND METHODS OF CONSTRUCTING THE PROPOSED WORK.
9. OBTAIN, PAY FOR AND COMPLY WITH PERMITS, NOTICES AND FEES NECESSARY TO COMPLETE THE WORK. ARRANGE AND PAY FOR NECESSARY INSPECTIONS AND APPROVALS FROM THE JURISDICTIONAL AUTHORITIES.
10. SHORE UTILITY TRENCHES WHERE FIELD CONDITIONS DICTATE AND/OR WHERE REQUIRED BY LOCAL, STATE AND FEDERAL HEALTH AND SAFETY CODES.
11. FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO CONSTRUCTION. IF FIELD CONDITIONS ARE OBSERVED THAT VARY SIGNIFICANTLY FROM THOSE SHOWN ON THE DRAWINGS, IMMEDIATELY NOTIFY THE ENGINEER IN WRITING FOR RESOLUTION OF THE CONFLICTING INFORMATION.
12. PROTECT AND MAINTAIN ALL UTILITIES IN THE AREAS UNDER CONSTRUCTION DURING THE WORK. LEAVE ALL PIPES AND STRUCTURES WITHIN THE LIMITS OF THE CONTRACT IN A CLEAN AND OPERABLE CONDITION AT THE COMPLETION OF THE WORK. TAKE ALL NECESSARY PRECAUTIONS TO PREVENT SAND AND SILT FROM DISTURBED AREAS FROM ENTERING THE DRAINAGE SYSTEM.
13. NOTIFY THE ENGINEER IN WRITING OF ANY CONFLICT, ERROR, AMBIGUITY, OR DISCREPANCY WITH THE PLANS OR BETWEEN THE PLANS AND ANY APPLICABLE LAW, REGULATION, CODE, STANDARD SPECIFICATION, OR MANUFACTURER'S INSTRUCTIONS.
14. EXCAVATE WITH EQUIPMENT SELECTED TO MINIMIZE DAMAGE TO EXISTING UTILITIES OR OTHER FACILITIES. HAND EXCAVATE AS NECESSARY TO LOCATE UTILITIES AND AVOID DAMAGE.
15. TAKE NECESSARY MEASURES AND PROVIDE CONTINUOUS BARRIERS OF SUFFICIENT TYPE, SIZE, AND STRENGTH TO PREVENT ACCESS TO ALL WORK AND STAGING AREAS AT THE COMPLETION OF EACH DAYS WORK.
16. NO OPEN TRENCHES WILL BE ALLOWED OVER NIGHT. THE USE OF ROAD PLATES TO PROTECT THE EXCAVATION WILL BE CONSIDERED UPON REQUEST, BUT BACKFILLING IS PREFERRED.
17. THE CONTRACTOR IS RESPONSIBLE FOR ALL NECESSARY TRAFFIC CONTROL/SAFETY DEVICES TO ENSURE SAFE VEHICULAR AND PEDESTRIAN ACCESS THROUGH THE WORK AREA, OR FOR SAFELY IMPLEMENTING DETOURS AROUND THE WORK AREA. PERFORM TRAFFIC CONTROL IN ACCORDANCE WITH THE CONTRACTOR'S APPROVED TRAFFIC CONTROL PLAN.
18. MAINTAIN EMERGENCY ACCESS TO ALL PROPERTIES WITHIN THE PROJECT AREA AT ALL TIMES DURING CONSTRUCTION.
19. WHEN WORKING IN THE ROAD, PROVIDE THE OWNER AND LOCAL FIRE/POLICE/SCHOOL AUTHORITIES A DETAILED PLAN OF APPROACH INDICATING METHODS OF PROPOSED TRAFFIC ROUTING ON A DAILY BASIS. PROVIDE COORDINATION TO ENSURE COMMUNICATION AND COORDINATION BETWEEN THE OWNER, CONTRACTOR AND LOCAL FIRE/POLICE/SCHOOL AUTHORITIES THROUGHOUT THE CONSTRUCTION PERIOD.
20. REMOVE AND DISPOSE OF ALL CONSTRUCTION-RELATED WASTE MATERIALS AND DEBRIS IN STRICT ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL LAWS.
21. THE TERM "DEMOLISH" USED ON THE DRAWINGS MEANS TO REMOVE AND DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REQUIREMENTS.
22. THE TERM "ABANDON" USED ON THE DRAWINGS MEANS TO LEAVE IN PLACE AND TAKE APPROPRIATE MEASURES TO DECOMMISSION AS SPECIFIED OR NOTED ON THE DRAWINGS.
23. ALL PROPOSED WORK MAY BE ADJUSTED IN THE FIELD BY THE OWNER'S PROJECT REPRESENTATIVE TO MEET EXISTING CONDITIONS.

EROSION CONTROL AND RESOURCE AREA PROTECTION NOTES

1. PROVIDE ALL EROSION CONTROL MEASURES SHOWN, SPECIFIED, REQUIRED BY PERMIT, AND/OR REQUIRED BY THE ENGINEER PRIOR TO ANY CONSTRUCTION OR IMMEDIATELY UPON REQUEST. MAINTAIN SUCH CONTROL MEASURES UNTIL FINAL SURFACE TREATMENTS ARE IN PLACE AND/OR UNTIL PERMANENT VEGETATION IS ESTABLISHED. INSPECT AFTER EACH RAINSTORM AND DURING MAJOR STORM EVENTS TO CONFIRM THAT ALL SEDIMENTATION AND EROSION CONTROL MEASURES REQUIRED ARE IN PLACE AND EFFECTIVE.
2. PRIOR TO STARTING WORK, CLEARLY STAKE WORK LIMITS. DO NOT DISTURB VEGETATION AND TOPSOIL BEYOND THE PROPOSED LIMITS. COORDINATE WITH THE ENGINEER FOR LOCATIONS OF TEMPORARY STOCKPILING OF TOPSOIL DURING CONSTRUCTION.
3. INSTALL SILT SACKS OR OTHER APPROVED SEDIMENTATION BARRIERS IN/AT ALL CATCH BASINS IN THE PROJECT AREA.
4. COMPACT, STABILIZE, AND LOAM AND SEED SIDE SLOPES, SHOULDER AREAS AND DISTURBED VEGETATED AREAS IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND AS REQUIRED BY PERMITS. GRADE SIDE SLOPES, SHOULDER AREAS AND DISTURBED VEGETATED AREAS TO A MAXIMUM SLOPE OF 3 HORIZONTAL TO 1 VERTICAL (3H:1V), WHERE POSSIBLE. PROVIDE BIODEGRADABLE EROSION CONTROL BLANKETS TO PREVENT EROSION WHERE SLOPES ARE STEEPER THAN 3H:1V.
5. SETTLE OR FILTER ALL SILT-LADEN WATER FROM DEWATERING ACTIVITIES IN A SEDIMENTATION OR FILTER BAG TO REMOVE SEDIMENTS PRIOR TO RELEASE USING A SEDIMENTATION OR FILTER BAG LOCATED DOWN-GRADIENT OF THE DEWATERED AREA.
6. REMOVE AND PROPERLY DISPOSE OF SILT TRAPPED AT BARRIERS IN UPLAND AREAS OUTSIDE BUFFER ZONES. REMOVE MATERIALS DEPOSITED IN ANY TEMPORARY SETTLING BASINS AT THE COMPLETION OF THE PROJECT. RESTORE ALL DISTURBED AREAS TO THEIR PRECONSTRUCTION CONDITION.
7. SWEEP, COLLECT, REMOVE AND DISPOSE OF ANY SEDIMENT TRACKED ONTO PUBLIC RIGHT-OF-WAYS AT THE END OF EACH DAY.
8. LOAM AND SEED ALL DISTURBED VEGETATED AREAS TO ESTABLISH COVER AND STABILIZATION AS SOON AS POSSIBLE FOLLOWING DISTURBANCE.
9. MAINTAIN AN ADDITIONAL SUPPLY OF EROSION CONTROL MEASURES ON-SITE FOR EMERGENCY REPAIRS.
10. STORE FUEL, OIL, PAINT, OR OTHER HAZARDOUS MATERIALS IN A SECONDARY CONTAINER AND REMOVE TO A SECURE LOCKED AND COVERED AREA DURING NON-WORK HOURS.
11. PROVIDE A SUPPLY OF ABSORBENT SPILL RESPONSE MATERIALS SUCH AS BOOMS, BLANKETS, AND OIL ABSORBENT MATERIALS AT THE CONSTRUCTION SITE AT ALL TIMES TO CLEAN UP POTENTIAL SPILLS OF HAZARDOUS MATERIALS. IMMEDIATELY REPORT SPILLS OF HAZARDOUS MATERIALS TO THE STATE ENVIRONMENTAL AGENCY AND THE MUNICIPALITY WHERE THE WORK IS OCCURRING.

SURFACE RESTORATION NOTES

1. ALL PAVEMENT DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPLACED IN-KIND.
2. PROVIDE SITE GRADING AT ACCESSIBLE SIDEWALK RAMPS, PATHWAYS AND OTHER GENERAL LOCATIONS THAT IS CONSISTENT WITH THE RELEVANT ACCESS REQUIREMENTS OF THE ARCHITECTURAL BARRIERS ACT (ABA), THE AMERICANS WITH DISABILITIES ACT (ADA) AND MA ARCHITECTURAL ACCESS BOARD REQUIREMENTS (AAB). SMALL CHANGES IN GRADE OVER RELATIVELY SHORT DISTANCES (E.G. AT PARKING SPACES, ACCESSIBLE ROUTES, AND RAMPS) MIGHT NOT BE CLEARLY DEPICTED WITHIN THE CONTOUR INTERVAL AS SHOWN. COMPLY WITH THE CRITERIA IN THESE STANDARDS. SELECT MAXIMUM SLOPE CRITERIA ARE REPRODUCED BELOW:
   - ACCESSIBLE PARKING STALL AND PASSENGER LOADING ZONE (ANY DIRECTION) SLOPE < 2.0%
   - LONGITUDINAL SLOPE ALONG ACCESSIBLE ROUTES < 5.0%
   - CROSS SLOPE ALONG ACCESSIBLE ROUTES < 2.0%
3. PROTECT PROJECT FEATURES (E.G., WALLS, FENCES, MAIL BOXES, SIGNS, SIDEWALKS, CURBING, STAIRS, WALKWAYS, TREES, ETC.) FROM DAMAGE DURING CONSTRUCTION, INCLUDING PROVIDING TEMPORARY SUPPORTS, WHEN APPROPRIATE.
4. IF REMOVAL OF PROJECT FEATURES IS REQUIRED IN ORDER TO PERFORM THE PROPOSED WORK, REMOVE THOSE SITE FEATURES ONLY UPON APPROVAL OF ENGINEER. REPLACE ALL REMOVED PROJECT FEATURES; NEW ITEMS SHALL BE EQUAL OR BETTER IN QUALITY AND CONDITION TO THE ITEMS REMOVED.
5. EXISTING SURVEY MONUMENTS DISTURBED BY THE CONTRACTOR SHALL BE REPLACED BY A LAND SURVEYOR LICENSED IN THE STATE IN WHICH THE WORK IS PERFORMED AT NO ADDITIONAL COST TO THE OWNER.
6. COORDINATE THE ADJUSTMENT OF EXISTING UTILITY STRUCTURES WITH EACH RESPONSIBLE UTILITY OWNER PRIOR TO RECONSTRUCTION AND/OR PAVING OPERATIONS. RAISE ALL STRUCTURES TO FINISHED GRADES PRIOR TO THE END OF THE CONSTRUCTION SEASON AND PRIOR TO FINISHED PAVING.
7. REPAIR DISTURBED PAVED SURFACES AT THE END OF EACH WORK WEEK, UNLESS OTHERWISE APPROVED/REQUIRED BY THE OWNER.
8. TRANSFER ALL TEMPORARY BENCHMARKS, AS NECESSARY.
9. RESTORE ALL AREAS DISTURBED BY THE CONTRACTOR BEYOND THE PAYLINE LIMITS TO ORIGINAL CONDITIONS AT NO ADDITIONAL COST TO THE OWNER.
10. REGRADE ALL UNPAVED AREAS DISTURBED BY THE WORK AS REQUIRED. REPAIR/REPLACE PAVED SURFACES DISTURBED BY THE WORK IN-KIND, UNLESS OTHERWISE NOTED. RESTORE SURFACES TO EXISTING OR PROPOSED CONDITIONS AS INDICATED ON THE DRAWINGS.
11. PROVIDE A SMOOTH, FLUSH TRANSITION BETWEEN ALL NEW AND EXISTING PAVEMENTS AND WALKING SURFACES.

LANDSCAPE NOTES

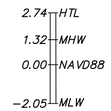
1. SEE SHEETS BY CRAWFORD LAND MANAGEMENT FOR REMOVAL OF EXISTING VEGETATION AND INSTALLATION OF PROPOSED VEGETATION.

REFERENCE PLAN

1. "SITE PLAN IN WEST YARMOUTH, MA, #251 ROUTE 28, PREPARED FOR CHARLES WHITE MANAGEMENT", PREPARED BY DOWN CAPE ENGINEERING, INC., REVISED APRIL 8, 2014.

ABBREVIATIONS

APPROX	APPROXIMATE
BIT	BITUMINOUS
BKF	BANKFULL
BLDG	BUILDING
BND	BOUND
BOW	BOTTOM OF WALL
CB	CATCH BASIN
CEM	CEMENT
CLF	CHAIN LINK FENCE
CONC	CONCRETE
CONST	CONSTRUCT
DIA	DIAMETER
DMH	DRAIN MANHOLE
E	EAST
EG	EXISTING GRADE
EL/ELEV	ELEVATION
EOP	EDGE OF PAVEMENT
EXIST	EXISTING
FG	FINISH GRADE
H	HORIZONTAL
HDPE	HIGH DENSITY POLYETHYLENE
HTL	HIGH TIDE LINE
HYD	HYDRANT
IN	INCHES
INV	INVERT
L	LENGTH OF CURB
LF	LINEAR FEET
LP	LIGHT POLE
LSCSF	LAND SUBJECT TO COASTAL STORM FLOWAGE
MAX	MAXIMUM
MH	MANHOLE
MHW	MEAN HIGH WATER
MIN	MINIMUM
MISC	MISCELLANEOUS
MLW	MEAN LOW WATER
N	NORTH
NAD	NORTH AMERICAN DATUM
NAVD	NORTH AMERICAN VERTICAL DATUM
NO	NUMBER
NTS	NOT TO SCALE
N/A	NOT APPLICABLE
OC	ON CENTER
PROP	PROPOSED
PFES	PROPOSED FLARED END SECTION
R	RADIUS
S	SLOPE/SOUTH
SAN	SANITARY
SF	SQUARE FEET
SMH	SEWER MANHOLE
STA	STATION
TBR	TO BE REMOVED
TEMP	TEMPORARY
TOCB	TOP OF COASTAL BANK
TW	TOP OF WALL
TYP	TYPICAL
UP	UTILITY POLE
V	VERTICAL
VIF	VERIFY IN FIELD
W	WEST
W/	WITH
W/O	WITHOUT
WG	WATER GATE
WV	WATER VALVE



NAVD 1988 DATUM PROFILE
SCALE: 1" = 4'

REF: NOAA VERTICAL DATUM 11-06-2023
REF: BUZZARDS BAY NATIONAL ESTUARY PROGRAM

VERTICAL DATUM IN U.S. SURVEY FEET REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) BASED UPON THE HEXAGON SMARTNET RTK NETWORK.

NOAA VERTICAL DATUM TIDAL PROFILE USED FOR DESIGN PURPOSES. NOAA EPOCH DATA (NOT PROVIDED) SHOULD BE REFERENCED FOR REGULATORY OR SURVEY PURPOSES.

Tighe&Bond

COMMONWEALTH OF MASSACHUSETTS
DENNIS G. MORAN
CIVIL
No. 53931
REGISTERED PROFESSIONAL ENGINEER
11-26-25

COMMONWEALTH OF MASSACHUSETTS
BRIAN S. HUNTLEY
CIVIL
No. 46273
REGISTERED PROFESSIONAL ENGINEER
11-2025

NOT FOR CONSTRUCTION

Chase Brook Park Restoration & Bridge Construction

Town of Yarmouth

Yarmouth, Massachusetts

MARK	DATE	DESCRIPTION
5	11/26/2025	ISSUED FOR BID
4	11/19/2025	REV. PER TOWN COMMENTS
3	11/7/2025	REV. PER TOWN COMMENTS
2	10/15/2025	REV. PER TOWN COMMENTS
1	8/29/2025	DRAFT ISSUED FOR BIDDING

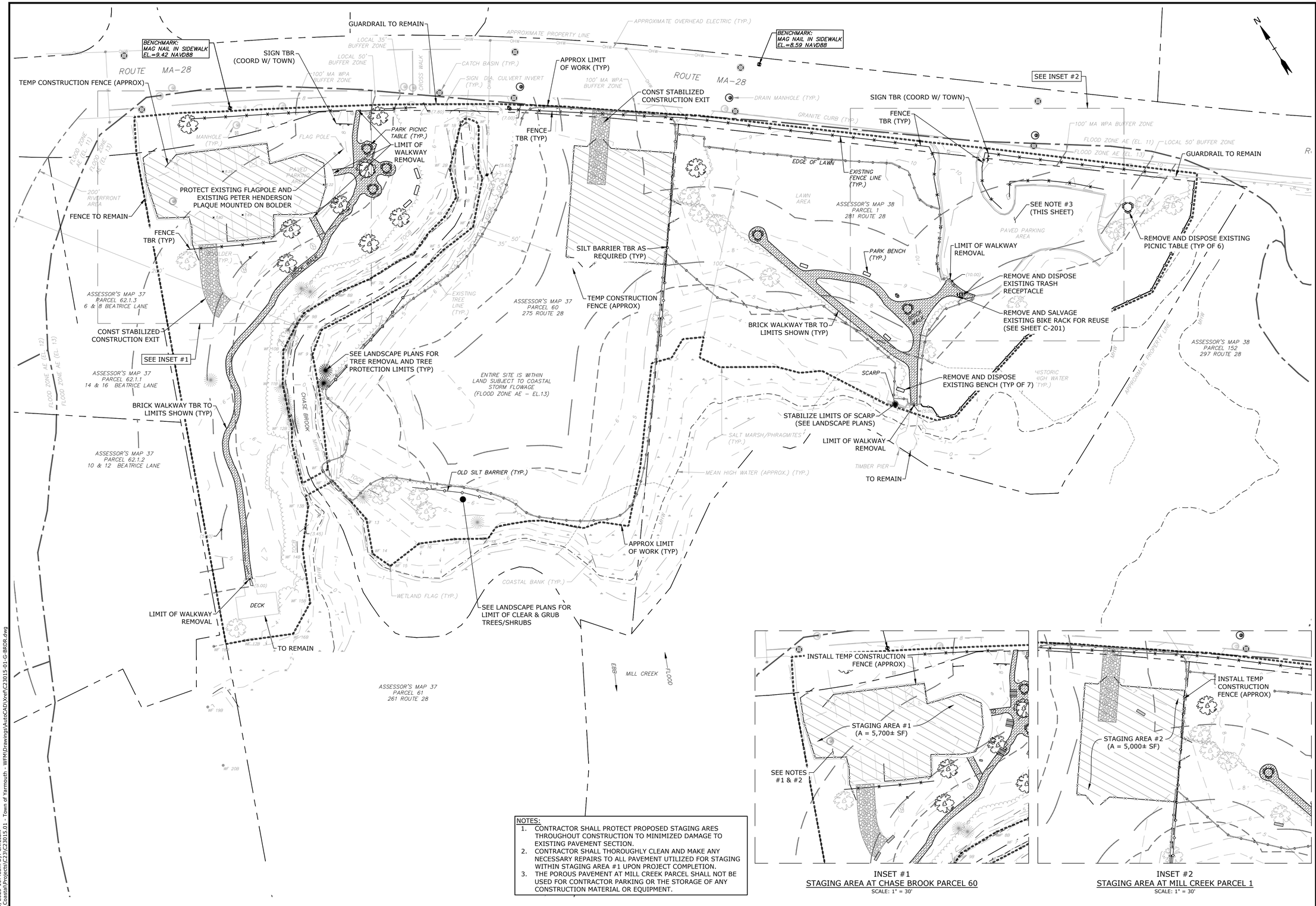
PROJECT NO:	C23015-01
DATE:	AUGUST 29, 2025
FILE:	C23015-01-G-BRDR.dwg
DRAWN BY:	MAB/CJK/NSC
DESIGNED/CHECKED BY:	DGM
APPROVED BY:	BSH

GENERAL NOTES, LEGEND & ABBREVIATIONS/ACRONYMS SHEET

SCALE: AS SHOWN

G-101

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NOTES:
1. CONTRACTOR SHALL PROTECT PROPOSED STAGING ARES THROUGHOUT CONSTRUCTION TO MINIMIZED DAMAGE TO EXISTING PAVEMENT SECTION.
2. CONTRACTOR SHALL THOROUGHLY CLEAN AND MAKE ANY NECESSARY REPAIRS TO ALL PAVEMENT UTILIZED FOR STAGING WITHIN STAGING AREA #1 UPON PROJECT COMPLETION.
3. THE POROUS PAVEMENT AT MILL CREEK PARCEL SHALL NOT BE USED FOR CONTRACTOR PARKING OR THE STORAGE OF ANY CONSTRUCTION MATERIAL OR EQUIPMENT.

INSET #1
STAGING AREA AT CHASE BROOK PARCEL 60
SCALE: 1" = 30'

INSET #2
STAGING AREA AT MILL CREEK PARCEL 1
SCALE: 1" = 30'

0 30' 60'
SCALE: 1" = 30'

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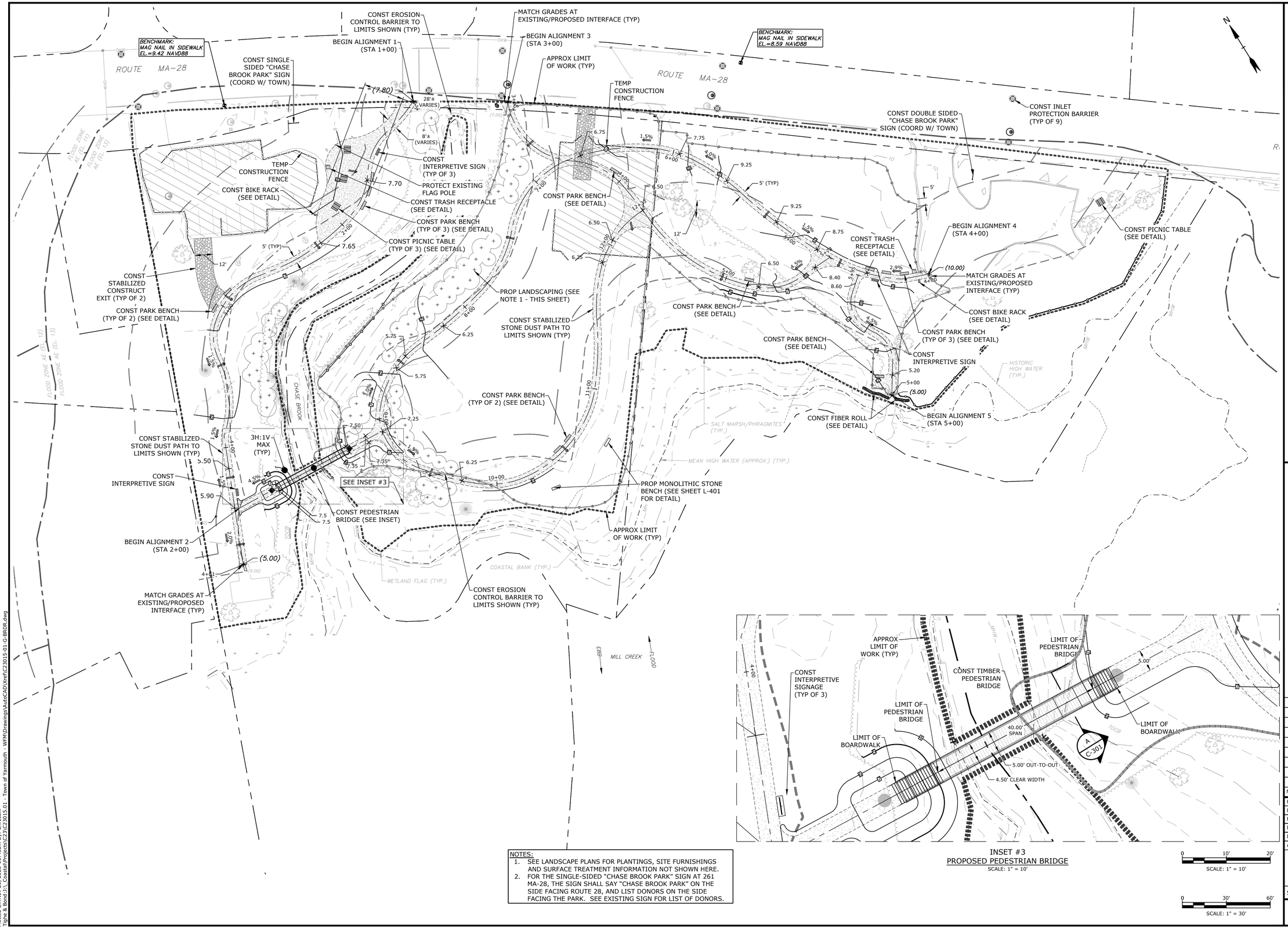
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APPROVED BY:	BSH

EXISTING CONDITIONS, DEMOLITION & ACCESS/STAGING PLAN

SCALE: AS SHOWN

C-101



NOTES:
1. SEE LANDSCAPE PLANS FOR PLANTINGS, SITE FURNISHINGS AND SURFACE TREATMENT INFORMATION NOT SHOWN HERE.
2. FOR THE SINGLE-SIDED "CHASE BROOK PARK" SIGN AT 261 MA-28, THE SIGN SHALL SAY "CHASE BROOK PARK" ON THE SIDE FACING ROUTE 28, AND LIST DONORS ON THE SIDE FACING THE PARK. SEE EXISTING SIGN FOR LIST OF DONORS.

INSET #3
PROPOSED PEDESTRIAN BRIDGE
SCALE: 1" = 10'

SCALE: 1" = 10'

SCALE: 1" = 30'

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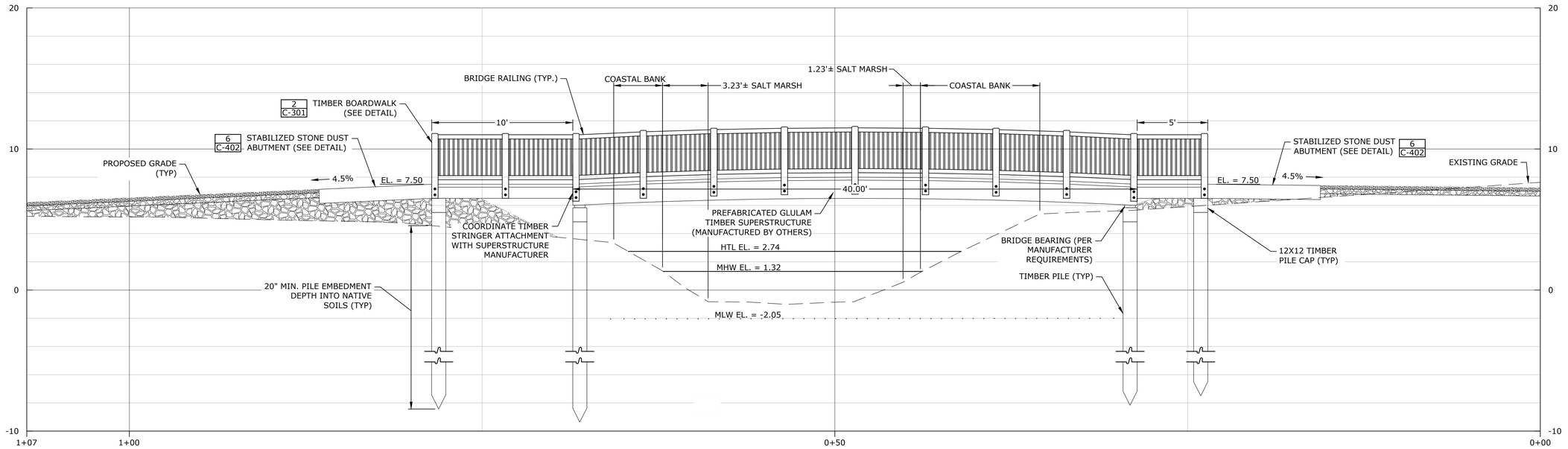
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SITE, GRADING, DRAINAGE & EROSION CONTROL PLAN

SCALE: AS SHOWN

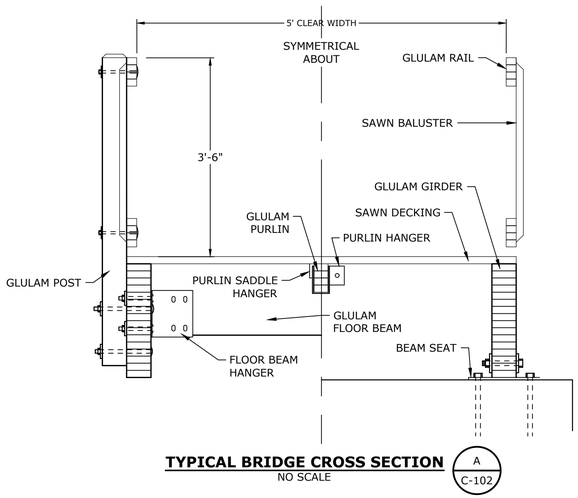
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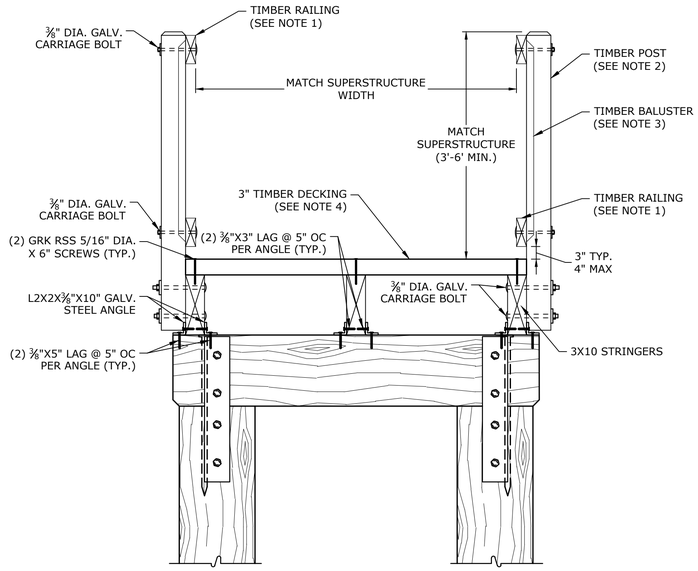


BRIDGE PROFILE 1 -
SCALE: 1/4" = 1'

0 2' 4' 8'
GRAPHIC SCALE



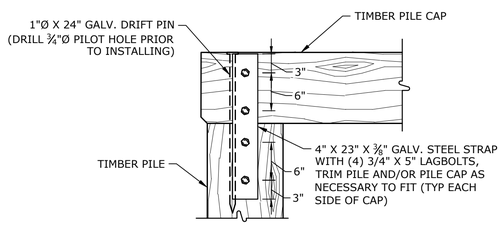
TYPICAL BRIDGE CROSS SECTION A C-102
NO SCALE



NOTES:
1. TIMBER RAILING SHALL BE THE SAME MATERIAL, FINISH, AND DIMENSION AS THE SUPERSTRUCTURE.
2. TIMBER POSTS SHALL BE THE SAME MATERIAL, FINISH, AND DIMENSIONS AS SUPERSTRUCTURE.
3. TIMBER BALUSTERS BE THE SAME MATERIAL, FINISH, DIMENSIONS AND SPACING AS THE SUPERSTRUCTURE.
4. TIMBER DECKING SHALL BE THE SAME MATERIAL, FINISH, WIDTH AND SPACING AS THE SUPERSTRUCTURE.

TYPICAL BOARDWALK SECTION 2 -
SCALE: 1" = 1'

0 0.5' 1' 2'
GRAPHIC SCALE



TIMBER PILE CAP CONNECTION DETAIL 3 -
SCALE: 1" = 1'

0 0.5' 1' 2'
GRAPHIC SCALE

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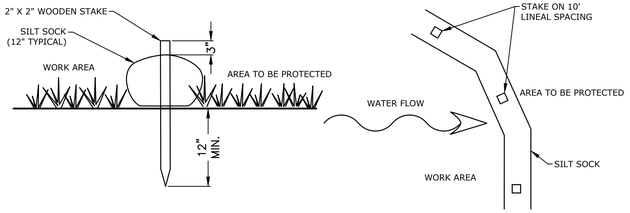
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DATE:	AUGUST 29, 2025
FILE:	C23015-01-C-PLOT.dwg
DRAWN BY:	MAB/CJK/NSC
DESIGNED/CHECKED BY:	DGM
APPROVED BY:	BSH

PEDESTRIAN BRIDGE & BOARDWALK DETAILS

SCALE: AS SHOWN

C-301

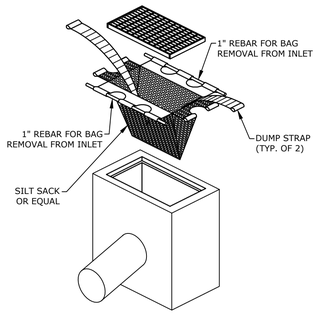
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Tighe & Bond:J:_Coastal\Projects\C23\C23015.01 - Town of Yarmouth - WPM\Drawings\AutoCAD\Sheet\C23015-01-C-PLOT.dwg



NOTES:
1. SILT SOCK SHALL BE SILT SOXX BY FILTREXX OR APPROVED EQUAL.
2. SILT SOCK SHALL BE FILLED WITH FILTERMEDIA BY FILTREXX OR APPROVED EQUAL.
3. WHERE TWO SILT SOCKS ARE JOINED, A MINIMUM OF 2 FEET OF OVERLAP SHALL BE MAINTAINED.
4. SILT SOCKS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
5. CONTRACTOR TO INSTALL SILT SOCK IN J-HOOK OR SMILE CONFIGURATION TO LIMIT CONCENTRATION OF STORMWATER RUNOFF AT A SINGLE DISCHARGE POINT.

SILT SOCK
NO SCALE

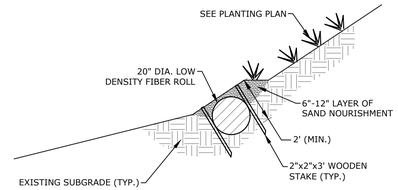
1
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NOTES:
1. INLET PROTECTION BARRIER SHALL BE SILT SACK BY ACF ENVIRONMENTAL OR APPROVED EQUAL.
2. INLET PROTECTION BARRIER SHALL BE INSTALLED IN ALL EXISTING AND PROPOSED CATCH BASINS LOCATED WITHIN THE LIMIT OF WORK.
3. SILT SACK SHALL BE INSPECTED REGULARLY AND MAINTAIN IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.

INLET PROTECTION BARRIER
NO SCALE

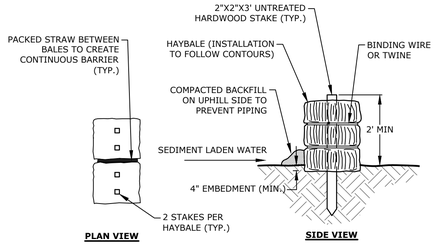
4
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NOTES:
1. SEE PLANTING PLANS FOR TYPE AND LOCATION OF PLANTS.
2. COIR LOGS SHALL BE STAKED PER MANUFACTURERS RECOMMENDATIONS

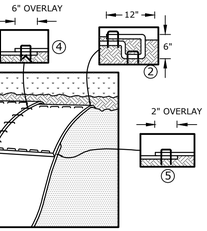
COIR LOG STREAM BANK
NO SCALE

7
-



HAYBALE BARRIER
NO SCALE

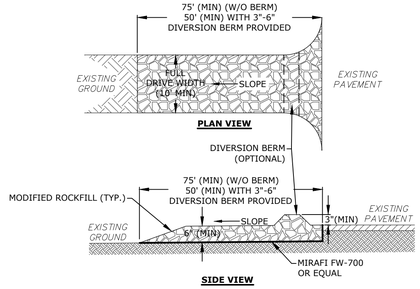
8
-



NOTES:
1. THE BLANKET SHALL BE 100% BIODEGRADABLE AND SHALL BE BY NORTH AMERICAN GREEN C125BN BLANKET, OR APPROVED EQUAL.
2. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER AND SEED.
3. BEGIN AT THE TOP OF THE SLOPE, 36" OVER THE GRADE BREAK, BY ANCHORING THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UPSLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF TAPLES/STAKES 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES SPACED 12" APART ACROSS THE WIDTH OF THE BLANKET.
4. ROLL THE BLANKETS DOWN THE SLOPE. ALL BLANKETS MUST BE SECURELY FASTENED TO THE SOIL SURFACE BY PLACING STAPLES IN APPROPRIATE LOCATIONS AS SHOWN ON THE STAPLE PATTERN GUIDE.
5. STAPLE LENGTHS SHALL BE A MINIMUM OF 8 INCHES.
6. APPLY TO ALL SLOPES GREATER THAN 3H:1V.

EROSION CONTROL BLANKET
NO SCALE

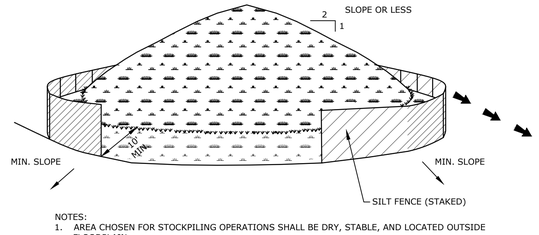
2
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NOTES:
1. THE EXIT SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OF SEDIMENT FROM THE SITE. WHEN WASHING IS REQUIRED, IT SHALL BE DONE SO RUNOFF DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING STORM DRAINS, DITCHES, OR WATERWAYS.
2. NATURAL DRAINAGE THAT CROSSES THE LOCATION OF THE STONE PAD SHOULD BE INTERCEPTED AND PIPED BENEATH THE PAD, AS NECESSARY, WITH SUITABLE OUTLET PROTECTION.

STABILIZED CONSTRUCTION EXIT
NO SCALE

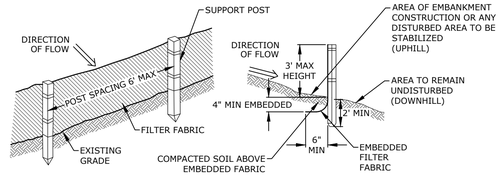
5
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NOTES:
1. AREA CHOSEN FOR STOCKPILING OPERATIONS SHALL BE DRY, STABLE, AND LOCATED OUTSIDE FLOODPLAIN.
2. MAXIMUM SLOPE OF STOCKPILE SHALL BE 2H:1V.
3. UPON COMPLETION OF SOIL STOCKPILING, EACH PILE SHALL BE SURROUNDED WITH EITHER SILT FENCING OR STRAW BALES.
4. STOCKPILE TO BE PLACED ON POLYETHYLENE SHEETING (MIN. 10 MIL THICKNESS); SECURELY COVER WITH POLYETHYLENE SHEETING (MIN. 10 MIL THICKNESS) WHEN NOT IN USE AND AT THE END OF EACH WORK DAY.

TEMPORARY SOIL STOCKPILING
NO SCALE

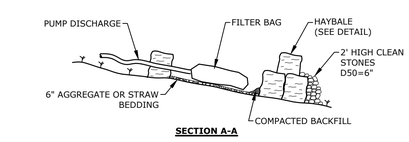
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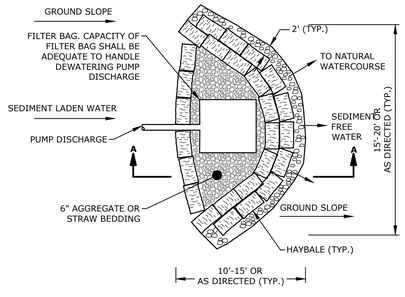


NOTES:
1. SILT FENCE SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
2. ADJOINING SECTIONS OF THE FENCE SHALL BE OVERLAPPED BY 6 INCHES, FOLDED AND STAPLED TO A SUPPORT POST.
3. THE MAXIMUM CONTRIBUTING DRAINAGE AREA ABOVE THE FENCE SHOULD BE LESS THAN ¼ ACRE PER 100 LINEAR FEET OF FENCE;
4. THE MAXIMUM LENGTH OF SLOPE ABOVE THE FENCE SHOULD BE 100 FEET;
5. THE MAXIMUM SLOPE ABOVE THE FENCE SHOULD BE 2:1;
6. FENCES SHOULD BE INSTALLED FOLLOWING THE CONTOUR OF THE LAND AS CLOSELY AS POSSIBLE, AND
   a. THE ENDS OF THE FENCE SHOULD BE FLARED UPSLOPE;
   b. THE FABRIC SHOULD BE EMBEDDED A MINIMUM OF 4 INCHES IN DEPTH AND 4 INCHES IN WIDTH IN A TRENCH EXCAVATED INTO THE GROUND, OR IF SITE CONDITIONS INCLUDE FROZEN GROUND, LEDGE, OR THE PRESENCE OF HEAVY ROOTS, THE BASE OF THE FABRIC SHOULD BE EMBEDDED WITH A MINIMUM THICKNESS OF 8 INCHES OF ¾-INCH STONE;
   c. THE SOIL SHOULD BE COMPACTED OVER THE EMBEDDED FABRIC;
   d. SUPPORT POSTS SHOULD BE SIZED AND ANCHORED ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS WITH MAXIMUM POST SPACING OF 6 FEET;
   e. ADJOINING SECTIONS OF THE FENCE SHOULD BE OVERLAPPED BY A MINIMUM OF 6 INCHES (24 INCHES IS PREFERRED), FOLDED AND STAPLED TO A SUPPORT POST. IF METAL POSTS ARE USED, FABRIC SHOULD BE WIRE-TIED DIRECTLY TO THE POSTS WITH THREE DIAGONAL TIES.
7. SILT FENCING SHOULD NOT BE STAPLED OR NAILED TO TREES.
8. THE FILTER FABRIC SHOULD BE A PERVIOUS SHEET OF PROPYLENE, NYLON, POLYESTER OR ETHYLENE YARN AND SHOULD BE CERTIFIED BY THE MANUFACTURER OR SUPPLIER.
9. THE FILTER FABRIC SHOULD CONTAIN ULTRAVIOLET RAY INHIBITORS AND STABILIZERS TO PROVIDE A MINIMUM OF 6 MONTHS OF EXPECTED USABLE CONSTRUCTION LIFE AT A TEMPERATURE RANGE OF 0 DEGREES FAHRENHEIT TO 120 DEGREES FAHRENHEIT.
10. POSTS FOR SILT FENCES SHOULD BE EITHER 4-INCH DIAMETER WOOD OR 1.33 POUNDS PER LINEAR FOOT STEEL WITH A MINIMUM LENGTH OF 5 FEET. STEEL POSTS SHOULD HAVE PROJECTIONS FOR FASTENING WIRE TO THEM. POSTS SHOULD BE PLACED ON THE DOWNSLOPE SIDE OF THE FABRIC.
11. THE HEIGHT OF A SILT FENCE SHOULD NOT EXCEED 36 INCHES AS HIGHER FENCES MAY IMPOUND VOLUMES OF WATER SUFFICIENT TO CAUSE FAILURE OF THE STRUCTURE.
12. THE FILTER FABRIC SHOULD BE PURCHASED IN A CONTINUOUS ROLL CUT TO THE LENGTH OF THE BARRIER TO AVOID THE USE OF JOINTS. WHEN JOINTS ARE NECESSARY, FILTER CLOTH SHOULD BE SPLICED TOGETHER ONLY AT SUPPORT POST, WITH A MINIMUM 6-INCH OVERLAP, AND SECURELY SEALED.
13. A MANUFACTURED SILT FENCE SYSTEM WITH INTEGRAL POSTS MAY BE USED.
14. POST SPACING SHOULD NOT EXCEED 6 FEET.
15. CONTRACTOR TO INSTALL SILT FENCE IN J-HOOK OR SMILE CONFIGURATION TO LIMIT CONCENTRATION OF STORMWATER RUNOFF AT A SINGLE DISHCARGE POINT.
16. A TRENCH SHOULD BE EXCAVATED APPROXIMATELY 4 INCHES WIDE AND 4 INCHES DEEP ALONG THE LINE OF POSTS AND UPGRADIENT FROM THE BARRIER.
17. THE STANDARD STRENGTH OF FILTER FABRIC SHOULD BE STAPLED OR WIRED TO THE POST, AND 8 INCHES OF THE FABRIC SHOULD BE EXTENDED INTO THE TRENCH. THE FABRIC SHOULD NOT EXTEND MORE THAN 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
18. THE INSTALLATION TRENCH SHOULD BE BACKFILLED AND THE SOIL COMPACTED OVER THE FILTER FABRIC.
19. SILT FENCE MAY BE INSTALLED BY "SLICING" USING MECHANICAL EQUIPMENT SPECIFICALLY DESIGNED FOR THIS PROCEDURE. THE SLICING METHOD USES AN IMPLEMENT TOWED BEHIND A TRACTOR TO "PLOW" OR SLICE THE SILT FENCE MATERIAL INTO THE SOIL. THE SLICING METHOD MINIMALLY DISRUPTS THE SOIL UPWARD AND SLIGHTLY DISPLACES THE SOIL, MAINTAINING THE SOIL'S PROFILE AND CREATING AN OPTIMAL CONDITION FOR SUBSEQUENT MECHANICAL COMPACTION.
20. SILT FENCES SHOULD BE INSTALLED WITH "SMILES" OR "J-HOOKS" TO REDUCE THE DRAINAGE AREA THAT ANY SEGMENT WILL IMPOUND (SEE DIAGRAMS NHDES STORMWATER MANUAL VOLUME 3 PAGES 97-99).
21. SILT FENCES PLACED AT THE TOE OF A SLOPE SHOULD BE SET AT LEAST 6 FEET FROM THE TOE TO ALLOW SPACE FOR SHALLOW PONDING AND TO ALLOW FOR MAINTENANCE ACCESS WITHOUT DISTURBING THE SLOPE.
22. SILT FENCES SHOULD BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREAS HAVE BEEN PERMANENTLY STABILIZED.

SILT FENCE
NO SCALE

3
-

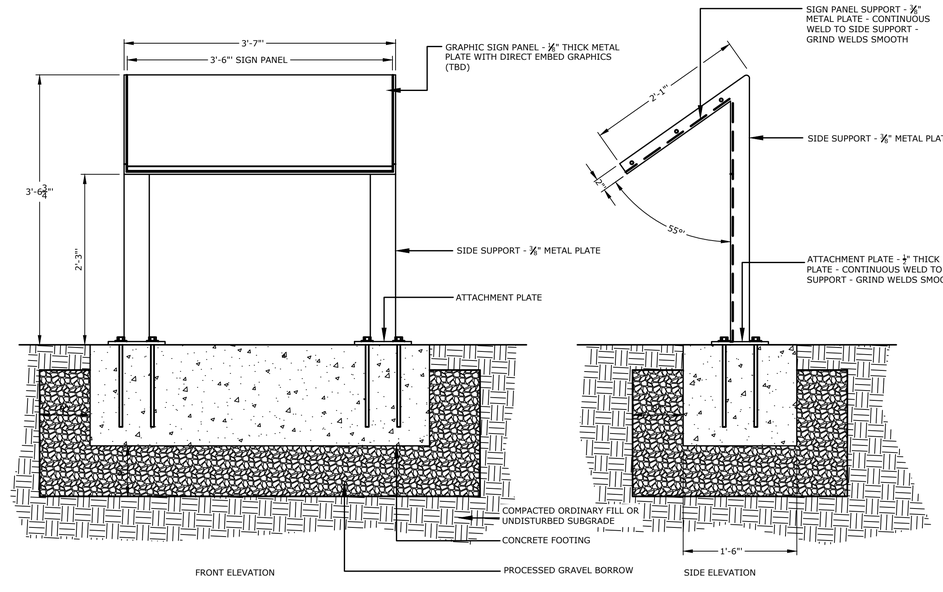




NOTES:
1. DISCHARGE LOCATION DEPENDS ON THE TYPE OF GROUNDWATER ENCOUNTERED.
2. DISCHARGE INTO LIKE WATER BODY AFTER FILTRATION.

DEWATERING BASIN
NO SCALE

6
-



INTERPRETIVE SIGNAGE
NO SCALE

11
-

Tighe&Bond

COMMONWEALTH OF MASSACHUSETTS
DENNIS G. MORAN
CIVIL
No. 53931
REGISTERED PROFESSIONAL ENGINEER
11-20-25

COMMONWEALTH OF MASSACHUSETTS
BRIAN S. HUNTLEY
CIVIL
No. 46273
REGISTERED PROFESSIONAL ENGINEER
11-20-25

NOT FOR CONSTRUCTION

Chase Brook Park Restoration & Bridge Construction

Town of Yarmouth

Yarmouth, Massachusetts

MARK	DATE	DESCRIPTION
5	11/26/2025	ISSUED FOR BID
4	11/19/2025	REV. PER TOWN COMMENTS
3	11/7/2025	REV. PER TOWN COMMENTS
2	10/15/2025	REV. PER TOWN COMMENTS
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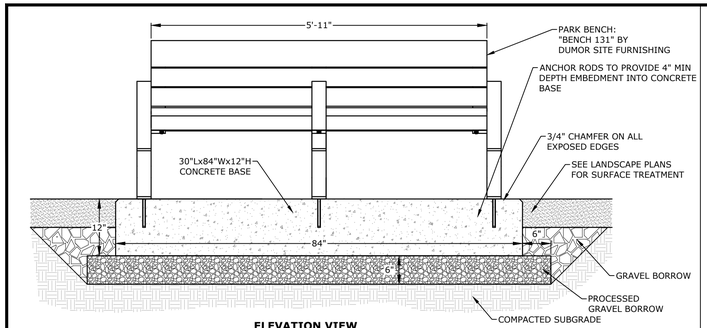
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DATE:	AUGUST 29, 2025
FILE:	C23015-01-G-BRDR.dwg
DRAWN BY:	MAB/CJK/NSC
DESIGNED/CHECKED BY:	DGM
APPROVED BY:	BSH

CIVIL DETAILS SHEET

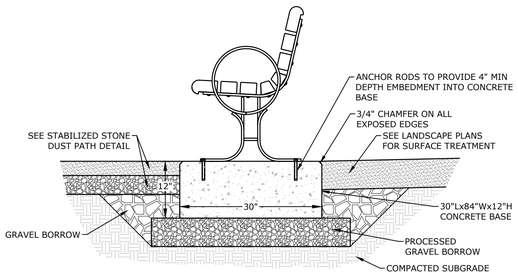
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C-401

Last Saved: 11/26/2025
Plotted: Nov 26, 2025 - 10:41am By: CKrzcuik
Tighe & Bond:J:_Coastal\Projects\C23\C23015.01 - Town of Yarmouth - WFM\Drawings\AutoCAD\Xref\C23015-01-G-BRDR.dwg



ELEVATION VIEW

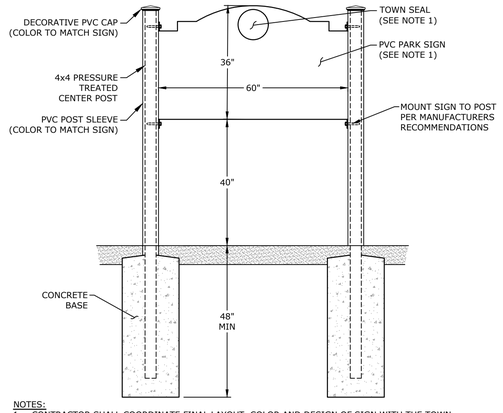


SECTION VIEW

BENCH DETAIL

NO SCALE

1
-

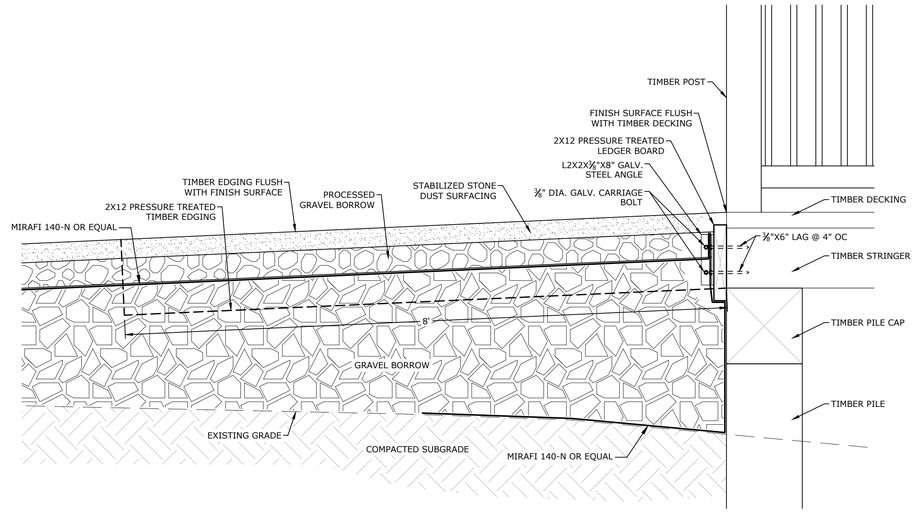


NOTES:
1. CONTRACTOR SHALL COORDINATE FINAL LAYOUT, COLOR AND DESIGN OF SIGN WITH THE TOWN PRIOR TO CONSTRUCTION.
2. THE STREET FACING SIDE OF THE SIGN ON MAP 37 LOT 1 SHALL BEAR "CHASE BROOK PARK" AND SEAL LAYOUT. THE REAR PARK FACING SIDE OF THE SIGN SHALL BEAR THE LIST OF DONORS. COORDINATE WITH THE TOWN.
3. THE PARK SIGN LOCATED ON MAP 38 LOT 1 SHALL BE DOUBLE SIDED BOTH BEARING THE "CHASE BROOK PARK" AND TOWN SEAL LAYOUT. COORDINATE WITH THE TOWN.

PARK SIGN

NO SCALE

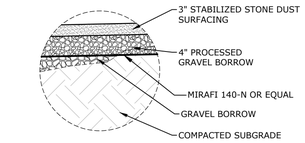
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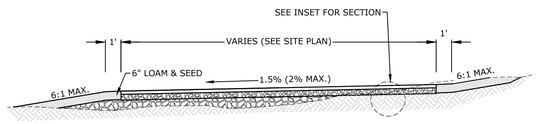
STABILIZED STONE DUST ABUTMENT DETAIL

NO SCALE

6
-



INSET



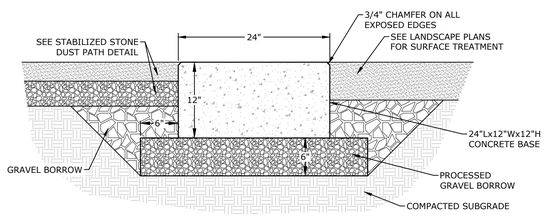
SECTION VIEW

NOTE:
1. SEE PLANS FOR LOCATIONS AND WIDTHS.

STABILIZED STONE DUST PATH

NO SCALE

2
-

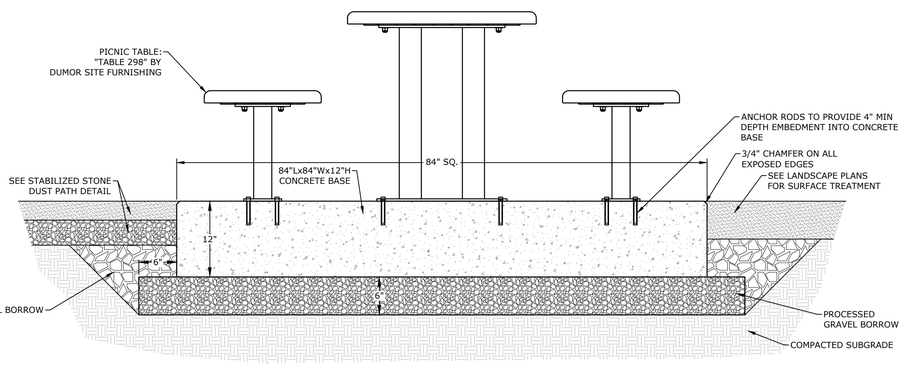


NOTES:
1. SALVAGED BIKE RACK SHALL BE MOUNTED TO CONCRETE BASE WITH 3/4" STAINLESS STEEL WEDGE ANCHORS.
2. WEDGE ANCHORS SHALL HAVE A 4" MIN DEPTH EMBEDMENT INTO CONCRETE BASE.

BIKE RACK BASE DETAIL

NO SCALE

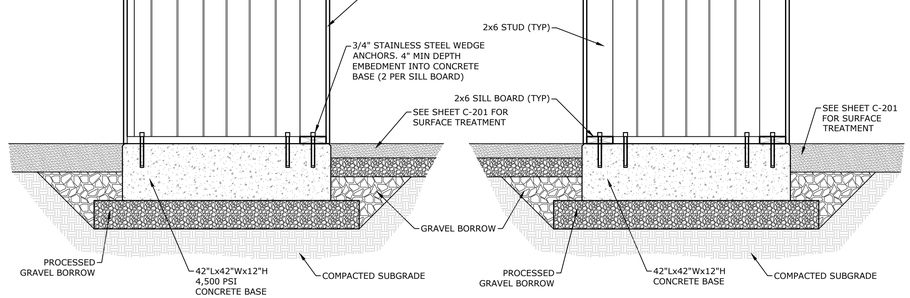
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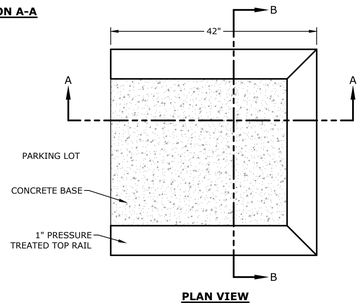
PICNIC TABLE DETAIL

NO SCALE

3
-



SECTION A-A **SECTION B-B**



PLAN VIEW

NOTES:
1. ALL WOOD SHALL BE PRESSURE TREATED.
2. ALL FASTENERS SHALL BE EXTERIOR GRADE #10 DECKING SCREWS.
3. TRASH RECEPTACLE SHALL BE EQUIPPED WITH WIRE ROPE CLASP CLOSURE ON THE OPEN SIDE OF THE ENCLOSURE.

TRASH RECEPTACLE DETAIL

NO SCALE

7
-

Tighe&Bond

COMMONWEALTH OF MASSACHUSETTS
DENNIS G. MORAN
CIVIL
No. 53931
REGISTERED PROFESSIONAL ENGINEER
11-26-25

COMMONWEALTH OF MASSACHUSETTS
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DRAWN BY:	MAB/CJK/NSC
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APPROVED BY:	BSH

CIVIL DETAILS SHEET

SCALE: AS SHOWN

C-402

Last Saved: 11/26/2025
Plotted: 11/26/2025 - 10:41am By: CKrzcuik
Tighe & Bond J:_Coastal\Projects\C23\C23015.01 - Town of Yarmouth - WPM\Drawings\AutoCAD\Xref\C23015-01-G-BRDR.dwg

Tighe&Bond
Engineers | Environmental Specialists

Boring No. **BL-1**
Page 1 of 2
File No. C23015.01
Checked by

Project: Chase Brook Park
Location: Yarmouth, MA
Client: Town of Yarmouth

Drilling Co.: Geologic - Earth Exploration, Inc.
Foreman: D. Jacobs
T&B Rep.: N/A
Date Start: 09/11/23 Date End: 09/11/23
Location See Exploration Location Plan
GS. Elev. Datum: NAVD88

	Casing	Sampler
Type		
I.D./O.D.	4" I.D.	1-3/8"/2"
Hammer Wt.	300#	140#
Hammer Fall	30"	30"
Rig		
Flush Joint		
Split Spoon		

Groundwater Readings

Date	Time	Depth	Casing	Sta. Time
09/11/23		29'		

Depth (ft.)	Casing Blows Per Ft.	Sample No. / Rec.(in)	Sample Depth (ft.)	Blows Per 6"	Sample Description	General Stratigraphy	Notes
		S1 / 3	0-2	5-6	S1: Medium dense, tan, coarse SAND, moist	SAND 2'	
				6-7			
		S2 / 5	2-4	5-6	S2: Medium dense, tan, coarse SAND, some Gravel, moist	GRAVELLY SAND 4'	
				6-7			
5		S3 / 8	4-6	10-8	S3: Medium dense, brown, coarse SAND, moist		
				12-11			
		S4 / 2	6-8	9-9	S4: Medium dense, brown, coarse SAND, moist		
				11-13			
		S5 / 14	8-10	12-14	S5: Medium dense, brown, coarse SAND, moist	SAND	
10				10-11			
						14'	
		S6 / 18	14-16	7-3	S6: Medium dense, brown, coarse SAND and GRAVEL, moist		
				12-13			
15						GRAVELLY SAND	
		S7 / 16	19-21	8-9	S7: Medium dense, brown/gray, coarse SAND, some Gravel, moist		
				11-11			
20						24'	
		S8 / 12	24-26	5-10	S8: Very stiff, gray, CLAY, moist	CLAY	
				14-18			
25							
						29'	
30		S9 / 18	29-31	11-18			

Notes:

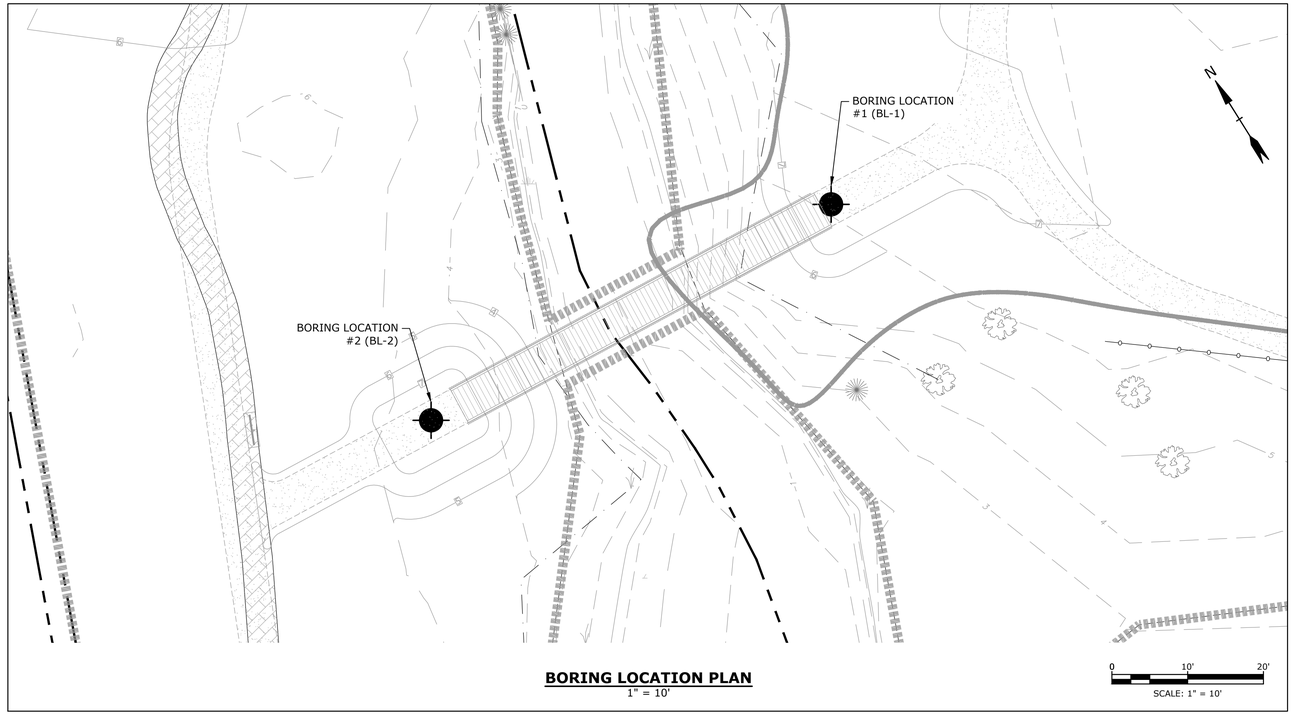
Proportions Used

TRACE (TR.)	0 - <10%
LITTLE (LI.)	10 - <20%
SOME (SO.)	20 - <35%
AND	35 - <50%

Density/Consistency

VERY LOOSE	0-4	VERY SOFT	<2
LOOSE	4-10	SOFT	2-4
MEDIUM DENSE	10-30	MEDIUM	4-8
DENSE	30-50	STIFF	8-15
VERY DENSE	>50	VERY STIFF	15-30
		HARD	>30

BORING #1
1 OF 2



BORING LOCATION PLAN
1" = 10'

Tighe&Bond
Engineers | Environmental Specialists

Boring No. **BL-1**
Page 2 of 2
File No. C23015.01
Checked by:

Project: Chase Brook Park
Location: Yarmouth, MA
Client: Town of Yarmouth

Depth (ft.)	Casing Blows Per Ft.	Sample No. / Rec.(in)	Sample Depth (ft.)	Blows Per 6"	Sample Description	General Stratigraphy	Notes
30				19-15	S9: Dense, gray, fine SAND, some Clay, wet	CLAYEY SAND 34'	
		S10 / 14	34-36	12-14	S10: Medium dense, gray, fine SAND, wet	SAND	
35				10-11			
		S11 / 10	39-41	8-10	S11: Medium dense, gray, fine to coarse SAND, wet		
40				12-13		41'	
					Exploration terminated at 41 feet		
45							
50							
55							
60							
65							

Notes:

BORING #1
2 OF 2

Tighe&Bond
Engineers | Environmental Specialists

Boring No. **BL-2**
Page 1 of 2
File No. C23015.01
Checked by

Project: Chase Brook Park
Location: Yarmouth, MA
Client: Town of Yarmouth

Drilling Co.: Geologic - Earth Exploration, Inc.
Foreman: D. Jacobs
T&B Rep.: N/A
Date Start: 09/07/23 Date End: 09/07/23
Location See Exploration Location Plan
GS. Elev. Datum: NAVD88

	Casing	Sampler
Type		
I.D./O.D.	4" I.D.	1-3/8"/2"
Hammer Wt.	300#	140#
Hammer Fall	30"	30"
Rig		
Flush Joint		
Split Spoon		

Groundwater Readings

Date	Time	Depth	Casing	Sta. Time
09/07/23		2'		

Depth (ft.)	Casing Blows Per Ft.	Sample No. / Rec.(in)	Sample Depth (ft.)	Blows Per 6"	Sample Description	General Stratigraphy	Notes
		S1 / 12	0-2	1-3	S1: Loose, brown, fine to coarse SAND, moist	TOP SOIL 2'	
				4-6			
		S2 / 4	2-4	5-5	S2: Medium dense, brown, fine to coarse SAND, wet	SAND 4'	
				6-4			
		S3 / 3	4-6	2-2	S3: Loose, brown, coarse SAND and GRAVEL, wet	SAND AND GRAVEL 6'	
5				5-4			
		S4 / 6	6-8	5-6	S4: Medium dense, gray, coarse SAND, trace roots, wet		
				5-7			
		S5 / 12	8-10	8-9	S5: Medium dense, brown, coarse SAND, wet		
10				9-7			
		S6 / 8	14-16	5-5	S6: Medium dense, gray, coarse SAND, trace roots, wet	SAND	
15				4-5			
		S7 / 10	19-21	4-5	S7: Medium dense, light brown, fine to coarse SAND, wet		
20				7-9			
		S8 / 24	24-26	3-4	S8: Stiff, gray, CLAY, wet	24'	
25				6-7		CLAY	
30		S9 / 12	29-31	17-24		29'	

Notes:

Proportions Used

TRACE (TR.)	0 - <10%
LITTLE (LI.)	10 - <20%
SOME (SO.)	20 - <35%
AND	35 - <50%

Density/Consistency

VERY LOOSE	0-4	VERY SOFT	<2
LOOSE	4-10	SOFT	2-4
MEDIUM DENSE	10-30	MEDIUM	4-8
DENSE	30-50	STIFF	8-15
VERY DENSE	>50	VERY STIFF	15-30

BORING #2
1 OF 2

Tighe&Bond
Engineers | Environmental Specialists

Boring No. **BL-2**
Page 2 of 2
File No. C23015.01
Checked by:

Project: Chase Brook Park
Location: Yarmouth, MA
Client: Town of Yarmouth

Depth (ft.)	Casing Blows Per Ft.	Sample No. / Rec.(in)	Sample Depth (ft.)	Blows Per 6"	Sample Description	General Stratigraphy	Notes
30				26-31	S9: Dense, gray, coarse SAND, wet		
		S10 / 18	34-36	8-11	S10: Medium dense, gray, fine SAND, little Silt, wet	SAND	
35				10-12			
		S11 / 8	39-41	12-17	S11: Dense, gray, fine to coarse SAND, wet		
40				16-19		41'	
					Exploration terminated at 41 feet		
45							
50							
55							
60							
65							

Notes:

BORING #2
2 OF 2

Tighe&Bond

COMMONWEALTH OF MASSACHUSETTS
DENNIS G. MORAN
CIVIL
No. 53931
REGISTERED PROFESSIONAL ENGINEER
11-20-25

COMMONWEALTH OF MASSACHUSETTS
BRIAN S. HUNTLEY
CIVIL
No. 46273
REGISTERED PROFESSIONAL ENGINEER
11-2025

NOT FOR CONSTRUCTION

Chase Brook Park Restoration & Bridge Construction

Town of Yarmouth

Yarmouth, Massachusetts

MARK	DATE	DESCRIPTION
5	11/26/2025	ISSUED FOR BID
4	11/19/2025	REV. PER TOWN COMMENTS
3	11/7/2025	REV. PER TOWN COMMENTS
2	10/15/2025	REV. PER TOWN COMMENTS
1	8/29/2025	DRAFT ISSUED FOR BIDDING

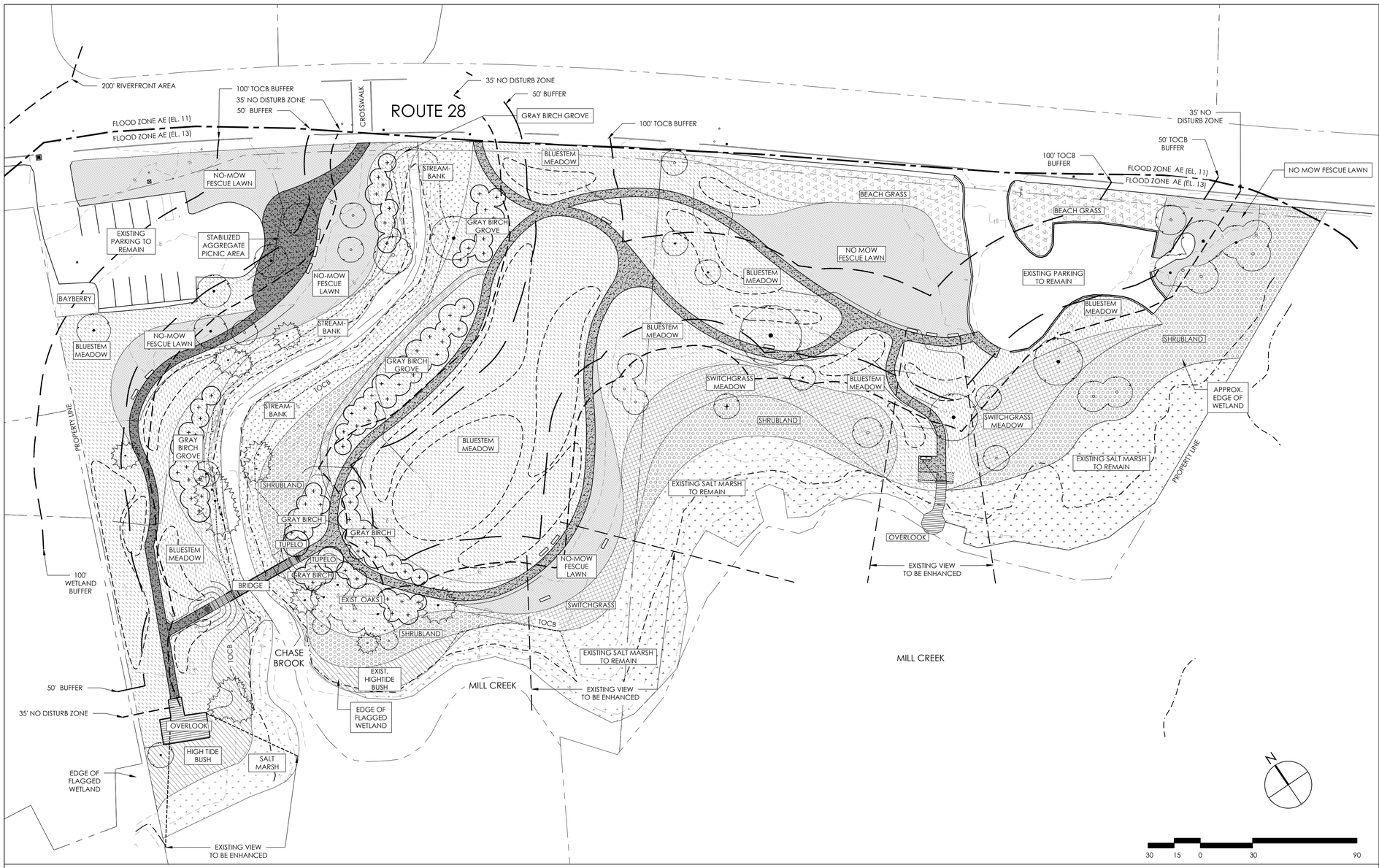
PROJECT NO:	C23015-01
DATE:	AUGUST 29, 2025
FILE:	C23015-01-G-BRDR.dwg
DRAWN BY:	MAB/CJK/NSC
DESIGNED/CHECKED BY:	DGM
APPROVED BY:	BSH

BORING LOCATION PLAN & BORING LOGS SHEET

SCALE: AS SHOWN

C-601

Last Saved: 11/26/2025
Printed: 11/26/2025 - 10:42am By: CKrzcuik
Tighe & Bond:J:_Coastal\Projects\C23\C23015.01 - Town of Yarmouth - WFM\Drawings\AutoCAD\Xref\C23015-01-G-BRDR.dwg



PRIOR TO PLANTING

Call DIGSAFE (1-888-344-7233) to locate existing utilities prior to any excavation. Protect existing utilities to remain throughout the construction process, and repair any damage at no cost to the Owner.

SILT FENCE:
Silt fence between areas of site disturbance and resource areas to be maintained in good repair until vegetation has been established.

TREE PROTECTION:
All existing trees that are not being removed are to be protected from construction activity. Tree protection fencing for trees in areas of site disturbance to be maintained in good repair until restoration work is complete. (See Tree Protection Specifications and Detail **(1/L-401).**

RESTORATION AND MAINTENANCE:
Refer to Demolition / Removal Plans, Specifications, and Land Management Plan by Crawford Land Management for additional protocol on site preparation and maintenance.

PLANT INSTALLATION
Refer to Planting Detail Sheet ***L-402*** *and Planting Specifications for installation protocol.*

SUPPLEMENTAL IRRIGATION:
Install a temporary, above-ground irrigation system to provide supplemental water to all plantings for 2-3 growing seasons, or until plants are fully established. New Trees and shrubs to be supplied with temporary drip system. No Mow Fescue and Meadow Areas to be set up with temporary spray system. Irrigation to be monitored and adjusted for seasonal variances. **(See Irrigation specifications)**

RESTORATION PLANTING LAYOUT NOTES

1. Locate, protect, and maintain bench marks, monuments, control points, and project engineering reference points. Re-establish disturbed or destroyed items at Contractor's expense.
2. Examine the areas and conditions under which site work is performed. Report any discrepancies with the plan to the Landscape Architect. Do not proceed with the work until unsatisfactory conditions are corrected.
3. Report discrepancies in drawings or specifications to the Landscape Architect for clarifications and adjustments before commencing work. Any deviations or changes from these drawings without written acceptance of the Landscape Architect shall obsolve the Landscape Architect of any and all responsibility of said deviation and change.
4. Contractor to mark edges of proposed plant communities in field for Landscape Architect review and approval prior to installation.
5. Existing and proposed tree and shrub locations are approximate and may be slightly adjusted in the field to accommodate existing, healthy native vegetation.
6. Written dimensions take precedence over scaled dimensions.
7. Dimensions indicated on plans are for horizontal control and are accurate if measured on a level line. Measure horizontal control dimensions on a level line, not parallel with ground slope.
8. All dimensions taken from vertical surfaces, i.e. curbs & walls, are understood to be measured from the face of the vertical element unless otherwise specified.

CONTRACTOR QUALIFICATIONS:

Invasive species removal and Planting Restoration work should only be completed by a company that specializes in natural resource management/ecological restoration work with a proven track record of successful invasive species management and restoration projects.

All work should be overseen by a Certified Ecological Restoration Practitioner as certified by the Society for Ecological Restoration.

All tree work should be completed or overseen by a licensed arborist.

All machine work should be completed by an insured operator with the appropriate hoisting and hydraulics licenses.

All herbicide applications should be completed by Massachusetts state-licensed and insured applicators that have extensive knowledge of native / invasive species and are able to identify species in bare twig conditions.

LEGEND

- NO-MOW / FESCUE LAWN
- BLUESTEM MEADOW
- SWITCHGRASS MEADOW
- STREAMBANK RESTORATION
- NATIVE SHRUBLAND
- BENCH LOCATION
- EXISTING HIGHTIDE BUSH TO REMAIN
- EXISTING SALT MARSH TO REMAIN
- STABILIZED AGGREGATE WALKWAY/SEATING AREA
- MULCHED PATH
- WILDFLOWER DRIFT (WITHIN MEADOW)
- EXISTING SURVEYED EVERGREEN TREE
- EXISTING UNSURVEYED EVERGREEN TREE
- EXISTING SURVEYED DECIDUOUS TREE
- EXISTING UNSURVEYED DECIDUOUS TREE OR LARGE SHRUB
- PROPOSED TREES

ABBREVIATIONS - ALL SHEETS

@	AT	LP	LOW POINT
ARCH	ARCHITECT	MH	MANHOLE
B&B	BALL AND BURLAP	MAX	MAXIMUM
CAL	CALIPER	MFTR	MANUFACTURER
CB	CATCH BASIN	MIN	MINIMUM
CJ	CONTROL JOINT	NIC	NOT IN CONTRACT
CL	CENTER LINE	NTS	NOT TO SCALE
CLR	CLEARANCE	OC	ON CENTER
CO	CLEAN OUT	OD	OUTSIDE DIAMETER
CONC	CONCRETE	PA	PLANTING AREA
CONT	CONTINUOUS	±	PLUS OR MINUS
Ø	DIAMETER	PC	POINT OF CURVATURE
DTL	DETAIL	PERF	PERFORATED
DWG/S	DRAWING/S	POB	POINT OF BEGINNING
EA	EACH	POC	POINT OF CONNECTION
ELECT	ELECTRICAL	PSI	POUNDS PER SQUARE INCH
EOP	EDGE OF PAVEMENT	PT	POINT OF TANGENCY
EQ	EQUAL	R	RADIUS
EW	EACH WAY	ROW	RIGHT OF WAY
FG	FINISH GRADE	SS	STAINLESS STEEL
FS	FINISH SURFACE	STRUC	STRUCTURAL
GB	GRADE BREAK	STD	STANDARD
HORIZ	HORIZONTAL	STL	STEEL
HP	HIGH POINT	TYP	TYPICAL
INV	INVERT	UON	UNLESS OTHERWISE NOTED
JT	JOINT	VEH	VEHICULAR
LA	LANDSCAPE ARCHITECT	VIF	VERIFY IN FIELD
LONGIT	LONGITUDINAL	W/	WITH
LOW	LIMIT OF WORK		

CRAWFORD LAND MANAGEMENT
JENICK STUDIO
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www.jenickstudio.com | 508.477.1346

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NO.	DATE:	REVISION:	BY:

ENGINEER / SURVEYOR
Tighe & Bond
53 Southampton Road
Westfield, MA 01085
413.562.1600
Tighebond.com

NOT FOR CONSTRUCTION (ISSUED FOR BID)

ALL SITEWORK MUST COMPLY WITH CONDITIONS OUTLINED BY THE STATE OF MASSACHUSSETTS AND YARMOUTH CONSERVATION COMMISSION PER ORDER OF CONDITIONS (MassDEP File #083-2410)

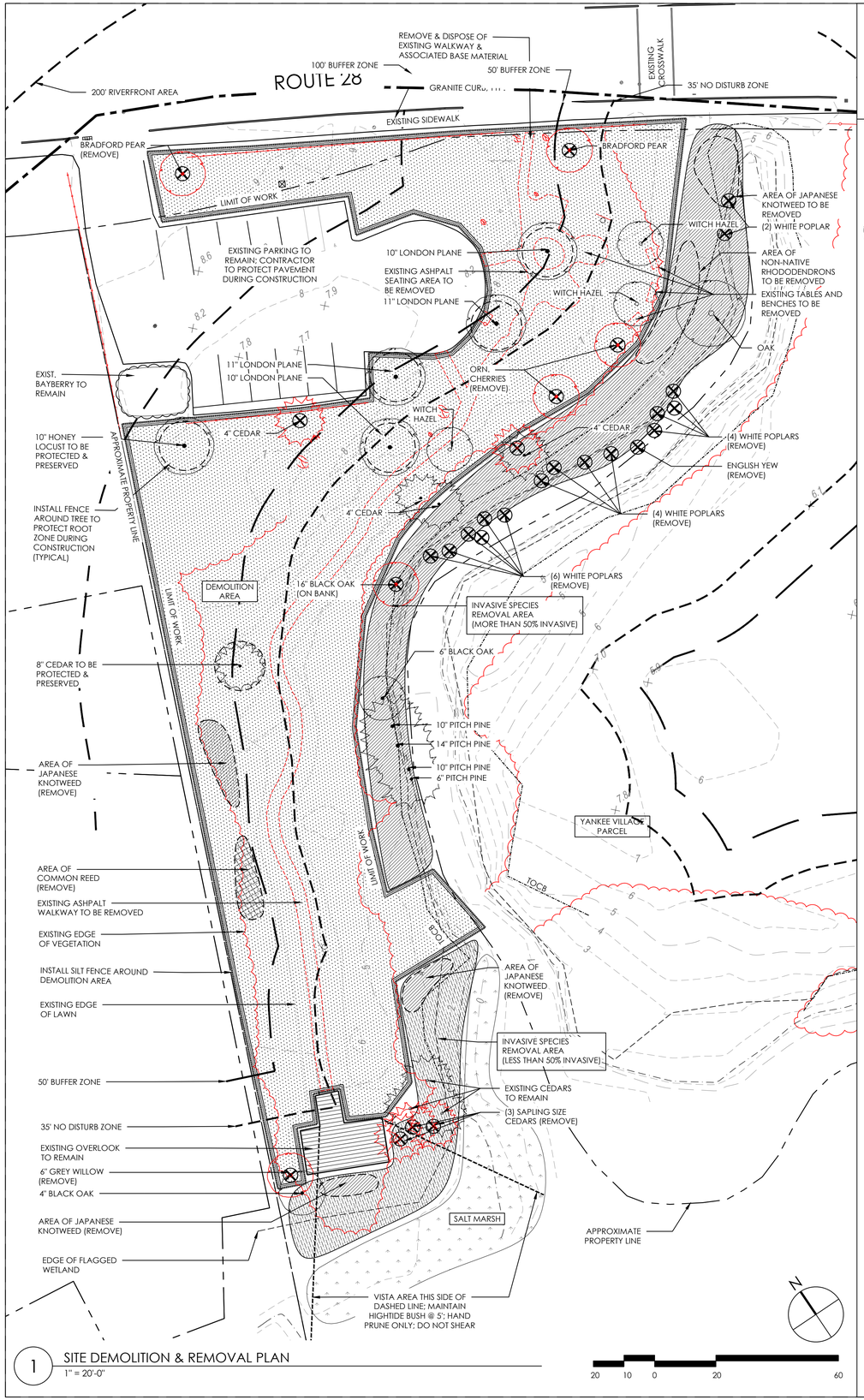
THE PURPOSE OF THIS PLAN IS FOR IMPLEMENTATION OF A PLANTING RESTORATION STRATEGY. REFER TO SPECIFICATIONS AND LAND MANAGEMENT PLAN BY CRAWFORD LAND MANAGEMENT FOR ADDITIONAL PLANTING AND INVASIVE MANAGEMENT PROTOCOL .

TOWN OF YARMOUTH
CHASE BROOK PARK RESTORATION
261, 275 & 281 MA-28
WEST YARMOUTH, MA 02673

MASTERPLAN (PLANTING OVERVIEW)

SCALE: 1" = 30'
DATE: 11/19/2025

L-101



1 SITE DEMOLITION & REMOVAL PLAN
1" = 20'-0"

THE SURVEY INFORMATION SHOWN ON THESE PLANS IS LIMITED. SIGNIFICANT TREE LOCATIONS, UTILITIES AND PROPERTY LINES SHOULD BE VERIFIED PRIOR TO ANY WORK TAKING PLACE IN CLOSE PROXIMITY TO THOSE ITEMS.

THE PURPOSE OF THIS PLAN IS FOR THE IMPLEMENTATION OF A LAND MANAGEMENT PLAN AND ASSOCIATED LANDSCAPE FEATURES.

LEGEND

- **EXISTING TREE TO BE REMOVED (APPROXIMATE LOCATION)**
- **EXISTING TREE WITHIN DEMOLITION AREA TO BE PRESERVED WITH TREE PROTECTION FENCING (SEE NOTES THIS PAGE)**
- **EXISTING SURVEYED EVERGREEN TREE TO REMAIN. PROTECT FROM CONSTRUCTION ACTIVITY**
- **APPROXIMATE LOCATION OF EXISTING UNSURVEYED EVERGREEN TREE TO REMAIN. PROTECT FROM CONSTRUCTION ACTIVITY.**
- **EXISTING SURVEYED DECIDUOUS TREE TO REMAIN. PROTECT FROM CONSTRUCTION ACTIVITY.**
- **APPROXIMATE LOCATION OF EXISTING UNSURVEYED DECIDUOUS TREE OR LARGE SHRUB TO REMAIN. PROTECT FROM CONSTRUCTION ACTIVITY**
- **LIMIT OF CONSTRUCTION WORK**
- **SILT FENCE**
- **EXISTING SPLIT RAIL FENCE**
- **PROPERTY LINE**
- **EXISTING CONTOUR**
- **EXISTING SPOT ELEVATION**
- **EXISTING HARDSCAPE OR SITE FEATURE TO BE REMOVED**
- **DEMOLITION AREA: REMOVE WALKWAYS AND BENCHES, AND ANY OLD CONSTRUCTION DEBRIS AS NOTED ON TIGHE AND BOND PLANS. REMOVE ALL VEGETATION EXCEPT ITEMS NOTED TO BE PROTECTED, AND SOIL CONDITION FUTURE PLANTING AREAS.**
- **INVASIVE SPECIES MANAGEMENT AREA (LESS THAN 50% INVASIVE CONTENT)**
- **INVASIVE SPECIES REMOVAL AREA (MORE THAN 50% INVASIVE CONTENT)**
- **EXISTING SALT MARSH TO REMAIN**
- **PHRAGMITES AUSTRALIS (COMMON REED) TO BE REMOVED**
- **EXISTING EDGE OF VEGETATION**

DEMOLITION & SITE PREPARATION NOTES:

Call DIGSAFE (1-888-344-7233) to locate existing utilities prior to any excavation. Protect existing utilities to remain throughout the construction process, and repair any damage at no cost to the Owner.

Orange construction fencing supported on steel or hardwood stakes 5' to 8' O.C. at the drip-line shall be used to protect trees, shrubs and other plantings as indicated on plan. Fencing is to be kept in good repair throughout the construction process. In areas where the entire root zone cannot be encompassed, a 3" layer of untreated/un-dyed wood chips is to be placed to reduce soil compaction. In areas where trenching or excavation cannot be avoided, the roots shall be cut by hand to encourage callusing and healing. Grading around trees to be preserved shall not exceed an increase of 3". **See Tree Protection Detail 1/L4.1.**

Utilities noted on drawing are illustrative. Contractor to take extreme precaution during demolition work.

Existing water line to be maintained and protected along with all existing spigots.

A soil compaction meter will be used to determine if soils have been compacted by previous demolition and grading activities. If they have, soils will be ripped to de-compact until compaction meter readings are acceptable. The restoration area will be soil conditioned, raked smooth and prepared for seeding with specified seed mix.

SITE GRADING:

Note - It is the contractor's responsibility to complete a thorough site investigation and to accommodate for grading modifications as necessary to ensure transitions from demolition areas to undisturbed adjacent areas are smooth and prepared for seeding. Areas of note are south of the existing parking where grading work needs to be completed in order to install the new aggregate trail. Contractor is responsible for ensuring all work maintains positive drainage with no low spots and that trails meet all ADA standards for slopes.

Provide samples of materials proposed for use for the review and approval of the Owner's Representative / Landscape Architect, including fill, topsoil, and pavements.

Promptly notify the Owner's Representative / Landscape Architect of unexpected sub-surface conditions. Contractor to set grade stakes showing lines and elevations for review and approval by the Landscape Architect/Restoration Designer prior to finish grading.

Perform grading within contract Limits of Construction, including adjacent transition areas, to new elevations, levels, profiles, and contours indicated. Provide subgrade surfaces parallel to finished surface grades. Provide uniform levels and slopes between new elevations and existing grades. Grade surfaces to prevent ponding and pockets of surface drainage.

Topsoil to be installed shall be natural, friable, fertile soil characteristic of productive soil in the vicinity, reasonably free of stones, clay lumps, roots, and other foreign matter. Do not use muddy topsoil. Place during dry weather. Allow for 4" average depth of topsoil.

Fine grade topsoil eliminating rough and low areas to ensure positive drainage. Maintain levels, profiles, and contours of subgrades.

Protect finish graded areas from traffic and erosion. Keep free of trash and debris. Repair and re-establish grades in settled, eroded, and damaged areas. Where completed areas are disturbed by restoration operations or adverse weather, scarify, re-shape, and compact to required density.

Upon completion of earthwork operation, clean areas within contract limits, remove tools, and equipment. Provide site clear, clean, free of debris, and suitable for further site work operations.

REFER TO SOIL PREPARATION DETAILS ON SHEET L-401

CONTRACTOR QUALIFICATIONS:

Restoration work should only be completed by a company that specializes in natural resource management/ecological restoration work with a proven track record of successful invasive species management and restoration projects.

All work should be overseen by a Certified Ecological Restoration Practitioner as certified by the Society for Ecological Restoration.

All tree work should be completed or overseen by a licensed arborist.

All machine work should be completed by an insured operator with the appropriate hoisting and hydraulics licenses.

All herbicide applications should be completed by Massachusetts state-licensed and insured applicators that have extensive knowledge of native / invasive species and are able to identify species in bare twig conditions.

INVASIVE, NON-NATIVE & SELECTIVE SPECIES REMOVALS:

NO HERBICIDES SHALL BE APPLIED FROM APRIL 1 TO JUNE 30TH OF ANY YEAR PER INSTRUCTION OF THE MASSACHUSETTS DIVISION OF MARINE FISHERIES (MA DMF)

**Note - The invasive species treatment and removals should be completed between the months of September to April; refer to individual species section notes for Phragmites & Japanese knotweed treatment timelines.*

TYPICAL INVASIVE AND AGGRESSIVE VEGETATION NOTED FOR REMOVAL:
Flush cut invasive, non-native and aggressive tree, shrub & vine species and treat w/ herbicide to prevent re-sprouting. Do not pull tree stumps; root grapple vines and shrubs where feasible. **Leave all soils intact and undisturbed in areas of Japanese knotweed. Leave all native species in place unless otherwise noted.** Dispose of all debris off-site.

After vegetation is removed, seed all exposed soils w/ native seed mix according to the plan, and cover areas with slopes greater than 3:1 with bio-degradable erosion control blankets and untreated hardwood eco-stakes. Install per manufacturer's instructions. In areas where slope is less than 3:1, cover with sterile chopped straw & install biodegradable wattles where runs are greater than 50' distances to prevent erosion potential before seed germination.

JAPANESE KNOTWEED (Fallopia japonica):
Inject Japanese knotweed during late August through October, weather dependent. Dispose of all debris off-site. Leave all soils containing Japanese knotweed undisturbed. Seed all exposed soils w/ native seed mix and cover with sterile chopped straw. DO NOT use erosion control blankets on areas with knotweed. If slopes are greater than 3:1, stake bio-degradable wattles in place perpendicular to slope every 20'-30' to help prevent erosion while seed is establishing.

In the following growing seasons, treat returning stalks with a stem injection method as needed if they are large enough diameter to treat. If the re-growth is too small, treat using a selective foliar application or a swipe application.

**** Note: Knotweed areas may need to be over-seeded multiple times in the coming seasons to establish a vegetated groundcover.***

PHRAGMITES (Phragmites australis):
Mow dead stalks when dormant (if feasible) and dispose of off-site. For the first treatment, bundle, cut, and treat cut ends of stalks w/ wetland approved herbicide during September. If stalks are sparse, cut individually and treat. Mow dead stalks during dormant season following initial treatment. Manage any Phragmites re-growth in following seasons by using either the same cut and wipe method or a swipe method to stalks and leaves during the summer/early fall months until Phragmites is eradicated from the project area.

SEEDING & PLANTING INFORMATION:
Refer to Restoration Planting Plan for planting specifications and seed mixes.

MATERIAL INFORMATION:
All erosion control measures used for the project should be 100% biodegradable. No materials that contain polypropylene or similar nettings or content shall be allowed.

FOLLOW-UP RESTORATION MAINTENANCE FOR INVASIVE SPECIES:
Monitor restoration areas and perform maintenance cut and wipe or selective foliar treatments or hand weed invasive, non-native, aggressive species that have germinated from existing seed bank, or re-sprouted from roots after removal. Site will be monitored and maintained throughout the year for both cool season and warm season invasive, non-native, and aggressive species. Maintain areas of Japanese knotweed and Phragmites reed as specified above.

MEADOW ESTABLISHMENT (3 YEARS MINIMUM):

Year 1 Maintenance: (for areas without wildflower plugs, or until wildflower plugs are installed)

Mow seeded areas to a height of six to eight inches when annual weeds are in flower or reach a height of 10 to 12 inches (often this occurs in June), before weeds set seed. Use a string trimmer on small areas and an off-set flail mower on larger areas. Do not mow past mid-September. If weed emergence is minimal, weeds may be hand pulled or spot treated with an appropriate herbicide. Treat any invasive species according to the Land Management plan. In the fall of the first growing season, maintain the vegetation at 8 to 10 inches through the winter. In areas where wildflower plugs are installed (or at the time plugs are installed), maintenance will switch from strictly a mowing routine to hand weeding and/or spot treatment routine for annual weeds and resprouting or newly germinating invasive species.

Year 2 Maintenance:

During the spring of the second year, mow any standing vegetation in April to a height of 2" to allow soil to warm more quickly to stimulate the emergence and growth of native seed. Rake off the cuttings. A second or third mowing may be required depending on weed species composition. Problem weeds should be hand pulled or spot sprayed with an approved herbicide.

Year 3+ Maintenance:

Mow once each year in April. Do not mow in fall. Leave meadow standing until the following spring for the annual mowing in April.

Continue to monitor for invasive weeds and remove problematic species before they colonize.

CRAWFORD LAND MANAGEMENT
JENICK STUDIO
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NO.	DATE:	REVISION:	BY:

ENGINEER / SURVEYOR
Tighe & Bond
53 Southampton Road
Westfield, MA 01085
413.562.1600
Tighebond.com

NOT FOR CONSTRUCTION (ISSUED FOR BID)

ALL SITEWORK MUST COMPLY WITH CONDITIONS OUTLINED BY THE STATE OF MASSACHUSSETTS AND YARMOUTH CONSERVATION COMMISSION PER ORDER OF CONDITIONS (MassDEP File #083-2410)

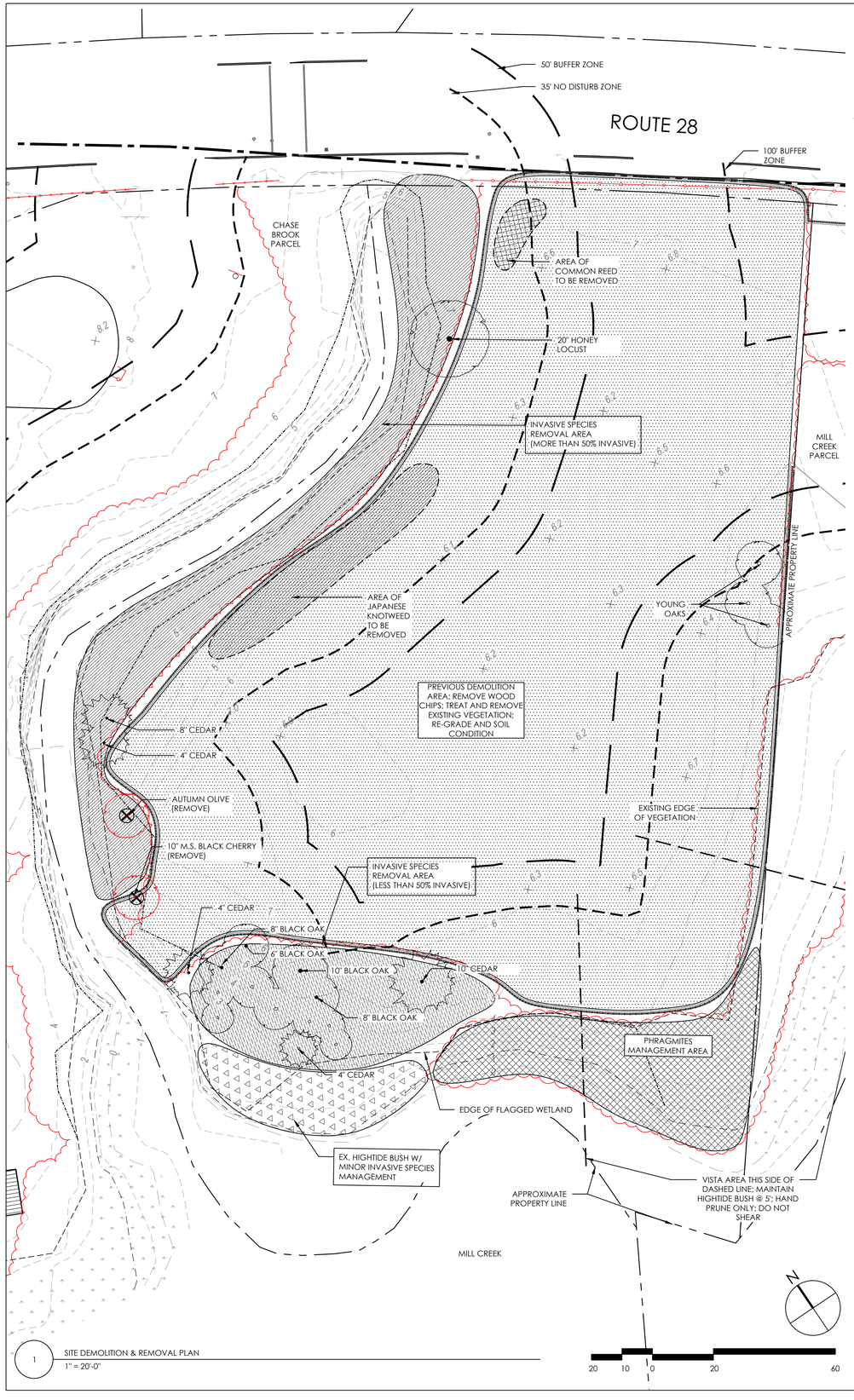
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TOWN OF YARMOUTH
CHASE BROOK PARCEL
261 MA-28
WEST YARMOUTH, MA 02673

DEMOLITION / REMOVAL PLAN

SCALE: AS NOTED
DATE: 11/19/2025

L-201



1 SITE DEMOLITION & REMOVAL PLAN
1" = 20'-0"

THE SURVEY INFORMATION SHOWN ON THESE PLANS IS LIMITED. SIGNIFICANT TREE LOCATIONS, UTILITIES AND PROPERTY LINES SHOULD BE VERIFIED PRIOR TO ANY WORK TAKING PLACE IN CLOSE PROXIMITY TO THOSE ITEMS.

THE PURPOSE OF THIS PLAN IS FOR THE IMPLEMENTATION OF A LAND MANAGEMENT PLAN AND ASSOCIATED LANDSCAPE FEATURES.

LEGEND

- **EXISTING TREE TO BE REMOVED (APPROXIMATE LOCATION)**
- **EXISTING TREE WITHIN DEMOLITION AREA TO BE PRESERVED WITH TREE PROTECTION FENCING (SEE NOTES THIS PAGE)**
- **EXISTING SURVEYED EVERGREEN TREE TO REMAIN. PROTECT FROM CONSTRUCTION ACTIVITY**
- **APPROXIMATE LOCATION OF EXISTING UNSURVEYED EVERGREEN TREE TO REMAIN. PROTECT FROM CONSTRUCTION ACTIVITY.**
- **EXISTING SURVEYED DECIDUOUS TREE TO REMAIN. PROTECT FROM CONSTRUCTION ACTIVITY.**
- **APPROXIMATE LOCATION OF EXISTING UNSURVEYED DECIDUOUS TREE OR LARGE SHRUB TO REMAIN. PROTECT FROM CONSTRUCTION ACTIVITY**
- **LIMIT OF CONSTRUCTION WORK**
- **SILT FENCE**
- **EXISTING SPLIT RAIL FENCE**
- **PROPERTY LINE**
- **EXISTING CONTOUR**
- **EXISTING SPOT ELEVATION**
- **EXISTING HARDSCAPE OR SITE FEATURE TO BE REMOVED**
- **DEMOLITION AREA: REMOVE WALKWAYS AND BENCHES AS NOTED, AND ANY OLD CONSTRUCTION DEBRIS. REMOVE ALL VEGETATION EXCEPT ITEMS NOTED TO BE PROTECTED, AND SOIL CONDITION FUTURE PLANTING AREAS.**
- **INVASIVE SPECIES MANAGEMENT AREA (LESS THAN 50% INVASIVE CONTENT)**
- **INVASIVE SPECIES REMOVAL AREA (MORE THAN 50% INVASIVE CONTENT)**
- **EXISTING SALT MARSH TO REMAIN**
- **PHRAGMITES AUSTRALIS (COMMON REED) TO BE REMOVED**
- **EXISTING EDGE OF VEGETATION**
- **EXISTING PREDOMINANTLY NATIVE VEGETATION TO REMAIN**
- **EXISTING SALT MARSH TO REMAIN**

DEMOLITION & SITE PREPARATION NOTES:

Call DIGSAFE (1-888-344-7233) to locate existing utilities prior to any excavation. Protect existing utilities to remain throughout the construction process, and repair any damage at no cost to the Owner.

Orange construction fencing supported on steel or hardwood stakes 5' to 8' O.C. at the drip-line shall be used to protect trees, shrubs and other plantings as indicated on plan. Fencing is to be kept in good repair throughout the construction process. In areas where the entire root zone cannot be encompassed, a 3" layer of untreated/un-dyed wood chips is to be placed to reduce soil compaction. In areas where trenching or excavation cannot be avoided, the roots shall be cut by hand to encourage callusing and healing. Grading around trees to be preserved shall not exceed an increase of 3". **See Tree Protection Detail 1/L4.1.**

Utilities noted on drawing are illustrative. Contractor to take extreme precaution during demolition work.

Existing water line to be maintained and protected along with all existing spigots.

A soil compaction meter will be used to determine if soils have been compacted by previous demolition and grading activities. If they have, soils will be ripped to de-compact until compaction meter readings are acceptable. The restoration area will be soil conditioned, raked smooth and prepared for seeding with specified seed mix.

SITE GRADING:

Note - It is the contractor's responsibility to complete a thorough site investigation and to accommodate for grading modifications as necessary to ensure transitions from demolition areas to undisturbed adjacent areas are smooth and prepared for seeding. Areas of note are south of the existing parking where grading work needs to be completed in order to install the new aggregate trail. Contractor is responsible for ensuring all work maintains positive drainage with no low spots and that trails meet all ADA standards for slopes.

Provide samples of materials proposed for use for the review and approval of the Landscape Architect/Restoration Designer, including fill, topsoil, and pavements.

Promptly notify the Landscape Architect/Restoration Designer of unexpected sub-surface conditions. Contractor to set grade stakes showing lines and elevations for review and approval by the Landscape Architect/Restoration Designer prior to finish grading.

Perform grading within contract Limits of Construction, including adjacent transition areas, to new elevations, levels, profiles, and contours indicated. Provide subgrade surfaces parallel to finished surface grades. Provide uniform levels and slopes between new elevations and existing grades. Grade surfaces to prevent ponding and pockets of surface drainage.

Topsoil to be installed shall be natural, friable, fertile soil characteristic of productive soil in the vicinity, reasonably free of stones, clay lumps, roots, and other foreign matter. Do not use muddy topsoil. Place during dry weather. Allow for 4" average depth of topsoil.

Fine grade topsoil eliminating rough and low areas to ensure positive drainage. Maintain levels, profiles, and contours of subgrades.

Protect finish graded areas from traffic and erosion. Keep free of trash and debris. Repair and re-establish grades in settled, eroded, and damaged areas. Where completed areas are disturbed by restoration operations or adverse weather, scarify, re-shape, and compact to required density.

Upon completion of earthwork operation, clean areas within contract limits, remove tools, and equipment. Provide site clear, clean, free of debris, and suitable for further site work operations.

REFER TO SOIL PREPARATION DETAILS ON SHEET L-401

CONTRACTOR QUALIFICATIONS:

Restoration work should only be completed by a company that specializes in natural resource management/ecological restoration work with a proven track record of successful invasive species management and restoration projects.

All work should be overseen by a Certified Ecological Restoration Practitioner as certified by the Society for Ecological Restoration.

All tree work should be completed or overseen by a licensed arborist.

All machine work should be completed by an insured operator with the appropriate hoisting and hydraulics licenses.

All herbicide applications should be completed by Massachusetts state-licensed and insured applicators that have extensive knowledge of native / invasive species and are able to identify species in bare twig conditions.

INVASIVE, NON-NATIVE & SELECTIVE SPECIES REMOVALS:

NO HERBICIDES SHALL BE APPLIED FROM APRIL 1 TO JUNE 30TH OF ANY YEAR PER INSTRUCTION OF THE MASSACHUSETTS DIVISION OF MARINE FISHERIES (MA DMF)

**Note - The invasive species treatment and removals should be completed between the months of September to April; refer to individual species section notes for Phragmites & Japanese knotweed treatment timelines.*

TYPICAL INVASIVE AND AGGRESSIVE VEGETATION NOTED FOR REMOVAL:
Flush cut invasive, non-native and aggressive tree, shrub & vine species and treat w/ herbicide to prevent re-sprouting. Do not pull tree stumps; root grapple vines and shrubs where feasible. **Leave all soils intact and undisturbed in areas of Japanese knotweed. Leave all native species in place unless otherwise noted.** Dispose of all debris off-site.

After vegetation is removed, seed all exposed soils w/ native seed mix according to the plan, and cover areas with slopes greater than 3:1 with bio-degradable erosion control blankets and untreated hardwood eco-stakes. Install per manufacturer's instructions. In areas where slope is less than 3:1, cover with sterile chopped straw & install biodegradable wattles where runs are greater than 50' distances to prevent erosion potential before seed germination.

JAPANESE KNOTWEED (Fallopia japonica):
Inject Japanese knotweed during late August through October, weather dependent. Dispose of all debris off-site. Leave all soils containing Japanese knotweed undisturbed. Seed all exposed soils w/ native seed mix and cover with sterile chopped straw. DO NOT use erosion control blankets on areas with knotweed. If slopes are greater than 3:1, stake bio-degradable wattles in place perpendicular to slope every 20'-30' to help prevent erosion while seed is establishing.

In the following growing seasons, treat returning stalks with a stem injection method as needed if they are large enough diameter to treat. If the re-growth is too small, treat using a selective foliar application or a swipe application.

**** Note: Knotweed areas may need to be over-seeded multiple times in the coming seasons to establish a vegetated groundcover.***

PHRAGMITES (Phragmites australis):
Mow dead stalks when dormant (if feasible) and dispose of off-site. For the first treatment, bundle, cut, and treat cut ends of stalks w/ wetland approved herbicide during September. If stalks are sparse, cut individually and treat. Mow dead stalks during dormant season following initial treatment. Manage any Phragmites re-growth in following seasons by using either the same cut and wipe method or a swipe method to stalks and leaves during the summer/early fall months until Phragmites is eradicated from the project area.

SEEDING & PLANTING INFORMATION:
Refer to Restoration Planting Plan for planting specifications and seed mixes.

MATERIAL INFORMATION:
All erosion control measures used for the project should be 100% biodegradable. No materials that contain polypropylene or similar nettings or content shall be allowed.

FOLLOW-UP RESTORATION MAINTENANCE FOR INVASIVE SPECIES:
Monitor restoration areas and perform maintenance cut and wipe or selective foliar treatments or hand weed invasive, non-native, aggressive species that have germinated from existing seed bank, or re-sprouted from roots after removal. Site will be monitored and maintained throughout the year for both cool season and warm season invasive, non-native, and aggressive species. Maintain areas of Japanese knotweed and Phragmites reed as specified above.

MEADOW ESTABLISHMENT (3 YEARS MINIMUM):

Year 1 Maintenance: (for areas without wildflower plugs, or until wildflower plugs are installed)

Mow seeded areas to a height of six to eight inches when annual weeds are in flower or reach a height of 10 to 12 inches (often this occurs in June), before weeds set seed. Use a string trimmer on small areas and an off-set flail mower on larger areas. Do not mow past mid-September. If weed emergence is minimal, weeds may be hand pulled or spot treated with an appropriate herbicide. Treat any invasive species according to the Land Management plan. In the fall of the first growing season, maintain the vegetation at 8 to 10 inches through the winter. In areas where wildflower plugs are installed (or at the time plugs are installed), maintenance will switch from strictly a mowing routine to hand weeding and/or spot treatment routine for annual weeds and resprouting or newly germinating invasive species.

Year 2 Maintenance:

During the spring of the second year, mow any standing vegetation in April to a height of 2" to allow soil to warm more quickly to stimulate the emergence and growth of native seed. Rake off the cuttings. A second or third mowing may be required depending on weed species composition. Problem weeds should be hand pulled or spot sprayed with an approved herbicide.

Year 3+ Maintenance:

Mow once each year in April. Do not mow in fall. Leave meadow standing until the following spring for the annual mowing in April.

Continue to monitor for invasive weeds and remove problematic species before they colonize.

CRAWFORD LAND MANAGEMENT
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NOT FOR CONSTRUCTION (ISSUED FOR BID)

ALL SITEWORK MUST COMPLY WITH CONDITIONS OUTLINED BY THE STATE OF MASSACHUSSETTS AND YARMOUTH CONSERVATION COMMISSION PER ORDER OF CONDITIONS (MassDEP File #083-2410)

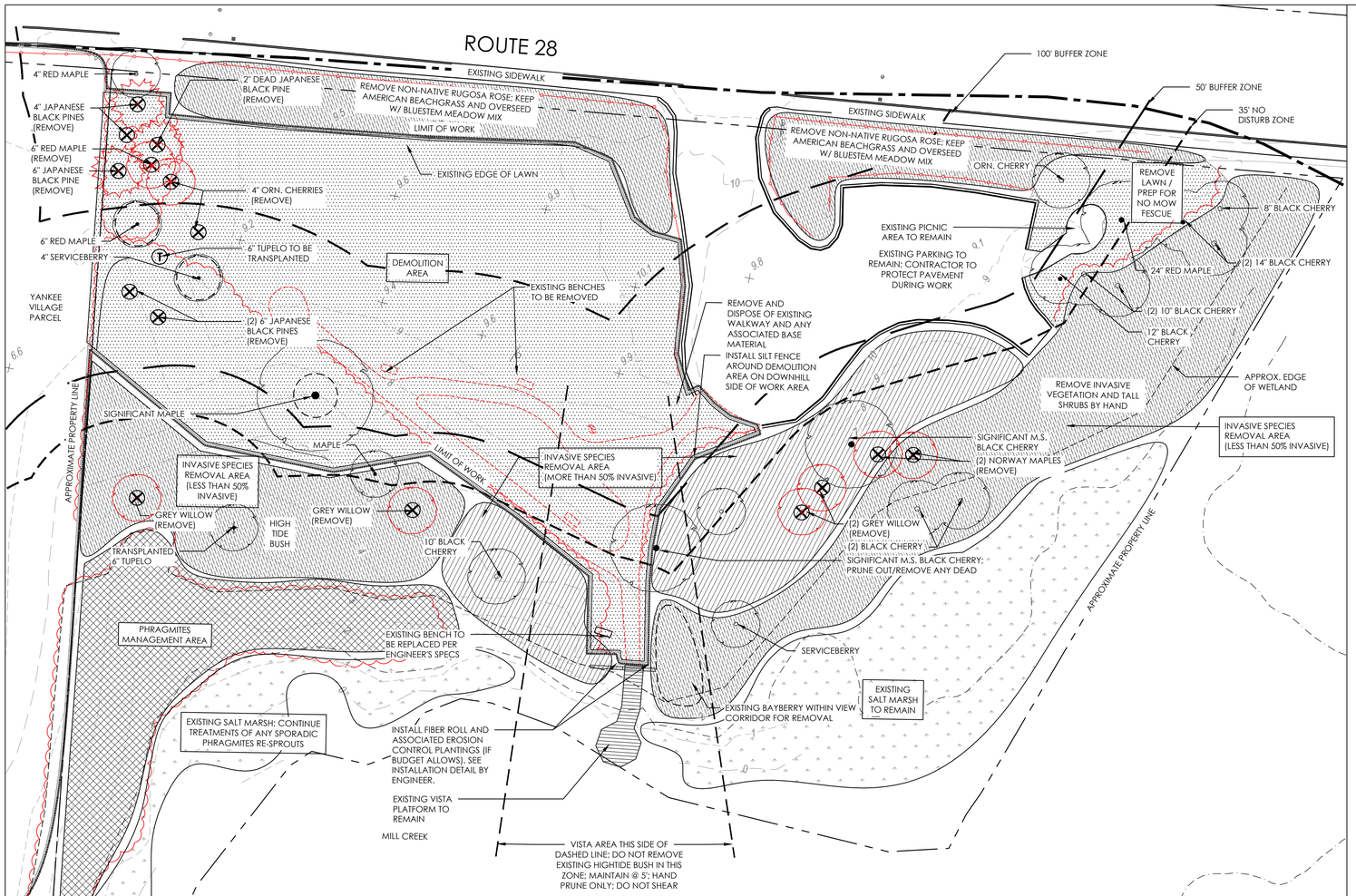
THE PURPOSE OF THIS PLAN IS FOR IMPLEMENTATION OF A PLANTING RESTORATION STRATEGY. REFER TO SPECIFICATIONS AND LAND MANAGEMENT PLAN BY CRAWFORD LAND MANAGEMENT FOR ADDITIONAL PLANTING AND INVASIVE MANAGEMENT PROTOCOL .

TOWN OF YARMOUTH
YANKEE VILLAGE PARCEL
275 MA-28
WEST YARMOUTH, MA 02673

DEMOLITION / REMOVAL PLAN

SCALE: 1" = 20'
DATE: 11/19/2025

L-202



THE SURVEY INFORMATION SHOWN ON THESE PLANS IS LIMITED. SIGNIFICANT TREE LOCATIONS, UTILITIES AND PROPERTY LINES SHOULD BE VERIFIED PRIOR TO ANY WORK TAKING PLACE IN CLOSE PROXIMITY TO THOSE ITEMS.

THE PURPOSE OF THIS PLAN IS FOR THE IMPLEMENTATION OF A LAND MANAGEMENT PLAN AND ASSOCIATED LANDSCAPE FEATURES.

1 SITE DEMOLITION & REMOVAL PLAN
1" = 20'-0"

LEGEND

- EXISTING TREE TO BE REMOVED (APPROXIMATE LOCATION)
- EXISTING TREE WITHIN DEMOLITION AREA TO BE PRESERVED WITH TREE PROTECTION FENCING (SEE NOTES THIS PAGE)
- EXISTING SURVEYED EVERGREEN TREE TO REMAIN. PROTECT FROM CONSTRUCTION ACTIVITY
- APPROXIMATE LOCATION OF EXISTING UNSURVEYED EVERGREEN TREE TO REMAIN. PROTECT FROM CONSTRUCTION ACTIVITY.
- EXISTING SURVEYED DECIDUOUS TREE TO REMAIN. PROTECT FROM CONSTRUCTION ACTIVITY.
- APPROXIMATE LOCATION OF EXISTING UNSURVEYED DECIDUOUS TREE OR LARGE SHRUB TO REMAIN. PROTECT FROM CONSTRUCTION ACTIVITY
- LIMIT OF CONSTRUCTION WORK
- SILT FENCE
- EXISTING SPLIT RAIL FENCE
- PROPERTY LINE
- EXISTING CONTOUR
- EXISTING SPOT ELEVATION
- EXISTING HARDSCAPE OR SITE FEATURE TO BE REMOVED
- DEMOLITION AREA: REMOVE WALKWAYS AND BENCHES AS NOTED, AND ANY OLD CONSTRUCTION DEBRIS. REMOVE ALL VEGETATION EXCEPT ITEMS NOTED TO BE PROTECTED, AND SOIL CONDITION FUTURE PLANTING AREAS.
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- EXISTING EDGE OF VEGETATION
- EXISTING PREDOMINANTLY NATIVE VEGETATION TO REMAIN
- EXISTING SALT MARSH TO REMAIN
- EXISTING TREE TO BE TRANSPLANTED
- FIBER ROLL EROSION CONTROL INSTALLATION

DEMOLITION & SITE PREPARATION NOTES:

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A soil compaction meter will be used to determine if soils have been compacted by previous demolition and grading activities. If they have, soils will be ripped to de-compact until compaction meter readings are acceptable. The restoration area will be soil conditioned, raked smooth and prepared for seeding with specified seed mix.

SITE GRADING:

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REFER TO SOIL PREPARATION DETAILS ON SHEET L-401

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In the following growing seasons, treat returning stalks with a stem injection method as needed if they are large enough diameter to treat. If the re-growth is too small, treat using a selective foliar application or a swipe application.

**** Note: Knotweed areas may need to be over-seeded multiple times in the coming seasons to establish a vegetated groundcover.***

PHRAGMITES (Phragmites australis):
Mow dead stalks when dormant (if feasible) and dispose of off-site. For the first treatment, bundle, cut, and treat cut ends of stalks w/ wetland approved herbicide during September. If stalks are sparse, cut individually and treat. Mow dead stalks during dormant season following initial treatment. Manage any Phragmites re-growth in following seasons by using either the same cut and wipe method or a swipe method to stalks and leaves during the summer/early fall months until Phragmites is eradicated from the project area.

SEEDING & PLANTING INFORMATION:
Refer to Restoration Planting Plan for planting specifications and seed mixes.

MATERIAL INFORMATION:
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Year 2 Maintenance:

During the spring of the second year, mow any standing vegetation in April to a height of 2" to allow soil to warm more quickly to stimulate the emergence and growth of native seed. Rake off the cuttings. A second or third mowing may be required depending on weed species composition. Problem weeds should be hand pulled or spot sprayed with an approved herbicide.

Year 3+ Maintenance:

Mow once each year in April. Do not mow in fall. Leave meadow standing until the following spring for the annual mowing in April.

Continue to monitor for invasive weeds and remove problematic species before they colonize.

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NO.	DATE:	REVISION:	BY:

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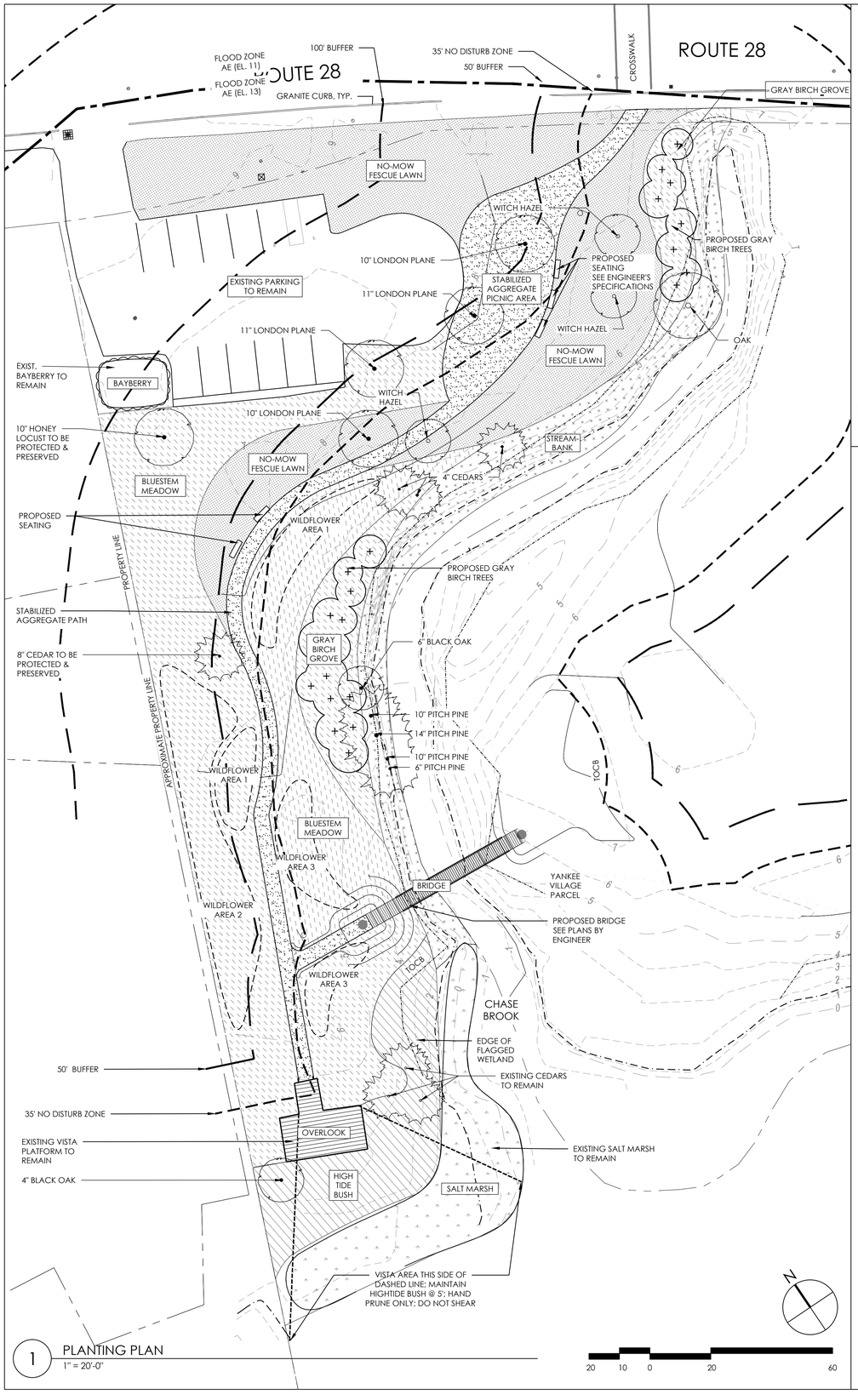
THE PURPOSE OF THIS PLAN IS FOR IMPLEMENTATION OF A PLANTING RESTORATION STRATEGY. REFER TO SPECIFICATIONS AND LAND MANAGEMENT PLAN BY CRAWFORD LAND MANAGEMENT FOR ADDITIONAL PLANTING AND INVASIVE MANAGEMENT PROTOCOL .

TOWN OF YARMOUTH
MILL CREEK PARCEL
281 MA-28
WEST YARMOUTH, MA 02673

DEMOLITION / REMOVAL PLAN

SCALE: 1" = 20'
DATE: 11/19/2025

L-203



1 PLANTING PLAN
1" = 20'-0"

LEGEND :

STABILIZED AGGREGATE AREA
Stabilized Aggregate Path (5' wide) - 2,020 +/- sf
Stabilized Aggregate Picnic Area - 1,520 +/- sf
(REFER TO ENGINEER'S PLANS & DETAILS)

EXISTING SURVEYED EVERGREEN TREE TO REMAIN. PROTECT FROM CONSTRUCTION ACTIVITY

APPROXIMATE LOCATION OF EXISTING UNSURVEYED EVERGREEN TREE TO REMAIN. PROTECT FROM CONSTRUCTION ACTIVITY.

EXISTING SURVEYED DECIDUOUS TREE TO REMAIN. PROTECT FROM CONSTRUCTION ACTIVITY.

APPROXIMATE LOCATION OF EXISTING UNSURVEYED DECIDUOUS TREE OR LARGE SHRUB TO REMAIN. PROTECT FROM CONSTRUCTION ACTIVITY

PROPOSED GRAY BIRCH TREES

PROPOSED BENCH LOCATION

WILDFLOWER AREA (AREA WITHIN SEEDED MEADOW TO BE SUPPLEMENTED WITH WILDFLOWERS)

EXISTING CONTOUR

PROPOSED CONTOUR

PROPOSED PLANT COMMUNITIES :

Bluestem Meadow - 12,950 +/- sf

	A	B	C	D	E	F
1	PLANT SCHEDULE					
2	SCIENTIFIC NAME	COMMON NAME	QUANTITY	SIZE	SPACING	NOTES
3	WILDFLOWER AREA 1 (850 sf)					
4	*Monarda fistulosa*	Wild Bergamot	200	DP50 Plugs	24" oc	100% of area
5	*Pycnanthemum incanum*	Hoary Mountain Mint	200	DP50 Plugs	24" oc	100% of area
6	*Symphyotrichum laeve*	Smooth Aster	850 sf	Seed	1 oz per 1000 sf	100% of area
7	WILDFLOWER AREA 2 (1620 sf)					
8	*Rhus typhina*	Staghorn Sumac	40	4'-6'	6' oc	100% of area
9	*Symphyotrichum ericoides*	Heath Aster	50	DP50 Plugs	24" oc	15% of area
10	WILDFLOWER AREA 3 (450 sf)					
11	*Allium cernuum*	Nodding Onion	150	DP50 Plugs	18" oc	100% of area
12	*Asclepias tuberosa*	Butterfly Weed	150	DP50 Plugs	18" oc	100% of area
13	*Penstemon pallidus*	Pale beardtongue	100	DP50 Plugs	18" oc	100% of area
14	*Symphyotrichum laeve*	Smooth Aster	450 sf	Seed	1 oz per 1000 sf	100% of area

SEEDING INFORMATION:
BLUESTEM MEADOW MIX by ERNST CONSERVATION SEEDS
General Product Information:
Tall grass meadow with cool season and warm season grasses.
Seed Rate: 20 lbs/acre
Species: Schizachyrium scoparium (Little Bluestem, Albany Pine Bush- NY Ecotype); Festuca brevipila (Hard Fescue, 'Jetty'); Festuca glauca (Blue Fescue, 'Azure'); Festuca ovina (Sheep Fescue)

Grey Birch Edgeland - 2,540 +/- sf
Seed with Bluestem Meadow Seed Mix. Install supplemental plants/seed per schedule below:

PLANT SCHEDULE					
SCIENTIFIC NAME	COMMON NAME	QUANTITY	SIZE	SPACING	NOTES
Aster divaricatus	White Wood Aster	100	DP50	30" oc	20% of area
Betula populifolia	Grey Birch	25	4'-6'	5' oc	100% of area
Betula populifolia	Grey Birch	25	3'-4'	5' oc	100% of area
Betula populifolia	Grey Birch	50	18"-24"	5' oc	100% of area
Solidago caesia	Bluestem Goldenrod	50	DP50	30" oc	10% of area

Chase Brook Streambank - 4000 +/- sf .
Seed with Bluestem Meadow Seed Mix. Install supplemental plants/seed per schedule below:

PLANT SCHEDULE					
SCIENTIFIC NAME	COMMON NAME	QUANTITY	SIZE	SPACING	NOTES
Elymus virginicus	Virginia Wildrye	300	DP50	30" oc	50% of area

Hightide Bush Colonies - 2550 +/- sf
Existing colony, no planting/seeding required.

No-mow Fescue Lawn - 8855 +/- sf
Seed with No Mow Lawn Seed Mix.

SEEDING INFORMATION:
NO MOW LAWN MIX by PRAIRIE NURSERY
https://www.prairienursery.com/no-mow-lawn-seed-mix.html

Follow specifications by Prairie Nursery for installation, establishment and maintenance

Seed Rate: 220 lbs per acre/5 lbs per 1,000 sq ft
Species: Festuca brevipila (Hard fescue), Festuca ovina (Sheep fescue), Festuca rubra subs. fallax (Chewings fescue), Festuca rubra (Red fescue), Festuca rubra var. rubra (Creeping red fescue)

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PRIOR TO PLANTING

Call DIGSAFE (1-888-344-7233) to locate existing utilities prior to any excavation. Protect existing utilities to remain throughout the construction process, and repair any damage at no cost to the Owner.

SILT FENCE:
Silt fence between areas of site disturbance and resource areas to be maintained in good repair until vegetation has been established.

TREE PROTECTION:
All existing trees that are not being removed are to be protected from construction activity. Tree protection fencing for trees in areas of site disturbance to be maintained in good repair until restoration work is complete. (See Tree Protection Specifications and Detail (1/L-401).

RESTORATION AND MAINTENANCE:
Refer to Demolition / Removal Plans, Specifications, and Land Management Plan by Crawford Land Management for additional protocol on site preparation and maintenance.

PLANT INSTALLATION
Refer to Planting Detail Sheet L-402 and Planting Specifications for installation protocol.

Plantings to be installed in the spring or fall, after construction activities are complete and invasive plants are 80% eradicated. Typically this is one full growing season after the initial removal is complete.

SUPPLEMENTAL IRRIGATION:
(See Irrigation specifications)

Install a temporary, above-ground irrigation system to provide supplemental water to all plantings for 2-3 growing seasons, or until plants are fully established.

New Trees and shrubs to be supplied with a temporary drip system.

No Mow Fescue / Lawn and Meadow Areas to be set up with a temporary spray system.

Irrigation to be monitored and adjusted regularly for seasonal variances.

Temporary Irrigation system to be removed once plants are established.

RESTORATION PLANTING LAYOUT NOTES

1. Locate, protect, and maintain bench marks, monuments, control points, and project engineering reference points. Re-establish disturbed or destroyed items at Contractor's expense.
2. Examine the areas and conditions under which site work is performed. Report any discrepancies with the plan to the Landscape Architect. Do not proceed with the work until unsatisfactory conditions are corrected.
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4. Contractor to mark edges of proposed plant communities in field for Landscape Architect review and approval prior to installation.
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CONTRACTOR QUALIFICATIONS:

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All machine work should be completed by an insured operator with the appropriate hoisting and hydraulics licenses.

All herbicide applications should be completed by Massachusetts state-licensed and insured applicators that have extensive knowledge of native / invasive species and are able to identify species in bare twig conditions.

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NO.	DATE:	REVISION:	BY:

ENGINEER / SURVEYOR
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Westfield, MA 01085
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Tighebond.com

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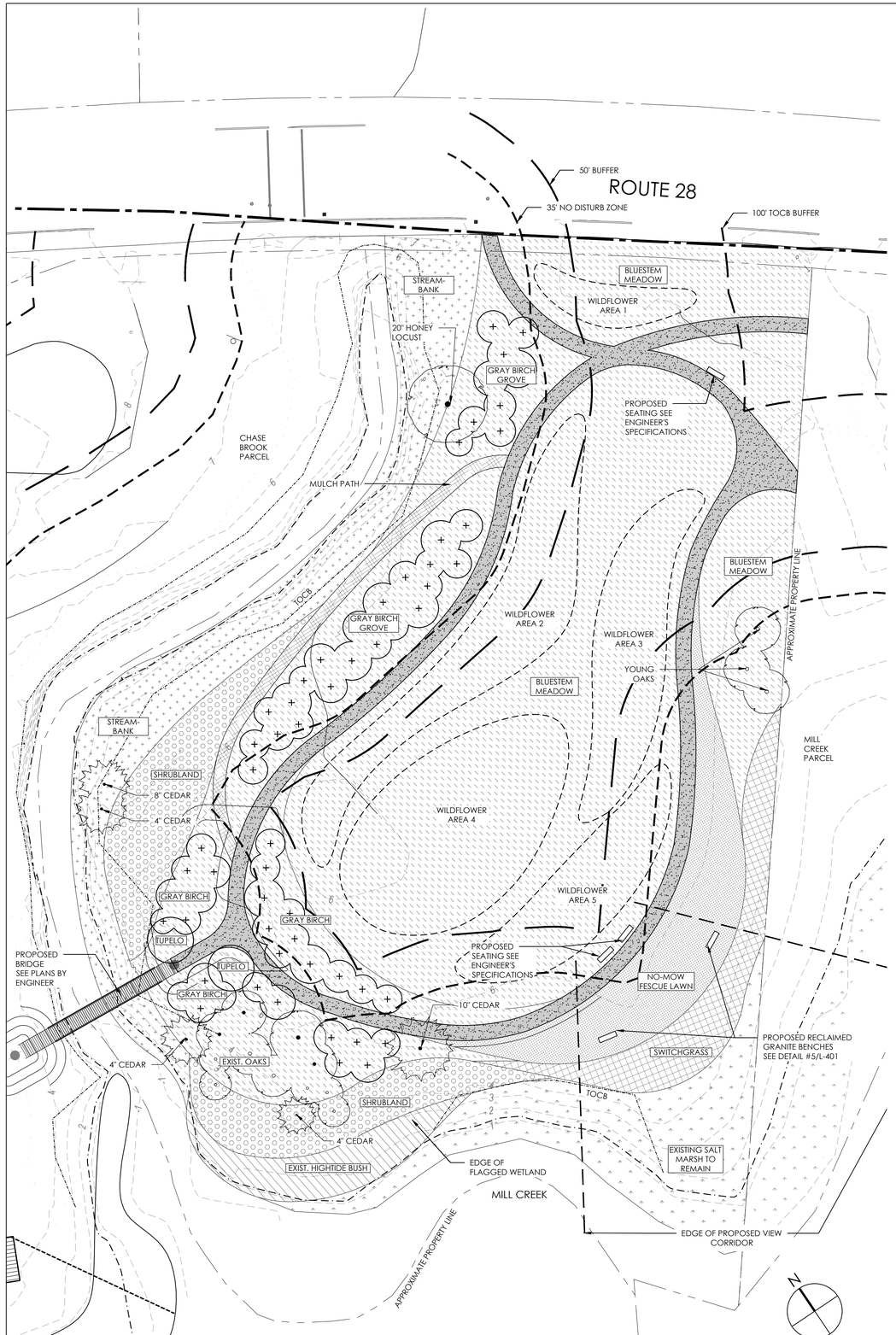
THE PURPOSE OF THIS PLAN IS FOR IMPLEMENTATION OF A PLANTING RESTORATION STRATEGY. REFER TO SPECIFICATIONS AND LAND MANAGEMENT PLAN BY CRAWFORD LAND MANAGEMENT FOR ADDITIONAL PLANTING AND INVASIVE MANAGEMENT PROTOCOL .

TOWN OF YARMOUTH
CHASE BROOK PARCEL
261 MA-28
WEST YARMOUTH, MA 02673

RESTORATION PLANTING PLAN

SCALE: 1" = 20'
DATE: 11/19/2025

L-301



1 PLANTING PLAN
1" = 20'-0"

THE SURVEY INFORMATION SHOWN ON THESE PLANS IS LIMITED. SIGNIFICANT TREE LOCATIONS, UTILITIES AND PROPERTY LINES SHOULD BE VERIFIED PRIOR TO ANY WORK TAKING PLACE IN CLOSE PROXIMITY TO THOSE ITEMS.

PROPOSED PLANT COMMUNITIES :

Bluestem Meadow - 23,750 +/- sf
Seed with Bluestem Meadow Seed Mix.

PLANT SCHEDULE					
SCIENTIFIC NAME	**COMMON NAME**	**QUANTITY**	**SIZE**	**SPACING**	**NOTES**
WILDFLOWER AREA 1 (600 SF)					
Asclepias tuberosa	Butterfly Weed	150	DP50	**24" oc**	100% of area
WILDFLOWER AREA 2 (3100 SF)					
Asclepias verticillata	Whorled Milkweed	**400**	DP 50	24" oc	100% of area
Penstemon pallidus	Pale Beardtongue	**400**	DP 50	24" oc	100% of area
WILDFLOWER AREA 3 (2100 SF)					
Monarda fistulosa	Wild Bergamot	300	DP50	24" oc	100% of area
Pycnanthemum incanum	Hoary Mountain Mint	200	DP50	24" oc	100% of area
WILDFLOWER AREA 4 (3600 SF)					
Achillia millefolium	Yarrow	**200**	DP 50	32" oc	100% of area
Lupinus perennis	Wild Lupine	3600 sf	seed	10 lbs/acre	100% of area
Solidago odora	Sweet Goldenrod	300	DP50	32" oc	100% of area
WILDFLOWER AREA 5 (1850 SF)					
Asclepias tuberosa	Butterfly Weed	300	DP50	**24" oc**	70% of area
Allium cernuum	Nodding Onion	500	DP50	**12" oc**	30% of area

SEEDING INFORMATION:
BLUESTEM MEADOW MIX by ERNST CONSERVATION SEEDS
General Product Information:
Tall grass meadow with cool season and warm season grasses.
Seed Rate: 20 lbs/acre
Species: Schizachyrium scoparium (Little Bluestem, Albany Pine Bush- NY Ecotype); Festuca brevipila (Hard Fescue, 'Jetty'); Festuca glauca (Blue Fescue, 'Azure'); Festuca ovina (Sheep Fescue)

Grey Birch Edgeland - 9300 +/- sf
Seed with Bluestem Meadow Seed Mix.

PLANT SCHEDULE					
SCIENTIFIC NAME	**COMMON NAME**	**QUANTITY**	**SIZE**	**SPACING**	**NOTES**
Aster divaricatus	White Wood Aster	300	DP50	30" oc	20% of area
Betula populifolia	Grey Birch	100	4'-6'	5' oc	100% of area
Betula populifolia	Grey Birch	100	3'-4'	5' oc	100% of area
Betula populifolia	Grey Birch	250	18"-24"	4-5' oc	100% of area
Comptonia peregrina	Sweetfern	300	#2	4' oc	50% of area
Nyssa sylvatica	Tupelo	2	#25	As shown	As shown
Solidago caesia	Bluestem Goldenrod	150	DP50	30" oc	10% of area

Chase Brook Streambank - 5575 +/- sf
Seed with Bluestem Meadow Seed Mix.

PLANT SCHEDULE					
SCIENTIFIC NAME	**COMMON NAME**	**QUANTITY**	**SIZE**	**SPACING**	**NOTES**
Elymus virginicus	Virginia Wildrye	400	DP50	30" oc	50% of area

Shrubland - 4260 +/- sf
Seed with Bluestem Meadow Seed Mix.

PLANT SCHEDULE					
SCIENTIFIC NAME	**COMMON NAME**	**QUANTITY**	**SIZE**	**SPACING**	**NOTES**
Aster divaricatus	White Wood Aster	200	DP50	24" oc	20% of area
Comptonia peregrina	Sweetfern	150	#2	4' oc	50% of area
Morella pensylvanica	Bayberry	40	#1	42" oc	Fill in area as needed
Solidago caesia	Bluestem Goldenrod	200	DP50	30" oc	30% of area

Hightide Bush Colonies - 1,150 +/- sf
Existing colony, no planting/seeding required.

Salt Marsh - 3940+/- sf
Existing salt marsh, no planting/seeding required.

Switchgrass Ribbon - 1750 +/- sf
Seed with Switchgrass Seed Mix and supplemental Wildflower Seed
SWITCHGRASS MIX by ERNST CONSERVATION SEEDS
General Product Information:
Short grass meadow with cool season and warm season grasses.
Seed Rate: 20 lbs/acre
Grass Species Composition: Panicum virgatum (Switchgrass, Long Island-NY Ecotype), Festuca brevipila (Hard Fescue, 'Jetty'), Festuca glauca (Blue Fescue, 'Azure'), Festuca ovina (Sheep Fescue)
Supplemental Wildflower Seed Composition: Asclepias incarnata (Swamp Milkweed), Aster novae-angliae (New England Aster), Eupatorium perfoliatum (Boneset), Monarda fistulosa (Wild Bergamot)

No-mow Fescue Lawn - 2,870 +/- sf
Seed with No Mow Lawn Seed Mix.
SEEDING INFORMATION:
NO MOW LAWN MIX by PRAIRIE NURSERY
https://www.prairienursery.com/no-mow-lawn-seed-mix.html
General Product Information:
Follow specifications by Prairie Nursery for installation, establishment and maintenance
Seed Rate: 220 lbs per acre/5 lbs per 1,000 sq ft
Species: Festuca brevipila (Hard fescue), Festuca ovina (Sheep fescue), Festuca rubra subs. fallax (Chewings fescue), Festuca rubra (Red fescue), Festuca rubra var. rubra (Creeping red fescue)

LEGEND :

- **STABILIZED AGGREGATE PATH** (5' wide) - 3,820 +/- sf (REFER TO ENGINEER'S PLANS & DETAILS)
- **MULCH PATH (3' wide) - 725 +/- sf** Install mulch path w/ 3" layer of wood chips.
- **EXISTING SURVEYED EVERGREEN TREE TO REMAIN. PROTECT FROM CONSTRUCTION ACTIVITY**
- **PROPOSED BENCH LOCATION**
- **APPROXIMATE LOCATION OF EXISTING UNSURVEYED EVERGREEN TREE TO REMAIN. PROTECT FROM CONSTRUCTION ACTIVITY.**
- **WILDFLOWER AREA (AREA WITHIN SEEDED MEADOW TO BE SUPPLEMENTED WITH WILDFLOWERS)**
- **EXISTING SURVEYED DECIDUOUS TREE TO REMAIN. PROTECT FROM CONSTRUCTION ACTIVITY.**
- **APPROXIMATE LOCATION OF EXISTING UNSURVEYED DECIDUOUS TREE OR LARGE SHRUB TO REMAIN. PROTECT FROM CONSTRUCTION ACTIVITY**
- **EXISTING CONTOUR**
- **PROPOSED GRAY BIRCH TREES**

PRIOR TO PLANTING

Call DIGSAFE (1-888-344-7233) to locate existing utilities prior to any excavation. Protect existing utilities to remain throughout the construction process, and repair any damage at no cost to the Owner.

SILT FENCE:
Silt fence between areas of site disturbance and resource areas to be maintained in good repair until vegetation has been established.

TREE PROTECTION:
All existing trees that are not being removed are to be protected from construction activity. Tree protection fencing for trees in areas of site disturbance to be maintained in good repair until restoration work is complete. (See Tree Protection Specifications and Detail (1/L-401).

RESTORATION AND MAINTENANCE:
Refer to Demolition / Removal Plans, Specifications, and Land Management Plan by Crawford Land Management for additional protocol on site preparation and maintenance.

PLANT INSTALLATION
Refer to Planting Detail Sheet L-402 and Planting Specifications for installation protocol.

Plantings to be installed in the spring or fall, after construction activities are complete and invasive plants are 80% eradicated. Typically this is one full growing season after the initial removal is complete.

SUPPLEMENTAL IRRIGATION:
(See Irrigation specifications)

Install a temporary, above-ground irrigation system to provide supplemental water to all plantings for 2-3 growing seasons, or until plants are fully established.

New Trees and shrubs to be supplied with a temporary drip system.

No Mow Fescue / Lawn and Meadow Areas to be set up with a temporary spray system.

Irrigation to be monitored and adjusted regularly for seasonal variances.

Temporary Irrigation system to be removed once plants are established.

RESTORATION PLANTING LAYOUT NOTES

1. Locate, protect, and maintain bench marks, monuments, control points, and project engineering reference points. Re-establish disturbed or destroyed items at Contractor's expense.
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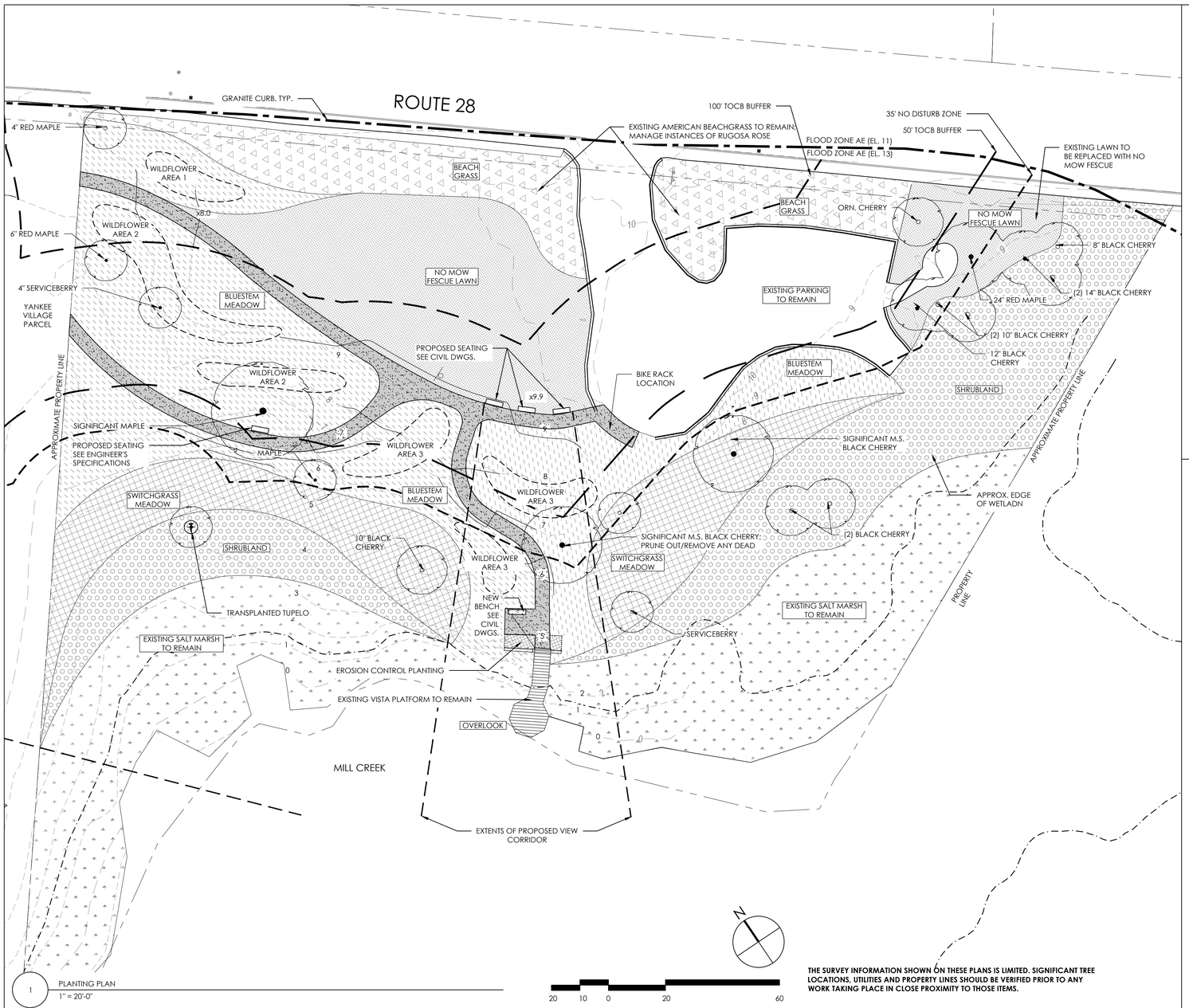
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TOWN OF YARMOUTH
YANKEE VILLAGE PARCEL
261 MA-28
WEST YARMOUTH, MA 02673

RESTORATION PLANTING PLAN

SCALE: 1" = 20'
DATE: 11/19/2025

L-302



1 PLANTING PLAN
1" = 20'-0"

20 10 0 20 60

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SUPPLEMENTAL IRRIGATION:
(See Irrigation specifications)
Install a temporary, above-ground irrigation system to provide supplemental water to all plantings for 2-3 growing seasons, or until plants are fully established.

New Trees and shrubs to be supplied with a temporary drip system.

No Mow Fescue / Lawn and Meadow Areas to be set up with a temporary spray system.

Irrigation to be monitored and adjusted regularly for seasonal variances.

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LEGEND :

STABILIZED AGGREGATE PATH (5' wide)
(2,480 +/- sf)
(REFER TO ENGINEER'S PLANS & DETAILS)

EXISTING SURVEYED EVERGREEN TREE TO REMAIN. PROTECT FROM CONSTRUCTION ACTIVITY

APPROXIMATE LOCATION OF EXISTING UNSURVEYED EVERGREEN TREE TO REMAIN. PROTECT FROM CONSTRUCTION ACTIVITY.

EXISTING SURVEYED DECIDUOUS TREE TO REMAIN. PROTECT FROM CONSTRUCTION ACTIVITY.

APPROXIMATE LOCATION OF EXISTING UNSURVEYED DECIDUOUS TREE OR LARGE SHRUB TO REMAIN. PROTECT FROM CONSTRUCTION ACTIVITY

EXISTING SALT MARSH TO REMAIN

EXISTING BEACH GRASS TO REMAIN

PROPOSED BENCH LOCATION

WILDFLOWER AREA (AREA WITHIN SEEDED MEADOW TO BE SUPPLEMENTED WITH WILDFLOWERS)

EXISTING CONTOUR

PROPOSED CONTOUR

PROPOSED GRAY BIRCH TREES

PROPOSED PLANT COMMUNITIES :

Bluestem Meadow - 15,200 +/- sf
Seed with Bluestem Meadow Seed Mix. Overseed Area 3 with Symphyotrichum laeve @ 4 oz/acre.

PLANT SCHEDULE					
SCIENTIFIC NAME	**COMMON NAME**	**QUANTITY**	**SIZE**	**SPACING**	**NOTES**
WILDFLOWER AREA 1 (460 SF)					
Lupinus perennis	Wild Lupine	460 SF	SEED	10 lbs/acre	100% of area
Solidago odora	Sweet Goldenrod	100	DP50	24" oc	100% of area
WILDFLOWER AREA 2 (1225 SF)					
Allium cernuum	Nodding Onion	200	DP 50	15" oc	30% of area
Asclepias tuberosa	Butterfly Weed	200	DP50	24" oc	70% of area
WILDFLOWER AREA 3 (1175 SF)					
Lupinus perennis	Perennial lupine	1175 SF	SEED	10 lbs/acre	100% of area
Penstemon pallidus	Pale Beardtongue	150	DP50	24" oc	50% of area
Monarda fistulosa	Wild Bergamot	150	DP50	24" oc	50% of area

SEEDING INFORMATION:
BLUESTEM MEADOW MIX by ERNST CONSERVATION SEEDS
General Product Information:
Tall grass meadow with cool season and warm season grasses.
Seed Rate: 20 lbs/acre
Species: Schizachyrium scoparium (Little Bluestem, Albany Pine Bush- NY Ecotype); Festuca brevipila (Hard Fescue, 'Jetty'); Festuca glauca (Blue Fescue, 'Azure'); Festuca ovina (Sheep Fescue)

Switchgrass Meadow - 6450 +/- sf
Seed with Switchgrass Seed Mix and supplemental Wildflower Seed

SWITCHGRASS MIX by ERNST CONSERVATION SEEDS
General Product Information:
Short grass meadow with cool season and warm season grasses.
Seed Rate: 20 lbs/acre
Grass Species Composition: Panicum virgatum (Switchgrass, Long Island-NY Ecotype), Festuca brevipila (Hard Fescue, 'Jetty'), Festuca glauca (Blue Fescue, 'Azure'), Festuca ovina (Sheep Fescue)
Supplemental Wildflower Seed Composition: Asclepias incarnata (Swamp Milkweed), Aster novae-angliae (New England Aster), Eupatorium perfoliatum (Boneset), Monarda fistulosa (Wild Bergamot)

EROSION CONTROL PLANTING AREA (50 to 100 SF)
Seed with Switchgrass Seed Mix and supplemental with salt marsh grass plugs

PLANT SCHEDULE					
SCIENTIFIC NAME	**COMMON NAME**	**QUANTITY**	**SIZE**	**SPACING**	**NOTES**
Distichlis spicata	Spike Grass	50	DP50	12-24" oc	100% of area
Spartina patens	Saltmeadow cordgrass	50	DP50	12-24" oc	100% of area

Shrubland (Existing Shrub Colonies to be Managed) - 10,400 +/- sf
Seed with Bluestem Meadow Seed Mix.

PLANT SCHEDULE					
SCIENTIFIC NAME	**COMMON NAME**	**QUANTITY**	**SIZE**	**SPACING**	**NOTES**
Aster divaricatus	White Wood Aster	250	DP50	24" oc	10% of area
Comptonia peregrina	Sweetfern	250	#2	48" oc	40% of area
Solidago caesia	Bluestem Goldenrod	100	DP50	36" oc	10% of area

No-mow Fescue Lawn - 8345 +/- sf
Seed with No Mow Lawn Seed Mix

SEEDING INFORMATION:
NO MOW LAWN MIX by PRAIRIE NURSERY
https://www.prairienursery.com/no-mow-lawn-seed-mix.html
Follow specifications by Prairie Nursery for installation, establishment and maintenance

Seed Rate: 220 lbs per acre/5 lbs per 1,000 sq ft
Species: Festuca brevipila (Hard fescue), Festuca ovina (Sheep fescue), Festuca rubra subs, fallax (Chewings fescue), Festuca rubra (Red fescue), Festuca rubra var. rubra (Creeping red fescue)

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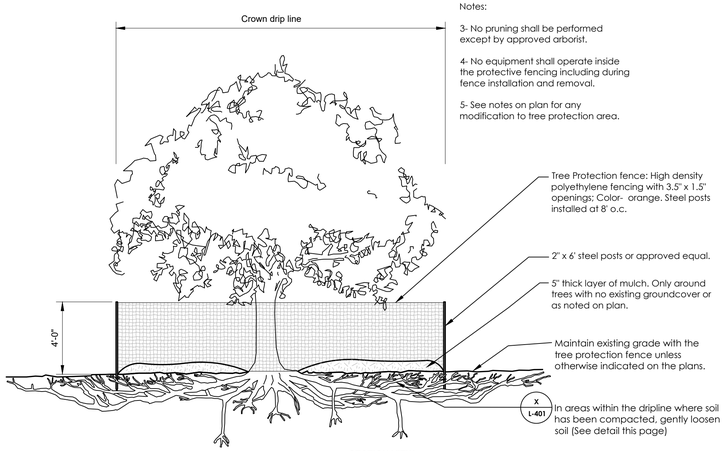
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TOWN OF YARMOUTH
MILL CREEK PARCEL
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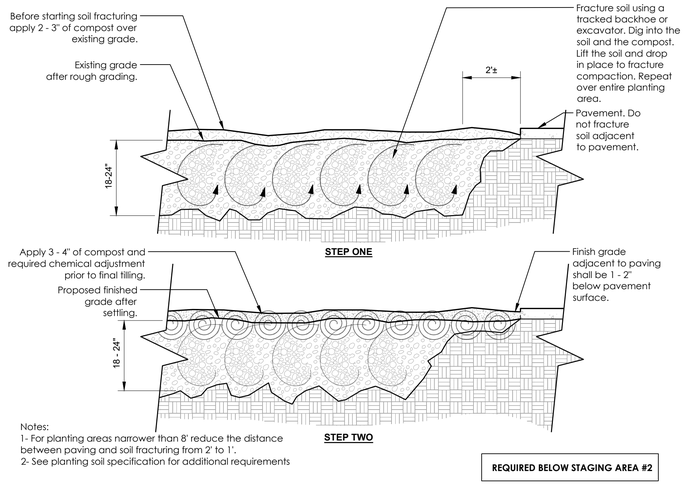
RESTORATION PLANTING PLAN

SCALE: 1" = 20'
DATE: 11/19/2025

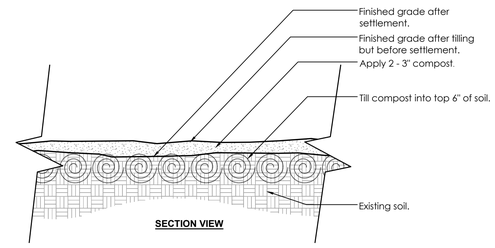
L-303



1 TREE & EXISTING VEGETATION PROTECTION DETAIL
NOT TO SCALE



2 MODIFIED EXISTING SOIL - COMPACTED SUB-SOIL (FRACTURING)
NOT TO SCALE



Notes:
1- See planting soil specifications for additional requirements.

URBAN TREE FOUNDATION ©2014 OPEN SOURCE FREE TO USE

3 MODIFIED EXISTING SOIL (COMPACTED SURFACE SOILS)
NOT TO SCALE

Notes:
1- Prior to the start of work remove all thatch, sod, and/or weeds.
2- Loosen soil with Air Knife or approved equal to a depth of 9 - 12" and work around encountered roots.
3- Apply 2 - 3" of compost over loosened soil. Using an air knife mix compost into loosened soil.
4- Water entire root zone at end of each work day.
5- See planting soil specifications for additional requirements.

URBAN TREE FOUNDATION ©2014 OPEN SOURCE FREE TO USE

4 MODIFIED EXISTING SOIL (COMPACTED SUB-SOIL WITHIN TREE DRIPLINE)
NOT TO SCALE

NOTE: SALVAGED STONES TO BE PROVIDED BY CONTRACTOR. (FINAL SELECTIONS TO BE APPROVED BY LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE) CONTRACTOR TO TRANSPORT AND INSTALL.

DIMENSIONS ON PLAN ARE APPROXIMATE. FINAL STONE SIZES WILL DEPEND ON AVAILABLE MATERIAL.

5 MONOLITHIC STONE BENCH / SEAT BOULDER
3/4" = 1'-0"

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ALL SITEWORK MUST COMPLY WITH CONDITIONS OUTLINED BY THE STATE OF MASSACHUSSETTS AND YARMOUTH CONSERVATION COMMISSION PER ORDER OF CONDITIONS (MassDEP File #083-2410)

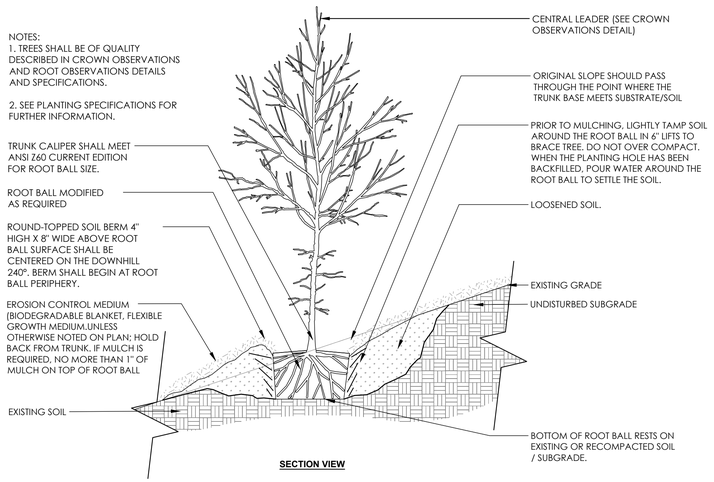
THE PURPOSE OF THIS PLAN IS FOR IMPLEMENTATION OF A PLANTING RESTORATION STRATEGY. REFER TO SPECIFICATIONS AND LAND MANAGEMENT PLAN BY CRAWFORD LAND MANAGEMENT FOR ADDITIONAL PLANTING AND INVASIVE MANAGEMENT PROTOCOL .

TOWN OF YARMOUTH
CHASE BROOK PARK RESTORATION
261 MA-28
WEST YARMOUTH, MA 02673

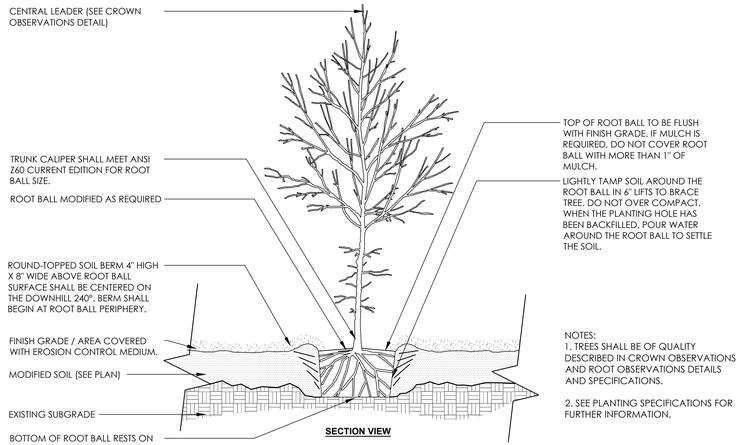
SITE FEATURE DETAILS

SCALE: AS NOTED
DATE: 11/19/2025

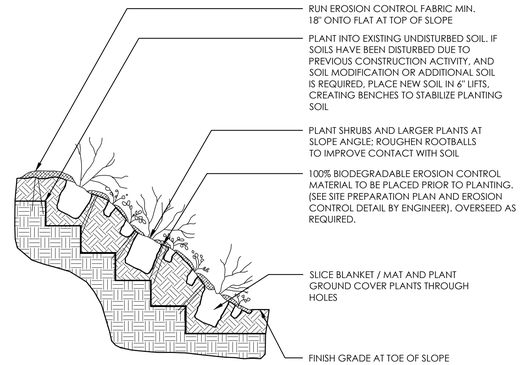
L-401



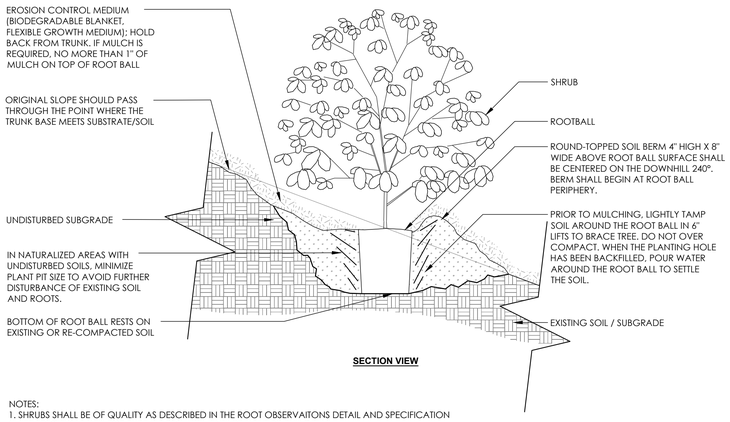
1 TREE PLANTING IN SLOPE / UNMODIFIED SOIL
NTS



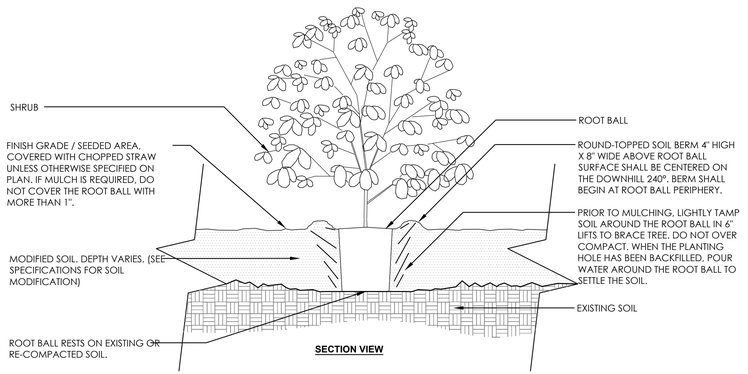
2 TREE PLANTING IN MODIFIED SOIL
NTS



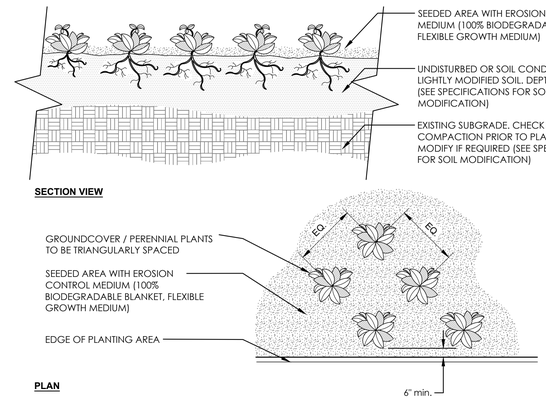
3 SUPPLEMENTAL PERENNIAL / GROUNDCOVER PLANTING ON SLOPE
NTS



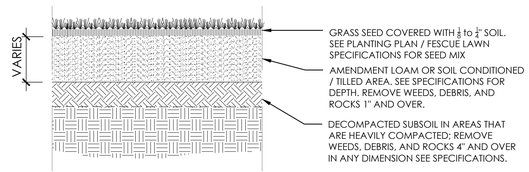
4 SHRUB PLANTING IN SLOPE / UNMODIFIED SOIL
NTS



5 SHRUB PLANTING IN MODIFIED SOIL
NTS



6 SUPPLEMENTAL PERENNIAL / GROUNDCOVER PLANTING
NTS



7 SEEDED NO MOW FESCUE OR DROUGHT TOLERANT FESCUE LAWN
NTS

CRAWFORD LAND MANAGEMENT
JENICK STUDIO
88 Route 6A, Suite 2B | Sandwich, MA 02563
www.crawfordlm.com | 508.477.1346
www.jenickstudio.com | 508.477.1346

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NO.	DATE:	REVISION:	BY:

ENGINEER / SURVEYOR
Tighe & Bond
53 Southampton Road
Westfield, MA 01085
413.562.1600
Tighebond.com

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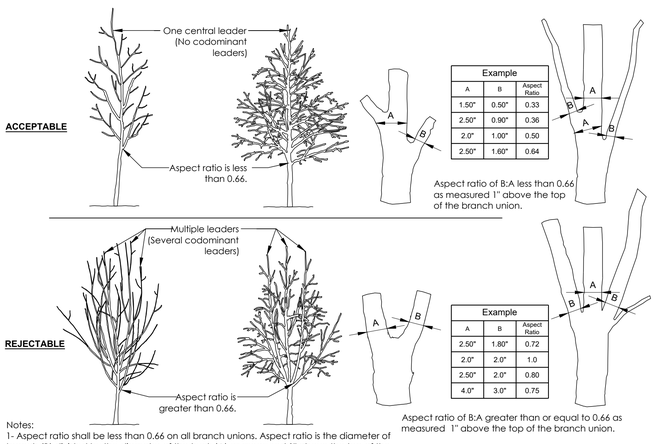
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TOWN OF YARMOUTH
CHASE BROOK PARK RESTORATION
261 MA-28
WEST YARMOUTH, MA 02673

PLANT INSTALLATION DETAILS

SCALE: AS NOTED
DATE: 11/19/2025

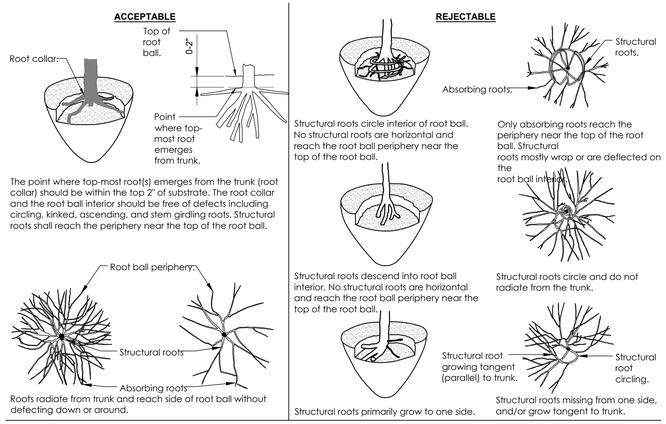
L-402



Notes:
1- Aspect ratio shall be less than 0.66 on all branch unions. Aspect ratio is the diameter of branch (B) divided by the diameter of the trunk (A) as measured 1" above the top of the branch union.

2- Any tree not meeting the crown observations detail may be rejected.

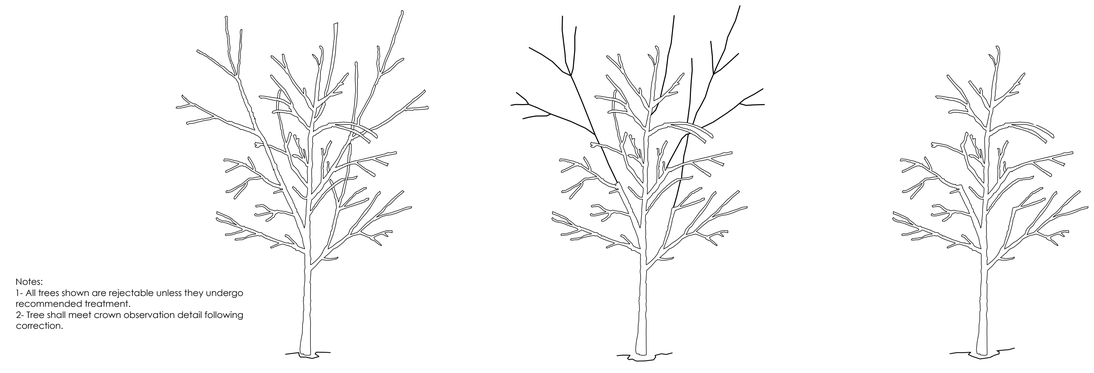
1 CROWN OBSERVATIONS: HIGH BRANCHES
1/4"=1'-0"



Notes:
1- Observations of roots shall occur prior to acceptance. Roots and soil may be removed during the observation process; substrate/soil shall be replaced after the observations have been completed.

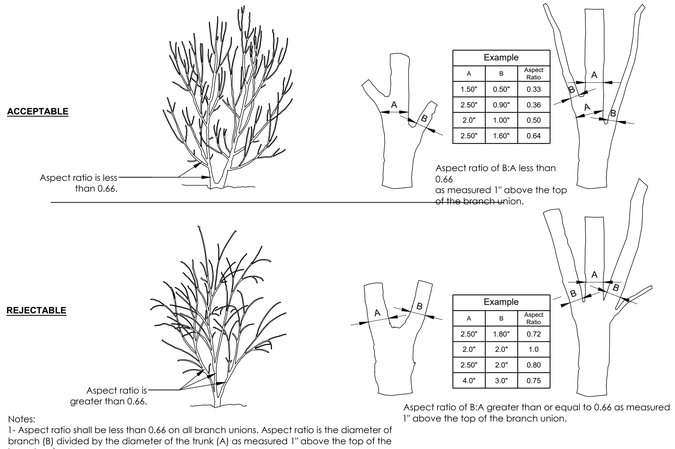
2- See specifications for observation process and requirements.

4 ROOT OBSERVATIONS: BALLED & BURLAP
1"=1'-0"



Notes:
1- All trees shown are rejectable unless they undergo recommended treatment.
2- Tree shall meet crown observation detail following correction.

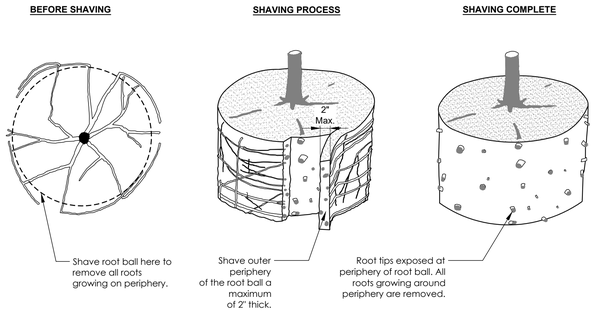
6 CROWN CORRECTION DETAILS
1/2"=1'-0"



Notes:
1- Aspect ratio shall be less than 0.66 on all branch unions. Aspect ratio is the diameter of branch (B) divided by the diameter of the trunk (A) as measured 1" above the top of the branch union.

2- Any tree not meeting the crown observations detail may be rejected.

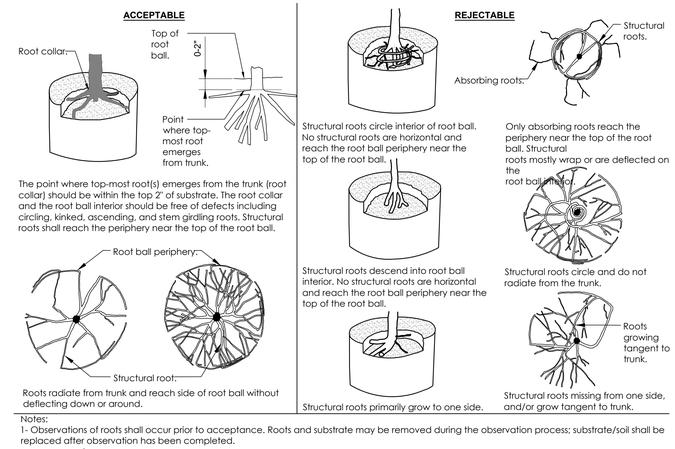
2 CROWN OBSERVATIONS: MULTI BRANCHES
1/4"=1'-0"



Notes:
1- Shaving to be conducted using a sharp blade or hand saw eliminating no more than needed to remove all roots on the periphery of root ball.

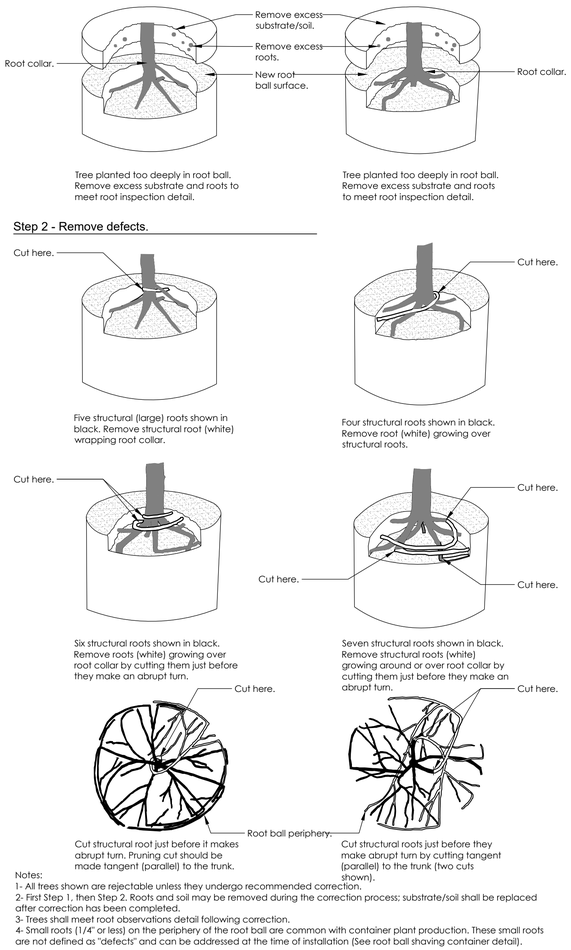
2- Shaving can be performed just prior to planting or after placing in the hole.

5 ROOT BALL SHAVING CONTAINER DETAIL
3"=1'-0"



Notes:
1- Observations of roots shall occur prior to acceptance. Roots and substrate may be removed during the observation process; substrate/soil shall be replaced after observation has been completed.
2- Small roots (¼" or less) that grow around, up, or down the root ball periphery are considered a normal condition in container production and are acceptable however they should be eliminated at the time of planting. Roots on the periperhy can be removed at the time of planting. (See root ball shaving container detail).
3- See specifications for observation process and requirements.

3 ROOT OBSERVATIONS: CONTAINER
1"=1'-0"



Notes:
1- All trees shown are rejectable unless they undergo recommended correction.
2- First Step 1, then Step 2. Roots and soil may be removed during the correction process; substrate/soil shall be replaced after correction has been completed.
3- Trees shall meet root observations detail following correction.
4- Small roots (1/4" or less) on the periphery of the root ball are common with container plant production. These small roots are not defined as "defects" and can be addressed at the time of installation (See root ball shaving container detail).

7 ROOT CORRECTION DETAILS
1-1/2"=1'-0"

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TOWN OF YARMOUTH
CHASE BROOK PARK RESTORATION
261 MA-28
WEST YARMOUTH, MA 02673

PLANT CORRECTION DETAILS

SCALE: AS NOTED
DATE: 11/19/2025

L-403

Tighe&Bond

EXHIBIT 9

CRAWFORD
LAND MANAGEMENT

CALL (508) 477-1346
EMAIL info@crawfordlm.com
MAIL 88 Route 6A, Unit 2B | Sandwich, MA 02563

TOWN OF YARMOUTH Chase Brook Park Restoration

MEADOW INSTALLATION PROTOCOL (for Bluestem and Switchgrass + Wildflower Seeded Areas)

Meadow Area Soil Preparation:
The following installation methods are a general guideline. Prior to installation, contractor to submit a detailed outline of their preferred methodology for meadow seeding and establishment for review and approval by Owner's Representative. Please note that these guidelines and seed mix rates are for hand broadcasting, and may be different if hydro-seeded.

- All existing vegetation within the proposed meadow seeding areas to be removed unless otherwise specified on the planting plan(s). Grub/root grapple any large woody material approved for removal. Leave all soils behind, remove roots only.
- Evaluate meadow areas and test surface soils and subsoils for over-compaction or lack of growing medium. If soils are overly compacted, loosen subgrade to a depth of 6-12", minimum.
- Remove stones larger than 1 in. in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
- If there is not sufficient growing medium:
    - Refer to Soil Specifications for supplemental soil requirements. If additional topsoil is required, thoroughly blend planting soil mix off-site before spreading or spread topsoil, apply soil amendments if required.
    - Spread planting soil mix to 6 in. depth, but not less than required to meet finish grades after light rolling and natural settlement.
    - Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.
- If sufficient, uncompacted growing medium is already in place, prepare seed bed by raking soils to 'fluff' them.

Meadow Area Seeding: (See Seed Mix Composition at end of this section)
- Once meadow area soils are prepared, mix specified seed mix with sand, or other carrier material to be approved by owner's representative.
- Divide the mixture in half and hand broadcast half of the seed mix evenly over the area.
- Hand broadcast the second half of the seed mix walking perpendicular to the first direction to ensure an even seed distribution.
- Lightly rake or drag seeded area.
- Roll seeded area with drum roller.
- Cover any slopes that are 3:1 or grader with 18-month biodegradable erosion control blankets & stake in place with wooden stakes per engineer's specifications.
- Cover all other seeded areas with ½" of clean, weed-free chopped straw.

MEADOW SEED MIXES
(for Bluestem and Switchgrass + Wildflower Seeded Areas)

BLUESTEM MEADOW MIX by Ernst Conservation Seeds
General Product Information: Tall grass meadow with cool season and warm season grasses.
Seed Rate: 20 lbs/acre

Grass Species Composition (PER 20 LBS):
10 lbs - Schizachyrium scoparium (Little Bluestem, Albany Pine Bush- NY Ecotype)
5 lbs - Festuca brevipila (Hard Fescue, 'Jetty');
5 lbs - Festuca glauca (Blue Fescue, 'Azure' / 'Blue Hornet')

CRAWFORD
LAND MANAGEMENT

CALL (508) 477-1346
EMAIL info@crawfordlm.com
MAIL 88 Route 6A, Unit 2B | Sandwich, MA 02563

SWITCHGRASS MEADOW MIX by Ernst Conservation Seeds
General Product Information: Short grass meadow with cool season and warm season grasses.
Seed Rate: 20 lbs/acre

Grass Species Composition (PER 20 LBS):
4 lbs - Schizachyrium scoparium (Little Bluestem, Albany Pine Bush- NY Ecotype)
5 lbs - Panicum virgatum (Switchgrass) Long Island-NY Ecotype
5 lbs - Festuca brevipila (Hard Fescue, 'Jetty')
5 lbs - Festuca glauca (Blue Fescue, 'Azure' / 'Blue Hornet')

Supplemental Wildflower Seed Composition:
0.6 lbs - Asclepias incarnata (Swamp Milkweed) PA Ecotype
0.2 lbs - Aster novae-angliae (New England Aster) PA Ecotype
0.1 lbs - Eupatorium perfoliatum (Boneset) PA Ecotype
0.1 lbs - Monarda fistulosa (Wild Bergamot) PA Ecotype

Meadow establishment (3 years minimum

Year 1 Maintenance: (for areas without wildflower plugs, or until wildflower plugs are installed)

Mow seeded areas to a height of six to eight inches when annual weeds are in flower or reach a height of **10 to 12** inches (often this occurs in June), before weeds set seed. Use a string trimmer on small areas and an off-set flail mower on larger areas.

Do not mow past mid-September. If weed emergence is minimal, weeds may be hand pulled or spot treated with an appropriate herbicide. Treat any invasive species according to the Land Management plan. In the fall of the first growing season, maintain the vegetation at 8 to 10 inches through the winter.

In areas where wildflower plugs are installed (or at the time plugs are installed), maintenance will switch from strictly a mowing routine to hand weeding and/or spot treatment routine for annual weeds and resprouting or newly germinating invasive species.

Monitor meadow and if large bare areas / areas of poor germination persist, overseed with the specified seed mix(s) in spring or fall.

Year 2 Maintenance:
During the spring of the second year, mow any standing vegetation in April to a height of 2" to allow soil to warm more quickly to stimulate the emergence and growth of native seed. Rake off the cuttings. A second or third mowing may be required depending on weed species composition. Problem weeds should be hand pulled or spot sprayed with an approved herbicide.

Year 3+ Maintenance:
Mow once each year in April. Do not mow in fall. Leave meadow standing until the following spring for the annual mowing in April.
Continue to monitor for invasive weeds and remove problematic species before they colonize.

Tighe&Bond

APPENDIX 2

7.2 APPENDIX 2 – REQUIRED BID SUBMITTAL FORM - Attachments

The following attachments hereto are incorporated by the following references as part of the RFP Documents. All attachments should be completed, signed, and included in your response.

7.2.1 Attachment A Bid Form

7.2.2 Attachment B Certifications Required by Law

7.2.3 Attachment C Reference Form

BID FORM

CHASE BROOK PARK RESTORATION & PEDESTRIAN BRIDGE
WEST YARMOUTH, MA

Name_____

Address_____

The name and address shown on the above lines shall be the official name and address of the person, partnership or corporation submitting this bid and shall agree with the "Signature of Bidder" in the case of an individual, the "Name of Firm or Partnership" in the case of a firm or partnership, or the "Name of Bidder" in the case of a corporation.

TO: Ms. Laura Hayden
Yarmouth DPW Engineering
c/o Yarmouth Department of Public Works
74 Town Brook Road
West Yarmouth, MA 02673
Tel: (508) 398-2231

The undersigned, having carefully examined the Site of the Work, the Project Manual titled "Project Manual Bidding Requirements and Technical Specifications", dated November 26, 2025 including all Addenda issued, the Supplemental Specifications, Special Provisions, Contract Agreement and Contract Bonds contained herein for the Chase Brook Park Restoration & Pedestrian Bridge Project, do(es) hereby propose and offer to enter into a contract to supply all the materials, tools, equipment and labor required to perform and construct the whole of the Work in strict accordance with the terms and conditions of this contract at the unit prices stated in the following "Schedule of Items" submitted by the undersigned. Terms used in this Agreement which are defined in the Standard General Conditions shall be as defined therein.

This Bid may be accepted by the Town of Yarmouth at any time within thirty (30) calendar days after opening of the bids.

(Fill out prices in ink, in writing and in figures; in case of a discrepancy between prices in writing and prices in figures, the writing shall govern. In case of discrepancy between total of items and total of bid amount stated, total of items shall govern. Use the pages in this document when submitting proposal and submit contract document intact.)

BID SCHEDULE

BID ITEM	DESCRIPTION	UNIT	QTY		UNIT BID PRICE		TOTAL COST
1	Mobilization and Demobilization	LUMP SUM	1				
	COST IN WORDS for Item 1:						
2	Staging and Temporary Controls	LUMP SUM	1				
	COST IN WORDS for Item 2:						
3	Demolition	LUMP SUM	1				
	COST IN WORDS for Item 3:						
4	Initial Invasive Species Removal	LUMP SUM	1				
	COST IN WORDS for Item 4:						
5	Earthwork and Grading	LUMP SUM	1				
	COST IN WORDS for Item 5:						

6	Installation of Timber Piles	LUMP SUM	1				
	COST IN WORDS for Item 6:						
7	Pedestrian Bridge and Suspended Boardwalk	LUMP SUM	1				
	COST IN WORDS for Item 7:						
8	Stabilized Stone Dust (Aggregate) Path	LUMP SUM	1				
	COST IN WORDS for Item 8:						
9	Park Furnishings	LUMP SUM	1				
	COST IN WORDS for Item 9:						
10	Landscaping and Planting	LUMP SUM	1				
	COST IN WORDS for Item 10:						

11	Year 2 Growing Season Invasive Species Management	LUMP SUM	1				
	COST IN WORDS for Item 11:						
12	Year 3 Growing Season Invasive Species Management	LUMP SUM	1				
	COST IN WORDS for Item 12:						
13	Coir Logs and Bank Stabilization	LUMP SUM	1				
	COST IN WORDS for Item 13:						

Total Bid Price for all Bid Items in numbers $_____

Total Bid Price for All Bid Items in words_____

By signing and submitting this form, the Respondent certifies the following:

- The proposed price is firm and binding offer by the respondent to the Town
- The proposed price is consistent with and contemplates the terms and conditions in the IFB, unless specific exceptions or conditions are noted and attached.
- The Proposed price is valid for a period of at least 30 days from the due date of the Response
- The acknowledgement of receipt of any and all addenda issued for the IFB Addenda Nos:_____
- The signer is a duly authorized representative of the Respondent

The undersigned also agrees as follows:

To provide a schedule of values for each Bid Item prior to the start of work.

To conduct the work in accordance with the time of year restrictions stated in Section 01140

To substantially complete work by December 31, 2026. Further, that monies will be deducted as liquidated damages at the rate specified in the Standard Form of Agreement for each day that the Work shall remain uncompleted after the time herein specified for completion of the Work.

To provide separate invoices for Pedestrian Bridge work including timber piles and related bridge construction, due to grant reimbursement restrictions.

That this offer is to continue open to acceptance until the formal contract is executed by the Successful Bidder of this Work, and the Town of Yarmouth may at any time without notice accept this proposal whether any other proposal has previously been accepted or not. Provided, however, that the Town of Yarmouth will accept, in writing, one of the proposals made, or reject all proposals made, within thirty (30) calendar days after the date of opening of the proposals.

The undersigned as Bidder, declares that the only persons or parties interested in this Proposal are those named herein; that the Bidder is not financially interested in, or otherwise affiliated in a business way with any other Bidder on this contract; and that this Proposal is made without collusion with any other person, firm or corporation.

The undersigned declares that any person(s) employed by the Town of Yarmouth, who has direct or indirect personal or financial interest in this proposal or in any portion of the profits which may be derived therefrom, has been identified and the interest disclosed by separate attachment. (Please include in your disclosure any interest which you know of. An example of a direct interest would be a Town of Yarmouth employee who would be paid to perform services under this proposal. An example of an indirect interest would be a Town of Yarmouth employee who is related to any officers, employees, principal or shareholders of your firm or you.) If in doubt as to status or interest, please disclose to the extent known.

Respectfully submitted this _____ day of _____, 2025

IF AN INDIVIDUAL, SIGN HERE

Signature of Bidder_____

Address_____

_____

Email_____ Phone #_____

(Signatures for a Firm, Partnership or Corporation on next page.)

IF A FIRM OR PARTNERSHIP, SIGN HERE

Signature of Bidder_____

Name of Firm or Partnership_____

Business Address_____

Telephone Number_____ Email_____

Soc. Sec. No. or Tax I.D. Number_____

Names and Addresses of Members of Firm or Partnership:

_____

_____

IF A CORPORATION, SIGN HERE

Name of Bidder_____

Authorized Signature_____
(Name) (Title)

Business Address_____

Telephone Number_____ Email_____

Soc. Sec. No. or Tax I.D. Number_____

Incorporated under the Laws of the State of_____

Names and Addresses of Officers of the Corporation:

President_____

Secretary _____

Treasurer _____ss

Before me, personally appeared _____ and acknowledged
that the signature to the preceding bid is his/her signature in his/her official capacity.

Date: _____

_____
Notary Public - Signature and Seal

ALL CORPORATIONS MUST SIGN THIS FORM
AND SUBMIT WITH THE BID FORM

(Insert copy of that part of the records of the corporation wherein authority is given to the officer of that corporation to sign this bid on behalf of the corporation.)

_____

_____

_____

_____

_____
(date)

The above is a true copy of the records of the_____

Corporation, which records are in my legal custody.

_____
Officer having custody of the records

_____ss

Before me appeared, _____

_____ of the _____ Corporation, and

made oath that the above statement is true.

_____
Notary Public - Signature and Seal

NOTICE

(This Must Be Filled Out)

The full names and residences of all persons interested in this bid as principals are as follows: (In case of Corporation, include and identify President, Treasurer, Manager)

CERTIFICATIONS REQUIRED BY LAW FOR PUBLIC CONSTRUCTION CONTRACTS

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

STATE CERTIFICATIONS

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

(1) Contractor is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work;

(2) All employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and they shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and

(3) All employees to be employed in the work subject to this contract have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration.

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.

COMPLETE AND SIGN BELOW:

_____ _____

Authorized Person's Signature Date

_____

Print Name & Title of Signatory

_____

Name of Contractor

TOWN OF YARMOUTH SIGNATORY AUTHORITY

PROJECT NAME: _____

At a duly constituted meeting of _____held on _____
(Name of Corporation) (Date)
at which all Directors were present or waived notice, it was voted that:

_____
(Name of Officer) (Title of Officer)

of this company, be and he/she is hereby authorized to execute contracts and bonds in the name and
behalf of said company, and affix its Corporate Seal thereto, and such execution of any contract or obligation in this company's name on its behalf of such
_____under seal of the company, shall
(Officer)
be valid and binding upon this company.
A TRUE COPY, ATTEST:

(Clerk of the Corporation) (Print Name & Signature)
Place of Business: _____
_____

IF A FOREIGN CORPORATION: 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.
(check one) □ Not Applicable □ I comply and am registered and in good stating with the Massachusetts Secretary of State.
I hereby certify that I am the clerk of the _____ and that
(Print Name of Corporation)

_____ is duly elected _____ of said
(Print Name of Officer) (Print Signatory Name & Title)

Company, and the above vote has not been amended or rescinded and remains in full force and effect as
of the date of this contract.

_____
(Clerk of the Corporation)
(CORPORATE SEAL)

NOTARIZATION:
On this _____ day of _____, 2018, before me, the undersigned notary public, personally
appeared _____, proved to me through satisfactory evidence

of
identification, which were _____,
to be the person whose name is signed on the preceding or attached document in my presence.

_____
Notary Public

My commission expires: _____

REFERENCE FORM

Proposer : _____

IFB Title: Chase Brook Park Restoration & Pedestrian Bridge

Bidders must provide a list of at least three (3) references to which similar size and scope projects have been completed within the past five (5) years, along with the name of a contact person and phone numbers. (Municipalities desired, if applicable). Additionally, please attach to this form a complete list of ongoing projects, projects completed within the past two years, including project names, values and contact names, and email addresses. The Town reserves the right to obtain additional references at their option. The Town shall interpret whether project references are similar in scope and size.

Reference: _____ Contact: _____
Address: _____ Phone: _____
_____ Email: _____

Description and date(s) of supplies or services provided:

_____
_____
_____

Reference: _____ Contact: _____
Address: _____ Phone: _____
_____ Email: _____

Description and date(s) of supplies or services provided:

_____
_____
_____

Reference: _____ Contact: _____
Address: _____ Phone: _____
_____ Email: _____

Description and date(s) of supplies or services provided:

_____
_____
_____

Attach additional sheets if necessary