

Department of Conservation and Recreation

PART I

INSTRUCTIONS TO BIDDERS

CONTRACTS FOR PUBLIC WORKS PROJECTS
AND
FOR BUILDING PROJECTS ESTIMATED TO
COST MORE THAN \$25,000 BUT NOT MORE THAN \$100,000
SUBJECT TO THE PROVISIONS OF M.G.L. CH. 30 SEC. 39M

**NOTICE TO CONTRACTORS – M.G.L. C. 30, sec. 39M CONSTRUCTION
ADVERTISEMENT OF INVITATION FOR BIDS
COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF CONSERVATION AND RECREATION
10 PARK PLAZA, SUITE 6620, BOSTON, MA 02116
PHONE: 617-626-1250
www.mass.gov/dcr**

Contract No. P25-3586-C5A
Title: Magazine Beach Improvements Phase 2.2 Grassy Beach
Location: Cambridge, Massachusetts

GENERAL BID proposals shall be submitted on a form furnished by the Department and will be received until 12:00 PM on Thursday March 6, 2025, through DCR's E-bid room at www.bidexpress.com/businesses/36765/home.

Individual sets of contract documents will only be available on DCR's E-bid room at www.bidexpress.com/businesses/36765/home.

If any addenda are issued throughout the open period for this project, DCR will distribute these addenda via Bid Express, which will also email identified prospective at the time plans and specifications are issued.

A pre-bidding conference for prospective bidders will be held at Magazine Beach.
Address: 719 Memorial Dr, Cambridge, MA. 02139 Friday February 14, 2025, at 10 am.

Questions are due by Friday February 21, 2025, at 12:00PM

The project consists of the next phase, 2.2, of implementation of the master plan, including: a river observation deck, a river dock, shoreline restoration, a "grassy beach" between Veterans' Pool and the river, accessible paths, benches, plantings, and improvements to the eastern end of the parking lot.

The estimated project cost is **\$2,306,000.00**

The work is to be accomplished within 540 calendar days of a notice to proceed. Liquidated damages in the amount of \$500 per day will be assessed if the work has not been completed in accordance with the provisions of the contract within the time specified (as extended by any authorized extension of time granted in accordance with the contract provisions).

Bidders must be pre-qualified by the Massachusetts Dept. of Transportation (MassDOT) Highway Division in RECREATIONAL FACILITIES to bid on the above project. An award will not be made to a Contractor who is not pre-qualified by MassDOT prior to the opening of Proposals.

The Proposed contract includes a requirement of **6% for MBE** (Minority Business Enterprise) **10% for WBE** (Women Business Enterprise) and **3% VOB**E requirement (Veteran-Owned Business Enterprise).

The applicable local minority workforce utilization percentage is a minimum goal of 15.3%. The applicable local women workforce utilization percentage is a minimum goal of 6.9%.

Each bid must be accompanied by a bid deposit, in the form of a bid bond, cash, certified check, or a treasurer's or cashier's check issued by a responsible bank or trust company, payable to the Department of Conservation and Recreation in the amount of 5% of the bid.

Each bid must be submitted through DCR's E-Bid room at www.bidexpress.com/businesses/36765/home. Please ensure that your bid is complete and marked as responsive when submitting through DCR's Bid room. Any bids found to be incomplete and/or marked unresponsive will be rejected by DCR and will not be considered when awarding the project.

Bids are subject to the provisions of M.G.L. Ch. 30, Sect. 39F, G, H and M inclusive. Wages are subject to minimum wage rates as per M.G.L. Ch. 149, sections 26 to 27D inclusive. The Department reserves the right to waive any informalities in or to reject any and all bids if it be in the public interest to do so.

Brian M. Arrigo, Commissioner
Massachusetts Department of Conservation and Recreation



**COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF CONSERVATION AND RECREATION**

**PART I
INSTRUCTIONS TO BIDDERS**

**CONTRACTS FOR PUBLIC WORKS PROJECTS
SUBJECT TO THE PROVISIONS OF M.G.L. C. 30. SEC. 39M**

Awarding Authority:

Department of Conservation and Recreation
10 Park Plaza, Suite 6620,
Boston, MA 02116
Telephone: 617-626-1250

DCR Contract No.: P25-3586-C5A

Title: Magazine Beach Improvements Phase 2.2 Grassy Beach

Project Scope: The project consists of the next phase, 2.2, of implementation of the master plan, including: a river observation deck, a river dock, shoreline restoration, a "grassy beach" between Veterans' Pool and the river, accessible paths, benches, plantings, and improvements to the eastern end of the parking lot.

Deadline for filing general bids is 12:00 P.M. on March 6, 2025.

The minimum wage rate and truck rate requirements for this Contract are located www.bidexpress.com/businesses/36765/home.

Bid forms for this Contract are located @ www.bidexpress.com/businesses/36765/home.

The Minority, Women & Veterans Business Enterprise participation for this Contract are to be found in the Notice to Contractors section (Part I - Page 2/3).

The time for completion of the Work is specified in Article 2 of the Department of Conservation and Recreation - Contractor Agreement. Liquidated damages for failure to complete on time are as stated in Article 8 of the Department of Conservation and Recreation - Contractor Agreement.

As used herein, capitalized terms shall have the meaning assigned to them in the General Conditions of the Contract and the Department of Conservation and Recreation - Contractor Agreement unless the context clearly indicates otherwise.

SECTION 1 - BIDDER'S REPRESENTATION

1.1 Each bidder (hereinafter sometimes referred to as "Bidder") by making a bid (hereinafter sometimes referred to as "Bid") represents and warrants that Bidder has visited and examined the Site and the Contract Documents; that Bidder is familiar with the local conditions under which the Work is to be performed; that Bidder has correlated personal observations with the requirements of the Contract Documents; and that where the Contract Documents require, in any part of the Work, a given result to be produced, the Contract Documents are adequate and that Bidder will produce the required result within the Bid price and that the Bid is made in accordance therewith.

1.2 FAILURE TO EXAMINE THE CONTRACT DOCUMENTS AND THE SITE WILL NOT RELIEVE ANY BIDDER FROM ANY OBLIGATION UNDER THE BID AS SUBMITTED. NEITHER THE COMMONWEALTH NOR THE DESIGNER WILL BE RESPONSIBLE FOR ERRORS, OMISSIONS AND/OR CHARGES FOR EXTRA WORK ARISING FROM BIDDER'S FAILURE TO FAMILIARIZE ITSELF WITH THE CONTRACT DOCUMENTS OR EXISTING CONDITIONS.

1.3 Pre-Bidding Conference

- A. If applicable, a pre-bidding conference for prospective bidders will be held at the date, time and location as specified in the Notice to Contractors section (Part I – page 2/3).
- B. At the conference, the project will be discussed in general. It is desirable that all prospective bidders attend. The Contract, Specifications, Drawings, and any other aspects of this project will be explained in response to questions by those attending. For interpretations of questions requiring legal, administrative, or engineering decision, prospective bidders shall comply with Section 3 herein.

SECTION 2 - GENERAL BIDDERS - QUALIFICATION

2.1 Every Bidder must submit the following documents, as required:

Special certification may be required as required by the Department on a contract-specific basis.

Refer to the Notice to Contractors for the specific qualification requirements of this contract.

SECTION 3 - REQUESTS FOR INTERPRETATION

3.1 Interpretation

A. The Plans and Specifications and other Contract Documents are to be considered together and are intended to be mutually complementary, so that any work shown on the Plans though not specified in the Specifications, and any work specified in the Specifications though not shown on the Plans, is to be executed by the Contractor as a part of this Contract.

B. All things that in the opinion of the Awarding Authority may be reasonably inferred from the Plans, Specifications and other Contract Documents are to be executed by the Contractor. The Awarding Authority shall determine whether the detail Plans conform to the general Plans and Contract Documents.

C. The tables of contents, titles, headings and marginal notes or sub-scripts contained herein are solely to facilitate references, are not intended to be construed as provisions of the Contract, and in no way affect the interpretation of the provisions to which they refer.

D. Where reference is made in the Contract Documents to publications, standards, or codes issued by associations or societies, such reference shall be interpreted to mean the current edition of such publications, standards, or codes, including revisions in effect on the date of the Advertisement, notwithstanding any reference to a particular date. The foregoing sentence shall not apply to the dates, if any, specified with respect to insurance policy endorsement forms.

E. In case of any conflict among the Contract Documents, unless the context clearly otherwise requires, the Contract Documents shall be construed according to the following priorities:

- First Priority: Contract Modifications
- Second Priority: Department of Conservation and Recreation - Contractor Agreement
- Third Priority: General Conditions of the Contract
- Fourth Priority: Drawings - Schedules take precedence over enlarged detail Drawings and enlarged Detail Drawings take precedence over reduced scale Drawings; figured dimensions shall prevail over scale.
- Fifth Priority: Specifications

3.2 Any questions by prospective Bidders concerning interpretation of the Contract Documents must be submitted in writing to the Awarding Authority and should be in its possession at least five working days before the date set for the receipt of Bids. The Awarding Authority will post to Bid Express any addenda or written interpretations that it deems necessary to Bidders who have taken out plans at the address given by them before the date set for the receipt of affected Bids. Bidders may not rely upon oral communications or interpretations from the Awarding Authority or the Designer, and the Awarding Authority shall not be bound by them.

Written Questions shall be submitted to:

Attn: Joseph Silveira PLA, Project Manager
Department of Conservation and Recreation
10 Park Plaza, Suite 6620,
Boston, MA 02116

Email (preferred): Joseph.Silveira@mass.gov

3.3 It is the sole responsibility of the Bidder to ascertain the existence of any addenda issued by the Awarding Authority, all addendums are posted on Bid Express- www.bidexpress.com/businesses/36765/home. Copies of addenda will be made available for inspection at the locations listed in the Advertisement where the Contract Documents are on file.

3.4 Wherever in the Contract Documents reference is made to Massachusetts General Laws, it shall be construed to include all amendments thereto effective as of the date of the issuance of the invitation to bid on the proposed work.

SECTION 4 - PREPARATION OF BIDS; ALTERNATES

4.1 Bids shall be submitted through the DCR E-Bid room at www.bidexpress.com/businesses/36765/home?agency=true.

4.2 All Bids submitted thru Bid Express must be deemed responsive by Bid Express to be considered

4.3 Where so indicated on the Bid Form, sums shall be expressed in both words and numerals. Where there is a discrepancy between the Bid sum expressed in words and the Bid sum expressed in figures, the Bid sum expressed in words shall control unless the intention of the Bidder clearly is otherwise as determined by the Awarding Authority in its sole discretion.

4.4 Each Bidder shall acknowledge all required alternates in Section C on the Bid Express by entering the dollar amount of addition or subtraction necessitated by the alternate(s).

4.5 If an alternate includes work within the Bidder's scope of work and does not involve a change in the cost of the Bid, the Bidder shall so indicate by writing "No Change" or "N/C" or "0" in the space provided for that alternate.

4.6 The lowest Bidder will be determined based on the sum of the base Bid and the accepted alternates.

4.7 Each bid must be accompanied by a bid deposit, payable to the Department of Conservation and Recreation in the amount of 5% of the bid. Bid Bonds must be submitted electronically, please ensure your company and your bonding agent's company register with one of the Bid Bond agencies affiliated with Bid Express: If you

need additional assistance, please call the Bid Express Customer Support Team at [888-352-2439](tel:888-352-2439), available Monday - Friday from 7:00am – 8:00pm (EST). You can also email the team at support@bidexpress.com

4.8 The amount of such bid deposit shall be **5% five per cent** of the value of the Bid.

SECTION 5 - SUBMISSION OF BIDS

5.1 Each bid, **including the bid deposit**, shall be submitted via DCR's Bid room at www.bidexpress.com/businesses/36765/home?agency=true

5.2 All Bids must be received by the Awarding Authority no later than the applicable date and time specified on page 1 of these Instructions to Bidders. Any Bid not received by the applicable deadline will not be accepted.

SECTION 6 - WITHDRAWAL OF BIDS; REJECTION OF BIDS

6.1 Any Bid may be withdrawn prior to the specified deadline for the receipt of Bids provided that the withdrawal shall be made by a written request signed by a person having the authority to bind the Bidder. The written request must be hand delivered or otherwise delivered to Robert Boncore, Director of Contracts and Procurement, at 10 Park Plaza, Suite 6620, Boston, MA 02116 or through email at Robert.Boncore@Mass.Gov, and must be received on or before the date and time appointed as the deadline for the receipt of Bids.

6.2 A Bidder may withdraw its Bid without penalty at any time up to the time of Award as defined below in subsection 9.1 only upon demonstrating to the satisfaction of the Awarding Authority that a death or disability has occurred, or a bona fide clerical error or mechanical error of a substantial nature was made during the preparation of the bid. Failure to demonstrate conclusively that a bona fide clerical error or mechanical error of a substantial nature was made may result in forfeiture of the Bid deposit

6.3 The Awarding Authority reserves the right to waive any informality in or to reject any and all Bids if it is in the public interest to do so. Without limiting the foregoing, the Awarding Authority reserves the right to reject unit prices which it deems unduly high or unduly low as unbalanced.

SECTION 7 – INSURANCE

7.1 Insurance Generally

A. The Contractor shall take out and maintain the insurance coverages listed in this Section with respect to the operations as well as the completed operations of this Contract. The insurance requirements stipulated shall cover all damage to property, whether above or below ground, and shall apply to all the Work to be performed under this Contract. This insurance shall be provided at the Contractor's expense and shall be in full force and effect for the full term of the Contract or for such longer period as this Article requires.

B. All policies shall be written on an occurrence basis and be issued by companies authorized to write that type of insurance under the laws of the Commonwealth and rated in Best's Insurance Guide (or any successor thereto or replacement thereof) as having a general policy holder rating of "A" or better and a financial rating of at least "9" or otherwise acceptable to the DCR.

C. The Contractor shall submit two originals of each certificate of insurance, acceptable to the DCR, simultaneously with the execution of this Contract. Certificates shall include:

DCR Contract Number /Project Name & *DCR is an additional insured as to all policies of insurance, with the exception of workmen's compensation. In addition, none of the above-referenced insurance coverages shall be cancelled, terminated, or materially modified in any way unless and until 10 (Ten) days advance written notice is given to the DCR. Contractor has paid all premiums.

The Contractor shall submit updated certificates prior to the expiration of any of the policies referenced in the certificates so that the DCR shall at all times possess certificates indicating current coverage. Certificates shall indicate the contractual liability coverage, and the Contractor's Protective Liability coverage is in force. Certificates shall include specific acknowledgment that the coverages set forth in this Section 7 are included in the policies.

7.2 Types and Amounts of Insurance

Contractor's Commercial General Liability

Bodily Injury &	<u>500,000.00</u> each occurrence
Property Damage	<u>1,000,000.00</u> general aggregate, per project

This policy shall include coverage relating to explosion, collapse, and underground property damage if blasting operations constitute part of the Work to be performed under this Contract.

If the Contract work includes work to be performed within fifty feet of a railroad, any exclusion for liability assumed under contract for work within fifty feet of a railroad shall be deleted.

Vehicle Liability

The Contractor shall provide the following minimum coverage with respect to the operations of any employee, including coverage for owned, non-owned, and hired vehicles:

Combined Single Limit: 1,000,000.00

Worker's Compensation

The Contractor shall provide the following coverage in accordance with M.G.L. c. 149, sec. 34A and M.G.L. c. 152 as amended, unless a higher coverage is specified below:

Part One	Provide Statutory Minimum
Employer's Liability	\$500,000.00 each accident
Part Two	\$500,000.00 disease per employee
	\$500,000.00 disease policy aggregate

SECTION 8 – MBE, WBE AND VOB PARTICIPATION

8.1 The apparent low Bidder's compliance with the requirements of this Section 8 is a prerequisite for receiving the Award of the Contract. The MBE, WBE and VOB participation for this Contract are as set forth on the first page of these Instructions to Bidders

8.2. The Awarding Authority reserves the right to reduce or waive the MBE or WBE participation established for this Contract upon written request made by a Bidder. Requests to reduce or waive the MBE,WBE & VOB participation for this Contract should be received by the Awarding Authority no later than Ten (10) working days before the date set for the receipt of general Bids. **THE AWARDING AUTHORITY RESERVES THE RIGHT TO REJECT ANY REQUEST TO REDUCE OR WAIVE THE MBE,WBE & VOB REQUIREMENTS FOR THIS CONTRACT THAT IS RECEIVED AFTER THESE DEADLINES.** Such written request must demonstrate to the satisfaction of the Awarding Authority that it is not feasible for a non-MBE or non-WBE general Bidder to meet the percentage established for this Contract based upon any or all of the following: (i) actual MBE,WBE & VOB availability, (ii) the geographic location of the project to the extent related to MBE,WBE & VOB availability, (iii) the scope of the work, (iv) the percentage of work available for subcontracting to MBE,WBE & VOBs and/or (v) other relevant factors, including a **documented** inability by the prospective Bidder to obtain commitments from MBE,WBE & VOB subcontractors sufficient to meet the MBE,WBE & VOB requirements after having made a diligent, good faith effort to do so. All the foregoing documentation shall accompany the Bidder's request for a reduction or waiver of the MBE,WBE & VOB participation requirements. Such documentation shall include, at a minimum, the following:

-- A list of all items of work under the Contract that the Bidder made available for subcontracting to MBE,WBE & VOBES. The Bidder shall identify all items of work that the Bidder did not make so available and shall state the reasons for not making such work available for subcontracting to MBE,WBE & VOBES. The Bidder shall also demonstrate that, where commercially reasonable, subcontracts were divided into units capable of being performed by MBE,WBE & VOBES.

-- Evidence that the Bidder sent written notices soliciting Bids or proposals to perform the items of work made available by the Bidder for subcontracting to all MBE,WBE & VOBES qualified to perform such work. The Bidder shall identify (i) each solicited, and (ii) each MBE,WBE & VOBES listed in the Massachusetts Supplier Diversity Office ("SDO" formerly "SOMWBA") directory under the applicable trade category that was not solicited and reasons, therefore. The Bidder shall also state the dates that notices were mailed and provide a copy of the written notice(s) sent.

-- Evidence that the Bidder made reasonable efforts to follow up the written notices sent to MBE,WBE & VOBES with telephone calls or personal visits to determine with certainty whether the MBE,WBE & VOBES were interested in performing the work. Phone logs or other documentation must be submitted.

-- A statement of the response received from each solicited, including the reason for rejecting any MBE,WBE & VOBES who submitted a bid or proposal.

-- Evidence of efforts made to assist MBE,WBE & VOBES that needed assistance in obtaining bonding or insurance, or lines of credit with suppliers if the inability of MBE,WBE & VOBES to obtain bonding, insurance, or lines of credit is the reason given for the Bidder's inability to meet the requirements.

The Bidder may also submit any other information supporting its request for a waiver or reduction in the MBE,WBE & VOBES participation, including without limitation evidence that the Bidder placed advertisements in appropriate media and trade association publications announcing the Bidder's interest in obtaining bids or proposals from MBE,WBE & VOBES, and/or sent written notification to MBE,WBE & VOBES economic development assistance agencies, trade groups and other organizations notifying them of the Contract and the work to be subcontracted by the Bidder to MBE,WBE & VOBES. The Bidder shall also submit any other information requested by the Awarding Authority to show that the Bidder has taken all actions that could be expected to achieve the MBE,WBE & VOBES participation.

8.3 Any reduction or waiver of the MBE,WBE & VOBES participation for this Contract will be made by written addendum via Bid Express to all persons who have taken out plans for the project.

8.4 No later than five (5) working days after the opening of Bids, the apparent low Bidder shall submit the following documents to the Awarding Authority's Contract Officer listed in subsection 5.1: (i) a completed Schedule for Participation by Minority/Women Business Enterprises ("Schedule for Participation") in the form provided by the Awarding Authority showing participation in amounts equal to or exceeding the MBE,WBE & VOB requirements for this Contract, (ii) a completed Letter of Intent in the form provided by the Awarding Authority for each MBE,WBE & VOB listed in the Schedule for Participation, and (iii) a current SDO certification letter for each MBE,WBE & VOB listed in the Schedule of MBE,WBE & VOB Participation showing that the MBE,WBE & VOB is certified in the area of work for which it is listed on the Letter of Intent.

8.5 Each Letter of Intent shall identify and describe the work to be performed by the named (the "MBE,WBE & VOB Work") with enough specificity to permit the Awarding Authority to identify the items of contract work that the MBE,WBE & VOB will perform for participation credit. The Awarding Authority reserves the right to reject any Letter of Intent if the price to be paid for the MBE,WBE & VOB Work does not bear a reasonable relationship to the value of such work under the Contract as determined by the Awarding Authority.

8.6 Within five (5) working days after receipt of the Schedule For MBE,WBE & VOB Participation, Letters of Intent, and SDO certification letters, the Awarding Authority shall review and either approve or disapprove the apparent low Bidder's submissions. If the apparent low Bidder has not submitted an appropriate Schedule For MBE,WBE & VOB and appropriate Letters of Intent and SDO certification letters establishing that the MBE,WBE & VOB participation for the project will be met, the apparent low Bidder may be considered ineligible for Award of the Contract and the Awarding Authority will Award the Contract to the second lowest Bidder, subject to said Bidder's compliance with these conditions.

8.7 The Contractor is required to submit to the Awarding Authority signed subcontracts with all subcontractors prior to the commencement of work to be performed under these contracts, and/or a purchase order or invoice from each material supplier and/or manufacturer listed on the Schedule For MBE,WBE & VOB Participation of the issuance of the Notice to Proceed by the Awarding Authority.

SECTION 9 - CONTRACT AWARD

9.1 "Award" means the determination, selection, and notification of the lowest, responsible, and eligible Bidder by the Awarding Authority.

9.2 The Contract will be awarded to the lowest responsible and eligible Bidder as determined by the Awarding Authority. Bidders will be required to hold firm their respective bids for thirty (30) days, Saturdays, Sundays, and legal holidays excluded, after the opening of the Bids.

9.3 As used herein, the term "lowest responsible and eligible Bidder" shall mean the Bidder whose Bid is the lowest of those Bidders who, in the Awarding Authority's opinion, are ready, willing and able to comply with all requirements of the Contract Documents and demonstrably possess the skill, ability, and integrity necessary for the faithful performance of the Work, based on the determination of past performance and financial soundness under M.G.L. c. 30, sec. 39M, (ii) the rules, regulations, orders, guidelines and policies promulgated from time to time by the Commissioner of the Department of Conservation and Recreation and (iii) any other relevant criteria that the Awarding Authority may prescribe.

9.4 The Bid price shall be the price set forth in paragraph C of the Bid Form.

9.5 Should the Contract Documents require submission of special data to accompany the Bid, the Awarding Authority reserves the right to rule the Bidder's failure to submit such data an informality and to receive said data subsequently within a reasonable time as set by the Awarding Authority, provided that no such ruling shall result in an unfair advantage to the Bidder.

9.6 Should the Contract Documents require submission of special data to accompany the Bid, the Awarding Authority reserves the right to rule the Bidder's failure to submit such data an informality and to receive said data subsequently within a reasonable time as set by the Awarding Authority, provided that no such ruling shall result in an unfair advantage to the Bidder. **In addition**, the Department reserves the right to waive minor defects in documents or time limits

SECTION 10 - EXECUTION OF CONTRACTS

10.1 Upon receipt of the Award, the Bidder awarded the Contract shall submit two (2) properly executed originals of each of the following documents prior to execution of the Contract by the Awarding Authority. All such documents shall be in the form prescribed by the Awarding Authority and received within five working days from receipt of the Award.

- Department of Conservation and Recreation-Contractor Agreement
- Certificate of Corporate Vote
- Joint Venture Authorization (if appropriate)
- Performance and Payment Bonds with power of attorney
- Certificates of Insurance evidencing coverages in amounts required by the Contract Documents.
- Any other documents that the Awarding Authority may require in connection with the Contractor's execution of the Contract.

10.2 Please note that no part of the Contractor's work may be subcontracted without the prior written approval of the Awarding Authority. The Contractor must complete a minimum of 51% of the scope of this contract by his own work force. If the Contractor desires to subcontract any part of the Work, the Contractor must promptly forward to the Awarding Authority a list in duplicate designating the work to be

performed and the name of each proposed subcontractor. Approved subcontractors are eligible for direct payments under M.G.L. 30, sec. 39F, as amended. Material suppliers not involving site labor need not be submitted for approval.

SECTION 11 - RETURN OF BID DEPOSITS

11.1 All Bid deposits of Bidders, except those of the three (3) lowest responsible and eligible general Bidders, shall be returned within five days, Saturdays, Sundays, and legal holidays excluded, after the opening of the Bids. The Bid deposits of the three (3) lowest responsible and eligible Bidders shall be returned upon the execution and delivery of the Contract, or if no award is made; except that, if any Bidder fails to perform its agreement to execute the Contract and furnish performance and payment bonds as stated in its Bid, then said Bidder's Bid deposit shall become the property of the Commonwealth as liquidated damages; provided that the amount of the Bid deposit that becomes the property of the Commonwealth shall not exceed the difference between the Contractor's Bid price and the Bid price of the next lowest responsible and eligible Bidder; and provided further that, in the case of death, disability, bona fide clerical or mechanical error of a substantial nature, or other similar unforeseen circumstances affecting the Bidder, such Bidder's Bid deposit shall be returned.

11.2 In addition to the provisions for the return of Bid deposits as provided above, upon receipt of a Bid Bond in an amount not less than the amount of the required Bid deposit, the Awarding Authority shall return any Bid deposit of a Bidder forthwith after the public opening of Bids.



**COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF CONSERVATION & RECREATION
STANDARD CONSTRUCTION CONTRACT
For Projects Subject to M.G.L. c. 149 or M.G.L. c. 30, sec. 39M**

PART II

**DEPARTMENT OF CONSERVATION AND RECREATION -
CONTRACTOR AGREEMENT**

Awarding Authority: The Massachusetts Department of Conservation and Recreation

Department Code: DCR

This agreement ("Contract") is made by and between the Commonwealth of Massachusetts acting by and through the Awarding Authority identified above with a principal place of business at 10 Park Plaza, Suite 6620, Boston, MA 02116, and hereinafter called the "Contractor".

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

The Awarding Authority and the Contractor agree as follows:

Article 1. Scope of Work. The Work under this Contract is defined as all work required by the Contract Documents for the construction of Contract No: P in accordance with and as described in the Plans and Specifications prepared by and as modified by Addenda () included herein.

Article 2. Time for Completion. The Contractor shall commence the Work under this Contract on the date specified in the written "Notice to Proceed," and shall within Days after such date, bring the Work to Substantial Completion and to the point at which a Certificate of Agency Use and Occupancy may be issued, and shall bring the Work to Final Acceptance within 10 days after the date specified for Substantial Completion.

Article 3. Contract Price. The Awarding Authority shall pay the Contractor, in current funds, for the performance of the Work, subject to additions and deductions by Approved Change Order(s), the Contract Price of Dollars and Zero Cents (\$,100.00). The Unit Prices, if any, approved by the Awarding Authority are those included in the Contractor's General Bid. The following Alternates have been accepted and their costs are included in the Contract Price:

Article 4. Approved Subcontractors. The filed Subcontractors listed in the Contractor's General Bid submitted by the Contractor have been approved for the performance of the specified portions of the Work subject to the Commonwealth's verification that they have complied with state corporation and partnership registration laws. No other filed Subcontractors and no non-filed Subcontractors shall be used for these or any other portions of the Work without the prior written approval of the Awarding Authority.

Article 5. Certifications. Pursuant to M.G.L. c. 62C, sec. 49A, the individual signing this Contract on behalf of the Contractor hereby certifies, under the penalties of perjury, that to the best of his or her knowledge and belief the Contractor has complied with all applicable state and federal tax laws. The individual signing this Contract on behalf of the Contractor further certifies under penalties of perjury that the Contractor is not presently debarred from doing public construction work in the Commonwealth under the provisions of M.G.L. c. 29, sec. 29F, or any other applicable debarment provisions of any other chapter of the General Laws or any rule or regulation promulgated thereunder and is not presently debarred from doing public construction work by any agency of the United States.

Article 6. The Contract Documents: The following documents form the Contract, are incorporated by reference herein, and are referred to as the "Contract Documents:"

- The Instructions to Bidders
- The General Bid submitted by the Contractor
- This Department of Conservation and Recreation – Contractor Agreement
- The General Conditions of the Contract
- The Special Conditions [Note: the term "Special Conditions" may also refer to Division 1 of the Specifications.]
- The Plans and Specifications, including Addenda identified in Article 1 above
- All Approved Change Orders issued after execution of this Department of Conservation and Recreation - Contractor Agreement

Article 7. Minority Business Enterprise, Women Business Enterprise and Veteran-Owned Business Enterprises Participation requirements and Minority/Women and Veteran-Owned Business Enterprises Workforce Utilization Percentages: The applicable requirements, if any, for minority business enterprise and women business enterprise participation, as well as those for minority and women workforce utilization percentages established for this Contract are to be found at the Notice to Contractors for this project, at Part I – Instructions to Bidders, and are incorporated by reference herein.

Article 8. Liquidated Damages. For the purposes of Article VI of the General Conditions of the Contract, liquidated damages for delay are to be found at the Notice to Contractors for this project at Part I – Instructions to Bidders and are incorporated by reference herein.

Article 9. Insurance Requirements. The insurance requirements are set forth in the Instructions to Bidders and are incorporated herein.

In witness whereof, the parties hereto have caused this instrument to be executed in duplicate under seal as of the date set forth above.

Forms Used During Contract Award and Execution

PAYMENT BOND
PERFORMANCE BOND
CERTIFICATE OF CORPORATE VOTE OF AUTHORITY
CERTIFICATE OF COMPLIANCE WITH STATE TAX LAWS AND WITH UNEMPLOYMENT
COMPENSATION CONTRIBUTION REQUIREMENTS
CERTIFICATE OF LIABILITY INSURANCE
A. SEE PART I, SECTION 7 – ARTICLE 7.1 C.
B. ADDING IN THE DESCRIPTION **DCR AS ADDITIONAL INSURED.**
SCHEDULE FOR WOMEN AND MINORITY BUSINESS ENTERPRISE
LETTER OF INTENT – MINORITY AND WOMEN BUSINESS PARTICIPATION
SCHEDULE FOR VETERAN-OWNED BUSINESS ENTERPRISE
LETTER OF INTENT – VETERAN-OWNED BUSINESS ENTERPRISE
EXECUTIVE ORDER 546 – CONTRACTOR CERTIFICATION - VOB POLICY OF THE
COMMONWEALTH
EXECUTIVE ORDER 481 – CONTRACTOR CERTIFICATION - UNDOCUMENTED WORKERS
POLICY OF THE COMMONWEALTH
EQUAL EMPLOYMENT OPPORTUNITY COMPLIANCE FORM
IF APPLICABLE FORM OF SUBCONTRACTOR(S)

IN WITNESS WHEREOF, said Contractor has caused these presents to be signed in its name and its behalf under seal by its officers, duly authorized to do so, and the said Commonwealth has executed these presents by the Commissioner of said Department, or its authorized agent, as prescribed by law, who shall not incur any personal liability by reason of the execution of these presents or of anything herein contained, and who hereby certifies under penalties of perjury that all applicable provisions of M.G.L. c. 149, sec. 44J, have been complied with.

(Executed in duplicate under Seal)

CONTRACTOR:

By: _____ SIGNATURE & SEAL

Name: _____

Title: _____

Date: _____

**COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF CONSERVATION AND RECREATION**

By: _____

Name: Brian M. Arrigo

Title: Commissioner

Date: _____

PAYMENT BOND

BOND No. _____

Know all men by these presents, that

_____ as principal and _____ as surety are held and firmly bound unto the Commonwealth of Massachusetts in the sum of Cents (\$.00) in lawful money of the United States of America, to be paid to the Commonwealth of Massachusetts, for which payments, well and truly to be made, we bind ourselves, our respective heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

Whereas the said principal has made a Contract with the Commonwealth acting through its Department of Conservation and Recreation ("Awarding Authority") the construction of

Now the condition of this obligation is such that if the principal shall pay for all labor performed or furnished and for all materials used or employed in said Contract and in any and all duly authorized modifications, alterations, extensions of time, changes or additions to said Contract that may hereafter be made, notice to the surety of such modifications, alterations, extensions of time, changes or additions being hereby waived, the foregoing to include any other purposes or items set out in, and to be subject to, the provisions of Massachusetts General Laws, Chapter 30, Section 39A, and Chapter 149, Section 29, as amended, then this obligation shall become null and void; otherwise it shall remain in full force and virtue.

In witness whereof we hereunto set our hand and seals this ___ day of _____, _____

_____ (Seal)
(Print Name of General Contractor)

_____ (Seal)
(Print Name of Surety)

By _____
(Signature – Title)

By _____
(Signature – Title)

Surety Address _____

PERFORMANCE BOND

BOND No. _____

Know all men by these presents, that

_____ as principal and _____ as surety are held and firmly bound unto the Commonwealth of Massachusetts in the sum of Cents (\$.00) in lawful money of the United States of America, to be paid to the Commonwealth of Massachusetts, for which payments, well and truly to be made, we bind ourselves, our respective heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

Whereas the said principal has made a Contract with the Commonwealth acting through its Department of Conservation and Recreation ("Awarding Authority") the construction of

Now the condition of this obligation is such that if the principal shall well and truly keep and perform all the undertakings, covenants, agreements, terms and conditions of said Contract and any extensions thereof that may be granted by the Commonwealth, with or without notice to the surety, and during the life of any guarantee required under the Contract, and shall also well and truly keep and perform all the undertakings, covenants, agreements, terms and conditions of any and all duly authorized modifications, alterations, changes or additions to said Contract that may hereafter be made, notice to the surety of such modifications, alterations, changes or additions being hereby waived, then this obligation shall become null and void; otherwise it shall remain in full force and virtue.

In the event that the Contract is abandoned by the Contractor or is terminated by the Commonwealth under the provisions of said Contract, said surety shall, if requested in writing by the Commonwealth, take such action as is necessary to complete the Contract.

In witness whereof we hereunto set our hand and seals this _____ day of _____, _____

_____ (Seal)
(Print Name of General Contractor)

_____ (Seal)
(Print Name of Surety)

By _____
(Signature – Title)

By _____
(Signature – Title)

Surety Address _____

CERTIFICATE OF CORPORATE VOTE

I hereby certify that I am the ___ clerk, ___ assistant clerk, of

_____ (the "Corporation") and that at a
(Name of Corporation)

duly authorized meeting of the Board of Directors of the Corporation held on

_____ in _____ at which a quorum was
(Date) (Location)

present and voting it was voted to authorize _____
(Name)

_____ of the Corporation to execute
(Officer Title)

and deliver on behalf of the Corporation Contract, and to act as principal to execute bonds in connection therewith,

I further certify that _____ is the duly qualified and acting
(Name of Corporate Officer)

_____ of the Corporation and that said vote has not been
(Officer Title)

Repealed, rescinded, or amended.

Name

Print Name

Date

(CORPORATE SEAL)

SUBSCRIBED AND SWORN TO THIS ___ DAY OF _____, 20___ BEFORE ME

Notary Public

My Commission Expires: _____

CERTIFICATE OF COMPLIANCE WITH STATE TAX LAWS AND WITH UNEMPLOYMENT
COMPENSATION CONTRIBUTION REQUIREMENTS

Pursuant to MGL, c. 62C, s. 49A and MGL, c. 515A, s. 29A, I,

_____ authorized signatory for
_____ whose principal place of business is at
_____ do hereby certify
under penalties of perjury that _____ has filed all
state tax returns and paid all taxes as required by law and has complied with all state laws
pertaining to contributions to the unemployment compensation fund and to payments
in lieu of contributions.

The Business Organization Social Security Number or Federal Identification Number is

_____.

Signed under the penalties of perjury the _____ day of _____ 20 _____

Signature: _____

Name and Title: _____

Schedule for Participation by Minority Business Enterprise
(To be completed and submitted within five calendar days from bid opening)

NOTE I: Participation of a Minority-owned enterprise may be counted in only one category.

Minority Business Enterprise Participation in the work

Name & address of MBE Requirement 6%	Dollar Value of Participation	Nature of Participation
1. _____ _____		
2. _____ _____		
3. _____ _____		
4. _____ _____		
5. _____ _____		
6. _____ _____		

Total MBE Commitment: _____

Participation (divide Total Commitment by Total Bid Price)= _____ Percentage MBE

The bidder agrees to furnish implementation reports as required by the Department to indicate the MBE(s) which it has used or intends to use. Breach of this commitment constitutes a breach of the contract.

Name of bidder: _____
 Date: _____ By: _____

Letter of Intent – Minority Business Enterprise Participation

(To be completed by W or MBE and Submitted by the Low Bidder within five calendar days of bid opening)

Project Number: _____

MBE

Project Location: _____

To: _____

Name of General Bidder

1. My company has been certified by SDO (Supplier Diversity Office) and it has not changed its minority ownership, control, or management without notifying SDO within thirty (30) calendar days of such a change.

2. My company understands that if your company is awarded the contract, your company intends to enter into an agreement with my company to perform the activity described below for the prices indicated. My firm also understands that your firm, as General Bidder, will make substitutions and quantity changes as allowed or required by the provisions of the contract with the Commonwealth.

3. This firm understands that under the terms of Article XIII of the contract, only work **performed** by an MBE will be credited toward MBE participation requirements, and this firm **cannot assign or subcontract out any of its work** without prior written approval of the DCR Compliance Office, and that any such assignment or subcontracting will not be credited toward MBE participation requirements.

W or MBE PARTICIPATION

Contract Item	Description of Activity (with Notation such as "Labor Only", "Material Only", etc.)	Quantity	Unit Price	Total Amount
---------------	---	----------	------------	--------------

Total Dollar Value: _____

(Additional copies of this form shall be prepared by the Contractor in the quantity necessary to comply with the contract.)

Name of MBE _____

Firm _____ Authorized Signature _____

Business Address _____

Print Name _____ Title _____

Telephone No. _____ Cell: _____ Date _____

Schedule for Participation by Women Business Enterprise
(To be completed and submitted within five calendar days from bid opening)

NOTE I: Participation of a Woman-owned enterprise may be counted in only one category.

Minority Business Enterprise Participation in the work

Name & address of WBE 10%	Dollar Value of Participation	Nature of Participation
1. _____		

2. _____		

3. _____		

4. _____		

5. _____		

6. _____		

Total WBE Commitment: _____

Percentage WBE Participation (divide Total Commitment by Total Bid Price) = _____

The bidder agrees to furnish implementation reports as required by the Department to indicate the WBE(s) which it has used or intends to use. Breach of this commitment constitutes a breach of the contract.

Name of bidder: _____

Date: _____ By: _____

Letter of Intent – Women Business Enterprise Participation

(To be completed by WBE and Submitted by the Low Bidder within five calendar days of bid opening)

Project Number: _____

WBE

Project Location: _____

To: _____

Name of General Bidder

4. My company has been certified by SDO (Supplier Diversity Office) and it has not changed its women ownership, control, or management without notifying SDO within thirty (30) calendar days of such a change.
5. My company understands that if your company is awarded the contract, your company intends to enter into an agreement with my company to perform the activity described below for the prices indicated. My firm also understands that your firm, as General Bidder, will make substitutions and quantity changes as allowed or required by the provisions of the contract with the Commonwealth.
6. This firm understands that under the terms of Article XIII of the contract, only work **performed** by a WBE will be credited toward WBE participation requirements, and this firm **cannot assign or subcontract out any of its work** without prior written approval of the DCR Compliance Office, and that any such assignment or subcontracting will not be credited toward WBE participation requirements.

W or MBE PARTICIPATION

Contract Item	Description of Activity (with Notation such as "Labor Only", "Material Only", etc.)	Quantity	Unit Price	Total Amount
---------------	---	----------	------------	--------------

Total Dollar Value: _____

(Additional copies of this form shall be prepared by the Contractor in the quantity necessary to comply with the contract.)

Name of WBE Firm _____ Authorized Signature _____

Business Address _____

Print Name _____ Title _____

Telephone No. _____ Cell: _____ Date _____

**COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF CONSERVATION AND RECREATION
VETERAN OWNED BUSINESS ENTERPRISE POLICY
AND CONTRACTOR CERTIFICATION**

In accordance with Executive Order No. 546, it is the policy of the Commonwealth and its executive agencies to promote self-reliance among veterans by offering such veterans who own and control business enterprises the opportunity to participate in state contracting activity, as well as to assist and encourage the participation of businesses owned and controlled by veterans in all areas of state procurement contracting, including contracts for public construction, design services, and commodities and services.

The Massachusetts Executive Office of Administration and Finance has therefore established the Veteran-Owned Business Enterprise (VOBE) Program (the "Program") to oversee the inclusion of business enterprises owned and controlled by veterans in all areas of state procurement contracting, including contracts for construction, design and professional services, and commodities and services. For more information on this Order, see: <http://www.mass.gov/governor/legislationexecorder/executiveorder/executive-order-no-546.html>.

DCR Requires Contractors to acknowledge this policy and the requirements as provided in the contract by signing this certification as well as the Contract Documents.

CONTRACTOR CERTIFICATION

As evidence by the signature of the Contractor's Authorized Signatory below, the Contractor certifies under the pains and penalties of perjury that the Contractor acknowledges the above-referenced policy as set forth in Executive Order 546, has read Executive Order 546, and will abide the requirements concerning the policy and order as set forth in the referenced Contract. The Contractor acknowledges that if the Contractor has not submitted an appropriate Schedule for VOB Participation and appropriate Letters of Intent establishing that the VOB participation requirements for the project will be met, the Contractor may not be considered eligible for Award of the Contract unless he/she requests a waiver by completing and submitting the waiver form to the Contracts Administrator/DCR and that request is approved. The Contractor also understands and agrees that a breach of any of these terms during the period of the Contract may be regarded as a material breach, subjecting the Contractor to sanctions, including but not limited to monetary penalties, withholding of payments, contract suspension and /or termination.

Contractor Authorizing Signature	Date: _____
Print Name	
Title: _____	Telephone: _____
Cell: _____	Email: _____

Schedule for Participation by Veteran-Owned Business Enterprise

(To be completed and submitted within five (5) calendar days from bid opening)

NOTE: Participation of a Veteran-Owned Enterprise may be counted in only one category; the same participation cannot be used in computing the percentage of DBE/MBE/WBE participation.

Veteran-Owned Business Enterprise Participation in the work

Name & address of VOB 3%	Dollar Value of Participation	Nature of Participation
1. _____ _____		
2. _____ _____		
3. _____ _____		
4. _____ _____		
5. _____ _____		
6. _____ _____		

Total VOB Commitment: _____

Percent VOB Participation (divide Total Commitment by Total Bid Price)= _____

The bidder agrees to furnish implementation reports as required by the Department to indicate the VOB(s) which it has used or intends to use. Breach of this commitment constitutes a breach of the contract.

Name of bidder: _____

Date: _____ By: _____

Letter of Intent – Veteran-Owned Business Enterprise Participation

(To be completed by VOB and Submitted by the Low Bidder within five (5) calendar days of bid opening; use and prepare extra forms as needed)

DCR Contract/ Project Number: _____

Project Location: _____

To: _____

VOBE

Name of General Bidder

My company has been certified by the Department of Veterans Affairs and or Supplier Diversity Office (SDO). it has not changed its veteran ownership, control, or management without notifying the Department of Veterans Affairs within thirty (30) calendar days of such a change.

1. My company understands that if your company is awarded the contract, your company intends to enter into an agreement with my company to perform the activity described below for the prices indicated. My firm also understands that your firm, as General Bidder, will make substitutions and quantity changes as allowed or required by the provisions of the contract with the Commonwealth.
2. This firm understands that under all relevant terms of the contract, only work **performed** by an VOB will be credited toward VOB participation requirements, and this firm **cannot assign or subcontract out any of its work** without prior written approval of the DCR Compliance Office, and that any such assignment or subcontracting will not be credited toward VOB participation requirements.

VOBE PARTICIPATION

Contract **Description of Activity** (with Item Notation such as “Labor Only”, Quantity, Unit Price, Total Amount, “Material Only”, etc.):

Activity	Labor or Material Only?	Quantity Unit Price	Total Dollar Value

VOBE Firm Name _____

Authorized Signature _____

Printed Name _____ Title _____

Telephone No. _____ Cell No. _____

E-mail: _____@_____ ; Date _____

INSTRUCTIONS:

Executive Order 481 applies to all state agencies in the Executive Branch, including all executive offices, boards, commissions, agencies, departments, divisions, councils, bureaus, and offices, now existing and hereafter established. As it is the policy of the Executive Branch to prohibit the use of undocumented workers in connection with the performance of state contracts, all contracts entered after February 23, 2007, require that contractors, as a condition of receiving Commonwealth funds under any Executive Branch contract, make the following certification:

CONTRACTOR CERTIFICATION:

As evidenced by the signature of the Contractor's Authorized Signatory below, the Contractor certifies under the pains and penalties of perjury that the Contractor shall not knowingly use undocumented workers in connection with the performance of all Executive Branch contracts; that pursuant to federal requirements, the Contractor shall verify the immigration status of all workers assigned to such contracts without engaging in unlawful discrimination; and that the Contractor shall not knowingly or recklessly alter, falsify, or accept altered or falsified documents from any such worker(s). The Contractor understands and agrees that breach of any of these terms during the period of each contract may be regarded as a material breach, subjecting the Contractor to sanctions, including but not limited to monetary penalties, withholding of payments, contract suspension or termination.

Date: _____

Contractor Authorizing Signature

Print Name

Title: _____

Telephone: _____

Cell: _____

Email: _____

EQUAL EMPLOYMENT OPPORTUNITY COMPLIANCE FORM

Contractor's Certificate

A contractor shall not be eligible for award of a contract unless such contractor has submitted the following certification to the Awarding Authority, said certification shall be deemed a part of the resulting contract:

Contractor's Certification

X

(Contractor)

certifies that it intends to use the following listed **certification trades** in the work subject to this contract.

X

and, further, that it will comply with the minority manpower ratio and specific affirmative action steps contained herein; and will obtain from each of its subcontractors and submit to the Awarding Authority prior to the award of any subcontract under this contract, the subcontractor certification required by these bid conditions.

X

(Signature of authorized representative of contractor)

Subcontractor's Certification

Prior to the award of any subcontract, regardless of tier, the prospective subcontractor must execute and submit to the general contractor the following certification, which shall be deemed a part of the resulting subcontract:

(Subcontractor)

certifies that: it intends to use the following listed construction trades in the work under the subcontract

and, further, it will comply with the manpower ratio and specific affirmative action steps contained herein and will obtain from each of the subcontractors prior to the award of any subcontract under this subcontract, the subcontractor certification required by these bid conditions.

(Signature of authorized representative of subcontractor)

To ensure that said subcontractor's certification becomes a part of all subcontracts under the general contract, no subcontract shall be executed unless or until an authorized representative of the Awarding Authority administering this contract has determined, in writing, that said certification has been incorporated in such subcontract, regardless of tier. Any subcontract executed without such written approval shall be void.

Exhibit A
Executive Order 504 Contractor Certification Form

BIDDER/CONTRACTOR LEGAL NAME:

BIDDER/CONTRACTOR VENDOR/CUSTOMER CODE: VC

Executive Order 504: For all Contracts involving the Contractor’s access to personal information, as defined in M.G.L. c. 93H, and personal data, as defined in M.G.L. c. 66A, owned or controlled by Executive Department agencies, or access to agency systems containing such information or data (herein collectively “personal information”), Contractor certifies under the pains and penalties of perjury that the Contractor (1) has read Commonwealth of Massachusetts Executive Order 504 and agrees to protect any and all personal information; and (2) has reviewed all of the Commonwealth of Massachusetts Information Technology Division’s Security Policies available at www.mass.gov/ITD under Policies and Standards.

Notwithstanding any contractual provision to the contrary, in connection with the Contractor’s performance under this Contract, for all state agencies in the Executive Department, including all executive offices, boards, commissions, agencies, departments, divisions, councils, bureaus, and offices, now existing and hereafter established, the Contractor shall:

(1) obtain a copy, review, and comply with the contracting agency’s Information Security Program (ISP) and any pertinent security guidelines, standards, and policies; (2) comply with all of the Commonwealth of Massachusetts Information Technology Division’s Security Policies (“Security Policies”) available at www.mass.gov/ITD under Policies and Standards.

(2) communicate and enforce the contracting agency’s ISP and such Security Policies against all employees (whether such employees are direct or contracted) and subcontractors.

(3) implement and maintain any other reasonable appropriate security procedures and practices necessary to protect personal information to which the Contractor is given access by the contracting agency from the unauthorized access, destruction, use, modification, disclosure, or loss.

(4) be responsible for the full or partial breach of any of these terms by its employees (whether such employees are direct or contracted) or subcontractors during or after the term of this Contract, and any breach of these terms may be regarded as a material breach of this Contract.

(5) in the event of any unauthorized access, destruction, use, modification, disclosure or loss of the personal information (collectively referred to as the “unauthorized use”): (a) immediately notify the contracting agency if the Contractor becomes aware of the unauthorized use; (b) provide full cooperation and access to information necessary for the contracting agency to determine the scope of the unauthorized use; and (c) provide full cooperation and access to information necessary for the contracting agency and the Contractor to fulfill any notification requirements.

Breach of these terms may be regarded as a material breach of this Contract, such that the Commonwealth may exercise all contractual rights and remedies, including without limitation indemnification under Section 11 of the Commonwealth’s Terms and Conditions, withholding of payments, contract suspension, or termination. In addition, the Contractor may be subject to applicable statutory or regulatory penalties, including and without limitation, those imposed pursuant to M.G.L. c. 93H and under M.G.L. c. 214, § 3B for violations under M.G.L. c. 66A.

Bidder/Contractor Name: _____

Bidder/Contractor Authorized Signature: _____

Print Name and Title of Authorized Signatory: _____

Date: _____

This Certification may be signed once and photocopied to be attached to any Commonwealth Contract that does not already contain this Certification Language and shall be interpreted to be incorporated by reference into any applicable contract subject to Executive Order 504 for this Contractor.



COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF CONSERVATION & RECREATION
STANDARD CONSTRUCTION CONTRACT

PART III

GENERAL CONDITIONS OF THE CONTRACT

FOR PROJECTS SUBJECT TO M.G.L. CH. 149 OR
M.G.L. CH. 30, SEC. 39M

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ARTICLE I: DEFINITION OF TERMS

The following words shall have the following meanings as used in this Contract:

Advertisement: The Advertisement or Notice Inviting Bids or Proposals for the Work identified in Article 1 of the Department of Conservation and Recreation - Contractor Agreement.

Approval: (or approved): An approval in writing signed by the authorized signatory of the Awarding Authority.

As directed (As permitted, as required, as determined or words of like effect): The direction, permission, requirement, or determination of the Awarding Authority. Similarly, *approved, acceptable, satisfactory* or words of like import shall mean approved by or acceptable or satisfactory to the Awarding Authority.

Awarding Authority: The Department of Conservation and Recreation, the public agency awarding and administering this Contract, as identified in the Department of Conservation and Recreation - Contractor Agreement. Where the Awarding Authority is an agency of the Commonwealth, references to the Awarding Authority shall also include the Commonwealth and its agencies.

Building Code: All applicable rules and regulations to which the Awarding Authority is subject, and which are contained or referenced in the code authorized by M.G.L. c. 143, sec. 93 et seq., including all amendments thereto.

Change Order: (1) A written order not requiring the consent of the Contractor, signed by the Project Engineer, and designated as a Change Order, directing the Contractor to make changes in the Work within the general scope of the Contract, or (2) any written or oral order from the Project Engineer that causes any change in the Work, provided that the Contractor has given the Awarding Authority written notice stating the date, circumstances, and source of the order and that the Contractor regards the order as a Change Order.

Contract: The Contract formed by the Contract Documents as defined in Article 6 of the Department of Conservation and Recreation - Contractor Agreement.

Contract Documents: The documents listed in Article 6 of the Department of Conservation and Recreation - Contractor Agreement.

Contract Modification: Any alteration of the Contract Documents accomplished by a written agreement properly executed by the parties to this Contract.

Contract Price: The Contract Price stated in Article 3 of the Department of Conservation and Recreation - Contractor Agreement, which is the total sum, owed to the Contractor for all the Work.

DCR: The Department of Conservation and Recreation, the public agency awarding and administering this Contract.

Designer: The architect or engineer who prepared the plans and specifications for the work, identified as the Designer in Article 1 of the Department of Conservation and Recreation – Contractor Agreement.

Dispute Review Board: A panel of three experienced impartial reviewers organized and agreed upon by the DCR and Contractor. The Board members are provided with project plans and Specifications and become familiar with project procedures and participants. The Board meets on the job site regularly to encourage the resolution of disputes at the job level and renders non-binding recommendations on the resolution of the dispute.

Drawings: The Drawings are the graphic and pictorial portions of the Contract Documents, wherever located and whenever issued, showing the design, location, and dimensions of the Work, generally including Plans, elevations, sections, details, schedules, and diagrams.

Engineer: The Project Engineer, except that the term "Resident Engineer" shall have the meaning otherwise specified herein.

Final Acceptance: The written determination by the Awarding Authority that the Work has been 100% completed, except for the Contractor's indemnification obligations, warranty obligations, obligations to continue to maintain insurance coverage for the time periods provided in the Contract Documents, and any other obligations which are intended to survive Final Acceptance and/or the termination of the Contract.

General Bid: The completed bid form submitted by the Contractor in accordance with the requirements of either M.G.L. c. 149 or M.G.L. c. 30, sec. 39M.

Laws: All applicable statutes, regulations, ordinances, codes, laws, orders, decrees, approvals, certificates, and requirements of governmental and quasi-governmental authorities.

Neutral: An impartial third party not having an interest in the Owner, DCR, the Contractor or the Project.

Notice to Proceed: The written notice provided by the Awarding Authority to the Contractor which authorizes the Contractor to commence the Work as of a date specified therein and complete the entire Work of the Contract by a date specified therein.

Or equal (or words of like import): Equal in the opinion of the Awarding Authority, determined pursuant to the provisions of M.G.L. c. 30, sec. 39M and the provisions of these General Conditions of the Contract.

Owner: The Commonwealth of Massachusetts or political subdivision thereof, authority, or other instrumentality that will own the Work.

Plan(s): Drawing(s).

Product Data: Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor or its Subcontractors and suppliers to illustrate materials or equipment for some portion of the Work. Product data also include any such information or instructions produced by the manufacturer or distributor of such materials or equipment and made readily available by said manufacturer or distributor.

Progress Schedule: The progress schedule Approved by the Awarding Authority in accordance with Article VI of these General Conditions of the Contract.

Project: The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner, the Department of Conservation and Recreation, or by separate contractors.

Project Engineer: The Awarding Authority's representative assigned to the Project.

Punch List: A list of items determined by the Awarding Authority to be minor incomplete or unsatisfactory work items that do not materially impair the usefulness of the Work for its intended purpose.

Resident Engineer: The On-Site representative of the Awarding Authority.

Samples: Samples are physical examples that illustrate materials, equipment, or workmanship and establish standards by which the Work will be judged.

Schedule of Values: The schedule Approved by the DCR pursuant to Article VIII of these General Conditions of the Contract which allocates the Contract Price to the various portions of the Work and is used as a basis for payments to the Contractor.

Shop Drawings: Drawings, diagrams, details, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate a portion of the Work.

Site: The land and, if any, building(s), space within any such building(s), or other structures on which or in which the Contractor is to perform the Work.

Specifications: The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, construction systems, standards, and workmanship for the Work and performance of related services.

Subcontractor: Person or entity with whom the Contractor contracts to perform the Work, except as otherwise specifically provided or required herein or by Law.

Substantial Completion: For work subject to M.G.L. c. 30 sec. 39K, "substantial completion" shall occur when (1) the Contractor fully completes the Work or substantially completes the Work so that the value of the Work remaining to be done is, in the estimate of the DCR, less than one percent of the original contract price, or (2) the Contractor substantially completes the Work and the DCR takes possession for occupancy, whichever occurs first. For work subject to M.G.L. c. 30 sec. 39G, "substantial completion" shall mean either that the work required by the Contract has been fully completed, completed except for work having a Contract Price of less than one percent of the then adjusted total Contract Price, or substantially all of the Work has been completed and opened to public use except for minor incomplete or unsatisfactory work items that do not materially impair the usefulness of the Work.

Superintendent: The licensed construction supervisor who is an employee of the Contractor designated to be in full-time attendance at the Site throughout the prosecution and progress of the Work and who shall have complete authority to act for the Contractor.

Work: The Work defined in Article 1 of the Department of Conservation and Recreation - Contractor Agreement, Article II, Section 2 of these General Conditions of the Contract and otherwise in the Contract Documents.

Working Hours: 7:00 a.m. to 5:00 p.m., but not more than eight hours per day, Monday through Friday, unless otherwise specified by applicable Laws or deemed necessary by the DCR for traffic considerations or to minimize another contract impacts to the public.

All terms that this Contract defines may be used with or without initial capital letters. Other terms, abbreviations and references are defined as they appear herein. Words and abbreviations that are not defined in the Contract Documents, but which have recognized technical, or trade meanings are used in accordance with those meanings. For additional definitions of terms, abbreviations and references refer to the *Special Conditions or Specifications*.

ARTICLE II: EXECUTION OF THE CONTRACT, SCOPE OF WORK, INTERPRETATION OF CONTRACT DOCUMENTS

1. Execution.

The execution of the Department of Conservation and Recreation – Contractor Agreement by the Contractor is a representation that the Contractor has visited the Site, has become familiar with local conditions under which the Work is to be performed and has correlated personal observations with requirements of the Contract Documents.

2. Scope of Work.

The Work consists of the Work identified in the Contract Documents. The Work comprises the completed construction required by the Contract Documents and includes all labor, tools, materials, supplies, equipment, permits, approvals, paperwork, calculations, submittals, and certificates necessary to develop, construct and complete the Work in accordance with all Laws, and all construction and other services required to be supervised, overseen, performed or furnished by the Contractor or that the Contract Documents require the Contractor to cause to be supervised, overseen, performed or furnished. The Contractor shall provide and perform for the Contract Price all the duties and obligations set forth in the Contract Documents.

3. Interpretation.

A. The Plans and Specifications and other Contract Documents are to be considered together and are intended to be mutually complementary, so that any work shown on the Plans though not specified in the Specifications, and any work specified in the Specifications though not shown on the Plans, is to be executed by the Contractor as a part of this Contract.

B. All things that in the opinion of the Project Engineer may be reasonably inferred from the Plans, Specifications and other Contract Documents are to be executed by the Contractor. The Project Engineer shall determine whether the detail Plans conform to the general Plans and Contract Documents, except as may be otherwise determined by the DCR.

C. The tables of contents, titles, headings and marginal notes or sub-scripts contained herein are solely to facilitate references, are not intended to be construed as provisions of the Contract, and in no way affect the interpretation of the provisions to which they refer.

D. Where reference is made in the Contract Documents to publications, standards, or codes issued by associations or societies, such reference shall be interpreted to mean the current edition of such publications, standards, or codes, including revisions in effect on the date of the Advertisement, notwithstanding any reference to a particular date. The foregoing sentence shall not apply to the dates, if any, specified with respect to insurance policy endorsement forms.

E. In case of any conflict among the Contract Documents, unless the context clearly otherwise requires, the Contract Documents shall be construed according to the following priorities:

- Priority: Contract Modifications
- Second Priority: Department of Conservation and Recreation - Contractor Agreement
- Third Priority: General Conditions of the Contract
- Fourth Priority: Special Conditions of the Contract
- Fifth Priority: Drawings -- Schedules take precedence over enlarged detail Drawings, and enlarged Detail Drawings take precedence over reduced scale Drawings; figured dimensions shall prevail over scale.
- Sixth Priority: Specifications

4. Distribution of Work.

The distribution of the Work is intended to be described under the appropriate trades and, except for filed sub-bid work, may be redistributed, except as directed herein, provided that such redistribution shall cause no controversy among the trades and no delay in the progress of the Work.

5. Contract Price.

The Contract Price constitutes full compensation to the Contractor for everything to be performed and furnished in connection with the Work and for all damages arising out of the performance of the Work and/or the action of the elements and constitutes the maximum compensation regardless of any difficulty incurred by the Contractor in connection with the Work or in consequence of any suspension or discontinuance of the Work. The costs associated with the requirements of the General Conditions and any required in the Special Conditions or Specifications shall be included in the Contract Price and no direct or separate payment shall be made to the Contractor.

ARTICLE III: CONTROL OF WORK/ADMINISTRATION OF THE CONTRACT

1. DCR.

The Project Engineer shall be responsible for the general administration of the Contract. Except as otherwise specifically provided herein, the Project Engineer shall decide all questions which may arise as to the conduct, quantity, quality, equality, acceptability, fitness, and rate of progress of the several kinds of work and materials to be performed and furnished under this Contract and shall decide all questions which may arise as to the interpretation of the Plans and Specifications and as to the fulfillment of this Contract on the part of the Contractor.

2. Right of Access to Work.

The DCR, and persons designated by it, may for any purpose enter upon the Work, the Site, and premises used by the Contractor, and the Contractor shall provide safe facilities therefor. Other contractors of the DCR may also enter upon the same for the purposes which may be required by their contracts or work. Any differences or conflicts which may arise between the Contractor and other contractors of the DCR with respect to their work shall be initially resolved by the DCR.

3. Inspection No Waiver.

No inspection by the DCR or its employees or agents, and no order, measurement, certificate, approval, payment order, payment, acceptance or any other action or inaction of any of them, shall operate as a waiver by the DCR of any provision of this Contract.

ARTICLE IV: GENERAL PERFORMANCE OBLIGATIONS OF THE CONTRACTOR

The Contractor shall complete for the Contract Price all the Work in a proper, thorough, and workmanlike manner in accordance with the Contract Documents. Without limiting the foregoing and without limiting the Contractor's obligations under any other provision of the Contract Documents, the Contractor shall for the Contract Price perform the following general obligations:

1. Review of Contract Documents and Field Conditions.

A. Before commencing the Work, the Contractor shall carefully study the Contract Documents and carefully compare all Specifications, Plans, Drawings, figures, dimensions, lines, marks, scales, directions of the Project Engineer, and any other information provided by the DCR and shall at once report to the Project Engineer in writing any questions, errors, inconsistencies, or omissions.

B. Before commencing the Work, the Contractor shall take field measurements and verify field conditions and shall carefully compare such field measurements and conditions and other information known to the Contractor with the Contract Documents and shall at once report to the Project Engineer in writing any questions, errors, inconsistencies, or omissions.

C. Any work performed by the Contractor after the discovery of said discrepancies without the written approval of the DCR shall be at the Contractor's risk and expense.

D. The Contractor shall be responsible for all errors in the Work arising from the Contractor's failure to comply with any of the requirements set forth in this section. The Contractor shall not be entitled to any extra compensation for any work or expense arising from or caused by his/her failure to comply with said requirements.

2. Supervision and Construction Procedures: Coordination: Cutting, and Patching.

A. The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and shall have control over, construction means, methods, techniques, sequences, and procedures, and shall be responsible for coordinating all portions of the Work under the Contract.

B. The Contractor shall be responsible for the proper fitting of all work and the coordination of the operations of all trades, subcontractors, and material suppliers engaged upon the Work. The Contractor shall guarantee to each of its subcontractors all dimensions which they may require for the fitting of their work to all surrounding work. Where equipment and lines of piping are shown diagrammatically, the Contractor shall be responsible for the coordination and orderly arrangement of the various lines of embedded piping and conduit included in the Work. The Contractor shall coordinate the work of any Subcontractor and prevent all interferences between the equipment, lines of piping or structural and architectural features, and avoid any unsightly arrangements in exposed work.

C. The Contractor should note that other contractors may be working on or near the Site where the Contractor's Work is being performed. The Contractor shall coordinate his/her work and the operations of all trades, subcontractors, and material suppliers engaged upon the Work so as not to interfere with or hinder the progress or completion of work being performed under another DCR contract.

D. All necessary cutting, coring, drilling, grouting, and patching required to fit together the several parts of the Work shall be done by the Contractor, except as may be specifically noted otherwise under any filed sub-bid section of the Specifications.

E. The Contractor shall be responsible to the DCR for the acts and omissions of the Contractor's employees, agents and Subcontractors, and their agents and respective contractors' employees, and other persons performing portions of the Work or supplying materials therefor.

F. The Contractor shall be responsible for the inspection of portions of the Work already performed under this Contract to determine that such portions are in proper condition to receive subsequent Work.

G. The Contractor shall employ a registered land surveyor to perform any engineering required for establishing grades, lines, levels, dimensions, layouts, and reference points for the trades. The Contractor shall be responsible for maintaining benchmarks and other survey marks and shall replace any benchmarks or survey marks that may have become disturbed or destroyed. The Contractor shall verify the materials shown on the Drawings before laying out the Work and shall be responsible for any error resulting from its failure to exercise this precaution.

H. Unless otherwise required by the Plans and Specifications, or directed in writing by the DCR, Work shall be performed during regular Working Hours. However, if the Contractor desires to carry on the Work outside of regular working hours or on Saturdays, Sundays, or Massachusetts or federal holidays, then the Contractor shall allow ample time to allow satisfactory arrangements to be made for inspecting Work in progress and shall bear the costs of such inspection. The DCR shall bill the Contractor directly for such costs.

I. Work performed outside of regular Working Hours without the consent or knowledge of the DCR shall be subject to additional inspection and testing as directed by the DCR. The cost of this inspection and testing shall be borne by the Contractor whether the Work is found to be acceptable or not. The DCR at its election shall be entitled either to issue a credit Change Order to cover such cost or to withhold such cost from any further payments due the Contractor and/or to receive a payment from the Contractor of the amount of such cost.

3. Superintendent.

A. The Contractor shall employ a Superintendent whose appointment shall be subject to the Approval of the DCR. The Superintendent shall attend the Site full-time during the performance of the Work. The Superintendent shall represent the Contractor. Communications given to and from the Superintendent shall be deemed given to and from the Contractor. Important communications shall be confirmed in writing. Other communications shall be similarly confirmed upon written request in each case. The Superintendent shall attend each job meeting. The Superintendent shall be responsible for coordinating all the Work of the Contractor and the Subcontractors.

B. The Superintendent shall be a competent employee regularly employed by the Contractor. The Superintendent shall be licensed in accordance with the Building Code, if applicable, and shall have satisfactorily performed similar duties on previous construction projects similar in type, complexity, and scale to the Project. The Superintendent's resume shall be submitted to the DCR prior to commencement of construction together with such other information as the DCR may reasonably require determining whether to Approve of his or her appointment. Any change in the Superintendent shall require the prior consent of the DCR. The Contractor shall establish an emergency telephone line by which the DCR or its agents may contact the Superintendent during non-working hours.

4. Labor.

A. The Contractor shall employ only competent workers. The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them. Whenever the DCR shall notify the Contractor in writing that any worker is, in the DCR's opinion, incompetent, unfaithful, disorderly, or otherwise unsatisfactory, such employee shall be discharged from the Work and shall not again be employed on the Project except with the consent of the DCR.

B. The Contractor shall employ enough workers to carry on the Work with all proper speed in accordance with Laws, the requirements of the Contract Documents, and the Progress Schedule.

C. The Contractor shall procure materials from such sources and shall manage its own forces and the forces of its Subcontractors and any sub-subcontractors in such a manner as will result in harmonious labor relations on the Project Site. If union and nonunion workers are employed to perform any part of the Work, the Contractor shall establish and maintain separate entrances to the Site for the use of union and nonunion workers. The Contractor shall cause persons to be employed in the Work who will work in harmony with others so employed. Should the Work be stopped or materially delayed in the DCR's reasonable judgment due to a labor dispute, the DCR shall have the right to require the Contractor to employ substitutes acceptable to the DCR.

D. The Contractor shall bear the entire expense, and no separate or direct payment shall be made by the DCR, because of extra work which may be necessary because of inferior workmanship, or for specific items of work which are normally considered a part of good workmanship in completing any phase of the work.

5. Notices and Permits.

A. The Contractor at its sole cost shall take out and pay for all approvals, permits, certificates and licenses required by Laws, pay all charges and fees, and pay for (or cause the appropriate Subcontractor to pay for) all utilities required for the proper execution of the Work. All permits secured by the Contractor, complete with the application and orders of conditions, shall be kept on file in the Contractor's office and field office with copies submitted to the Project Engineer.

B. The Contractor shall comply with all Laws and shall give all notices required thereby.

C. Except as otherwise specified in this Contract, it is not the Contractor's responsibility to ascertain that the Contract Documents are in accordance with applicable Laws. However, if the Contractor observes that portions of the Contract Documents are at variance with the requirements of Laws, the Contractor shall promptly notify the DCR in writing, and necessary changes shall be accomplished by an appropriate Contract Modification.

D. If the Contractor performs work knowing it to be contrary to Laws without giving such notice to the DCR, the Contractor shall bear full responsibility for such Work and all costs attributable thereto, including, without limitation, corrections to the Work.

6. Lines, Marks etc.

The Contractor shall furnish batter boards and stakes and shall cause to be placed and maintained thereon to be easily read, such lines, marks and directions relating to the Work as the Project Engineer shall from time to time direct. The Project Engineer shall establish base lines and benchmarks on the Drawings for the locations of the Work but all other lines and grades in the field shall be determined by the Contractor.

7. Excavation.

The Contractor shall prevent by sheeting and shoring or bracing, if necessary, any caving or bulging of the sides of any excavation made by the Contractor, leaving sheeting, and shoring in place, or if any is removed, filling solid the spaces left thereby.

8. Dewatering/Hoisting/Staging.

The Contractor shall provide pumping, drainage, and disposal of all water and other flows so that no puddle, nuisance, or damage will be caused by water or flooding. If pumping results in contaminated water the Contractor shall take appropriate measures to treat this water prior to discharge and shall seek appropriate permits for discharge of water. The Contractor shall provide all hoisting equipment and machinery required for the proper execution of the Work. The Contractor shall provide all exterior and interior staging required to be over eight feet in height, except as may be otherwise provided in the Contract Documents.

9. Corrections to the Work: Inspection No Bar to Subsequent Corrections.

The DCR's inspection of the Work shall not relieve the Contractor of its responsibilities to fulfill the Contract obligations. Defective work may be rejected by the DCR whether such work and/or materials have been previously overlooked or misjudged by the Resident Engineer or Project Engineer and accepted for payment. If the Work or any part thereof shall be found defective at any time before the Final Acceptance of the whole Work, the Contractor shall forthwith cease the performance of any defective work in progress and, whether such work is still in progress, shall forthwith correct such defect in a manner satisfactory to the Project Engineer. If any material brought upon the Site for use in the Work, or selected for the same, shall be rejected by the Project Engineer as unsuitable or not in conformity with the Contract Documents, or as damaged by casualty or deteriorated due to improper storage at the Site or to any other factor, the Contractor shall forthwith remove such materials from the Site. The Contractor shall pay for the cost of making good all work or property of other contractors, the Owner or of the Department of Conservation and Recreation destroyed or damaged by such removal or replacement; repair any injury, defect, omission, or mistake in the Work as soon as it is discovered; finish and immediately make good any defect, omission, or mistake in the Work; and complete and leave the Work in perfect condition.

10. Sanitary Facilities.

The Contractor shall provide and maintain sanitary facilities for all persons employed on the Work, beginning with the first worker at the Site. Said facilities shall meet the following requirements unless otherwise specified in the Special Conditions or Specifications.

A. There shall be no fewer facilities than the number required by applicable Laws.

B. Facilities shall be always kept in a clean sanitary condition and shall be adequately screened to be inaccessible to flies. (**Note:** If existing sanitary facilities at the Site are to be used by the Contractor, this requirement will be modified accordingly in the Special Conditions or Specifications.)

11. Temporary Offices.

A. Contractor's Field office. The Contractor shall erect a temporary field office at or near the Site of the Work at which the Contractor's authorized representative shall be always present while the Work is in progress. Instructions, notices, and other communications delivered there by the DCR shall be deemed delivered to the Contractor. The Contractor shall adequately furnish and maintain this office in a clean, orderly condition.

B. Resident Engineer's Office. The Contractor shall erect an Office for the Resident Engineer if, and as required by the Special Conditions or Specifications of the Contract.

12. Telephones.

A. The Contractor shall provide and maintain telephone service in the Contractor's field office. The Contractor shall pay for all calls and costs relating to this service. The DCR and its employees and authorized agents shall always be allowed the use of this telephone service without charge. Telephone service and equipment shall meet the requirements, if any, of the Special Conditions or Specifications.

B. The Contractor shall also provide and maintain telephone service in the Resident Engineer's Office, when the Contractor is required to erect such office, for the use of the DCR and its employees and authorized agents. The Contractor shall pay for all calls and costs relating to this service. Telephone service and equipment shall meet the requirements, if any, of the Special Conditions or Specifications.

13. Project Sign.

A. The Contractor shall furnish and erect at a suitable location, Approved by the Project Engineer, at the start of the work, a sign having dimensions of at least eight (8) feet long by four (4) feet high, bearing the words: Massachusetts Department of Conservation and Recreation. Also included may be the project title, expected completion date, and facility name.

B. The Contractor shall submit the design of the sign to the Project Engineer for review and approval prior to posting.

14. Contract Documents and Samples at the Site.

The Contractor shall maintain at the Site for the use and information of the DCR one record copy of the Drawings, Specifications, Addenda, Change Orders, Approved Shop Drawings, Product Data, Samples, updated Progress Schedule, and all other submittals, all in good order and marked currently to record changes and selections made during construction. These shall be available to the DCR and shall be delivered to the DCR upon completion of the Work.

15. Safety Laws, Regulations, and Practices.

- A.** The Contractor shall comply with all health and safety Laws applicable to the Work. Without limitation,
- (1) If the Contractor uses or stores toxic or hazardous substances it shall comply with M.G.L. c. 111F, sec. 2, the "Right to Know" law and regulations promulgated by the Department of Public Health, 105 CMR 670, the Department of Environmental Protection, 310 CMR 33, and the Department of Labor and Workforce Development, 441 CMR 21; and shall post a Workplace Notice obtainable from the Department of Labor and Workforce Development.
 - (2) The Contractor shall comply with the Federal Resource Conservation and Recovery Act, the Federal Comprehensive Environmental Response, Compensation and Liability Act, M.G.L. c. 21C, M.G. L. c. 21E, and any other Laws affecting toxic or hazardous materials, solid, special, or hazardous waste (collectively "Hazardous Materials Laws"). Should the Contractor discover unforeseen materials subject to Hazardous Materials Laws at the Site, the Contractor shall immediately notify the DCR of such discovery.
 - (3) The Contractor shall be responsible for the location of all utilities in connection with the Work. Without limiting the foregoing, the Contractor shall comply with Dig Safe Laws. Dig Safe is the Utility Underground Plant Damage Prevention System established pursuant to M.G.L. c. 164, sec. 76D. This System is operated by Dig Safe Systems, Inc., located at 331 Montvale Avenue, Woburn, MA 01801, whose toll-free telephone number is 1-888-DIG-SAFE (1-888-344-7233). The Contractor shall notify Dig Safe of contemplated excavation, demolition, or explosive work in public or private ways, and in any utility company right of way or easement, by certified mail, with a copy to Department of Environmental Protection (DEP). This notice shall be given at least 72 hours prior to the work, but not more than sixty days before the work is to be done. Such notice shall state the name of the street or the route number of the way and shall include an accurate description of the location and nature of the proposed work. Dig-Safe is required to respond to the notice within 72 hours of receipt by designating the location of pipes, mains, wires, or conduits at the Site. The Contractor shall not commence work until Dig-Safe has responded. The work shall be performed in such manner and with reasonable precautions taken to avoid damage to utilities under the surface at the work location. The Contractor shall provide the Superintendent with current Dig-Safe regulations, and a copy of M.G.L. c. 82, sec. 40. Any costs related to the services performed by Dig-Safe shall be borne by the Contractor.
 - (4) The Contractor shall comply with Public Law 92-596, "Occupational Safety and Health Act of 1970" (OSHA), with respect to all rules and regulations pertaining to construction, U.S. Code Title 29, sections 651 et seq. including Volume 36, numbers 75 and 105 of the Federal Register as amended, and as published by the U.S. Department of Labor.
 - (5) The Contractor shall comply with M.G.L. c. 149, sec. 129A, relative to shoring and bracing of trenches.

- B.** The Contractor shall take reasonable precautions to prevent damage, injury, or loss to persons (whether under his management, DCR staff, or the public) or property. Nothing herein shall relieve Subcontractors of their responsibility for the safety of persons and property, and for compliance with all Laws applicable to the Work and their activities in connection therewith. Without limitation, the Contractor shall take all reasonable precautions for the safety of, and the prevention of injury or damage to (1) all agents and employees and contractors on the Work and all other persons who may be affected thereby including the general public, (2) all the Work and all materials and equipment to be incorporated therein, whether in storage on or off the Site, under the care custody or control of the Contractor or any of its Subcontractors or any contractors directly or indirectly contracting through any of them, and (3) other property at the Site or adjacent thereto, including but not limited to trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of the Work. The Contractor shall promptly remedy all damage or loss to any such property caused in whole or in part by the Contractor, any Subcontractor, or anyone directly or indirectly contracted or employed by any of them or by anyone for whose acts any of them may be liable. Without limiting the foregoing, the Contractor shall:
- (1) post and maintain adequate danger signs and other warnings against hazards.
 - (2) promulgate safety regulations and give appropriate notices to the DCR and users of adjacent utilities and property.

- (3) ensure the adequate strength and safety of all scaffolding, staging and hoisting equipment, temporary shoring, bracing, and tying.
- (4) protect adjoining private or public property.
- (5) provide barricades, temporary fences, and covered walkways required by prudent construction practices, Laws and/or the Contract Documents.
- (6) furnish approved hard hats and other personal protective equipment, furnish approved first aid supplies, furnish the name of the first aid attendant, and maintain a posted list of emergency facilities.
- (7) provide proper means of access to property where the existing access is cut off by the Contractor, including maintaining traffic over, through or around the Work included in this contract, with the maximum safety, and practicable convenience to such traffic suspended temporarily.
- (8) maintain from the beginning of any darkness or twilight through the whole of every night sufficient lights on or near any obstruction to guard or protect travelers from injury from such obstruction.
- (9) maintain adequate security at the Site so as not to expose the Work, the materials to be incorporated in the Work, DCR's materials stored or otherwise located upon the Site, and surrounding property to vandalism or malicious mischief.
- (10) provide adequate fire protection procedures during the use of cutting torches, welding equipment, plumbers' torches and other flame and spark producing apparatus.
- (11) take prompt action to correct any dangerous or hazardous conditions.

C. Use of Explosives: The use of explosives will not be permitted in the Work unless specifically authorized in the technical Specifications, Special Conditions and/or Drawings or approved by the DCR in writing. If such approval is given, the Contractor shall comply with all Laws and obtain all permits, approvals, and certificates required in connection with the same and shall exercise best efforts, including but not limited to the employment and supervision of properly qualified personnel, to prevent damage, injuries, and accidents involving said explosives.

D. Written notice shall be given by the Contractor to all public service corporations or officials owning or having charge of public or private utilities of his/her intention to commence operations affecting such utilities at least seventy-two (72) hours exclusive of Saturdays, Sundays, and legal Holidays in advance of the start of such operations, and the Contractor shall at the same time file a copy of said notice with the DCR.

E. When necessary, the Contractor shall cooperate with representatives of public service companies to avoid damage to their structures by furnishing and erecting suitable supports, props, shoring or other means of protection. Fire hydrants adjacent to the work always shall be readily accessible to fire apparatus and no materials or other obstructions shall be placed within a radius of 10 feet of a fire hydrant.

F. Although the drawings may indicate the approximate location of existing subsurface utilities in the vicinity of the work, the accuracy and completeness of the information is not guaranteed by the DCR. Before commencing any work, or operations which may endanger or damage any subsurface structures, the Contractor shall carefully locate all such structures and conduct his/her operations in such manner as to avoid damage thereto. He/she shall not interrupt live services until new services have been provided. All abandoned services shall be plugged or otherwise made secure.

G. If the Contractor wishes to have any utilities temporarily relocated for his/her convenience, other than those specified by DCR, he/she shall submit such a request in writing to the Project Engineer. If the DCR approves this request, the Contractor shall pay for the cost of the relocation at his/her sole expense.

H. Land monuments and property markers shall be carefully protected. If is necessary to remove land monuments and/or property markers to perform the contract Work, the Contractor shall do so only at the DCR's direction and after an authorized agent of the DCR has referenced their location.

I. The Contractor shall not injure or remove trees or shrubs without authorization from the DCR.

J. Disturbance or damage to any above- or below-ground structures, conduits, cables, or the like, caused by any act of omission, neglect or misconduct in the execution or non-execution of work thereof by the Contractor shall be repaired, and/or replaced by the Contractor to the satisfaction of the DCR and at no additional expense to the DCR.

K. Disturbance or damage to any structure shall be replaced or repaired by the Contractor to the satisfaction of the DCR and at no additional expense to the DCR.

L. The Contractor shall receive no extra compensation for protection and restoration of property unless said compensation is authorized in writing by the DCR, as specified under Article VI I of the Contract General Conditions.

M. The Contractor shall not permit cutting or welding in or immediately adjacent to existing property of the Department of Conservation and Recreation or of anyone else without the DCR's prior approval in each instance.

N. The Contractor shall designate by notice to the DCR a responsible member of its organization at the Site whose duties shall include preventing accidents.

O. The Contractor shall submit to the DCR without delay verbal and written reports of all accidents involving bodily injury or property damage arising in connection with the Work.

P. In any emergency affecting the safety of persons or property the Contractor shall immediately act in the exercise of reasonable judgment to prevent threatened damage, injury, or loss. The Contractor shall immediately notify the DCR of such emergency.

16. Environmental Protection

A. The DCR shall secure the required environmental permits required under M.G.L. Chapters 131 and 91, including the National Pollutant Discharges Elimination System (NPDES) Construction General Permit and those issued by the Army Corps of Engineers under Section 404 of the Clean Water Act (33 U.S.C. 1344) and Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403). The Contractor is obligated to conform to all the requirements of the permits and subsequent requirements issued by the governing agencies.

B. Contractors operating under a DEP permit shall post on the Site a sign in a format consistent with that enclosed.

C. Prevention of Water Pollution:

1. The Contractor shall take such precautions in the conduct of the Work as may be necessary to avoid contaminating water in adjacent watercourses, water resources or wetlands. All earthwork, moving of equipment, water control for excavation or foundation areas, and other operations likely to create silting shall be conducted to avoid pollution of watercourses, water resources and wetlands.

2. Erosion Control: The Contractor shall utilize such methods as may be necessary to effectively prevent erosion and sediment from entering nearby waterways.

3. Control of Surface Water Runoff: The Contractor shall keep the rate of runoff from the Site at a minimum, and control it by constructing diversion ditches, trenches, and berms, and taking any other necessary action to retard and divert runoff to protect watercourses. The Contractor shall inspect said Site controls regularly, after significant storm events (greater than one-half inch over a 24-hour period) and in accordance with a site-specific storm water pollution prevention plan (SWPPP) prepared by the Contractor. The Contractor shall repair any damage to Site controls to prevent discharge of sediments or pollutants.

4. The Contractor shall construct silt retention basins in areas of the Work adjacent to streams, or rivers, as directed by the DCR. These basins shall be removed upon completion of the Work. Water used during the Work which has become contaminated with oil, bitumen, harmful or objectionable chemicals, sewage or other pollutants shall be discharged in accordance with all Laws to avoid affecting nearby waters.

5. Under no circumstances shall the Contractor discharge pollutants into any watercourse, water resource, or wetland. When water from adjacent natural sources is used in the contract work, intake methods shall be such as to avoid contaminating the source of supply.

D. Protection of Land Resources

1. Prevention of Landscape Defacement: The Contractor shall not deface, injure, remove, cut, or destroy trees or shrubs, without authority from the DCR. No ropes, cables, or guys shall be fastened to or attached to any existing nearby trees for anchorages unless specifically approved by the DCR. Where such activity is permitted, the Contractor shall adequately wrap the tree with burlap or rags over which softwood slats shall be tied. The Contractor shall be responsible for any damage resulting from such use. Where trees may possibly be defaced, bruised, injured, or otherwise damaged by equipment, dumping, or other operations, the Contractor shall protect such trees by placing boards, planks or approved protective fencing around them.

2. Restoration of Landscape Damage: Any trees or other landscape feature scarred or damaged by equipment or operations shall be restored as nearly as possible to the original condition, as approved by DCR. All trimming or pruning shall be performed in an approved manner by licensed arborists with saws or pruning shears. Trimming with axes will not be permitted.

3. Plant Pest Control: If the Work under this contract requires the use of soil moving equipment in an area with plant infestation, the Contractor shall be subject to applicable plant quarantine regulations. In general, these regulations require the thorough cleaning of soil from equipment before such equipment is moved from regulated areas to area's noninfected

E. Noise Control: The Contractor shall use every effort and every means possible to minimize noise caused by his/her operations which the DCR may consider objectionable. Each Contractor shall provide working machinery and equipment designed to operate with the least possible noise, and when gearing is used, such gearing shall be of a type designed to reduce noise to a minimum. Compressors shall be equipped with silencers on intake lines. All gas or oil operated equipment shall be equipped with silencers or mufflers on intake and exhaust lines. Electricity shall be used for power to reduce noise. Dumping bins, hoppers and trucks used for disposal of excavated materials shall be lined with wood or other sound-deadening material if required. Where required by agencies having jurisdiction, certain noise-producing work may have to be performed during specified periods only.

E. Air Pollution Control: The Contractor shall conduct his/her operations to comply with all Laws pertaining to air pollution, including Section 142B of Chapter 111 of the Massachusetts General Laws.

1. Diesel Equipment Emission Controls

a.) All motor vehicles and construction equipment shall comply with all pertinent local, state, and federal regulations covering exhaust emission controls and safety.

b.) All Contractor and Sub-Contractor diesel-powered non-road construction equipment with engine horsepower (HP) ratings of 50 and above, which are used on the Project Site for a period more than 30 calendar days over the course of the construction period on the Project Site, shall be retrofitted with Emission Control Devices to reduce diesel emissions.

c.) The reduction of emissions of volatile organic compounds (VOCs); carbon monoxide (CO) and particulate matter (PM) from diesel-powered equipment shall be accomplished by installing Retrofit Emission Control Devices.

d.) Acceptable Retrofit Emission Control Devices for the Project shall consist of oxidation catalysts that are (1) included on the US Environmental Protection Agency (EPA) *Verified Retrofit Technology List* and/or the California Air Resources Board (CARB) *Currently Verified Technologies List*; and (2) are verified by EPA, CARB, or certified by the manufacturer to provide a minimum emissions reduction of 50 percent for VOCs, 40 percent for CO and 20 percent for PM. Attainment of the required reduction in PM emissions can also be accomplished by using less polluting Clean Fuels. Verified technologies can be identified on the following websites:

EPA: <http://www.epa.gov/otaq/retrofit/retroverifiedlist.htm>

CARB: <http://www.arb.ca.gov/diesel/verdev/verifiedtechnologies/cvt.htm>

e.) The emission control equipment can be procured through the Statewide Contract #VEH71 that has fixed costs associated with retrofitting of diesel emission control devices.

f.) Construction shall not proceed until the Contractor has submitted a certified list of the non-road diesel-powered construction equipment subject to this provision which either are or will be retrofitted with emission control devices. The list shall include (1) the equipment number, type, make, and Contractor/Sub-Contractor name; and the emission control device make, model, and EPA verification number. Contractors shall also submit a receipt or other documentation from a manufacturer or installer that verifies that appropriate equipment has been installed. The Contractor shall also identify any vehicles that will use Clean Fuels. Equipment that has been retrofitted with an emission control device shall be stenciled or otherwise clearly marked as "Low Emission Equipment".

g.) The Contractor shall submit monthly reports, updating the same information stated in Paragraph f above, including the quantity of Clean Fuel utilized. The addition or deletion of non-road diesel equipment shall be indicated in the report.

h.) The Contractor shall use methods to control nuisance odors associated with diesel emissions from construction equipment including but not limited to the following: (1) turning off diesel combustion engines on construction equipment not in active use and on trucks that are idling for five minutes or more; and (2) locating diesel equipment away from the public and sensitive receptors.

i.) All costs associated with implementation of the diesel equipment emissions control shall be borne by the respective Contractor or subcontractor and included in their cost for performing the work of the Contract.

2. Dust Control.

A. The Contractor is placed on notice that blowing dust from un-stabilized earth areas of the work under his/her control will be considered a nuisance. He/she shall, by spraying with water or by other approved means, dampen the soil to hold down the dust. The use of calcium chloride as a wetting agent will not be permitted. During working hours and before leaving the work for the evening, for weekends, or for a more extended period, the Contractor shall assess the moisture content of the soil and dampen it to the extent necessary to hold down the dust. While work is suspended, he/she shall return to work, if so, directed by the DCR, to maintain the dust control.

17. Debris, Excavated Material and Chemical Waste.

A. The Contractor shall not permit the accumulation of interior or exterior debris. The Contractor shall always keep the Work area clean. Without limitation, garbage shall be removed daily. Where no disposal area is shown on the Drawings, the Contractor shall remove and legally dispose of all materials off land owned by the Commonwealth to a location approved by the DCR. Documentation certifying proper disposal shall be submitted to the DCR.

B. The Contractor shall, at his/her own expense, and in accordance with all Laws, arrange for the waste of materials from excavations that are unacceptable for use in the refill or that are more than the refill materials required, in spoil banks off the lands owned by the Commonwealth of Massachusetts. Materials, if any, which cannot be placed at once in permanent positions may be deposited in storage piles at locations designated, but materials re-excavated from such storage piles shall not again be paid for as excavation.

C. The Contractor shall properly classify and remove debris and waste from the Site and transport and dispose of it, all in accordance with Laws, employing a qualified and properly licensed transporter, at any landfill, disposal or recycling facility licensed under applicable Laws, including without limitation, hazardous materials laws. The Contractor shall make all arrangements and give and obtain all notices, communications, documentation, permits, certificates, and approvals necessary for said disposal from the owner or officials in charge of such landfills, disposal, or recycling facilities. The Contractor shall bear all fees and costs in connection with such classification, removal, transportation, disposal, and storage, except as otherwise specifically provided or required by the Special Conditions or other Contract Document. The Contractor shall not permit any storage of debris or waste except in accordance with Laws.

D. The Contractor shall not permit any open fire on the Site.

E. Chemical Waste: Chemical waste shall be identified and labeled properly, stored in appropriate Department of Transportation approved containers in a secure location, removed from the Site, and disposed of not less frequently than monthly unless more frequently required by Laws, including without limitation hazardous materials laws, or by the Special Conditions or Specifications. Disposal of chemical waste shall be performed in accordance with requirements of the U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (DEP). Stockpiles of contaminated soils will be placed on a protective surface and covered to prevent migration or erosive loss by wind or water. Fueling and lubricating of vehicles and equipment shall be conducted in a manner that affords the maximum protection against spills and evaporation. Lubricants shall be disposed of in accordance with procedures meeting all applicable Laws. The Contractor shall immediately notify the DCR of any hazardous materials release large enough to require reporting under applicable Laws. The Contractor shall be responsible for immediately containing and cleaning up in accordance with Laws any oil or hazardous materials releases resulting from his/her operations. Any costs incurred in cleaning up any such releases shall be borne by the Contractor.

18. Nuisances.

The Contractor shall strictly prohibit and take all necessary measures to prevent the committing of nuisances on the land of the Commonwealth and adjacent properties.

19. Weather Protection (M.G.L. c. 149, sec. 44G and 44F(1)).

A. For all building projects, the Contractor shall furnish and install "weather protection," which means temporary protection of that Work adversely affected by moisture, wind and cold. Weather protection shall be achieved by covering, enclosing and/or heating working areas such that a minimum temperature of 40 degrees Fahrenheit is maintained at the working surface during the months of November through March to permit construction to be carried on during such period in accordance with the Progress Schedule. After the building or portion thereof is completely enclosed by either permanent construction or substantial temporary materials having a resistance comparable to the specified permanent construction, the Contractor shall provide heat therein of not less than 55 degrees Fahrenheit nor more than 75 degrees Fahrenheit. The foregoing provisions do not supersede any specific requirements for methods of construction, curing of materials and the like. Concrete, masonry, plaster, and all other materials that require special considerations in temperatures below 40 degrees Fahrenheit shall be installed, applied, and cured in accordance with the specific requirements for cold weather protection as defined in the project specifications.

B. The general contractor may, with the approval of the Engineer, elect to utilize the permanent heating system for temporary heat after the building is enclosed and after it has been tested and ready to operate. It shall, however, be his responsibility to thoroughly clean and restore to first-class condition any portion of the permanent heating system used for heating during construction to the satisfaction of the Engineer.

C. The Contractor shall furnish and install one thermometer for every 2,000 square feet of floor space or fraction thereof.

D. Installation of weather protection and heating devices shall comply with all safety regulations including provisions for adequate fire protection devices. Approved methods of heating should also provide for adequate ventilation to prevent exposing people and materials to carbon monoxide, carbon dioxide and other noxious fumes.

E. Within 30 calendar days after the award of this contract, the general contractor shall submit in writing to the Engineer three (3) copies of his proposed methods for "Weather Protection" for approval.

F. The Contractor shall give adequate notification to the Engineer and all subcontractors prior to the erection and removal of temporary protective enclosures.

G. Such weather protection shall be consistent with the Progress Schedule, shall permit the continuous progress of the Work necessary to maintain an orderly and efficient sequence of construction operations and shall meet such additional requirements as may be specified by the Special Conditions or Specifications.

20. Furnishings and Equipment.

When, in the opinion of the DCR, any portion of the Work is in a reasonable condition to receive fittings, furniture, or other property of the Department of Conservation and Recreation not covered by this Contract, the Contractor shall allow the DCR to bring such fittings, furniture, and/or other property into such portions of the Work and shall provide all reasonable facilities and protection thereof. No such occupancy shall be construed as interfering with the provisions relating to time of completion, or as constituting an acceptance of the whole or any part of the Work. Any furniture or fittings so installed shall be placed in the Work at the risk of the DCR except that the Contractor shall be liable for damages or losses to such furniture or fittings to the extent such damages or losses arise in whole or in part from the negligence or intentional misconduct of Contractor, Subcontractors, their agents and/or employees, or anyone for whose acts the Contractor is responsible.

21. Form for Sub-contract.

The Contractor when subcontracting with sub-bidders filed pursuant to M.G.L. c. 149, sec. 44F shall use the form for sub-Contract in M.G.L. c. 149, sec. 44F(4)(c). The Contractor shall not interpret paragraph 3 of the statutory form of Subcontract to require such sub-bidders to provide insurance with limits higher than the limits that are required by the Contract Documents, if the term "Contractor" refers to the sub-bidder and that the term "Contract Price" refers to the sub-bidder's price stated in paragraph 1 of the statutory form of Subcontract.

22. Sales Tax Exemption and Other Taxes.

All building materials and supplies as well as the rental charges for construction vehicles, equipment and machinery rented exclusively for use on the Site, or while being used exclusively for the transportation of materials for the Work are entitled to an exemption from sales taxes under M.G.L. c. 64H, sec. 6(f). The Contractor shall take all action required to obtain the benefit of such sales tax exemption. The Contractor shall bear the cost of any sales taxes that the Contractor incurs in connection with the Work and the DCR shall not reimburse the Contractor for any such taxes. The exemption number assigned to the Contractor as an exempt purchaser shall be provided to the Contractor by the DCR upon the written request of the Contractor.

23. Final Cleaning.

At the completion of the Work, the Contractor shall remove all waste materials, rubbish, tools, equipment, machinery, and surplus materials, and professionally clean all sight-exposed surfaces so that the Work is clean and ready for occupancy and/or use. After installation of DCR furniture, telephones, and equipment, the Contractor shall provide such additional cleaning as may be necessary to remove any soil resulting from installation of such furniture, telephones, and equipment. The costs of the required cleaning are included in the Contract price.

All permanent drainage structures such as catch basins, permanent detention or retention basins, drainage conveyances, piping, sumps, and particle separators will be cleaned of sediments and debris prior to acceptance of the Work. Any sediments or debris accumulated during construction shall be removed and disposed in accordance with local and state requirements.

24. Maintenance Data.

Subject to such additional requirements as may be provided in the Special Conditions or Specifications, the Contractor shall compile 3 complete and identical binders of operating and maintenance data for the entire Work. The Contractor shall submit record maintenance data to the DCR for approval and shall instruct and train the DCR's personnel in proper inspection and maintenance procedures.

25. Drainage Specifications.

Subject to such additional requirements as may be provided in the Special Conditions or Specifications, where construction involves replacement or construction of new storm water drainage systems including but not limited to catch basins, roof drains, recharge to groundwater systems and outfall structures, the Contractor shall provide drawings and electronic records in a form acceptable to the DCR that provides specifications and a site plan that identifies locations of the drainage system components and cleanout, if applicable.

26. Closeout Procedures.

The Contractor shall take all actions and submit all items required for Final Acceptance as specified in the Contract Documents.

27. Risk of Loss.

The Contractor shall bear all risk of loss to the Work during the term of the Contract except for any portion of the Work as to which the DCR has given final acceptance. Nothing herein shall limit the Contractor's responsibilities under Article IX or XV of these General Conditions of the Contract.

28. Photographs.

A. At the request of the DCR, the Contractor shall furnish the DCR suitable 4" X 6" color photographs and/or digital image files of the construction area, and any related work areas.

B. If the DCR requires the Contractor to provide photographs of the Work, the areas to be photographed and the locational reference point from which they are to be taken will be designated by the DCR, and shall be taken according to the following schedule:

- a. Before construction operations have been started.
- b. Each month during the performance of the Work.
- c. After construction has been completed.

C. Each photograph shall have permanently written on its face a legible description or title indicating date, location, direction from which taken, project title and item of work photographed.

D. Upon completion of all work under this contract, the Contractor shall deliver all negatives, clearly identified, to the DCR. Photographs will be placed in acetate sleeves and bound in three booklet form.

E. The cost of furnishing photographs shall be included in the prices bid for the various items scheduled in the Proposal.

ARTICLE V: MATERIALS AND EQUIPMENT

1. Materials Generally.

A. Unless otherwise specifically provided in the Contract Documents, the Contractor shall provide and pay for materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether incorporated or to be incorporated in the Work.

B. Materials and equipment to be installed as part of the Work (both or either of which are hereinafter referred to as "materials") shall be new, unused, of recent manufacture, assembled, and used in accordance with the best construction practices. The Contractor shall inform himself/herself as to, and shall comply with, the provisions of M.G.L. c. 7, sec. 23A, as amended, and shall abide by the same and all applicable rules, regulations, and orders made thereunder in relation to the purchase of supplies and materials in the execution of the Work, including the provisions of M.G.L. c. 7, sec. 22, paragraph 17, which provides that there be *"a preference in the purchase of supplies and materials, other considerations being equal, in favor, first, of supplies and materials manufactured and sold within the Commonwealth, and, second, of supplies and materials manufactured and sold elsewhere within the United States."*

C. All materials furnished by the DCR to the Contractor for installation in the work will be delivered by freight train, truck, or other means of common carrier to the nearest convenient public railroad siding, freight station, trucking terminal or such other designated delivery point of which he will receive due notification. The Contractor, at his/her own expense, shall do all handling and conveying of such materials at and from the noted deliver site. He shall unload and remove them promptly from the cars, trucks, or terminals upon notification of their arrival and he shall be responsible for any demurrage, delay charges, damage done or loss of materials from the time of delivery to the final acceptance of the work. Materials previously delivered shall be turned over to the Contractor as soon as possible after the date ordered to begin work. He shall make a complete inventory with the Resident Engineer as to content and condition; thereafter he shall be responsible for the care, custody, and handling until the final acceptance of the work.

2. Shop Drawings, Product Data, and Samples.

A. The Contractor shall furnish to the Project Engineer all samples of the materials to be used in the execution of the Work as required by the Contract Documents. The Contractor shall furnish to the DCR in a timely manner all coordination Drawings, shop details, Shop Drawings, and setting diagrams which may be necessary for acquiring and installing materials. These shall be reviewed as required by the DCR. A minimum of six (6) copies shall be submitted for final approval, one of which shall be returned to the Contractor, one given to the Resident Engineer, and four maintained by the DCR. The inspection and approval by the DCR of Shop Drawings, etc. shall be general and shall in no way relieve the Contractor from responsibility for proper fitting, coordinating, construction, and construction sequencing. The Contractor shall furnish to the DCR such information and vouchers relative to the Work, the materials therefore, and the persons employed thereon, as the DCR shall from time-to-time request.

B. Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. The purpose of their submission is to demonstrate for those portions of the Work for which submittals are required the way the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents.

C. The Contractor shall review, approve, and submit to the DCR, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the DCR or of separate contractors. Submittals made by the Contractor which are not required by the Contract Documents, or which do not comply with the Contract Documents may be returned without action. The Contractor's attention is directed to the provisions of Section 4 of this Article V and to the Specifications.

D. The Contractor shall prepare and keep current for the DCR's approval a schedule of submittals which is coordinated with the Progress Schedule and allows the DCR reasonable time to review submittals.

E. The Contractor shall perform no portion of the Work requiring submittal and review of Shop Drawings, Product Data, Samples, or similar submittals until the respective submittal has been approved by the DCR. Such Work shall be in accordance with Approved submittals.

F. By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents that the Contractor has determined and verified materials, field measurements, and field construction criteria related thereto and has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

G. The Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the DCR's approval of Shop Drawings, Product Data, Samples, or similar submittals unless the Contractor has specifically informed the DCR in writing of such deviation at the time of submittal and the DCR has given explicit written approval to the specific deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals by the DCR's actions.

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

I. Informational submittals upon which the DCR is not expected to take responsive action may be so identified in the Contract Documents.

J. When professional certification of performance criteria of materials, systems or equipment is required by the Contract Documents, such certification must be stamped by a registered Massachusetts professional in the discipline required. The DCR shall be entitled to rely upon the accuracy and completeness of such calculations and certifications.

K. Materials furnished or used or employed under the Contract must be equal in quality to the samples furnished and be satisfactory to the DCR.

3. Tests.

A. Any material to be used in the Work may be tested or inspected at any time, on or off Site, by or under direction of the DCR, and may be rejected if it fails to comply with specified tests. The Contractor shall test all materials unless specified otherwise in the Special Conditions or Specifications. The Contractor shall also pay for all testing of specified material unless specified otherwise in the Special Conditions or Specifications. If the Contractor requests permission to use a material that was not specified, then the Contractor in all cases shall pay for such testing. The cost of testing of materials that fail the testing criteria shall be borne by the Contractor

B. The Contractor shall notify the DCR of the proposed sources of materials in time to permit all required testing and inspection before the material is needed for incorporation into the Work. The Contractor shall have no claim arising from the Contractor's failure to designate the proposed source or to order the material in time for adequate testing and inspection. Necessary arrangements shall be made to permit the DCR to make factory, shop or other inspection of materials or equipment ordered for the Work in the process of manufacture or fabrication, as required by the Contract Documents. The DCR will not assume any obligation for the sampling and testing of materials other than on the Site, unless so required by the Specifications.

C. Where tests of materials will be made by the DCR or under its direction, the Contractor or his/her suppliers shall furnish such facilities as the DCR may require for collecting and forwarding samples and shall not make use of, nor incorporate into the Work, any material represented by the samples until the required tests have been made and the material accepted, unless otherwise directed. The Contractor in all cases shall furnish the required samples without charge. In the event of failure of materials to meet the Contract Documents, any retesting of new materials or of the same materials after reworking, shall be paid for by the Contractor.

D. The testing of the Work shall not relieve the Contractor of any of his/her obligations to fulfill the terms of the Contract as herein prescribed by the Contract Documents. Failure to reject any defective work or materials shall in no way prevent later rejection when such defect is discovered, notwithstanding that such defective work or materials had been previously overlooked or misjudged by the DCR and accepted or estimated for payment, nor shall such obligate the DCR to make final acceptance thereof. If sampling and testing reveal that the material is unsatisfactory, it will then be the responsibility of the Contractor to remove it from the Work, replace it, or blend it with such other material so that an acceptable material will be produced. The removal, replacement and blending of such material shall be done by the Contractor without additional compensation.

4. "Or Equal" Submissions.

A. Where products or materials are prescribed by manufacturer name, trade name, or catalog reference, the words "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 DCR (a) it is at least equal in quality, durability, appearance, strength, and design, (b) it performs at least equally the function imposed in the general design for the Work, 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 products or materials substituted as an "or equal" shall be at the expense of the Contractor. If the cost of the material substituted as an "or equal" is less than the cost of the material specified, such savings in cost shall be credited to the DCR and deducted from the price. "Approved equal" shall mean an item with respect to which the DCR shall have issued a written statement to the Contractor to the effect that the item is, in the DCR's opinion, equal within the meaning of this paragraph to that prescribed in the Contract Documents.

B. The Contractor shall be responsible for providing the DCR with any information and test results that the DCR reasonably requires to determine whether a material is equal to a material named or described in the Contract Documents.

C. The Contractor shall make all requests for substitution of a material named or described in the Contract Documents in writing, and at least thirty (30) days prior to the date the materials will be used in the Work, or immediately upon becoming aware of the following exigencies: (1) the non-availability of the specified material, (2) delay of the delivery of the specified material that will preclude the completion of the Work or any part thereof within the time specified in the Contract or (3) unforeseen field conditions that necessitate the substitution of the specified material. In no event shall the Contractor maintain a claim for delays based upon the DCR's review of such substituted materials if the Contractor failed to submit a written request for such substitution in accordance with the provisions of this paragraph. A written request for a material substitution due to an exigency set forth above shall be accompanied with documentation of the exigency, including but not limited to, a photocopy of a letter from the supplier or manufacturer stating that he/she is unable to furnish the specified materials and the reasons that he/she is unable to furnish the materials, as required by the DCR. If the Contractor's proposed substitution due to an exigency is declined, the DCR shall, at its discretion, specify an "or equal" substitution.

D. The Contractor shall have the burden of proof with respect to any claimed increases in the Contract Price resulting from the improper rejection by the DCR of any material proposed by the Contractor as an equal. No increase in the Contract Price shall be permitted unless the Contractor submits documentary evidence sufficient to prove to the reasonable satisfaction of the DCR that the rejection increased the Contractor's costs over the costs provided for in the Bid pricing documents, net of all savings the Contractor obtained by substituting other "or equal" items. The Contractor shall submit copies of all pricing materials, calculations, plans, Specifications, Drawings, and other design documents that the DCR deems necessary or desirable to evidence such increased costs. In calculating the Contractor's increased costs, a deduction shall be made for all costs that the Contractor would have incurred making structural or mechanical changes to include within the Work the item later found to have been improperly rejected.

5. Delivery and Storage of Materials: Inspection.

A. Materials and equipment shall be progressively delivered to the Site so that there will be neither delay in the progress of the Work nor an undue accumulation of materials that are not to be used within a reasonable time, and stored so that their security, quality, and fitness of the materials for the Work is preserved.

B. Vehicle Weight Limits

1. The Contractor's attention is directed to Chapter 90, Section 19A of the General Laws as amended concerning the weight limits for construction type motor vehicles.
2. No materials supplied for the project shall be accepted in vehicles whose gross weight exceed the legal load limits as determined by the regulatory agencies of the Commonwealth and Federal Government
3. Weight slips that indicate the load exceeding the legal load limit will not be countersigned by the DCR.

C. If the Engineer so requests, the Contractor, at any time before final acceptance of the work, shall remove or uncover such portions of the finished work as may be directed. After examination, the Contractor shall restore said portions of the work to the standard required by the specifications. Should the work thus exposed or examined prove acceptable, the uncovering, or removing, and the replacing of the covering or making good of the parts removed will be paid for as extra work; but should the work so exposed or examined prove unacceptable, the uncovering or removing and the replacing of the covering or making good of the parts removed, will be at the Contractor's expense.

D. Necessary arrangements shall be made to permit the DCR to perform all required inspection and testing of materials or equipment ordered for the Work at the factory or shop during the process of manufacture or fabrication, or in storage on or off Site. The Contractor shall have no claims because of his/her failure to designate the proposed source of the material in time for adequate testing and inspection.

E. Materials stored off Site shall be insured and stored at the expense of the Contractor to guarantee the preservation of their security, quality, and fitness for the Work. Without derogating from the Contractor's responsibilities in the previous sentence, when necessary to avoid deterioration or damage, material (on or off Site) shall be placed on wooden platforms or other hard clean surfaces and not on the ground and shall be properly protected.

F. Expenses for inspection of material by DCR personnel including travel, quarters, and subsistence shall be borne by the Contractor requesting the inspection of material stored outside the Commonwealth of Massachusetts as part of the Contract Price. The policy of the DCR precludes the payment for material stored outside the boundaries of Massachusetts except in extremely limited circumstances with the express written consent of the DCR. If the Contractor requests an inspection of material stored outside the Commonwealth of Massachusetts, the DCR will initially pay for all expenses of inspecting the material incurred by DCR's personnel including travel, quarters, and subsistence. The DCR will then give Contractor an invoice for those costs and the Contractor shall submit a credit Change Order for those expenses.

G. Stored materials either at the Site or at some other location agreed upon in writing shall be so located as to facilitate prompt inspection and even though approved before storage, may again be inspected prior to their use in the Work.

H. Where no inspection of materials is arranged by the DCR and before such materials are incorporated into the work, the Contractor shall be required to submit to the DCR for approval, three copies of the Manufacturer's or Supplier's statement for each kind of material furnished, which shall contain the following information:

1. Work for which the material is consigned.
2. Name of the Contractor to which the material is supplied.
3. Description of material supplied.
4. Quantity of material supplied.
5. Means of identifying the consignment, such as label, marking, seal number, etc.
6. Date and method of shipment.
7. Statement to the effect that the material has been tested and found in conformance with the Contract Documents.
8. Results of all required tests, or in lieu of said results, the Manufacturer's, or Supplier's guarantee that he/she shall maintain said results, and make them available to the DCR for a period of not less than three years from the date of final acceptance of final payment by the Commonwealth.
9. Signature of a person duly authorized to bind the Manufacturer or Supplier.

I. All storage sites shall be restored to their original condition by the Contractor at the Contractor's expense. This shall not apply to the stripping and storing of topsoil, or to other materials salvaged from the work.

J. The Contractor shall take charge of and be liable for any loss of or injury to the materials for his/her use delivered to or in the vicinity of the place where the Work is being done, whether furnished by the DCR or otherwise. The Contractor shall notify the DCR as soon as any such materials are so delivered, allow them to be examined by the DCR, and furnish workers to assist therewith.

K. Private property shall not be used for storage purpose without the written permission of the property owner, and if requested by the DCR copies of such written permission shall be furnished by the Contractor.

6. Defective, Damaged, or Deteriorated Materials and Rejection Thereof.

The DCR may reject materials if the DCR reasonably determines that such materials do not conform to the Contract Documents in any manner, including but not limited to materials that have become damaged or deteriorated from improper storage whether such materials have previously been accepted. The Contractor at its own expense shall remove rejected materials from the Work. No rejected material, the defects of which have been subsequently corrected, shall be used except with the written permission of the DCR. Should the Contractor fail to remove rejected material within a reasonable time, the DCR may, in addition to any other available remedies, remove and/or replace the rejected material, and deduct the cost of such removal and/or replacement from any moneys due or to become due the Contractor. No extra time shall be allowed for completion of Work by reason of such rejection. The inspection of the Work shall not relieve the Contractor of any of its obligations herein prescribed, and any defective Work shall be corrected. Work not conforming to the Contract Documents may be rejected notwithstanding that such Work and materials have been previously overlooked or misjudged by the DCR and accepted for payment. If the Work or any part thereof shall be found defective at any time before Final Acceptance of the whole Work, the Contractor shall forthwith make good such defect in a manner satisfactory to the DCR. Nothing in the Contract shall be construed as vesting in the Contractor any property rights in the materials used after they have been attached or affixed to the Work or the Site; but all such materials shall upon being so attached or affixed become a property of the DCR.

7. Measurement

A. The method of measurement for materials necessary for the proper execution of the Work is set forth at the end of each Section of these Specifications. The computations to be used in determination of quantities of material furnished and of work performed under the Contract shall be selected by the DCR.

B. For the estimating of quantities in which the computations or areas by analytic and geometric methods would be comparatively laborious, it is stipulated and agreed that the planimeter shall be considered an instrument of precision adapted to the measurement of such area.

C. To aid the Resident Engineer in determining the quantities and weights of cement and other materials to be paid for, the Contractor shall, whenever so required, give him access to the proper invoices, bills of lading, etc., and shall provide scales and assistance for weighing, or assistance for measuring, any of the materials.

D. All measurements shall be confirmed by the DCR as they are made to determine the quantities of the various items of work performed. All measurements shall be made according to the United States Standard Units of Measurement.

E. Unless otherwise specified, longitudinal measurements for area computations will be made horizontally. Unless otherwise specified transverse measures for area computations will be the dimensions shown on the Drawings or in writing by the DCR.

F. All items which are measured by the linear foot, including, but not limited to pipe, culverts, guardrail, curbing, will be measured parallel to the base or foundation upon which such structures are placed, unless otherwise shown on the Drawings.

G. In computing volumes of excavation, the average end area method, or other methods acceptable to the DCR will be used.

H. A sworn weigher shall weigh all materials required to be weighed. The weighing of such materials may be witnessed by the DCR.

I. If materials are shipped by rail or trucks, the car weights or quarry weights may be accepted. Weight slips shall be provided for each shipment of material weighed. Each weight slip shall be signed by the sworn weigher, and countersigned, on delivery, by the DCR. Material listed on weight slips that are not countersigned by the DCR shall not be included for payment under the Contract.

J. When requested by the Contractor and approved by the DCR in writing, material specified to be measured in weight may be weighed and converted to volume measurement for payment purposes.

ARTICLE VI: PROSECUTION AND PROGRESS

1. Beginning, Progress Schedule, and Completion of Work.

A. The Contract time shall commence the work upon the date specified in the Notice to Proceed. The Contractor shall begin Work at the Site within ten (10) days of said date unless otherwise ordered in writing by the DCR.

B. Within seven (7) days after the issuance of the Notice to Proceed, Saturdays, Sundays and legal holidays excluded, the Contractor shall submit to the DCR a progress schedule for the term of the Contract as required by the Contract Documents, showing in detail his/her proposed progress for the construction of the various parts of the Work and the proposed times for receiving required materials. Upon approval by the DCR, said schedule shall constitute the Progress Schedule. The Contractor shall at the end of each month, or more often if required, furnish to the DCR a schedule meeting the requirements of the Specifications showing the actual progress of the parts of the Work in comparison with the Progress Schedule.

C. Time is of the essence of this Contract. The Work shall be completed within the time specified in Article 2 of the Department of Conservation and Recreation - Contractor Agreement. Should the Contractor require additional time to complete the Work, the Contractor shall document the reasons therefor and submit a written request for an extension of time within 20 days of the occurrence of the event alleged to be the cause of the delay, as provided in this Article and in Article VII of these General Conditions of the Contract. Failure to submit said written request within the time required by the preceding sentence shall preclude the Contractor from subsequently claiming any time extension due to said delay.

D. If, in the opinion of the DCR, the Contractor fails to comply with the construction schedule as set forth in the Contractor's bid or the Project specifications, the DCR may give the Contractor a notice specifying the time limits and performance standards that the Contractor is failing to meet whereupon (1) the Contractor shall, if the notice requires, discontinue all or any portion of the Work (which discontinuance shall neither terminate the Contract nor give the Contractor any claim for an increase in the Contract Price, damages, or an extension of any completion deadlines); or (2) at Contractor's sole cost increase the work force, equipment and plant, or any of them, employed on the whole or any part of the Work, to the extent required by such notice, and employ the same from day to day until the completion of the Work or such part thereof, or until the failure regarding the rate of progress, in the opinion of the DCR, shall have been sufficiently corrected.

E. If, in the opinion of the DCR, the Contractor fails to comply with the construction schedule, and whether the DCR shall have given the Contractor a notice described in D above, the DCR may (but shall not be required to) give the Contractor notice of such failure and five (5) days to cure the same. Unless the Contractor shall within that five days take all necessary steps to do so (including, if the DCR requires, increasing its forces, equipment and plant) and continue to do so until in the opinion of the DCR the failure is corrected, the DCR may at the Contractor's expense and without terminating this Contract take exclusive or joint possession of all or a portion of the Site and employ and direct the labors of existing or such additional forces, equipment and plant as may in the DCR's opinion be necessary to insure the completion of the Work or such part thereof within the time specified in the Contract Documents or at the earliest possible date thereafter. The DCR may exercise its rights under this Article at any time and from time to time without waiving any of its rights under this Contract, at law or in equity, including, without limitation, the right to deem this Contract terminated or to order the Contractor to discontinue the Work at any time thereafter. The Contractor shall continue to perform the remaining Work under this Contract even if the DCR elects to have another contractor perform a portion of the Work under this Article.

F. The DCR shall deduct the cost of any actions the DCR takes under this Article from any amount then due or which might have become due to the Contractor under this Contract had the Contractor performed as required. On demand, the Contractor shall pay the DCR any amount by which the cost of completing all or any portion of the Work exceeds the amount attributable to that Work under the Contract Documents. The DCR's sole goal will be to complete the Work that it elects to complete within the time limits stated in the Contract or soon thereafter. Consequently, the DCR shall have no obligation to obtain competitive bids or the lowest cost for completing the Work or any part thereof, except when it is required by law. The DCR's election to complete all or part of the Work shall not release the Contractor from any liability for failure to complete the Work as the Contract Documents require and shall not entitle the Contractor to a claim for an increase in the Contract Price or an extension of the time for completing the Work. If the cost that the DCR incurs in completing all or any portion of the Work is less than the amount that the Contract Documents attribute to that Work, the DCR will pay or credit the difference to the Contractor, less any other costs and expenses that the DCR incurs, including the cost of supervision, and attorneys' fees and costs.

2. Failure to Complete Work on Time - Liquidated Damages.

A. If liquidated damages are specified in the Department of Conservation and Recreation - Contractor Agreement, the DCR has determined that its damages because of Contractor's failure to complete the Work fully within the time specified will be difficult or impracticable to ascertain. Accordingly, if the Work is not completed to such point by the date specified in this Contract, the Contractor shall pay to the DCR the sum designated as liquidated damages in the Contract for each calendar day that the Contractor is in default in completing the Work to such point. Such moneys shall be paid as liquidated damages, not as a penalty, to cover losses and expenses to the DCR resulting solely from the fact that the Work is not completed on time.

B. Similarly, if the Contract states that by a specified date a designated portion of the Work shall be fully completed, and if such portion has not been prosecuted to such point by said date, the Contractor shall pay to the DCR the sum designated in the Contract for each calendar day that the Contractor is in default in completing such portion of the Work to such point. Such moneys shall also be paid as liquidated damages, not as a penalty, to cover losses and expenses to the Department of Conservation and Recreation resulting solely from the fact that the Work is not completed on time.

C. The DCR may recover such liquidated damages by deducting the amount thereof from any moneys due or that might become due the Contractor, and if such moneys shall be insufficient to cover the liquidated damages, then the Contractor or the Surety shall pay to the DCR the amount due.

D. Permitting the Contractor to continue and finish the Work or any portion of it after the time fixed in the Contract for its completion shall not be deemed as a waiver of any of the DCR's rights hereunder, at law or in equity.

E. Liquidated damages or a portion thereof may be waived by the DCR if the Contractor submits evidence satisfactory to the DCR that the delay was caused solely by conditions beyond the control of the Contractor and that the DCR has not suffered any damages because of said delay.

F. Failure by the DCR to specify a sum as liquidated damages in the Department of Conservation and Recreation - Contractor Agreement, or the insertion of "N/A" or "none" in the space provided therein for liquidated damages, shall not be deemed a waiver of the DCR's right to recover actual damages arising from the Contractor's failure to complete the Work on time.

3. Delays: Statutory Provisions (M.G.L. c. 30, sec. 39O).

A. Notwithstanding any provision of this Contract to the contrary, except as otherwise provided by law as set forth in paragraph B below, the Contractor shall not be entitled to increase the Contract Price or to receive damages on account of any hindrances or delays, avoidable or unavoidable; but if any delay is caused in the opinion of the DCR, the Contractor shall be entitled to an extension of time. The length of the extension shall be sufficient in the opinion of the DCR for the Contractor to complete the Work. Although no delay shall increase the Contract Price, the DCR may require that any change in the date by which the Contractor must complete all or any part of the Work be processed on a Change Order form.

B. If a suspension, delay, interruption or failure to act of the DCR increases the cost of performance to any Subcontractor, that Subcontractor shall have the same rights against the Contractor with respect to such increase as the Contractor shall have against the DCR by virtue of (a) and (b) of M.G.L. c. 30, s. 39O set forth below, but nothing in provisions (a) and (b) shall alter any other rights which the Contractor or the subcontractor may have against each other. As used in the statutory language of (a) and (b) below, "contract" means this Contract, "general contractor" means the Contractor and "awarding authority" means the DCR:

"(a) The awarding authority may order the general contractor in writing to suspend, delay, or interrupt all or any part of the work for such period of time as it may determine to be appropriate for the convenience of the awarding authority; provided, however, that if there is a suspension, delay or interruption for fifteen days or more or due to a failure of the awarding authority to act within the time specified in this contract, the awarding authority shall make an adjustment in the contract price for any increase in the cost of performance of this contract but shall not include any profit to the general contractor on such increase; and provided further, that the awarding authority shall not make any adjustment in the contract price under this provision for any suspension, delay, interruption or failure to act to the extent that such is due to any cause for which this contract provides for an equitable adjustment of the contract price under any other contract provisions.

(b) The general contractor must submit the amount of a claim under provision (a) to the awarding authority in writing as soon as practicable after the end of the suspension, delay, interruption or failure to act and, in any event, not later than the date of final payment under this contract and except for costs due to a suspension order, the awarding authority shall not approve any costs in the claim incurred more than twenty days before the general contractor notified the awarding authority in writing of the act or failure to act involved in the claim."

4. Occupancy and/or Use of Project Prior to Final Acceptance.

A. The Contractor agrees to the occupancy and/or use of the Project or any portion thereof before Final Acceptance of the Work by the DCR.

B. The DCR will cooperate with the Contractor with respect to the completion of the Work by taking such reasonable steps as may be possible to avoid interference with the Contractor's Work if they do not interfere with the proper functioning of the facility.

C. The Contractor shall not be responsible for wear and tear or damage resulting solely from temporary occupancy.

D. Occupancy and/or use of any part of the Work prior to Final Acceptance by the DCR shall not relieve the Contractor from maintaining the required payment and performance bonds and insurance (to the extent that insurance is required to be maintained after Substantial Completion) required by this Contract.

5. Substantial Completion – Punch List.

A. When the Work, or portion thereof which the DCR agrees to accept separately has reached the state of Substantial Completion as shown on an Approved payment request, the Contractor shall develop, with the participation of the DCR, the Punch List identifying those items of unfinished or unacceptable Work that remain to be performed or corrected under the Contract.

B. Before the Work shall be deemed completed to the point where it is ready for the issuance of Final Acceptance, the Contractor shall:

- (1) Provide Contractor's proposed Punch List containing a statement of the reason for each item listed thereon.
- (2) Advise the DCR of proposed changes in insurance in accordance with the provisions of this Contract, and provide to the DCR evidence of the Contractor's Completed Operations insurance coverage to the extent required by the Contract Documents.
- (3) Execute and submit a notarized warranty on a form provided by the DCR meeting the requirements of Article IX of these General Conditions of the Contract, to commence upon the date of the Certificate of Final Acceptance, unless otherwise provided in the Certificate of Final Acceptance.
- (4) Submit signed special warranties and warranties of longer than one year as required by the Contract Documents.
- (5) Submit signed maintenance agreements for all portions of the Work specified to receive maintenance after the issuance of the Certificate of Final Acceptance.
- (6) Submit all preliminary record Drawings to the DCR and documents and framed data in the forms required by the Contract Documents.
- (7) Complete all items required to be completed by the Department of Public Safety and obtain a Certificate of Occupancy from the Department of Public Safety and similar releases which permit the full and unrestricted use of the areas claimed to be ready for occupancy.
- (8) Deliver specified maintenance stocks of materials, required spare parts, and all special tools furnished by manufacturers to persons designated by the DCR and obtain written receipts for same.
- (9) Make final changes of lock cylinders or cores and advise the DCR of the change of project security responsibility.
- (10) Complete start-up of systems, and instruct DCR personnel on proper operation and routine maintenance of all systems and equipment.
- (11) Remove all remaining temporary facilities that are no longer needed, surplus materials, and debris; (the Contractor shall not remove construction offices and trailers without the prior Approval of the DCR).
- (12) Submit final utility meter readings and similar information and advise the DCR of the change of responsibility for utility charges and payments upon occupancy and/or use,
- (13) Complete final clean-up of all Work, restoration of damaged land and property, including finishes, and replacement of all damaged and broken glass not listed on the Contractor's Punch List.
- (14) Complete such other items as may be called for in the Special Conditions, if any, or Specifications.

C. After completing the items specified in subsection A above, the Contractor shall make a written request for the DCR's inspection for a Certificate of Final Acceptance in accordance with the Contract Documents. The DCR shall review the submittals and the Work and shall either 1) sign a Certificate of Final Acceptance or 2) notify the Contractor of incomplete and/or incorrect Work that must be completed and corrected prior to the issuance of the Certificate of Final Acceptance. The DCR shall notify the Contractor of any additions to the Punch List. In connection with the execution of the Certificate of Final Acceptance, the DCR shall assign dollar values to each item on the Punch List. Failure to include any incomplete or defective item on the Punch List shall not relieve the Contractor of the obligation to complete all Work in accordance with the Contract Documents.

6. Final Acceptance of the Work.

A. Prerequisites for Final Acceptance. After the Contractor has completed all the Work required by this Contract, including Change Orders and Punch List Items, the Contractor shall submit the following completed items to the DCR together with such additional items as may be specified in the Contract Documents:

- (1) A final request for payment showing a final accounting of all changes in the Work.
- (2) Certification and satisfactory evidence that all taxes, fees, and similar obligations have been paid.
- (3) Consent of the Surety to Final Payment executed by applicable bonding companies.
- (4) Certified copy of the Punch List stating that the Contractor has completed or corrected every item listed.
- (5) Evidence of the Contractor's continuing Completed Operations Insurance coverage to the extent required by the Contract Documents.
- (6) All final record Drawings and documents in the forms specified by the Contract Documents.
- (7) A notarized certification that all purchases made under the tax exemption certificate were legitimate and entitled to exemption.
- (8) Written certifications from the Department of Public Safety and/or the DCR, where required, to the effect that: a) the Work has been inspected for compliance with the Contract Documents and has satisfied the Department of Public Safety; b) all equipment and systems included in the Work have been tested in the presence of the DCR and are operational and satisfactory; c) the Work is completed and ready for final inspection.
- (9) Such other items as may be required by the Contract Documents.

B. Reinspection; Final Acceptance. After notification from the Contractor that all remaining contract exceptions, omissions, and incompletions have been completed (except for the Contractor's continuing warranty, insurance, indemnification, and such other obligations as are intended by the terms of the Contract Documents to extend beyond the date of Final Acceptance), the DCR shall inspect the Work to verify the completion of the same. If the Work is satisfactory, the DCR shall prepare a Certificate of Final Acceptance or shall notify Contractor of items which remain to be completed prior to Final Acceptance.

7. One-Year Warranty Repair List and Inspection.

Approximately 30 days prior to the expiration of the comprehensive one-year warranty period, the Contractor shall schedule an appointment with the DCR for a re-inspection of the Work with the DCR and shall thereafter inspect the Work at the time scheduled. Based on this inspection and on prior inspections, the DCR shall issue a "Warranty Repair List" of items to be corrected by the Contractor. The Contractor shall make the repairs and/or replacements listed within 30 days of the issuance of the Warranty Repair List unless otherwise agreed by the DCR in writing.

ARTICLE VII: CHANGES IN THE WORK

1. Change Orders Generally.

A. The DCR may, pursuant to the provisions of M.G.L. c. 30, sec. 39K, authorize in writing, alterations in the line, grade, plans, form, dimensions or materials of the work, or any part thereof, either before, or after the commencement of construction. If such alterations diminish or increase the quantity included to be done and paid for at a unit price, or work substituted for the work specified is of a different cost and quality, the parties shall be governed by the aforesaid provisions of Law. No changes in the Work shall be made in absence of a Change Order defined in Article I of these General Conditions of the Contract, directing the Contractor to perform such changes. A request for a change in the provisions of this Contract may be submitted to the DCR by the Contractor, Project Engineer or Resident Engineer. The request must be made in writing and in accordance with the provisions of this Contract, Laws, and the procedures of the DCR. The DCR reserves the right to increase or decrease quantities, to eliminate portions of the work or add work of similar nature, and to direct the commencement and order of prosecution of various portions of the work.

B. A Change Order may be issued by the DCR for changes in the Work within the scope of the Contract, including but not limited to, changes in: (1) the Plans and Specifications; (2) the method or manner of performance of the Work; (3) the DCR-furnished facilities, equipment, materials, services, or Site; (4) the schedule for performance of the Work.

C. The Contractor shall immediately perform any Change Order work that is ordered by the DCR.

D. Whenever a Change Order is issued and said Change Order will cause a change in the Contractor's cost, the Contractor or the DCR may request an equitable adjustment in the Contract Price. A request for such an adjustment shall be in writing and shall be submitted by the party making such claim to the other party before commencement of the pertinent work or as soon thereafter as possible.

E. The DCR and the Contractor shall negotiate in good faith an agreement on an equitable adjustment in the Contract Price, and/or time if appropriate, before commencement of the pertinent work or as soon thereafter as is possible. In the absence of an agreement for an equitable adjustment, the DCR shall unilaterally determine the costs attributable to the change and provide the Contractor with a written notice to that effect. The determination of the DCR shall be final as to all questions of the amount and value of extra work, where the Contractor does not appeal said decision pursuant to the process set forth in this paragraph. The Contractor may appeal the decision of the DCR within thirty days of receipt of said notice, to the Commissioner of the DCR or his designee. The Contractor shall have the right to such further appeal as is provided in M.G.L. c. 30, sec. 39Q set forth in Section 4.D of this Article VII. However, if the Contractor shall exercise its rights to appeal the decision of the DCR as aforesaid, the Contractor shall be required to engage in the mediation procedures set forth in Section 5 of this Article VII, should the DCR require such mediation.

F. During the negotiation of an equitable adjustment in the Contract Price, the Contractor shall, if requested, provide the DCR with all cost and pricing data used by him in computing the amount of the equitable adjustment, and the Contractor shall certify that the pricing data used was accurate, complete, and current. If the DCR subsequently determines that the data submitted by the Contractor was incomplete, incorrect, or not current, the DCR may exclude such data from consideration under the equitable adjustment request.

2. Methods of Computing Equitable Adjustments.

A. Equitable adjustments in the Contract Price shall be determined according to one of the following methods, or a combination thereof, as determined by the DCR: (1) fixed price basis, provided that the fixed price shall be inclusive of items (a) through (e) below and shall be computed in accordance with those provisions; (2) estimated lump sum basis to be adjusted in accordance with Contract unit prices or other agreed upon unit prices provided that the unit prices shall be inclusive of all costs related to such equitable adjustment; (3) time and materials basis to be subsequently adjusted on the basis of actual costs (but subject to a predetermined "not to exceed limit") calculated as follows:

(a) the direct cost (or credit) for labor at the minimum wage rates established for this Contract pursuant to M.G.L. c. 149, sections 26-27H, and the direct cost for material and use of equipment.

(b) plus (or minus) the cost of Workmen's Compensation Insurance, Liability Insurance, Federal Social Security and Massachusetts Unemployment Compensation, or as an alternative the Contractor may elect to use a flat 30% of the total labor rate computed in accordance with subparagraph (a) above.

(c) plus, an allowance equal to 20% of the amount of (a) above for overhead, superintendence, and profit; (In the case of Item 1 work, which is the work of the Contractor and all his non-filed Subcontractors, said 20% allowance shall be paid to the Contractor and the Contractor and said non-filed Subcontractors shall agree upon the distribution of this amount as a matter of contract between them. In the case of Item 2 work, which is work performed by a Subcontractor filed pursuant to M.G.L. c. 149, sec. 44F, said 20% allowance shall be paid to the filed Subcontractor, it being understood that this provision does not apply to other Subcontractors including sub-Subcontractors listed under paragraph E of the form for sub-Bid).

(d) plus, for work performed by a Subcontractor filed pursuant to M.G.L. c. 149, sec. 44F, an additional allowance equal to 7% of the sum of (a) through (c) above as full compensation to the Contractor for processing forms and assuming full responsibility for the faithful performance of such work by said filed Subcontractor(s).

(e) plus (or minus) the actual direct additional premium costs and expenses incurred because of collective bargaining agreements or other agreements between organized labor and employers, and plus (or minus) the actual direct premium cost of payment and performance bonds required of the Contractor and filed Subcontractors for this Contract.

B. If the net change is an addition to the Contract Price, it shall include the Contractor's overhead, superintendence, and profit. On any change that involves a net credit, no allowance for overhead, superintendence and profits shall be included. For any change that does not include labor performed or materials installed in the Project, there will be no markup for the Contractor's overhead, superintendence, and profit, even though there may be a net increase in the Contract Price. Charges for small tools known as "tools of the trade" are not to be computed in the amount of any change in the Contract Price.

C. Statutory Contract adjustments made under the provisions of M.G.L. c. 149, sec. 44F shall not be considered Change Orders and shall not entitle the Contractor to any adjustments for overhead, profit, and superintendence, although the DCR may require that such Contract adjustments be processed on standard Change Order and equitable adjustment forms.

3. Work Performed Under Protest.

The Contractor agrees to perform all Work as directed by the DCR, and if the Project Engineer determines that certain Work that the Contractor believes to be or to warrant a Change Order under this Article does not represent a change in the Work, the Contractor shall perform said Work. The Contractor shall be deemed to have concurred with the Project Engineer's determination as aforesaid unless the Contractor shall perform Work under protest in compliance with the following sub-paragraphs (1) and (2) below:

(1) If the Contractor claims compensation for a change in the Work that is not deemed by the Project Engineer to be a change or to warrant additional compensation as claimed by the Contractor, the Contractor shall within one week after the commencement of any such work or the sustaining of any such damage submit to the Resident Engineer a written statement of the nature of such work or claim. The Contractor shall not be entitled to additional compensation for any work performed or damage sustained for which written notice is not given within the time limit specified in the preceding sentence, even though similar in character to work or damage with respect to which notice is timely given.

(2) On or before the fifteenth day of the month succeeding that in which any such extra work shall have been done or any such damage shall have been sustained, the Contractor shall file to the extent possible with the Resident Engineer, itemized statements of the details and costs of such work performed, or damage sustained. If the Contractor shall fail to make such statement to the extent possible, then the Contractor shall not be entitled to additional compensation for any such work or damages.

4. False Claims. Statutory Provisions Regarding Changes.

A. Criminal Penalties: The Contractor's attention is directed to M.G.L. c. 30, sec. 39I which provides criminal penalties for unauthorized deviations from the Plans and Specifications, and to M.G.L. c. 30, sec. 39J, and if performing work on a capital facility project, M.G.L. c. 7, sec. 42E-42I. The Contractor's attention is also directed to M.G.L. c. 266, sec. 67B which provides criminal penalties for false claims by Contractor under this Contract: *"Whoever makes or presents to any employee, department, agency or public instrumentality of the commonwealth, or of any political subdivision thereof, any claim upon or against any department, agency, or public instrumentality of the commonwealth, or any political subdivision thereof, knowing such claim to be false, fictitious, or fraudulent, shall be punished by a fine of not more than ten thousand dollars or by imprisonment in the state prison for not more than five years, or in the house of correction for not more than two and one-half years, or both."*

B. Differing Site Conditions (M.G.L. c. 30, sec. 39N): *"If, during the progress of the work, the contractor or the awarding authority discovers that the actual subsurface or latent physical conditions encountered at the Site differ substantially or materially from those shown on the plans or indicated in the contract documents either the contractor or the contracting authority may request an equitable adjustment in the contract price of the contract applying to work affected by the differing Site conditions. A request for such an adjustment shall be in writing and shall be delivered by the party making such claim to the other party as soon as possible after such conditions are discovered. Upon receipt of such a claim from a contractor, or upon its own initiative, the contracting authority shall make an investigation of such physical conditions, and, if they differ substantially or materially from those shown on the plans or indicated in the contract documents or from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the plans and contract documents and are of such a nature as to cause an increase or decrease in the cost of performance of the work or a change in the construction methods required for the performance of the work which results in an increase or decrease in the cost of the work, the contracting authority shall make an equitable adjustment in the contract price and the contract shall be modified in writing accordingly."*

C. Timely Decision by Awarding Authority. (M.G.L. c. 30, sec. 39P): *"Every contract subject to section thirty-nine M of this chapter or section forty-four A of chapter one hundred forty-nine which requires the awarding authority, any official, its architect or engineer to make a decision on interpretation of the specifications, approval of equipment, material or any other approval, or progress of the work, shall require that the decision be made promptly and, in any event, no later than thirty days after the written submission for decision; but if such decision requires extended investigation and study, the awarding authority, the official, architect or engineer shall, within thirty days after the receipt of the submission, give the party making the submission written notice of the reasons why the decision cannot be made within the thirty day period and the date by which the decision will be made."*

D. Change Order / Contract Interpretation Appeal Procedure (M.G.L. c. 30, sec. 39Q): The following provisions apply to every contract awarded by any state agency as defined by M.G.L. c. 7, sec. 39A for the construction, reconstruction, alteration, remodeling, repair, or demolition of any capital facility as defined by the aforesaid section 39A:

"(a) Disputes regarding changes in and interpretations of the terms or scope of the contract and denials of or failures to act upon claims for payment for extra work or materials shall be resolved according to the following procedures, which shall constitute the exclusive method for resolving such disputes. Written notice of the matter in dispute shall be submitted promptly by the claimant to the chief executive official of the state agency which awarded the contract or his designee. No person or business entity having a contract with a state agency shall delay, suspend, or curtail performance under that contract because of any dispute subject to this section. Any disputed order, decision or action by the agency or its authorized representative shall be fully performed or complied with pending resolution of the dispute.

"(b) Within thirty days of submission of the dispute to the chief executive official of the state agency or his designee, he shall issue a written decision stating the reasons therefore and shall notify the parties of their right of appeal under this section. If the official or his designee is unable to issue a decision within thirty days, he shall notify the parties to the dispute in writing of the reasons why a decision cannot be issued within thirty days and of the date by which the decision shall issue. Failure to issue a decision within the thirty-day period or within the additional time specified in such written notice shall be deemed to constitute a denial of the claim and shall authorize resort to the appeal procedure described below. The decision of the chief executive official or his/her designee shall be final and conclusive unless an appeal is taken as provided below.

"(c) Within twenty-one calendar days of the receipt of a written decision or of the failure to issue a decision as stated in the preceding subparagraph, any aggrieved party may file a notice of claim for an adjudicatory hearing with the division of hearing officers or the aggrieved party may file an action directly in a court of competent jurisdiction and shall serve copies thereof upon all other parties in the form and manner prescribed by the rules governing the conduct of adjudicatory proceedings of the division of hearing officers. In the event an aggrieved party exercises his option to file an action directly in court as provided in the previous sentence, the twenty-one-day period shall not apply to such filing and the period of filing such action shall be the same period otherwise applicable for filing a civil action in superior court. The appeal shall be referred to a hearing officer experienced in construction law and shall be prosecuted in accordance with the formal rules of procedure for the conduct of adjudicatory hearings of the division of hearing officers, except as provided below. The hearing officer shall issue a final decision as expeditiously as possible, but in no event more than one hundred and twenty calendar days after conclusion of the adjudicatory hearing, unless the decision is delayed by a request for extension of time for filing post-hearing briefs or other submissions assented to by all parties. Whenever, because an extension of time has been granted, the hearing officer is unable to issue a decision within one hundred and twenty days, he shall notify all parties of the reasons for the delay and the date when the decision will issue. Failure to issue a decision within the one-hundred-and-twenty-day period or within the additional period specified in such written notice shall give the petitioner the right to pursue any legal remedies available to him without further delay.

"(d) When the amount in dispute is less than ten thousand dollars, a contractor who is party to the dispute may elect to submit the appeal to a hearing officer experienced in construction law for expedited hearing in accordance with the informal rules of practice and procedure of the division of hearing officers. An expedited hearing under this subparagraph shall be available at the sole option of the contractor. The hearing officer shall issue a decision no later than sixty days following the conclusion of any hearing conducted pursuant to this subparagraph. The hearing officer's decision shall be final and conclusive and shall not be set aside except in cases of fraud."

5. Mediation.

In the case of every dispute where the dollar amount in dispute (or the estimated dollar value of the extension of time in dispute) is \$50,000 or more and the Contractor appeals the decision of the DCR or his designee described in Section 4.B above, the DCR shall retain the option at its sole discretion of initiating a process whereby the DCR and the Contractor shall engage in good faith in a non-binding mediation process, which process shall be concluded within sixty days from the date that the Contractor files an appeal from said decision as provided in Section 4.B above.

ARTICLE VIII: PAYMENT PROVISIONS

1. Schedule of Values.

Before the first application for payment the Contractor shall submit to the DCR a schedule of values allocated to various portions of the Work in sufficient detail to reflect the various major components of each trade (with filed Subcontractors as well as MBE/WBE noted), including quantities when requested, aggregating the total Contract Price, and divided so as to facilitate payments for work under each section of the Specifications. The schedule shall be prepared in such form and supported by such data to substantiate its accuracy as the DCR may require. Each item in the schedule shall include its proper share of overhead and profit. When approved by the DCR, it shall constitute the Schedule of Values and shall be used only as a basis for the Contractor's requests for payments.

2. Payment Liabilities of Contractor.

A. The Contractor shall pay to the DCR all expenses, losses, and damages, as determined by the DCR, incurred in consequence of any default, defect, omission or mistake of the Contractor or his/her employees or Subcontractors or the making good thereof.

B. If the Work (or a portion thereof) is not completed to Substantial Completion and the Contractor has not fully completed the Work by the date specified in Article 2 of the Department of Conservation and Recreation - Contractor Agreement, the Contractor shall pay to the DCR liquidated damages as provided in Article VI, Section 2 of these General Conditions of the Contract.

3. Retention of Moneys by the DCR.

A. The DCR may keep any moneys which would otherwise be payable at any time hereunder, and apply the same, or so much as may be necessary therefor, to (1) the DCR's expenditures for the Contractor's account, (2) to secure the DCR's remedies against the Contractor for the Contractor's breach of its obligations under this Contract or the breach of any person performing any part of the Work and (3) the payment of any expenses, losses or damages incurred by the DCR as a result of the failure of the Contractor to perform its obligations hereunder. The DCR may retain, until all claims are settled, such moneys as the DCR estimates to be the fair value of the DCR's claims against the Contractor, and of all claims for labor performed or furnished and for materials used or employed in or in connection with the Work and for the rental of vehicles, appliances and equipment employed and for the employment of substitute contractors and labor in connection with the Work, in accordance with M.G.L. c. 30, sections 39A and 39F. The DCR may make such settlements and apply thereto any moneys retained under this Contract.

B. The Contractor shall each week examine all claims so filed, and if the same are in any respect incorrect or do not correctly show the amount due from the Contractor to the claimant for such labor and materials, the Contractor shall forthwith file with the DCR a separate written statement of all inaccuracies in each claim and of the correct amount due from the Contractor to each claimant therefor, and shall immediately file a statement of all payments thereafter made to such claimants. Each such statement shall be sworn to and contain a detailed breakdown as required by M.G.L. c. 30 s. 39F(d). Unless such statements are so filed by the Contractor the amount shown by the claims filed shall at the option of the DCR be conclusively deemed to be the accurate amount due from the Contractor therefor in all accounting with the DCR. If the moneys retained under this Contract are insufficient to pay the sums found by the DCR to be due under the claims for labor and materials filed as aforesaid, the DCR may, at its discretion, pay the same, and the Contractor shall repay to the DCR all sums paid out. The DCR may also at its discretion use any moneys retained, due or to become due under this Contract, for the purpose of paying for both labor and materials used or employed in the Work for which claims have not been filed with the DCR.

C. No moneys retained under the provisions of this Article shall be held to be statutory security for the payment of claims filed in accordance with the provisions of M.G.L. c. 149, sec. 29, as amended, for which security is provided by bond.

4. Applications for Payment.

A. The Contractor shall, once in each month on the day of the month corresponding to the day of the month specified in the Notice to Proceed referenced in Article 2 of the Department of Conservation and Recreation - Contractor Agreement, in writing and in the manner prescribed by the DCR, submit to the Resident Engineer a statement showing the total amount of Work done to the time of such estimate and the value thereof as approved by the Resident Engineer and the Project Engineer. It shall be the sole responsibility of the Contractor to deliver or cause to be delivered to the Resident Engineer said periodic estimate in proper form, approved as provided above and arithmetically correct. All periodic estimates shall contain such certifications and other evidence supporting the Contractor's right to payment as the DCR may require, including without limitation, lien waivers and other evidence, on such forms as the DCR may require, establishing that title to the equipment or materials is unencumbered and has been transferred to the Department of Conservation and Recreation. If there is no Resident Engineer assigned to the Contract, the DCR shall designate a person at the project field office or alternatively the home office of the DCR. The Contractor shall include in such periodic estimate only such materials as are incorporated in the Work, except as provided in paragraph C below. The DCR shall retain no more than five percent of such estimated value as part security for the completion of the Work and shall pay to the Contractor while carrying on the Work the balance not retained as aforesaid, subject to the approval of the DCR after deducting therefrom all previous payments and all sums to be kept under the provisions of this Contract.

B. Each periodic estimate shall constitute the Contractor's representation that (1) the payment then requested to be disbursed has been incurred by the Contractor on account of the Work and is justly due to Subcontractors or, to the Contractor in the case of other Work performed by the Contractor on account thereof, (2) the materials, supplies and equipment for which Application for Payment is being submitted have been installed or incorporated into the Work or have been stored at the Site or at such off Site storage locations as the DCR shall have Approved, (3) the materials, supplies and equipment are insured in accordance with the provisions of this Contract, (4) the materials, supplies and equipment are owned by the Department of Conservation and Recreation and are not subject to any liens or encumbrances, (5) the Work which is the subject of such periodic estimate has been performed in accordance with the Contract Documents and (6) that all due and payable bills with respect to the Work have been paid to date or shall be paid from the proceeds of such periodic estimate. The Contractor's attention is directed to the criminal penalties for false claims referenced in paragraph A above.

C. The Contractor may include in a periodic estimate the value of materials or equipment delivered at the Site (or at some location agreed to in writing) only upon delivery to the DCR of: (1) an acceptable transfer of title on the form provided by the DCR; (2) written certification by the Contractor (or applicable subcontractor) on the form provided by the DCR that the Contractor (or the Subcontractor which executed the transfer of title) is the lawful owner and that the materials or equipment are free from all encumbrances, accompanied by receipted invoices or other acceptable proof of encumbrance-free ownership if such proof is deemed necessary by the DCR; (3) a stored materials insurance binder that covers the materials for which payment is requested, that names the Department of Conservation and Recreation as an insured party should the stored materials be subjected to any casualty, loss, or theft prior to their inclusion in the Work. The material(s) or equipment must, in the judgment of the DCR (1) meet the requirements of the Contract, including prior drawing, product data, and sample approval, (2) be ready for use, and (3) be properly stored by the Contractor and be adequately protected until incorporated into the Work. See also Article V.5.C of these General Conditions of the Contract concerning the cost of inspections.

D. The DCR may make changes in any periodic estimate submitted by the Contractor in accordance with M.G.L. c. 30, sec. 39K for building projects (see below), and in accordance with M.G.L. c. 30, sec. 39G for public works projects (see below), and the payment due shall be computed in accordance with the changes so made. The provisions of said section 39K shall govern payments for building projects on which the DCR has made changes, and the provisions of said section 39G shall govern payments for public works projects on which the DCR has made changes.

E. No certificate for payment and no progress payment shall constitute acceptance of Work that is not in accordance with the Contract Documents.

F. The Contractor and all Subcontractors furnishing labor on this Contract agree to furnish certified payroll reports if requested to do so, at no additional expense to the DCR. The DCR may at all reasonable times audit such reports.

5. Periodic Payments (M.G. L. c. 30, sec. 39K) for Building Projects.

For building contracts, the DCR shall make payment to the Contractor in accordance with M.G.L. c. 30, sec. 39K, which provides as follows:

" Within fifteen days (30 days in the case of the commonwealth, including local housing authorities) after receipt from the contractor, at the place designated by the awarding authority if such a place is so designated, of a periodic estimate requesting payment of the amount due for the preceding month, the awarding authority will make a periodic payment to the contractor for the work performed during the preceding month and for the materials not incorporated in the work but delivered and suitably stored at the site (or at some location agreed upon in writing) to which the contractor has title or to which a subcontractor has title and has authorized the contractor to transfer title to the awarding authority upon certification by the contractor that he is the lawful awarding authority and that the materials are free from all encumbrances, but less (1) a retention based on its estimate of the fair value of its claims against the contractor and less (2) a retention for direct payments to subcontractors based on demands for same in accordance with the provisions of section thirty-nine F, and less (3) a retention not exceeding five percent of the approved amount of the periodic payment. After the receipt of a periodic estimate requesting final payment and within sixty-five days after (a) the contractor fully completes the work or substantially completes the work so that the value of the work remaining to be done is, in the estimate of the awarding authority, less than one percent of the original contract price, or (b) the contractor substantially completes the work and the awarding authority takes possession for occupancy, whichever occurs first, the awarding authority shall pay the contractor the entire balance due on the Contract less (1) a retention based on its estimate of the fair value of its claims against the contractor and of the cost of completing the incomplete and unsatisfactory items of work and less (2) a retention for direct payments to subcontractors based on demands for same in accordance with the provisions of section thirty-nine F, or based on the record of payments by the contractor to the subcontractors under this contract if such record of payment indicates that the contractor has not paid subcontractors as provided in section thirty-nine F. If the awarding authority fails to make payment as herein provided, there shall be added to each such payment daily interest at the rate of three percentage points above the rediscount rate then charged by the Federal Reserve Bank of Boston commencing on the first day after said payment is due and continuing until the payment is delivered or mailed to the contractor; provided, that no interest shall be due, in any event, on the amount due on a periodic estimate for final payment until fifteen days (twenty-four days in the case of the commonwealth) after receipt of such period estimate from the contractor, at the place designated by the awarding authority if such a place is so designated. The contractor agrees to pay to each subcontractor a portion of any such interest paid in accordance with the amount due each subcontractor.

The awarding authority may make changes in any periodic estimate submitted by the contractor and the payment due on said periodic estimate shall be computed in accordance with the change so made, but such changes or any requirement for a corrected periodic estimate shall not affect the due date for the periodic payment or the date for the commencement of interest charges on the amount of the periodic payment computed in accordance with the changes made, as provided herein; provided, that the awarding authority may, within seven days after receipt, return to the contractor for correction, any periodic estimate which is not in the required form or which contains computations not arithmetically correct and, in that event, the date of receipt of such periodic estimate shall be the date of receipt of the corrected periodic estimate in proper form and with arithmetically correct computations. The date of receipt of a periodic estimate received on a Saturday shall be the first working day thereafter. The provisions of section thirty-nine G shall not apply to any contract for the construction, reconstruction, alteration, remodeling, repair, or demolition of any public building to which this section applies.

All periodic estimates shall be submitted to the awarding authority, or to its designee as set forth in writing to the contractor, and the date of receipt by the awarding authority or its designee shall be marked on the estimate. All periodic estimates shall contain a separate item for each filed sub-trade and each sub-sub-trade listed in sub-bid form as required by specifications and column listing the amount paid to each filed subcontractor as of the date of the periodic estimate is filed. The person making payment for the awarding authority shall add the daily interest provided for herein to each payment for each day beyond the due date of receipt marked on the estimate.

A certificate of the architect to the effect that the contractor has fully or substantially completed the work shall, subject to the provisions of section thirty-nine J, be conclusive for the purposes of this section.

Notwithstanding the provisions of this section, at any time after the value of the work remaining to be done is, in the estimation of the awarding authority, less than 1 per cent of the adjusted contract price, or the awarding authority has determined that the contractor has substantially completed the work and the awarding authority has taken possession for occupancy, the awarding authority may send to the general contractor by certified mail, return receipt requested, a complete and final list of all incomplete and unsatisfactory work items, including, for each item on the list, a good faith estimate of the fair and reasonable cost of completing such item. The general contractor shall then complete all such work items within 30 days of receipt of such list or before the contract completion date, whichever is later. If the general contractor fails to complete all incomplete and unsatisfactory work items within 45 days after receipt of such items furnished by the awarding authority or before the contract completion date, whichever is later, subsequent to an additional 14 days' written notice to the general contractor by certified mail, return receipt requested, the awarding authority may terminate the contract and complete the incomplete and unsatisfactory work items and charge the cost of same to the general contractor and such termination shall be without prejudice to any other rights or remedies the awarding authority may have under the contract. The awarding authority shall note any such termination in the evaluation form to be filed by the awarding authority pursuant to the provisions of section 44D of chapter 149."

6. Payment of Subcontractors (M.G.L. c. 30, sec. 39F).

The Contractor shall make payments to Subcontractors in accordance with the provisions of M.G.L. c. 30, sec. 39F, which is quoted in this section below, where applicable. (M.G.L. c. 30, sec. 39F requires that subparagraphs (a) through (h) be set forth in contracts awarded under M.G.L. c. 30, sec. 39M and M.G.L. c. 149, sections 44A-44H; said statute requires that subparagraph (i) be set forth in contracts awarded under M.G.L. c. 149, sections 44A-44H).

"1(a) Forthwith after the general contractor receives payment on account of a periodic estimate, the general Contractor shall pay to each subcontractor the amount paid for the labor performed and the materials furnished by that subcontractor, less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the subcontractor by the general contractor.

(b) Not later than the sixty-fifth day after each subcontractor substantially completes his work in accordance with the Plans and Specifications, the entire balance due under the subcontract less amounts retained by the awarding authority as the estimated cost of completing the incomplete and unsatisfactory items of work, shall be due the subcontractor; and the awarding authority shall pay that amount to the general contractor. The general contractor shall forthwith pay to the subcontractor the full amount received from the awarding authority less any amount specified in any court proceedings barring such payment and less any amount claimed due from the subcontractor by the general contractor.

(c) Each payment made by the awarding authority to the general contractor pursuant to subparagraphs (a) and (b) of this paragraph for the labor performed and the materials furnished by a subcontractor shall be made to the general contractor for the account of that subcontractor; and the awarding authority shall take reasonable steps to compel the general contractor to make each such payment to each such subcontractor. If the awarding authority has received a demand for direct payment from a subcontractor for any amount which has already been included in a payment to the general contractor or which is to be included in a payment to the general contractor for payment to the subcontractor as provided in subparagraphs (1) and (2) the awarding authority shall act upon the demand as provided in this section.

(d) If, within seventy days after the subcontractor has substantially completed the subcontract work, the subcontractor has not received from the general contractor the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor, less any amount retained by the awarding authority as the estimated cost of completing the incomplete and unsatisfactory items of work, the subcontractor may demand direct payment of that balance from the awarding authority. The demand shall be by a sworn statement delivered to or sent by certified mail to the awarding authority, and a copy shall be delivered to or sent by certified mail to the general contractor at the same time. The reply shall contain a detailed breakdown of the balance due under the subcontract and a statement of the status of completion of the subcontract work. Any demand made after substantial completion of the subcontract work shall be valid even if delivered or mailed prior to the seventieth day after the subcontractor has substantially completed the subcontract work. Within ten days after the subcontractor has delivered or so mailed the demand to the awarding authority and delivered or so mailed a copy to the general contractor, the general contractor may reply to the demand. The reply shall be by a sworn statement to or sent by certified mail to the awarding authority and a copy shall be delivered to or sent by certified mail to the subcontractor at the same time. The reply shall contain a detailed breakdown of the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor and of the amount due for each claim made by the general contractor against the subcontractor.

(e) Within fifteen days after receipt of the demand by the awarding authority, but in no event prior to the seventieth day after substantial completion of the subcontract work, the awarding authority shall make direct payment to the subcontractor of the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor, less any amount (i) retained by the awarding authority as the estimated cost of completing the incomplete or unsatisfactory items of work, (ii) specified in any court proceedings barring such payment, or (iii) disputed by the general contractor in the sworn reply; provided that the awarding authority shall not deduct from a direct payment any amount as provided in part (iii) if the reply is not sworn to, or for which the sworn reply does not contain the detailed breakdown required by subparagraph (d). The awarding authority shall make further direct payments to the subcontractor forthwith after the removal of the basis for deduction from direct payments made as provided in parts (i) and (ii) of this subparagraph.

(f) The awarding authority shall forthwith deposit the amount deducted from a direct payment as provided in part (iii) of subparagraph (5) in an interest-bearing joint account in the names of the general contractor and the subcontractor in a bank in Massachusetts selected by the awarding authority or agreed upon by the general contractor and the subcontractor and shall notify the general contractor and the subcontractor of the date of the deposit and the bank receiving the deposit. The bank shall pay the amount in the account, including accrued interest, as provided in an agreement between the general contractor and the subcontractor or as determined by decree of a court of competent jurisdiction.

(g) All direct payments and all deductions from demand for direct payments deposited in an interest-bearing account or accounts in a bank pursuant to subparagraph (6) shall be made out of amounts payable to the general contractor at the time of receipt of a demand for direct payment from a subcontractor and out of amounts which later become payable to the General contractor and in the order of receipt of such demands from subcontractors. All direct payments shall discharge the obligation of the awarding authority to the general contractor to the extent of such payment.

(h) The awarding authority shall deduct from payments to a General contractor amounts which, together with the deposits in interest bearing accounts pursuant to subparagraph (6) are sufficient to satisfy all unpaid balances of demands for direct payment received from subcontractors. All such amounts shall be earmarked for such direct payments, and the subcontractors shall have a right in such deductions prior to any claims against such amounts by creditors of the general contractor.

(i) If the subcontractor does not receive payment as provided in subparagraph (1) or if the general contractor does not submit a periodic estimate for the value of the labor or materials performed or furnished by the subcontractor and the subcontractor does not receive payment for same when due less the deductions provided for in subparagraph (1), the subcontractor may demand direct payment by following the procedure in subparagraph (4) and the general contractor may file a sworn reply as provided in that same subparagraph. A demand made after the first day of the month following that for which the subcontractor performed or furnished the labor and materials for which the subcontractor seeks payment shall be valid even if delivered or mailed prior to the time payment was due on a periodic estimate from the general contractor. Thereafter the awarding authority shall proceed as provided in subparagraph (e), (f), (g) and (h).

(2) Any assignment by a subcontractor of the rights under this section to a surety company furnishing a bond under the provisions of section twenty-nine of chapter one hundred forty-nine shall be invalid. The assignment and subrogation rights of the surety to amounts included in a demand for direct payment which are in the possession of the awarding authority, or which are on deposit pursuant to subparagraph (6) shall be subordinate to the rights of all subcontractors who are entitled to be paid under this section and who have not been paid in full.

(3) "subcontractor" as used in this section (l) for contracts awarded as provided in sections forty-four A to forty-four L, inclusive, of chapter one hundred forty-nine shall mean a person who files a sub-bid and received a subcontract as a result of that filed sub-bid or who is approved by the awarding authority in writing as a person performing labor or both performing labor and furnishing materials pursuant to a contract with the general contractor, (ii) for contracts awarded as provided in paragraph (1) of section thirty-nine M of chapter thirty shall mean a person approved by the awarding authority in writing as a person performing labor or both performing labor and furnishing materials pursuant to a contract with the general contractor, and (iii) for contracts with the commonwealth not awarded as provided in sections forty-four A to forty-four L, inclusive, of chapter one hundred forty-nine shall also mean a person contracting with the general contractor to supply materials used or employed in a public works project for a price in excess of five thousand dollars.

(4) A general contractor or a subcontractor shall enforce a claim to any portion of the amount of a demand for direct payment deposit as provided in subparagraph (6) by a petition in equity in the superior court against the other and the bank shall not be a necessary party. A subcontractor shall enforce a claim for direct payment or a right to require a deposit as provided in subparagraph (6) by a petition in equity in the superior court against the awarding authority and the general contractor shall not be a necessary party. Upon motion of any party the court shall advance for speedy trial any petition filed as provided in this paragraph. Sections fifty-nine and fifty-nine B of chapter two hundred thirty-one shall apply to such petitions. The court shall enter an interlocutory decree upon which execution shall issue for any part of a claim found due pursuant to sections fifty-nine and fifty-nine B and, upon motion of any party, shall advance for speedy trial the petition to collect the remainder of the claim. Any party aggrieved by such interlocutory decree shall have the right to appeal therefrom as from a final decree. The court shall not consolidate for trial the petition of any subcontractor with the petition of one or more subcontractors or the same general Contract unless the court finds that a substantial portion of the evidence of the same events during the course of construction (other than the fact that the claims sought to be consolidated arise under the same general contract) is applicable to the petitions sought to be consolidated and that such consolidation will prevent unnecessary duplication of evidence. A decree in any such proceeding shall not include interest on the disputed amount deposited more than the interest earned for the period of any such deposit. No person except a subcontractor filing a demand for direct payment for which no funds due the general contractor are available for direct payment shall have a right to file a petition in court of equity against the awarding authority claiming a demand for direct payment is premature and such subcontractor must file the petition before the awarding authority has made a direct payment to the subcontractor and has made a deposit of the disputed portion as provided in part (iii) of subparagraph (5) and in subparagraph (6).

(5) In any petition to collect any claim for which a subcontractor has filed a demand for direct payment the court shall, upon motion of the general contractor, reduce by the amount of any deposit of a disputed amount by the awarding authority as provided in part (iii) of subparagraph (5) and in subparagraph (6) any amount held under a trustee writ or pursuant to a restraining order or injunction."

7. Contracts for Public Works Governed by M.G.L. c. 30, sec. 39G:

The following statutory provision applies only to contracts for public works governed by M.G.L. c. 30, sec. 39G: *"Upon substantial completion of the work required by a Contract with the Owner, or any agency or political subdivision thereof, for the construction, reconstruction, alteration, remodeling, repair or improvement of public ways, including bridges, and other highway structures, sewers and water mains, airports and other public works, the contractor shall present in writing to the awarding authority its certification that the work has been substantially completed. Within twenty-one days thereafter, the awarding authority shall present to the contractor either a written declaration that the work has been substantially completed or an itemized list of incomplete or unsatisfactory work items required by the Contract sufficient to demonstrate that the work has not been substantially completed. The awarding authority may include with such a list a notice setting forth a reasonable time, which shall not in any event be prior to the Contract completion date, within which the contractor must achieve substantial completion of the work. If the awarding authority fails to respond, by presentation of a written declaration or itemized list as aforesaid, to the contractor's certification within the twenty- one-day period, the contractor's certification shall take effect as the awarding authority's declaration that the work has been substantially completed.*

Within sixty-five days after the effective date of a declaration of a substantial completion, the awarding authority shall prepare and forthwith send to the contractor for acceptance a substantial completion estimate for the quantity and price of the work done and all but one percent retainage of that undisputed part of each work item and extra work item in dispute but excluding the disputed part thereof, less the estimated cost of completing all incomplete and unsatisfactory work items and less the total periodic payments made to date for the work. The awarding authority also shall deduct from the substantial completion estimate an amount equal to the sum of all demands for direct payments filed by subcontractors and not yet paid to subcontractors or deposited in joint accounts pursuant to section thirty-nine F, but no Contract subject to said section thirty-nine F shall contain any other provision authorizing the awarding authority to deduct any amount by virtue of claims asserted against the Contract by subcontractors, material suppliers or others.

If the awarding authority fails to prepare and send to the contractor any substantial completion estimate required by this section on or before the date herein above set forth, the awarding authority shall pay to the contractor interest on the amount which would have been due to the contractor pursuant to such substantial completion estimate at the rate of three percentage points above the rediscount rate then charged by the Federal Reserve Bank of Boston from such date to the date on which the awarding authority sends that substantial completion estimate to the contractor for acceptance or to the date of payment therefor, whichever occurs first. The awarding authority shall include the amount of such interest in the substantial completion estimate.

Within fifteen days after the effective date of the declaration of substantial completion, the awarding authority shall send to the contractor by certified mail, return receipt requested, a complete list of all incomplete or unsatisfactory work items, and, unless delayed by causes beyond his control, the contractor shall complete all such work items within forty-five days after the receipt of such list or before the then Contract completion date, whichever is later. If the contractor fails to complete such work within such time, the awarding authority may, after seven days' written notice to the contractor by certified mail, return receipt requested, terminate the Contract, and complete the incomplete or unsatisfactory work items and charge the cost of same to the contractor.

Within thirty days after receipt by the awarding authority of a notice from the contractor stating that all of the work required by the Contract has been completed, the awarding authority shall prepare and forthwith send to the contractor for acceptance a final estimate for the quantity and price of the work done and all retainage on that work less all payments made to date, unless the awarding authority's inspection shows that work items required by the Contract remain incomplete or unsatisfactory, or that documentation required by the Contract has not been completed. If the awarding authority fails to prepare and send to the contractor the final estimate within thirty days after receipt of notice of completion, the awarding authority shall pay to the contractor interest on the amount which would have been due to the contractor pursuant to such final estimate at the rate hereinabove provided from the thirtieth day after such completion until the date on which the awarding authority sends the final estimate to the contractor for acceptance or the date of payment therefore, whichever occurs first, provided that the awarding authority's inspection shows that no work items required by the Contract remain incomplete or unsatisfactory. Interest shall not be paid hereunder on amounts for which interest is required to be paid in connection with the substantial completion estimate as hereinabove provided. The awarding authority shall include the amount of the interest required to be paid hereunder in the final estimate.

The awarding authority shall pay the amount due pursuant to any substantial completion or final estimate within thirty-five days after receipt of written acceptance for such estimate from the contractor and shall pay interest on the amount due pursuant to such estimate at the rate hereinabove provided from that thirty-fifth day to the date of payment. Within 15 days, 30 days in the case of the commonwealth, after receipt from the contractor, at the place designated by the awarding authority, if such place is designated, of a periodic estimate requesting payment of the amount due for the preceding periodic estimate period, the awarding authority shall make a periodic payment to the contractor for the work performed during the preceding periodic estimate period and for the materials not incorporated in the work but delivered and suitably stored at the Site, or at some location agreed upon in writing, to which the contractor has title or to which a subcontractor has title and authorized the contractor to transfer title to the awarding authority, upon certification by the contractor that he is the lawful owner and that the materials are free from all encumbrances. The awarding authority shall include with each such payment interest on the amount due pursuant to such periodic estimate at the rate herein above provided from the due date. In the case of periodic payments, the contracting authority may deduct from its payment a retention based on the estimate of the fair value of its claims against the contractor, a retention for direct payments to subcontractors based on demands for same in accordance with the provisions of section thirty-nine F, and a retention to secure satisfactory performance of the contractual work not exceeding five per cent of the approved amount of any periodic payment, and the same right to retention shall apply to bonded subcontractors entitled to direct payment under section thirty-nine F of chapter thirty; provided that a five per cent value of all items that are planted in the ground shall be deducted from the periodic payments until final acceptance.

No periodic, substantial completion or final estimate or acceptance or payment thereof shall bar a contractor from reserving all rights to dispute the quantity and amount of, or the failure of the awarding authority to approve a quantity and amount of, all or part of any work item or extra work item.

Substantial completion, for the purposes of this section, shall mean either that the work required by the Contract has been completed except for work having a Contract Price of less than one percent of the then adjusted total Contract Price, or substantially all of the work has been completed and opened to public use except for minor incomplete or unsatisfactory work items that do not materially impair the usefulness of the work required by the contract”

8. Liens

Neither the final payment nor any part of the retained percentage shall become due until the Contractor, if required, delivers to the DCR a complete release of all liens arising out of this Contract, or receipts in full in lieu thereof and, if required in either case, an affidavit that so far as he/she has knowledge or information, the releases and receipts include all labor and material for which a lien could be filed; but the Contractor may, if any Subcontractor refuses to furnish a release or receipt in full, furnish a bond satisfactory to the DCR, to indemnify him against any lien. If any lien remains unsatisfied after all payments are made, the Contractor shall refund to the DCR, all moneys that the latter may be compelled to pay in discharging such a lien, including all costs and a reasonable attorney's fee.

9. Final Payment: Release of Claims by Contractor.

Upon Final Acceptance of the Work the Contractor shall be entitled to payment of the balance of the Contract Price. Final payment shall be as provided in this Article above and in accordance with any process set forth in the Special Conditions. The Contractor agrees to execute a Certificate of Final Inspection, Release (with Contractor's own exceptions listed thereon) and Acceptance as a condition precedent to Final Payment. The acceptance by the Contractor of the Final Payment made as aforesaid, or the execution of the Certificate of Final Acceptance by the Contractor, shall constitute a release of the Department of Conservation and Recreation, and every member and agent of it, from all claims of and liability to the Contractor for anything done or furnished for or relating to the Work, or for any act or neglect of the Department of Conservation and Recreation, or of any person relating to or affecting the Work, except the claim against the Department of Conservation and Recreation for the remainder, if any there be, of the amounts set forth by the Contractor in the Certificate of Final Inspection, Release and Acceptance. Final Acceptance shall not relieve the Contractor of the requirements of Articles IX, XIV, and XV of these General Conditions of the Contract, or of other provisions of this Contract, to the extent that the same are intended to survive Final Acceptance.

ARTICLE IX. GUARANTEES AND WARRANTIES

1. General Warranty.

If at any time during the period of one (1) year from the date of Final Acceptance, any part of such Work shall in the reasonable opinion of the DCR be defective or require replacing or repairing, or damage to other property of the DCR is caused by any defect in the Work, the DCR shall notify the Contractor in writing to make the required repairs or replacements and repair such damage. If the Contractor shall neglect to commence such repairs or replacements to the satisfaction of the DCR within ten (10) days from the date of the giving of such notice, then the DCR may employ other persons to make the same. The Contractor agrees, upon demand, to pay to the DCR all amounts which it expends for such repairs, replacements, and/or damages. During this one-year guarantee period any corrective work shall be performed under all the applicable terms of this Contract, and if Change Orders are issued in accordance with the terms of this Contract, the Contractor shall be entitled to compensation for special insurance, as required. This one-year guarantee shall not limit any express guaranty or warranty provided elsewhere in the Contract.

2. Special Guarantees and Warrantees.

A. The Contractor's obligation to correct Work as set forth in paragraph 1 above is in addition to, and not in substitution of, such guarantees or warranties as may be required in the various sections of the Specifications.

B. Guarantees and warranties required in the various sections of the Specifications must be delivered to the DCR before final payment to the Contractor may be made, or in the case of guarantees and warranties which originate with a subcontractor's section of the Work, before final payment for that sub-trade or for the phase of Work to which the guarantee or warranty relates.

C. The failure to deliver a required guarantee or warranty shall constitute a failure to fully complete the Work in accordance with the Contract Documents.

ARTICLE X: MISCELLANEOUS LEGAL REQUIREMENTS.

1. Contractor to be Informed.

The Contractor shall inform itself of all existing and future Laws in any manner affecting those engaged or employed in the Work, or the materials used or employed in the Work, or in any way affecting the conduct of the Work, and of all orders and decrees of bodies or tribunals having any applicable jurisdiction or authority over the Work.

2. Compliance with all Laws.

The Contractor shall cause all persons employed in the performance of the Work to comply with all existing and future Laws, including but not limited to those set forth below:

A. Corporate Disclosures. The Contractor if a foreign corporation, shall comply with M.G.L. c. 30, sec. 39L.

B. Veterans Preference. In the employment of mechanics and apprentices, teamsters, chauffeurs, and laborers in the performance of Work in the Commonwealth, preference shall first be given to citizens of the Commonwealth who have been residents of the Commonwealth for at least six months at the commencement of their employment and who are veterans as defined M.G.L. c. 4, sec. 7(43), and who are qualified to perform the work to which the employment relates; and secondly, to citizens of the Commonwealth generally who have been residents of the Commonwealth for at least six months at the commencement of their employment, and if they cannot be obtained in sufficient numbers, then to citizens of the United States.

C. Prevailing Wages. The Contractor shall comply with M.G.L. c. 149, sections 26- 27H. The prevailing wage schedule is found in Exhibit A to the Instructions to Bidders, listing the prevailing minimum wage rates that must be paid to all workers employed in the Work. The DCR is not responsible for any errors, omissions, or misprints in said schedule. Such Schedule shall continue to be the minimum rate of wages payable to workers employed in the Work throughout the term of this Contract, subject to the exceptions provided in M.G.L. c. 149, sections 26-27H. The Contractor shall not have any claim for extra compensation from the Department of Conservation and Recreation if the actual wages paid to workers employed in the Work exceeds the rates listed on the schedule or as otherwise provided by law. The Contractor shall cause a copy of said Schedule to be kept in a conspicuous place at the Site during the term of the Contract. If reserve police officers are employed by the Contractor, they shall be paid the prevailing wage of regular police officers. (See M.G.L. c. 149, sec. 34B).

D. Payroll Records and Statement of Compliance. The Contractor shall comply and shall cause its Subcontractors to comply with Massachusetts General Law c. 149, sec. 27B, which requires that a true and accurate record be kept of all persons employed on a project for which the prevailing wage rates have been provided. The Contractor and all Subcontractors shall keep these records and preserve them for a period of three years from the date of completion of the Contract. Such records shall be open to inspection by any authorized representative of the Department of Conservation and Recreation at any reasonable time, and as often as may be necessary. The Contractor shall, and shall cause its subcontractors to, submit weekly copies of their weekly payroll records to the DCR. In addition, the Contractor and each Subcontractor shall furnish to the Executive Department of Labor within fifteen days after completion of its portion of the Work a signed statement in the form required by the DCR.

E. Vehicle operators. If the Director of the Department of Labor and Workforce Development has established a Schedule of wage rates to be paid to the operators of trucks, vehicles or equipment for the Work, the Contractor shall be obligated to pay such operators at least the minimum wage rate contained on such Schedule. (See M.G.L. c.149, sections 26-27H).

F. Eight Hour Day. The Contractor shall comply with M.G.L. c. 149, sections 30 and 34, which provide that no laborer, workman, mechanic, foreman or inspector working within the Commonwealth in the employ of the Contractor, subcontractor or other person doing or contracting to do the whole or part of the Work shall be required or permitted to work more than eight hours in any one day or more than forty-eight hours in any one week, or more than six days in any one week, except in cases of extraordinary emergency.

G. Timely Payment of Wages. The Contractor shall comply with and shall cause its Subcontractors to comply with M.G.L. c. 149, sec. 148 which requires the weekly or biweekly payment of employees within six days of the end of the pay period during which wages were earned if employed for five or six days of a calendar week, and within other periods of time under certain circumstances as set forth therein.

H. Lodging, etc. The Contractor shall comply with, and shall cause its Subcontractors to comply with, M.G.L. c. 149, sec. 25 which provides that every employee under this Contract shall lodge, board, and trade where and with whom he elects, and neither the Contractor nor his agents or employees shall, either directly or indirectly, require as a condition of the employment of any person that the employee shall lodge, board, or trade at a particular place or with a particular person.

I. Truck Rates. The use by the Contractor of trucks or other motor vehicles hired from either common or contract motor carriers in the course of performance of this Contract is subject to such minimum rates and charges, and rules and regulations as may from time to time be promulgated by the Department of Public Utilities of the Commonwealth of Massachusetts or other agency of the State or Federal government which may be authorized by law to set rates or otherwise regulate the use of such vehicles. The Contractor expressly assumes the risk of any additional expense that may arise by reason of any change in such minimum rates and charges, and rules and regulations, and shall be entitled to no additional compensation or reimbursement by reason thereof.

J. Anti-Boycott Covenant (Executive Order #130). The Contractor warrants, represents and agrees that during the time this Contract is in effect, neither it nor any affiliated company, as hereafter defined, participates in or cooperates with an international boycott, as defined in Section 999(b) (3) and (4) of the Internal Revenue Code of 1954, as amended, or engages in conduct declared to be unlawful by M.G.L. c. 151E, sec. 2. If there shall be a breach in the warranty, representation or agreement contained in this paragraph, then without limiting such other rights as it may have the DCR shall be entitled to rescind this contract. As used herein, an affiliated company shall be any business entity of which at least 51% of the ownership interests are directly or indirectly owned by the Contractor or by a person or persons or business entity or entities directly or indirectly owning at least 51% of the ownership interests of the Contractor; or which directly or indirectly owns at least 51% of the ownership interests of the Contractor.

K. Contractor's Agreements with Suppliers--Anti-Boycott and Anti-Discrimination Provisions.

(1) The Contractor shall not purchase or rent any materials, equipment, machinery, vehicles or supplies for or in connection with the Work from any person or entity who does not sign, under pains and penalties of perjury, a certificate that recites: "the undersigned warrants, represents and agrees that during the time its agreement with (insert contractor's name) is in effect for materials, supplies or equipment to be used in connection with the Department of Conservation and Recreation Contract No. (insert contract number), neither the undersigned or any affiliated company, as hereafter defined, participates in or cooperates with an international boycott, as defined in Section 999(b)(3) and (4) of the Internal Revenue Code of 1954, as amended, or engages in conduct declared to be unlawful by Section 2 of Chapter 151E of the Massachusetts General Laws. As used herein, an affiliated company shall be any business entity of which at least 51% of the ownership interests are directly or indirectly owned by the undersigned or by a person or persons or business entity or entities directly or indirectly owning at least 51% of the ownership interests of the undersigned; or which directly or indirectly owns at least 51% of the ownership interests of the undersigned."

(2) The DCR shall not be obligated to pay the Contractor for the cost of any materials, supplies, or equipment purchased or rented from any individual or entity from whom the Contractor has not previously obtained and delivered to the DCR the certificate that the previous paragraph requires. The Contractor will immediately terminate its contract with any supplier who breaches the warranty, representation and agreement contained in the previous paragraph.

(3) The Contractor shall include in the Contractor's agreement with any person or entity from whom the Contractor intends to purchase or rent any materials, equipment, machinery, vehicles or supplies for or in connection with the Work, (a) a notice that this Contract obligates the Contractor to terminate the supply contract upon discovery of such breach of the sworn certificate delivered under subparagraph (1) and such termination shall be without liability to the Contractor or the DCR and (b) a provision which states: "The Governor or his designee, the secretary of administration and finance, and the state auditor or his designee shall have the right at reasonable times and upon reasonable notice to examine the books, records and other compilations of the undersigned vendor which pertain to the performance and requirements of this agreement to provide materials of any nature to the undersigned contractor in connection with DCR Contract No. (insert contract number)."

L. Access to Contractor's Records (Executive Order #195). The Governor or his/her designee, the secretary of administration and finance, and the state auditor or his/her designee shall have the right at reasonable times and upon reasonable notice to examine the books, records, and other compilations of data of the Contractor which pertain to the performance and requirements of this Contract.

ARTICLE XI: CONTRACTOR'S ACCOUNTING METHOD REQUIREMENTS (M.G.L. c. 30, sec. 39R)

1. Definitions.

The words defined herein shall have the meaning stated below whenever they appear in this Article XI:

--"Contractor" means any person, corporation, partnership, joint venture, sole proprietorship, or other entity awarded a Contract pursuant to M.G.L. c. 30, sec. 39M, and M.G.L. c. 149, sections 44A-H.

--"Contract" means any Contract awarded or executed pursuant to M.G.L. c. 30, sec. 39M, M.G.L. c. 149, sections 44A-H.

--"Independent Certified Public Account" means a person duly registered in good standing and entitled to practice as a certified public accountant under the laws of the place of his/her residence or principal office and who is in fact independent. In determining whether an accountant is independent with respect to a particular person, appropriate consideration should be given to all relationships between the accountant and that person or any affiliate thereof. Determination of an accountant's independence shall not be confined to the relationships existing in connection with the filing of reports with the awarding authority.

--"Records" means books of original entry, accounts, checks, bank statements and all other banking documents, correspondence, memoranda, invoices, computer printouts, tapes, discs, papers and other documents or transcribed information of any type, whether expressed in ordinary or machine language.

--"Audit", when used regarding financial statements, means an examination of records by an independent certified public accountant in accordance with generally accepted accounting principles and auditing standards for the purpose of expressing a certified opinion thereon, or, in the alternative, a qualified opinion or a declination to express an opinion for stated reasons.

Accounting terms, unless otherwise defined herein, shall have a meaning in accordance with generally accepted accounting principles and auditing standards.

2. Record Keeping.

A. The Contractor shall make, and keep for at least six years after final payment, books, records, and accounts that in reasonable detail accurately and fairly reflect the transactions and dispositions of the Contractor.

B. Until the expiration of six years after final payment, the Inspector General and the DCR shall have the right to examine any books, documents, papers or records of the Contractor and Subcontractors that directly pertain to and involve transactions relating to the Contractor and Subcontractors.

C. The Contractor shall describe any change in the method of maintaining records or recording transactions which materially affects any statements filed with the DCR including the date of the change and reasons therefor and shall accompany said description with a letter from the Contractor's independent certified public accountant approving or otherwise commenting on the changes.

D. The Contractor represents that it has, prior to the execution of the Contract, filed a statement of management on internal accounting controls as set forth in Section 3 below.

E. The Contractor represents that it has, prior to the execution of the Contract, filed an audited financial statement for the most recent completed fiscal year as set forth in section 4 below and will continue to file such statement annually during the term of the Contract.

3. Statement of Management Controls.

A. The Contractor shall file with the DCR a statement of management as to whether the system of internal accounting controls of the Contractor and its subsidiaries reasonably assures that:

- (1) transactions are executed in accordance with management's general and specific authorization.
- (2) transactions are recorded as necessary: (a) to permit preparation of financial statements in conformity with generally accepted accounting principles, and (b) to maintain accountability for assets.
- (3) access to assets is permitted only in accordance with management's general or specific authorization; and
- (4) the recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action was taken with respect to any difference.

B. The Contractor shall file with the DCR a statement prepared and signed by an independent certified public accountant, stating that the accountant has examined the statement of management on internal accounting controls, and expressing an opinion as to:

- (1) whether the representations of management in response to subparagraph 3 above are consistent with the results of management's evaluation of the system of internal accounting controls; and
- (2) whether such representations of management are reasonable with respect to transactions and assets in amounts which would be material when measured in relation to the applicant's financial statement.

4. Annual Financial Statement.

A. Every Contractor awarded a contract under M.G.L. c. 30, sec. 39M or M.G.L. c. 149, sections 44A-44H shall annually file with the Commissioner of the Division of Capital Asset Management and Maintenance during the term of the Contract a financial statement prepared by an independent certified public accountant based on an audit by such accountant. The final statement filed shall include the date of final payment. All statements shall be accompanied by an accountant's report. Such statements shall be made available to the DCR upon request.

B. The office of Inspector General and the DCR shall have the right to enforce the provisions of this Article. A Contractor's failure to satisfy any of the requirements of this section may be grounds for debarment pursuant to M.G.L. c. 149, sec. 44C.

5. Bid Pricing Materials.

The Contractor shall save the written calculations, pricing information, and other data that the Contractor used to calculate the bid that induced the DCR to enter this Contract (the "Bid Pricing Materials") for at least six years after the DCR makes final payment under this Contract.

ARTICLE XII: EQUAL EMPLOYMENT OPPORTUNITY, NON-DISCRIMINATION, AND AFFIRMATIVE ACTION PROGRAM.

This Contract includes the provisions of the DCR's "Equal Employment Opportunity, Non-Discrimination, and Affirmative Action Program," attached as Appendix A to these General Conditions of the Contract and incorporated herein by reference.

ARTICLE XIII: GOALS FOR PARTICIPATION BY MINORITY BUSINESS ENTERPRISES AND WOMEN BUSINESS ENTERPRISES

This Contract includes the provisions of the DCR's "Goals for Participation by Minority Business Enterprises and Women Business Enterprises (Executive Order 390), attached as Appendix B to these General Conditions, and as set forth in Section 8 of the Instructions to Bidders, and incorporates same herein by reference.

ARTICLE XIV: INSURANCE REQUIREMENTS

The Contractor shall carry insurance, in the amounts and types specified in Section 7 of the Instructions for Bidders for this Contract and shall comply with all provisions relating to insurance set forth in said Section 7.

ARTICLE XV: INDEMNIFICATION

1. Generally.

To the fullest extent permitted by law, the Contractor shall indemnify, defend (with counsel subject to the supervision of the Attorney General of the Commonwealth of Massachusetts as required by M.G.L. c. 12, sec. 3) and hold harmless the Commonwealth of Massachusetts, its Department of Conservation and Recreation, and its officers, agents, divisions, employees, representatives, successors and assigns from and against all claims, damages, losses and expenses, including but not limited to court costs and attorneys' fees, arising out of or resulting from the performance of the Work, including but not limited to those arising or resulting from:

- labor performed or furnished and/or materials used or employed in the performance of the Work.
- violations by the Contractor, any subcontractor, or by any person directly or indirectly employed or used by any of them in the performance of the Work or anyone for whose acts any of them may be liable (Contractor, subcontractor and all such persons herein collectively called "Contractor's Personnel") of any Laws.
- violations of any provision of this Contract by any of Contractor's Personnel.
- injuries to any persons or damage to any property in connection with the Work.
- any act, omission, or neglect of Contractor's Personnel.

The Contractor shall be obligated as provided above, regardless of whether such claims, damages, losses and/or expenses are caused in whole or in part by the actions or inactions of a party indemnified hereunder. In all claims by Contractor's Personnel against parties indemnified hereunder, the Contractor's indemnification obligation set forth above shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any subcontractor under workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts. Such obligation shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in this Article XV.

2. DCR's Actions.

The obligations of the Contractor under Section 1 above shall not extend to the liability of the DCR, its agents or employees, arising out of (i) the preparation or approval of maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications by the DCR, or (ii) the giving of or the failure to give directions or instructions by the DCR, its agents or employees provided such giving or failure to give is the primary cause of the injury or damage.

3. Survival.

The provisions of this Article XV are intended to survive Final Acceptance and/or any termination of this Contract.

ARTICLE XVI: PERFORMANCE AND PAYMENT BONDS

1. Contractor Bonds.

A. The Contractor shall provide performance and payment (labor and materials) bonds in the form provided by the DCR, executed by a surety licensed by the Commonwealth of Massachusetts Division of Insurance. Each such bond shall be in the amount of the Contract Price.

B. If at any time prior to final payment to the Contractor, the Surety:

- is adjudged bankrupt or has made a general assignment for the benefit of its creditors.
- has liquidated all assets and/or has made a general assignment for the benefit of its creditors.
- is placed in receivership.
- otherwise petitions a state or federal court for protection from its creditors; or
- allows its license to do business in Massachusetts to lapse or be revoked.

then the Contractor shall, within 21 days of any such action listed above, provide the DCR with new performance and payment bonds as described in Paragraph A above. Such bonds shall be provided solely at the Contractor's expense.

2. Subcontractor Bonds.

The Contractor is responsible for the costs of the payment and performance bonds of the sub-contractors for the full amount of their respective Subcontracts.

ARTICLE XVII: TERMINATION OF CONTRACT

1. Termination for Cause.

A. The DCR may without prejudice to any other right or remedy deem this Contract terminated for cause if any of the following defaults shall occur and not be cured within five days (5) days after the giving of notice thereof by the DCR to the Contractor and any surety that has given bonds in connection with this Contract:

- (1) The Contractor has filed a petition, or a petition has been filed against the Contractor with its consent, under any federal or state law concerning bankruptcy, reorganization, insolvency or relief from creditors, or if such a petition is filed against the Contractor without its consent and is not dismissed within sixty (60) days; or if the Contractor is generally not paying its debts as they become due; or if the Contractor becomes insolvent; or if the Contractor consents to the appointment of a receiver, trustee, liquidate, custodian or the like of the Contractor or of all or any substantial portion of its assets and such appointment or possession is not terminated within sixty (60) days; or if the Contractor makes an assignment for the benefit of creditors;
- (2) The Contractor refuses or fails, except in cases for which extension of time is provided under this Contract's express terms, to supply enough properly skilled workers or proper materials to perform its obligations under this Contract, or the DCR has determined that the rate of progress required for the timely completion of the Work is not being met.
- (3) The Contractor fails to make prompt payment to Subcontractors or for materials, equipment, or labor.
- (4) All or a part of the Work has been abandoned.
- (5) The Contractor has sublet or assigned all or any portion of the Work, the Contract, or claims thereunder, without the prior written consent of the Department of Conservation and Recreation, except as expressly permitted in this Contract.
- (6) The Contractor has failed to comply with Laws.
- (7) The Contractor fails to maintain, or provide to the DCR evidence of the insurance or bonds required by this Contract, or
- (8) The Contractor has failed to prosecute the Work or any portion thereof to the standards required under this Contract or has otherwise breached any material provision of this Contract.

B. The DCR shall give the Contractor, and any surety notice of such termination for cause, but the giving of notice of such termination shall not be a condition precedent or after the termination's effectiveness. In the event of such termination, and without limiting any other available remedies, the DCR may, at its option:

- (1) hold the Contractor and its sureties liable in damages for a breach of Contract.
- (2) notify the Contractor to discontinue all work, or any part thereof, and the Contractor shall discontinue all work, or any part thereof, as the Department of Conservation and Recreation may designate.
- (3) complete the Work, or any part thereof, and charge the expense of completing the Work or part thereof, to the Contractor.

(4) require the surety or sureties to complete the Work and perform all the Contractor's obligations under this Contract.

If the DCR elects to complete all or any portion of the Work as specified in (3) above, it may take possession of all materials, equipment, tools, machinery, implements owned by the Contractor at or near the Site and finish the Work at the Contractor's expense by whatever means the DCR may deem expedient; and the Contractor shall cooperate at its expense in the orderly transfer of the same to a new contractor or to the DCR as directed by the DCR. In such case the DCR shall not make any further payments to the Contractor until the Work is finished. The Department of Conservation and Recreation shall not be liable for any depreciation, loss, or damage to said materials, machinery, implements or tools during said use and the Contractor shall be solely responsible for their removal from the Site after the Department of Conservation and Recreation has no further use for them. Unless so removed within fifteen days after notice to the Contractor to do so, they may be sold at public auction, after publication of notice thereof at least twice in any newspaper published in the county where the Work is being performed, and the proceeds credited to the Contractor's account; or they may, at the option of the DCR, be stored at the Contractor's expense subject to a lien for the storage charges.

C. Damages and expenses incurred under paragraph B above shall include, but not be limited to, costs for the DCR's extra services and Project representative services required, in the opinion of the DCR, to successfully inspect and administer the construction contract through final completion of the Work.

D. Expenses charged under paragraph B above may be deducted and paid by the DCR out of any moneys then due or to become due the Contractor under this Contract.

E. All sums, damages, and expenses incurred by the Department of Conservation and Recreation to complete the Work shall be charged to the Contractor. In case the damages and expenses charged are less than the sum that would have been payable under this Contract if the same had been completed by the Contractor, the Contractor shall be entitled to receive the difference. In case such expenses shall exceed the said sum, the Contractor shall pay the amount of the excess to the Department of Conservation and Recreation.

2. Termination For Convenience.

A. The DCR may terminate this Contract for convenience even though the Contractor is not in default by giving notice to the Contractor specifying in said notice the date of termination.

B. In case of such termination without cause, the Contractor shall be paid:
(1) all sums due and owing under this Contract through the date of termination, including any retainage withheld to the date of termination, less any amount which the DCR determines is necessary to correct or complete the Work performed to the date of termination; plus (2) a reasonable sum to cover the expenses which the Contractor would not have incurred but for the early termination of the Contract, such as demobilization of the work force, restocking charges, and termination fees payable to Subcontractors.

C. The payment provided in paragraph B above shall be considered to fully compensate the Contractor, and any consultants, Subcontractors, and suppliers, for all claims and expenses directly or indirectly attributable to the termination, including any claims for lost profits.

3. Contractor's Duties Upon Termination for Convenience.

Upon termination of this Contract for convenience as provided in Section 2 of this Article, the Contractor shall: (1) stop the Work; (2) stop placing orders and Subcontracts in connection with this Contract; (3) cancel all existing orders and Subcontracts; (4) surrender the Site to the DCR in a safe condition; (5) transfer to the DCR all materials, supplies, work in process, appliances, facilities, equipment and machinery of this Contract, and all plans, Drawings, Specifications and other information and documents used in connection with this Contract.

ARTICLE XVIII: MISCELLANEOUS PROVISIONS

1. No Assignment by Contractor.

The Contractor shall not assign by power of attorney or otherwise, or sublet or subcontract, the Work, or any part thereof, without the previous written consent of the DCR and shall not, either legally or equitably, assign any of the moneys payable under this Contract, or Contractor's claims hereunder, unless with the like consent of the DCR, whether said assignment is made before, at the time of, or after the execution of the Contract. The Contractor shall remain responsible for satisfactory performance of all Work sublet or assigned. Consent of the DCR shall not be deemed to constitute a representation or waiver of any right hereunder by the DCR as to the qualifications or the responsibility of the Contractor or Subcontractor(s).

2. Non-Appropriation.

The Commonwealth certifies that at the time of the execution of this Contract, sufficient appropriations exist and shall be encumbered to fund the Contract Price. Payments are subject to appropriation and shall be made only for work performed in accordance with the terms of this Contract. The Contractor shall not be obligated to perform, and shall not perform, work outside the scope of this Contract without an appropriate amendment to this Contract, and a sufficient appropriation(s) to support such additional work. The Commonwealth may immediately terminate or suspend this Contract if the appropriation(s) funding this Contract is eliminated or reduced to an amount which will be insufficient to support anticipated future obligations under this Contract. Such termination shall be deemed a termination for convenience subject to the provisions of paragraph 2 of Article XVII of this Contract.

3. Claims by Others Not Valid.

No person other than the Contractor and the surety on any bond given pursuant to the terms of this Contract shall acquire any interest in this Contract or any claim against the DCR hereunder, and no claim by any other person shall be valid except as provided in M.G.L. c. 30, sec. 39F of the General Laws.

4. No Personal Liability of Public Officials.

No public official, employee, or agent of the DCR shall have any personal liability for the obligations of the DCR set forth in this Contract.

5. Severability.

The provisions of this Contract are severable, and if any of these provisions shall be held unconstitutional or unenforceable by any court of competent jurisdiction, the decision of such court shall not affect or impair any of the other provisions of this Contract.

6. Choice of Laws.

This Contract shall be governed by the laws of the Commonwealth of Massachusetts for all purposes, without regard to its laws on choice of law. All proceedings under this Contract or related to the Project shall be brought in the courts of the Commonwealth of Massachusetts.

7. Standard Forms.

Unless directed otherwise in writing by the DCR, the Contractor shall use the standard forms in use by the Department of Conservation and Recreation.

8. No Waiver of Subsequent Breach.

No waiver of any breach or obligation of this Contract shall constitute a waiver of any other or subsequent breach or obligation.

9. Remedies Cumulative.

All remedies of the DCR provided in this Contract shall be construed as cumulative and may be exercised simultaneously or in any order as determined by the DCR in its sole discretion. The DCR shall also be entitled as of right to specific performance and equitable relief including the right to an injunction against any breach of any of the provisions of this Contract

10. Notices.

Notices to the Contractor shall be deemed given when hand delivered to the Contractor's temporary field office at or near the Site, or when deposited in the U.S. mail addressed to the Contractor at the Contractor's address specified in the Department of Conservation and Recreation - Contractor Agreement, or when delivered by courier to either location. Unless otherwise specified in writing by the DCR, notices and deliveries to the DCR shall be effective only when delivered to the DCR at the address specified in the Department of Conservation and Recreation - Contractor Agreement and date-stamped at the reception desk or for which a receipt has been signed by the agent or employee designated by the DCR to receive official notices.

APPENDIX A to General Conditions of the Contract

The following provisions from Article XII of the General Conditions of the Contract where DCR is the Awarding Authority.

EQUAL EMPLOYMENT OPPORTUNITY, NON-DISCRIMINATION, AND AFFIRMATIVE ACTION PROGRAM.

1. Compliance Generally.

For purpose of this Article, “minority” refers to Asians, Blacks, Western Hemisphere Hispanics, Native Americans, and Cape Verdeans; “Commission” refers to the Massachusetts Commission Against Discrimination. During the performance of this Contract, the Contractor and all its Subcontractors (hereinafter collectively referred to as the Contractor) shall comply with all applicable equal employment opportunity, non-discrimination and affirmative action requirements, including but not limited to the following:

2. Non-Discrimination and Affirmative Action.

A. The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religious creed, national origin, age, handicap, sexual orientation, or sex. The aforesaid provision shall include, but not be limited to, the following: employment rates of pay or other forms of compensation; conditions or privileges of employment; and selection for apprenticeship. The Contractor shall comply with the provisions of MGL, c. 151B and all other applicable anti-discrimination and equal opportunity laws.

B. The Contractor shall comply with the provisions of Executive Order No. 478 entitled Revoking and Superseding Executive Orders Numbers 253 and 452, with respect to affirmative action programs for handicapped individuals, which is herein incorporated by reference and made a part of this Contract.

C. In connection with the performance of the Work, the Contractor shall undertake in good faith affirmative action measures designed to eliminate any discriminatory religious creed, national origin, age, sexual orientation, or sex and to eliminate and remedy any effects of such discrimination in the past. Such affirmative action shall entail positive and aggressive measures to ensure equal opportunity in the areas of hiring, upgrading, demotion or transfer, recruitment, layoff or termination, rate of compensation, and in-service or apprenticeship training programs. This affirmative action shall include all action required to guarantee equal employment opportunity for all persons, regardless of race, color, religious creed, national origin, age, sexual orientation, or sex. A purpose of this provision is to fully ensure possible an adequate supply of skilled tradesmen for future public construction projects.

D. If the Contractor shall use any subcontractor on any work performed under this Contract, the Contractor shall take affirmative steps to negotiate with qualified minority and women subcontractors. These affirmative steps shall cover both pre-bid and post-bid periods. It shall include notification to the State Office of Minority and Women Business Assistance or its designee, while bids are in preparation, of all products, work, or services for which the Contractor intends to negotiate bids. In all solicitations either by competitive bidding or negotiation made by the Contractor either for work to be performed under a subcontract or for the procurement of materials or equipment, each potential subcontractor or supplier shall be notified in writing by the Contractor of the Contractor’s obligations under this Contract relative to non-discrimination and affirmative action.

E. As part of its obligation of remedial action under this Article, the Contractor shall maintain on this project not less than the percent ratio set forth in the Owner – Contractor Agreement of minority employee worker hours to total worker hours in each job category including but not limited to bricklayers, carpenters, cement masons, electricians, ironworkers, operating engineers, and those “classes of work” enumerated in MGL, c. 149, Sec. 44F.

F. In the hiring of minority journeypersons, apprentices, trainees and advanced trainees, the Contractor shall rely on referrals from a multi-employer affirmative action program approved by the Commission, traditional referral methods utilized by the construction industry, and referrals from agencies, not more than three in number at any one time, designated by the Liaison Committee or the Awarding Authority.

3. Liaison Committee, Reports and Records.

A. At the option of the Awarding Authority, there may be established for the term of this Contract a body to be known as the Liaison Committee. The Liaison Committee shall be composed of one representative each from the Awarding Authority, the Commission and such other representatives as may be designated by the Commission in conjunction with the Awarding Authority. The Contractor (or his agent, if any, designated by him as the on-site equal employment opportunity officer) shall recognize the Liaison Committee as an affirmative action body, and shall establish a continuing working relationship with the Liaison Committee, consulting with the Liaison Committee on all matters related to minority recruitment, referral, employment and training.

B. The Contractor shall prepare projected staffing tables on a quarterly basis. These shall be broken down into projections, by week, of workers required in each trade. Copies shall be furnished one week in advance of the commencement of the period covered, and when updated, to the Awarding Authority and Liaison Committee. The Contractor shall prepare weekly reports in a form approved by the Awarding Authority of hours worked in each trade by each employee, identified as minority or non-minority. Copies of these shall be provided at the end of each such week to the Awarding Authority and to the Liaison Committee.

C. Records of employment referral orders, prepared by the Contractor, shall be made available to the Awarding Authority and to the Liaison Committee on request.

D. A designee of the Awarding Authority and a designee of the Liaison Committee shall each have right to access to the Site.

E. The Contractor shall comply with the provisions of MGL, c. 151B as amended, of the Massachusetts General Laws, both of which are herein incorporated by reference and made a part of this Contract.

F. The Contractor shall provide all information and reports required by the Awarding Authority or the Commission on forms and in accordance with instructions issued by either of them and will permit access to its facilities and any books, records, accounts, and other sources of information which may be determined by the Awarding Authority or the Commission to affect the employment of personnel. This provision shall apply only to information pertinent to the Owner's supplementary affirmative action Contract requirements. Where information required is in the exclusive possession of another who fails or refuses to furnish this information, the Contractor shall so certify to the Awarding Authority or the Commission as appropriate and shall set forth what efforts he has made to obtain the information.

4. Sanctions.

A. Whenever the Awarding Authority, the Commission, or the Liaison Committee believes the Contractor, or any Subcontractor may not be operating in compliance with the terms of this Article, the Commission shall directly, or through its designated agent, conduct an appropriate investigation, and may confer with the parties to determine if such Contractor is operating in compliance with the terms of this Article. If the Commission or its agent finds the Contractor or any Subcontractor not in compliance, it may make a preliminary report on non-compliance and notify such Contractor in writing of such steps as will in the judgment of the Commission or its agent bring such Contractor into compliance. If such Contractor fails or refuses to fully perform such steps, the Commission may make a final report of non-compliance and recommend to the Awarding Authority the imposition of one or more of the sanctions listed below. If, however, the Commission believes the Contractor or any Subcontractor has taken or is taking every possible measure to achieve compliance, it shall not make a final report of non-compliance. Within fourteen days of the receipt of the recommendations of the Commission, the Awarding Authority shall move to impose one or more of the following sanctions, as it may deem appropriate to attain full and effective enforcement:

(I) The recovery by the Awarding Authority from the Contractor of 1/100 of 1% of the Contract award price or \$1,000 whichever sum is greater, in the nature of liquidated damages or, if a Subcontractor is in non-compliance, the recovery by the Awarding Authority from the Contractor, to be assessed by the Contractor as a back charge against the subcontractor, of 1/10 of 1% of the sub-contract price, or \$400 whichever sum is greater, in the nature of liquidated damages, for each week that such party fails or refuses to comply.

(2) The suspension of any payment or part thereof due under the Contract until such time as the Contractor or any subcontractor can demonstrate his compliance with the terms of the Contract.

(3) The termination, or cancellation, of the Contract, in whole or in part, unless the Contractor or any Subcontractor can demonstrate within a specified times his compliance with the terms of the contract.

(4) The denial to the Contractor or any subcontractor of the right to participate in any future contracts awarded by the Awarding Authority for a period of up to three years.

B. If any time after the imposition of one or more of the above sanctions a Contractor can demonstrate that it follows this Article, the Contractor may request the Awarding Authority, in consultation with the Commission, to suspend the sanctions conditionally, pending a final determination by the Commission as to whether the Contractor complies. Upon final determination of the Commission, the Awarding Authority, based on the recommendation of the Commission, shall either lift the sanctions or reimpose them.

C. Sanctions recommended by the Commission and enumerated under Section 4 above shall not be imposed by the Awarding Authority except after an adjudicatory proceeding, as that term is used in MGL, c. 30A, has been conducted. No investigation by the Commission or its agent shall be initiated without prior notice to the Contractor.

D. Notwithstanding the provisions of 4A-4C above, if the Awarding Authority determines after investigation that the Contractor or any Subcontractor is not in compliance with the terms of this Article, it may suspend any payment or portion thereof due under the Contract until the contractor demonstrates to the satisfaction of the Awarding Authority compliance with the terms of this Article. This temporary suspension of payments by the Awarding Authority is separate from the sanctions set forth in Section 4A-4C of this Article above, which are determined by MCAD and recommend to the Awarding Authority. Payment may be suspended only after the Contractor and any other interested party shall have been given the opportunity to present evidence in support of its position at an informal hearing held by the Awarding Authority, and the Awarding Authority has concluded upon review of all the evidence that such penalty is justified. Payment shall not be suspended if the Awarding Authority finds that the Contractor made its best efforts to comply with this Article, or that some other justifiable reason exists for waiving the provisions of this Article in whole or in part.

APPENDIX B to General Conditions of the Contract

The following provisions from Article XIII of the General Conditions of the Contract where DCR is the Awarding Authority.

GOALS FOR PARTICIPATION BY MINORITY BUSINESS ENTERPRISES AND WOMEN BUSINESS ENTERPRISES (EXECUTIVE ORDER 390, MGL, c. 7, s. 40N)

1. Goals.

A. The goals for minority business enterprise and women business enterprise participation established for this Contracts are as set forth in the Owner – Contractor Agreement.

B. The Contractor and all Subcontractors, sub-subcontractors, and materials suppliers shall comply with all the terms and conditions of this Article, which include the provisions pertaining to M/WBE participation set forth in the Owner – Contractor Agreement to meet the M/WBE participation goals established for this Contract.

2. M/WBE Participation Credit.

A. If the Contractor is itself an MBE or WBE, M/WBE participation credit will be given in an amount equal to the entire Contract Price. If the Contractor is not an MBE or WBE then M/WBE participation credit will be given for the value of the Work that is performed by each MBE or WBE subcontractor or subcontractor.

B. If the Contractor is a joint venture with one or more M/WBE joint venturers, M/WBE participation credit shall be given to the joint venture as follows:

(1) If the joint venture is certified by SOMBWA as an MBE or WBE, M/WBE participation credit shall be given in an amount equal to the Contract Price.

(2) If the joint venture is not certified as an MBE or WBE by SOMWBA, M/WBE participation credit shall be given to the joint venture for the value of the Work that is performed by the M/WBE joint ventures(s), and for the value of the Work that is performed by each MBE or WBE subcontractor or sub-subcontractor.

C. MBE participation credit shall be given for the work performed by MBEs only, and WBE participation credit shall be given for the work performed by WBEs only. MBE participation may not be substituted for WBE participation, nor may WBE participation be substituted for MBE participation.

3. Establishing M/WBE Status.

A. A minority-owned business shall be considered an MBE only if it has been certified as a minority business enterprise by the State Office of Minority and Women Business Assistance (“SOMWBE”).

B. A woman-owned business shall be considered a WBE only if it has been certified as a woman business enterprise by SOMWBA.

C. Certification as a disadvantaged business enterprise (“DBE”), certification as an M/WBE by any agency other than SOMWBA, or submission of an application to SOMWBA for certification as an M/WBE shall not confer M/WBE status on a firm for the purposes of this Contract.

4. Subcontracts with M/WBEs.

Within thirty (30) days after the award of this Contract, the Contractor shall (i) execute a subcontract with each M/WBE Subcontractor which has executed a Letter of Intent approved by the Awarding Authority, (ii) cause its Subcontractors to execute a sub-subcontract with each M/WBE sub-subcontractor, and (iii) furnish the Awarding Authority with a signed copy of each such subcontract and sub-subcontract.

5. Performance of Contract Work by M/WBEs.

A. The Contractor shall not perform with its own organization or subcontract or assign to any other firm work designated to be performed by any W/MBE in the Letters of Intent or Schedule of M/WBE Participation without the prior Approval of the Awarding Authority, nor shall any M/WBE assign or subcontract to any other firm or permit any other firm to perform any of its M/WBE Work without the prior Approval of the Awarding Authority. Any such unapproved assignment, subcontracting, sub-subcontracting, or performances of M/WBE Work by others shall be a change in the M/WBE Work for the purposes of this Contract. The Awarding Authority WILL NOT APPLY TO THE M/WBE PARTICIPATION GOALS(S) ANY SUMS ATTRIBUTABLE TO SUCH UNAPPROVED ASSIGNMENTS, SUB-CONTRACTS, SUB-SUBCONTRACTS, OR PERFORMANCE OF M/WBE WORK BY OTHERS.

B. The Contractor shall be responsible for monitoring the performance of M/WBE Work to ensure that each scheduled M/WBE performs its own M/WBE Work with its own workforce.

C. The Contractor and each M/WBE shall provide the Awarding Authority with all information and documentation that the Awarding Authority determines is necessary to ascertain whether an M/WBE has performed its own M/WBE Work. At the discretion of the Awarding Authority, failure to submit such documentation to the Awarding Authority shall establish conclusively for the purpose of giving M/WBE participation credit under this Contract that such M/WBE did not perform such work.

6. Notification of Changes in M/WBE Work.

A. If any time during the performance of the Contract the Contractor determines or has reason to believe that a scheduled M/WMBE is unable to unwilling to perform its M/WBE Work, or that there has been or will be a change in any M/WMBE Work, or that the Contractor will be unable to meet the M/WBE participation goal(s) for this Contract for any reason, the Contractor shall immediately notify the Awarding Authority Contract Compliance Office in writing of such circumstances.

B. Any notice of a change in M/WBE Work pursuant to subparagraph "A: above shall include a revised Schedule of M/WBE Participation, and additional or amended Letters of Intent and subcontracts.

7. Actions Required if there is a Reduction in M/WBE Participation.

A. In the event there is a change or reduction in any M/WBE Work which will result in the Contractor failing to meet the M/WBE participation goal(s) for this Contract, other than a reduction in M/WBE Work resulting from a Change Order initiated by the Awarding Authority, then the Contractor shall immediately undertake a diligent, good faith effort to make up the shortfall in M/WBE participation as follows:

- (1)** The Contractor shall identify all items of the Work remaining to be performed under the Contract that may be made available for subcontracting to W/MBEs. The Contractor shall send a list of such items of work to the Awarding Authority, together with a list of the remaining items of the Work that was not made available to M/WBEs and the reason for not making such work available for subcontracting to M/WBEs.
- (2)** The Contractor shall send written notices soliciting proposals to perform the items of the Work that may be made available for subcontracting to W/MBEs to all W/MBEs qualified to perform such work. The Contractor shall advise the Awarding Authority of (i) each W/MBE solicited, and (ii) each W/MBE listed in the SOMWBA directory under the applicable trade category who was not solicited and the reasons, therefore. The Contractor shall also advise the Awarding Authority of the dates notices were mailed and provide a copy of the written notice(s) sent.
- (3)** The Contractor shall make reasonable efforts to follow up the written notices sent to M/WBEs with telephone calls or personal visits to determine with certainty whether the M/WBEs were interested in performing the work. Phone logs or other documentation must be submitted to the Awarding Authority evidencing this effort.
- (4)** The Contractor shall make reasonable efforts to assist M/WBEs that need assistance in obtaining insurance, bonds, or lines of credit to perform work under the Contract and shall provide the Awarding Authority with evidence that such efforts were made.

(5) The Contractor shall provide the Awarding Authority with a statement of the response received from each M/WBE solicited, including the reason for rejecting any M/WBE who submitted a proposal.

(6) The Contractor shall take any additional measures reasonably requested by the Awarding Authority to meet the M/WBE participation goal(s) established for this Contract, including, without limitation, placing advertisements in appropriate media and trade association publications announcing the Contractor's interest in obtaining proposals from M/WBEs, and/or sending written notification to M/WBE economic development assistance agencies, trade groups and other organizations notifying them of the project and of the work available to be subcontracted by the Contractor to M/WBEs.

B. If the Contractor is unable to meet the M/WBE participation goals for this Contract after complying fully with each of the requirements of paragraph "A" above, and the Contractor is otherwise in full compliance with the terms of this Article, the Awarding Authority may reduce the M/WBE participation goals for this Contract to the extent that such goals cannot be achieved.

8. Suspension of Payment and/or Performance for Noncompliance.

A. If at any time during the performance of this Contract, the Awarding Authority determines or has reason to believe that (1) there has been a change or reduction in any M/WBE Work which will result in the Contractor failing to meet the M/WBE participation goal(s) for this Contract, other than a reduction in M/WBE Work resulting from a change in the Contract work ordered by the Awarding Authority, and (2) the Contractor has failed to comply fully with all of the terms and conditions of paragraphs 1 through 7 above, the Awarding Authority may:

(1) suspend payment to the Contractor of an amount equal to the value of the work which was to have been performed by an M/WBE pursuant to the Contractor's Schedule of M/WBE Participation, but which was not

so performed, to ensure that sufficient Contract funds will be available if liquidated damages are assessed pursuant to paragraph 9 and/or

(2) suspend the Contractor's performance of this Contract in whole or in part.

B. The Awarding Authority shall give the Contractor prompt written notice of any action taken pursuant to paragraph A above and shall give the Contractor and any other interested party, including any M/WBEs, an opportunity to present evidence to the Awarding Authority that the Contractor is in compliance with the requirements of this Article, or that there is some justifiable reason for waiving the requirements of this Article in whole, or in part. The Awarding Authority may invite SOMWBA and the Massachusetts Commission Against Discrimination to participate in any proceedings undertaken pursuant to this paragraph.

C. Upon a showing that the Contractor is in full compliance with the requirements of this Article, or that the Contractor has met or will meet the M/WBE participation goals for this Contract, the Awarding Authority shall release any funds withheld pursuant to clause A(1) above and lift any suspension of the Contractor's performance under clause A(2) above.

9. Liquidated Damages: Termination.

A. If payment by the Awarding Authority or performance by the Contractor is suspended by the Awarding Authority as provided in paragraph 8 above, the Awarding Authority shall have the following rights and remedies if the Contractor thereafter fails to take all action necessary to bring the Contractor into full compliance with the requirements of this Article, or if full compliance is no longer possible because the default of the Contractor is no longer susceptible to cure, if the Contractor fails to take such other action as may be required by the Awarding Authority to meet the M/WBE participation goals set forth in this Contract:

(1) the Awarding Authority may terminate this Contract, and/or

(2) the Awarding Authority may retain from final payment to the Contractor, as liquidated damages, an amount equal to the difference between (x) the total of the M/WBE participation goals set forth in this Contract, and (y) the amount of M/WBE participation credit earned by the Contractor for M/WBE Work performed under this Contract as determined by the Awarding Authority, the parties agreeing that the damages for failure to meet the M/WBE participation goals are difficult to determine and that the foregoing amount to be retained by the Awarding Authority represents the parties' best estimate of such damages. Any liquidated damages will be assessed separately for MBE and WBE participation.

B. Before exercising its rights and remedies hereunder, the Awarding Authority may, but the Awarding Authority shall not be obligated to, give the Contractor and any other interested party another opportunity to present evidence to the Awarding Authority that the Contractor is in compliance with the requirements of this Article or that there is some justifiable reason for waiving the requirements of this Article in whole or in part. The Awarding Authority may invite SOMWBA and the Massachusetts Commission Against Discrimination to participate in any proceedings undertaken hereunder.

10. Reporting Requirements.

The Contractor shall submit to the Awarding Authority all information or documentation that is necessary in the judgment of the Awarding Authority to ascertain whether the Contractor has complied with any of the provisions of this Article.

11. Awarding Authority's Right to Waive Provisions of this Article in Whole or in Part.

The Awarding Authority reserves the right to waive any provision or requirement of this Article if the Awarding Authority determines that such waiver is justified and in the public interest. No such waiver shall be effective unless in writing and signed by a representative of the Awarding Authority's Compliance Office or the office of its General Counsel. No other action or inaction by the Awarding Authority shall be construed as a waiver of any provision of this Article.

**COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF CONSERVATION AND RECREATION**

**SPECIAL GOOD FAITH REQUIREMENTS FOR PARTICIPATION BY VETERAN OWNED
BUSINESS ENTERPRISES**

**(Implementing Executive Order No. 546, Establishing the Veteran Owned Business
Enterprise Program).**

BIDDER'S INSTRUCTIONS

THE APPARENT LOW BIDDER'S COMPLIANCE WITH THE REQUIREMENTS OF THIS SECTION IS A PREREQUISITE FOR RECEIVING THE AWARD OF THE CONTRACT.

1) Participation Goals and Program Operation

In order to be an eligible VOB for the participation goals of this Contract, the business enterprise must be listed as a veteran-owned business within the VetBiz database, located at www.VetBiz.gov, at the time of the bid submission deadline. Only a VOB identified as a veteran-owned small business via the VetBiz database shall count towards meeting the Program participation goal.

The Contractor must demonstrate that VOBs are eligible for the following participation goals via its listing as a veteran-owned small business within the VetBiz database, located at www.VetBiz.gov, at the time said VOB seeks to participate in business provided under this Contract; provided, that it shall also be the responsibility of the Awarding Authority to verify the status of the SDVOB via said VetBiz database prior to the awarding of the Contract.

a) Design Services Contracts – In furtherance of the goals and objectives of the program, commencing July 1, 2013 until such time as the Secretary for Administration and Finance has adopted a new participation goal, the participation goal, which shall be expressed in the form of a benchmark for each design services contract, shall be three (3) percent; provided, that said participation goal may be met by the veteran-owned business enterprise performing as either a general or prime contractor, a subcontractor, or both; provided further, that the awarding agency shall verify the status of business enterprise participation on a design services contract.

b) Public Construction Contracts – In furtherance of the goals and objectives of the Program, commencing July 1, 2013 until such time as the Secretary of Administration and Finance has adopted a new participation goal, the participation goal, which shall be expressed in the form of a benchmark for each public construction contract, shall be three (3) percent; provided, that said participation goal may be met by the veteran-owned business enterprise performing as either a general or prime contractor, a subcontractor, or both; provided further, that the awarding agency shall verify the status of a service veteran-owned business enterprise prior to said business enterprise participation on a public construction contract.

2) Goal Reduction/Waiver

- A) The Awarding Authority reserves the right to reduce or waive the SDVOBE participation goals established for this Contract upon written request made by a Bidder using the VOB E Waiver Request Form provided by the Awarding Authority.
- B) If filed Sub-Bids are solicited for this Contract, requests from prospective general Bidders to reduce or waive the VOB E participation goals for this Contract should be received by the Awarding Authority no later than four (4) working days after the list of filed Sub- Bidders is mailed by the Awarding Authority to persons who have taken out plans for the Contract, using the VOB E Waiver Request Form provided by the Awarding Authority.
- C) If there are no filed sub-Bids solicited for this Contract, requests to reduce or waive the SDVOBE participation goals for this Contract should be received by the Awarding Authority no later than five (5) working days before the date set for the receipt of general Bids. **THE AWARDING AUTHORITY RESERVES THE RIGHT TO REJECT ANY REQUEST TO REDUCE OR WAIVE THE VOB E PARTICIPATION GOALS FOR THIS CONTRACT THAT IS RECEIVED AFTER THESE DEADLINES.** Such written request must demonstrate to the satisfaction of the Awarding Authority that it is not feasible for a non- VOB E or non- VOB E general Bidder to meet the goals established for this Contract based upon any or all the following:
- a) actual VOB E availability.
 - b) the geographic location of the project to the extent related to SDVOBE availability.
 - c) the scope of the work.
 - d) the percentage of work available for subcontracting to VOB Es; and/or
 - e) other relevant factors, including a **documented** inability by the prospective Bidder to obtain commitments from VOB E subcontractors sufficient to meet the VOB E goals after having made a diligent, good faith effort to do so. All the foregoing documentation shall accompany the completed Waiver Request Form. Such documentation shall include, at a minimum, the following:
 - A list of all items of work under the Contract that the Bidder made available for subcontracting to VOB Es. The Bidder shall identify all items of work, other than work to be performed by filed sub-Bidders, that the Bidder did not make so available and shall state the reasons for not making such work available for subcontracting to VOB Es. The Bidder shall also demonstrate that, where commercially reasonable, subcontracts were divided into units capable of being performed by VOB Es.
 - Evidence that the Bidder sent written notices soliciting Bids or proposals to perform the items of work made available by the Bidder for subcontracting to all available VOB Es qualified to perform such work. The Bidder shall identify each VOB E solicited, state the dates that notices were mailed, provide a copy of the written notice(s) sent, and provide a copy of any statement or response received from each VOB E solicited, including the reason for rejecting and VOB E who submitted a bid or proposal.
 - Evidence that the Bidder made reasonable efforts to follow up on the written notices sent to VOB Es with telephone calls or personal visits to determine with certainty whether the VOB Es were interested in performing the work. Phone logs or other documentation must be submitted.

- Evidence of efforts made to assist VOBES that needed assistance in obtaining bonding or insurance, or lines of credit with suppliers if the inability of SDVOBE to obtain bonding, insurance, or lines of credit is the reason given for the Bidder's inability to meet the VOBES goals.

- D) The Bidder may also submit any other information supporting its request for a waiver or reduction in the VOBES participation goals, including without limitation evidence that the Bidder placed advertisements in appropriate media and trade association publications announcing the Bidder's interest in obtaining bids or proposals from VOBES, and/or sent written notification to VOBES economic development assistance agencies, trade groups and other organizations notifying them of the Contract and the work to be subcontracted by the Bidder to VOBES. The Bidder shall also submit any other information reasonably requested by the Awarding Authority to show that the Bidder has taken all actions that could reasonably be expected to achieve the VOBES participation goals.
- 3) No later than five (5) working days after the opening of general Bids, the apparent low Bidder shall submit the following documents to the Awarding Authority's Contract Officer:
- (i) a completed Schedule for Participation by VOBES ("Schedule for Participation") in the form provided by the Awarding Authority showing VOBES participation in amounts equal to or exceeding the VOBES participation goals for this Contract; and
 - (ii) a completed Letter of Intent in the form provided by the Awarding Authority for each SDVOBE listed in the Schedule for Participation.
- 4) Each Letter of Intent shall identify and describe the work to be performed by the named VOBES (the "VOBES Work") with enough specificity to permit the Awarding Authority to identify the items of contract work that the VOBES will perform for VOBES participation credit. The Awarding Authority reserves the right to reject any Letter of Intent if the price to be paid for the VOBES Work does not bear a reasonable relationship to the value of such work under the Contract as determined by the Awarding Authority.
- 5) Within five (5) working days after receipt of the Schedule for VOBES Participation and Letters of Intent, the Awarding Authority shall review and either approve or disapprove the apparent low Bidder's submissions. If the apparent low Bidder has not submitted an appropriate Schedule for VOBES Participation and appropriate Letters of Intent establishing that the VOBES participation goal for the project will be met, the apparent low Bidder will be considered ineligible for Award of the Contract and the Awarding Authority will Award the Contract to the second lowest Bidder, subject to said Bidder's compliance with these conditions.
- 6) The Contractor is required to submit to the Awarding Authority signed subcontracts with all subcontractors prior to the commencement of work to be performed under these contracts, and/or a purchase order or invoice from each material supplier and/or manufacturer listed on the Schedule for VOBES Participation within thirty (30) days of the issuance of the Notice to Proceed by the Awarding Authority.
- 7) A filed Sub-Bidder is not required to submit a Schedule for VOBES Participation with its Bid. A filed Sub-Bidder may, at its option, submit a Letter of Intent with its Bid if it is a VOBES. If a filed sub-Bidder intends to sub-subcontract work to a VOBES, and the filed sub-Bidder wishes that sub-subcontract to be credited toward the participation goals for this Contract, the filed sub-Bidder should submit a Letter of Intent from that VOBES with its Bid. A filed sub-Bidder can subcontract out up to 20% of its work to VOBES, unless such work is designated as sub-subcontract Paragraph E work in the Bid Documents, in which case the 20% cap does not apply.

This is a:

- Design Contract**
- Construction contract**

The goal for this contract is Three (3 %) percent of the value of the contract unless waived in part or whole by DCR in writing.

APPENDIX C to the General Conditions of the Contract

INDEX OF THE COMMONLY USED FORMS

(Forms used during bidding are in Attachment B to the Instructions to Bidders)

Contractor's Weekly Workforce Report

Minorities/Women in Contractor's Weekly Workforce Report

Weekly Payroll Report Form and Statement of Compliance

Certification of Payment by Contractor to MBE/WBE and Instructions

Certificate of Completion by Minority/Women Business Enterprise

Certificate of Final Inspection, Release and Acceptance – E-2

CONTRACTOR'S WEEKLY WORKFORCE REPORT
 THE COMMONWEALTH OF MASSACHUSETTS
 DEPARTMENT OF CONSERVATION AND RECREATION

DCR Project No. _____ Project Name _____ Project Location _____

Name of General Contractor _____ Minority Goal % _____ Women Goal %

Name of Contractor Filing Report _____ Address _____

Week Ending _____ Report No. _____ Date Work Began _____ Date work completed _____

NOTE: **Min. = Minority** **Wom. = Women** Check here if this is a final report

Job Category	Number of Employees	Number of Employees Who Are		Total Weekly Workforce Hours	Total Weekly Workforce Hours		Weekly % Workforce Hours		Total Workforce Hours To Date	Total Workforce Hours to Date		% Of Workforce Hours to Date	
		Min.	Wom.		Min.	Wom.	Min.	Wom.		Min.	Wom.	Min.	Wom.
TOTALS:													

Mail with Weekly Payroll report to the assigned Project Manager at: Department of Conservation & Recreation
Project Manager Name
 10 Park Plaza
 Boston, MA 02116

The undersigned hereby certifies under pains and penalties of perjury that the above information is true and accurate.

Authorized Signature _____ Date _____

Print Name _____ Title _____

Telephone No. _____ FAX No. _____

MINORITIES/WOMEN IN CONTRACTOR'S WEEKLY WORKFORCE REPORT
THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF CONSERVATION AND RECREATION

DCR Project No. _____ Project Name _____

Name of General Contractor _____

Project Location _____

Name of Contractor Filing Report _____

Address _____

Week Ending _____ Report No. _____

JOB CATEGORY	NAME OF EMPLOYEE	MINORITY GROUP	GENDER

In contract Article XII, "Minority" refers to: Asian-Americans, Blacks, Western Hemisphere Hispanics, Native Americans, and Cape Verdeans

WEEKLY PAYROLL REPORT FORM
THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF CONSERVATION AND RECREATION

DCR Project No. _____ Project Name _____

Project Location _____

Name of General Contractor _____

Name of Contractor Filing Report _____

Address _____

Week Ending _____ Date Work Began _____ Date work completed _____

Report No. _____ Check here if this is a final report

Employee Name & Address	Work Classification	Hours Worked							(A)	(B)	Employer Contributions			(F)	(G)
		S	M	T	W	T	F	S	Total Hours	Hourly Base Wage	(C) Health & Welfare	(D) Pension	(E) Supp. unemplo yed	[B+C+D+E] Hourly Total Wage (prev.	[A*F] Weekly Total Amount

NOTE: Every contractor and subcontractor are required to submit a copy of their weekly payroll records to DCR. The undersigned states under the pains & penalties of perjury that the above provided and attached information is a true and accurate record of each person employed on the project and the hours worked and wages paid to each such employee, including payments to the referenced benefits. M.G.L. c. 149 §27B.

Authorized signature _____ Print Name _____

Print Title _____

Mail to: Department of Conservation and Recreation
Project Manager Name
 10 Park Plaza
 Suite 6620
 Boston, MA 02116

**WEEKLY PAYROLL RECORDS REPORT
& STATEMENT OF COMPLIANCE**

In accordance with Massachusetts General Law c. 149, §27B, a true and accurate record must be kept of all persons employed on the public works construction project for which the enclosed rates have been provided. The *Weekly Payroll Report Form* includes all the information required to be kept by law. Every contractor or subcontractor is required to keep these records and preserve them for a period of three years from the date of completion of the project.

In addition, every contractor and subcontractor are required to submit a copy of their weekly payroll records to the awarding authority. This is required to be done on a weekly basis. Once collected, the awarding authority is also required to preserve those records for three years.

In addition, each such contractor, subcontractor, or public body shall furnish to the **Executive Office of Labor**, within fifteen days after completion of its portion of the work, a statement, executed by the contractor, subcontractor or public body who supervises the payment of wages, in the following form:

STATEMENT OF COMPLIANCE

Date: _____/_____/_____

I, _____, _____
(Name of signatory party) (Title)

do hereby state:

That I pay or supervise the payment of the persons employed by

_____ on the _____
(Contractor, subcontractor, or public body) (Building or project)

and that all mechanics and apprentices, teamsters, chauffeurs, and laborers employed on said project have been paid in accordance with wages determined under the provisions of sections twenty-six and twenty-seven of chapter one hundred and forty-nine of the General Laws.

Signature _____

Title _____

CERTIFICATE OF PAYMENT

BY CONTRACTOR/DESIGNER TO MINORITY, WOMEN BUSINESS
& VETERAN OWNED BUSINESS ENTERPRISES

TO: Supplier Diversity Reports
Department of Conservation and
Recreation ,10 Park Plaza
Suite 6620,Boston,MA 02116

Reporting Period: Fiscal Year 20__

RE: Project:
Project Number:

Contract Start Date:

The undersigned hereby certifies under the pains and penalties of perjury that the vendor named below has made the following payments to the named Minority, Women Business and Veteran Owned Enterprises for work performed on the above project:

Firm Name of General Contractor:

Authorized Signature Date

Print Name Print Title

Phone Number Email address

Work performed/payments made (use additional pages if needed):

	Firm Name	Work Performed	Subcontract Amount	Payments This Quarter	FY Payments to date (This fiscal year)	Cumulative Payments (Total payments over the life of the contract)
<input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> VOBE			\$	\$	\$	\$
<input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> VOBE			\$	\$	\$	\$
<input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> VOBE			\$	\$	\$	\$
<input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> VOBE			\$	\$	\$	\$
<input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> VOBE			\$	\$	\$	\$
<input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> VOBE			\$	\$	\$	\$
<input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> VOBE			\$	\$	\$	\$

* MBE, WBE and VOBE payment reports are required for each quarter of the fiscal year for each of your DCR projects. Reports are to cover the following three-month periods: 1st quarter, July 1st – September 30th; 2nd quarter, October 1st – December 31st; 3rd quarter, January 1st – March 31st; 4th quarter, April 1st – June 30th. Reports must be submitted within 10 business days of your receipt of this form.

NOTICE: *Intentionally submitting false information in this document may subject the contractor/ designer to criminal prosecution and/ or debarment from public contracting.*

INSTRUCTIONS FOR COMPLETING CERTIFICATE OF PAYMENT

As part of its effort to ensure reliable, up-to-date information concerning the actual payments made to certified MBE, WBE and VOB E subcontractors on all DCR projects, we have prepared these instructions to assist you in completing the enclosed form. **PLEASE READ THESE INSTRUCTIONS CAREFULLY. DCR WILL RETURN ANY CERTIFICATION OF PAYMENT THAT IS INCOMPLETE OR INACCURATE.**

PLEASE NOTE: IF THIS PROJECT IS COMPLETE, ON HOLD, OR YOUR FIRM PREVIOUSLY SUBMITTED A **FINAL** CERTIFICATION OF M/WBE/VOBE PAYMENT FOR THIS PROJECT, PLEASE SO, INDICATE ON THE FORM AND RETURN IT TO: SUPPLIER DIVERSITY REPORTS, DEPARTMENT OF CONSERVATION AND RECREATION, 10 Park Plaza, Suite 6620 Boston, MA 02116

PLEASE INCLUDE THE FOLLOWING INFORMATION IN THE DESIGNATED SECTIONS OF THE FORM:

FIRM NAME: Include the M/WBE/VOBEs listed on the project's approved Schedule for Participation and any additional M/WBE/VOBEs that worked on the project. Be sure to check M/WBE/VOBE category for which they are certified. Note that any change in M/WBE/VOBEs participation used to meet the project goals must be pre-approved by the Project Manager or Engineer responsible for this project and a revised M/WBE/VOBE Schedule of Participation will be required. Contact the DCR Supplier Diversity coordinator immediately if you anticipate or have any changes in M/WBE/VOBE participation on this project.

WORK PERFORMED: Include a brief description of the work performed by each subcontractor listed. The description should match the M/WBE/VOBE Letter of Intent and approved Schedule of Participation. M/WBE/VOBEs must be certified in the category of work performed on this project for firms used to meet the project M/WBE/VOBE goals.

SUBCONTRACT AMOUNT: Include the contract or subcontract amounts listed on the M/WBE/VOBE Letters of Intent and approved Schedule of Participation. If the value of an MBE/WBE/VOBE contract or subcontract has decreased or increased for any reason, you must contact the Project Manager or Engineer responsible for this project immediately. If additional M/WBE/VOBE firms not listed on the Schedule for Participation worked on this project list the amount of their subcontracts.

PAYMENTS THIS QUARTER: Include the amount you paid the M/WBE/VOBE subcontractor, either directly or indirectly, for work performed on this project during the three-month period covered by this Certification of Payment. If the amount paid was zero, please indicate that. Do not include payments from previous periods or estimated future payments in this column. Please note that you may be required to submit copies of cancelled checks to verify the amounts reported for firms used to meet the project's M/WBE/VOBE goals.

FY PAYMENTS TO DATE: Include the total amount you paid the M/WBE/VOBE subcontractor, either directly or indirectly, for work performed on this project for all quarters in **this fiscal year**. To ensure accurate reporting, please review the prior Certifications of Payments previously submitted for this project. Where necessary, correct any earlier mathematical or reporting errors and submit revised Certifications of Payment.

CUMULATIVE PAYMENTS: Include the total amount you paid the M/WBE/VOBE subcontractor, either directly or indirectly, for work performed over the entire life of this project (all quarters).

IF YOU HAVE ANY QUESTIONS, CONTACT DCR Supplier Diversity coordinator at 617.626.4925

CERTIFICATE OF COMPLETION
BY MINORITY/WOMEN BUSINESS/VETERAN OWNED BUSINESS ENTERPRISE
DEPARTMENT OF CONSERVATION AND RECREATION

TO: Supplier Diversity Reports
 Department of Conservation and
 Recreation 10 Park Plaza
 Suite 6620, Boston, MA 02116

Reporting Period: Fiscal Year

RE: Project:
 Project Number:
 General Contractor:

Contract Start Date:

The undersigned hereby certifies under the pains and penalties of perjury that the vendor named below has received the payments to the named Minority, Women Business and Veteran Owned Enterprises for work performed on the above project:

Firm Name of Subcontractor:

Print Name	Print Title
Phone Number	Email address

DESCRIPTION OF WORK (AS SHOWN IN LETTER OF INTENT)

BRIEF DESCRIPTION OF ACTIVITY: (Note "Labor Only," "Material Only," "Material and Labor," "Complete")

Original Subcontract Amount	\$ _____
Adjusted Subcontract Amount (Change Orders, etc.)	\$ _____
Total Payments Received to Date from Prime Contractor	\$ _____
Balance Due from Prime Contractor	\$ _____

If the completed activity is different from that listed on the Letter of Intent, please explain: _____

(If more space is needed, continue back of sheet)

The individuals signing below hereby certify under the pains and penalties of perjury that all work listed on the Contract Letter of Intent (or approved changes thereto as explained above) was completed by the MBE/WBE/VOBE firm on _____, 20____and the above amounts listed for these services are true and accurate.

FOR CONTRACTOR

FOR MBE/WBE/VOBE FIRM

 Authorized Signature

 Authorized Signature

 Print Name

 Print Name

NOTE: To be submitted to the DCR Compliance Office within ten (10) days after completion of work by MBE/WBE/VOBE.

**E-2 Final Acceptance
Certificate of Final Inspection, Release and Acceptance**

Title: _____

Location: _____

Contractor: _____

This is to certify that a complete inspection of the above-referenced project was made on _____ by the undersigned, and that the entire work was completed in accordance with the plans and specifications. The undersigned recommends acceptance of the project.

_____ by: _____ Title: _____ Date: _____
 _____ Designer Authorized
 Signature

 Resident Engineer Date Project Manager Date

 Project Engineer Date

CERTIFICATE OF RELEASE

1.) The undersigned hereby certifies that all work has been completed in accordance with the plans, specifications, and contract documents and that all change orders have been supported pursuant to Article VII of the General Conditions of the Contract.

2.) Contract Award Price: \$ Adjusted Contract Price: \$
 Authorized Additions: \$ Paid to Date:\$
 Authorized Deductions:\$ Balance Due: \$

3.) The undersigned further certifies that in addition to the amount set forth above, there are outstanding and unsettled the following change orders as submitted to the DCR.

Request No.	Date:	Amount:
Request No.	Date:	Amount:
Request No.	Date:	Amount:

Subject to satisfactory disposition of change orders listed in Item 3 above, the undersigned releases the Commonwealth of Massachusetts from all further claims for wages or payments to subcontractors or suppliers except: (list on attached sheet).

_____ by: _____
 Contractor Authorized Signature

The above-referenced project is accepted as of _____
 Date

Deputy Commissioner, Engineering
 Deputy Director
 Project Manager
 Resident Engineer
 Office of Contract Administration
 Contractor



BID PACKAGE

**Part IV
Special Conditions**

PART IV

SPECIAL CONDITIONS OF THE CONTRACT

GENERAL

The General Contractor is responsible for coordinating all aspects of the **Magazine Beach Improvements Phase 2.2 Grassy Beach** project, located at **719 Memorial Drive, Cambridge, MA**.

- **Respect for Park Users:** The Contractor and subcontractors must be respectful of park users within the Charles River Reservation.
- **Working Hours:** Monday through Friday, from **7:00 AM to 3:00 PM**, unless otherwise approved by the Department.
- **Requests for Information (RFIs):** Any RFIs should be submitted electronically to the Department via email, with the project manager and landscape architect copied.

SEQUENCE OF CONSTRUCTION, SCHEDULE, AND RESTRICTIONS

- **Work Sequence:** The Contractor must follow a clear and structured work sequence and schedule during the entire project. The Contractor shall begin with establishment and verification of horizontal and vertical control, locating the project limits, and mobilizing all necessary equipment to the site. The Contractor's schedule for progress and completion will be reviewed by the Department of Conservation and Recreation (DCR).

The Contractor must ensure that all work methods are planned and executed to avoid any damage to existing structures, vegetation (to remain), trees (to remain), hardscapes (such as parking lots and nearby paths), pool infrastructure, drainage, or wildlife habitat areas. These elements must be protected from any damage. Any damage to these areas or adjacent property caused by the Contractor's activities, whether directly or indirectly and determined by DCR, will be the Contractor's responsibility and repaired at their expense.

- **Construction Schedule:** The contractor must submit a construction schedule within **15 days of the NTP** to DCR. The schedule should outline the entire work sequence and phasing to include timeframes and preparation tasks like:
 - Erosion and sediment control installation
 - Tree protection
 - Demolition and site removals
 - Dock and deck installation
 - Utility work
 - Major earth-moving activities
 - Material delivery

- Hardscape and site furnishing installations
- Invasive plant removal, planting and plant maintenance
- Turf establishment
- Final sitework

The schedule must account for the following **site-specific restrictions**:

1. **Environmental Compliance:** Submit an **E-NOI / SWPPP** to the **EPA** 21 days before construction begins. Mobilization can only occur **21 days** after the EPA receives the E-NOI / SWPPP. The SWPPP must include soil management, spill prevention, containment, and a refueling plan for equipment working on land or in water.
2. **Permit Submission to Cambridge ConCom:** Submit the project schedule and SWPPP, outlining all points in bullet 1, to **Cambridge ConCom** two weeks before starting work. A pre-construction meeting with the ConCom is required.
3. **Permit Availability on Site at All Times:** Keep all required permits, including **OOO**, general permits, any extensions, any approved plans, on-site **at all times**.
4. **Pile Driving Restrictions:** Pile driving for the dock and deck is only allowed between **7 AM and 11 AM** during the pool season (**6/01/2025 - 8/24/2025**). **MA DMF TOY (Massachusetts Department of Marine Fisheries Time of Year) restrictions** for water-based work apply from **February 15 – July 15** and **September 1 – November 15**. Pile driving work occurring within MA DMF TOY restrictions dates require a turbidity curtain installed one week prior to the commencement of work. See detail 7 on drawing C 0.2 as this work is proposed to occur within the MA DMF TOY restriction dates.
5. **No Dust Generating Operation Restrictions:** Earth-moving or trenching operations are not permitted during the **Veterans Pool Season (6/01/2025 - 8/24/2025)**. Earthwork must be scheduled before or after the pool season.
6. **Charles River Regatta:** No work is allowed from **10/14/2025 - 10/19/2025** due to the **Charles River Regatta**. Secure the site for this event. If plant warranty work is needed in **October 2026**, no work is allowed from **10/13/2026 – 10/18/2026**.
7. **Utility Coordination:** Begin coordinating with utility companies as soon as the NTP is issued to avoid delays.
8. **Certificate of Compliance:** Per the Order of Conditions issued by the City of Cambridge Conservation Commission, as-built plans prepared by a Professional Engineer or Land Surveyor registered in the Commonwealth of Massachusetts showing final park development shall be submitted to DCR for submission to the Conservation Commission with a request for a Certificate of Compliance. In addition, an affidavit from a Professional Engineer or Land Surveyor registered in the Commonwealth of Massachusetts shall be submitted, which states that the project was completed in accordance with the requirements of the Order of Conditions. The Contractor shall include this work in their bid.

9. **2026:** Contractor shall perform all required plant maintenance from 06/01/2026 – 08/23/2025 between **7Am -11Am Monday – Friday only**. From 11am onward the public will have access to paths, dock and deck. Contractor should submit a plan for public access for this time.
10. The Contractor is advised to review the project permits attached and above restrictions to determine what work is impacted by these restrictions and shall plan the work accordingly. Schedule constraints will be discussed at the pre-bid meeting.

SUBMITTALS

1. **Submittal Schedule:** Unless otherwise specified, within seven (7) calendar days of the date of the notice to proceed or at the pre-construction meeting, whichever occurs first, the Contractor shall submit to DCR a list of all submittals needing approval and a timeline of their submission.
2. **Schedule Updates:** The construction schedule must be maintained on-site for review during meetings. Any significant changes to the schedule must be emailed to the resident engineer with the project manager copied immediately for review.

INSPECTIONS

1. **Inspection Team:** The Department will assign inspectors and/or resident engineers to this project on either a full time or part-time basis, as required to cover the work under this Contract, as justified by the Department.
2. **Material Shipments:** The contractor must notify the Department at least **48 hours** in advance of material shipments to arrange for inspection.

PERMITS

1. **Permits:** All permits required to be obtained by DCR prior to construction are included in the attached documentation.
2. **Compliance:** The contractor shall comply with all permit requirements.

ADDITIONAL SITE-SPECIFIC NOTES

1. **Minimize Interference:** Perform site work and debris removal in a way that minimizes disruption to navigation, streets, walkways, parking areas, buildings, and other adjacent facilities.
2. **Permission for Closures:** Obtain written permission from the relevant authorities and police details, if determined by DCR, to close or obstruct streets, walkways, or adjacent facilities. If necessary, provide alternate routes for traffic and pedestrians as required by those authorities.
3. **Protect Utilities and Fixtures:** Where applicable, protect and maintain light poles, utility poles and services, traffic signal control boxes, curb boxes, valves, and other utilities, unless specified for removal or modification.
4. **Obstruction of Navigable Waterways:** a. The contractor must promptly recover and remove any material, equipment, or machinery lost, discarded, or misplaced into the water that could obstruct navigation, as determined by the Department. b. The contractor must notify DCR

immediately with a description and location of any obstructions. c. When instructed by DCR, the contractor must mark or buoy the obstruction until it is removed.

MASSACHUSETTS WATER RESOURCES AUTHORITY

PERMIT

8m Permit # 22-10-1992M

25-Oct-22

Department of Conservation and Recreation
251 Causeway St. # 600
Boston, MA 02114

This Permit is subject to the 8(m) Permit Terms and Conditions, and the 8(m) Permit Special Terms and Conditions, if any, attached hereto and made a part hereof. Permittee agrees that it shall be bound by, and shall comply with, said Terms and Conditions.

The land is described as follows:

MWRA Section 1 (South Charles Relief Sewer) 668 Memorial Drive Cambridge between Sta. 34+15 and 30+00 as depicted within " Magazine Beach Site Improvements Phase 2 Charles River Cambridge, MA Site Plan" LP-3 dated 4/14/21 and "Magazine Beach Improvements Grassy Beach Site Preparation & Demolition Plan" dated 6/30/01 Sheet LP-1.

You may use the land for the purpose of:

Phase II work consists of removal of unusable portion of existing parking lot, invasive vegetation removal, river bank planting and restoration, pathway restoration / construction and dock/ overlook construction along river. Applicant to delineate MWRA easement, no vehicle exceeding HS-20 loading allowed to cross over MWRA infrastructure and existing paved area to remain in place until dock construction is complete. No stockpiling or staging within easement.

Approved as to Form:
Massachusetts Water Resources Authority

Approved
Massachusetts Water Resources Authority

Christopher John
Law Division

Carolyn M. Fice 12/15/22
Deputy Chief OO, PP&P

This Permit is subject to the 8(m) Permit Terms and Conditions, and the 8(m) Permit Special Terms and Conditions, if any, attached hereto and made a part hereof. Permittee agrees that it shall be bound by, and shall comply with, said Terms and Conditions.

Permittee: VL Johnson 11/28/2022 / Virginia (Ginna) Johnson
Signature Print Name

This Permit shall have no effect until such time as the Authority issues the fully executed original of this Permit.

Massachusetts Water Resources Authority
2 Griffin Way
Chelsea, MA 02150
Attn: Wastewater Operations - Permitting Department

8(m) PERMIT TERMS AND CONDITIONS

1. Permittee shall be responsible to stay apprised of and comply with all applicable federal, state and local laws, rules, and orders including, but not limited to, guidelines and requirements for construction sites, and all supplements, amendments and/or changes thereto and notices thereof. Prior to commencing work pursuant to this Permit, Permittee shall have obtained all other required permits, written approval(s) and necessary authorizations to perform the work. Failure to comply with the terms stated herein shall render this Permit null and void by the Authority, and Permittee shall bear all responsibility, liability, damages and costs arising from the Permittee's noncompliance.
2. Permittee's use of the permitted land shall at no time interfere with the Authority's activities or operations on the permitted land. The Authority has the right to review and approve all of the Permittee's work including such plans and specifications, as the Authority deems necessary. Any proposed future work beyond the scope of this Permit shall have the prior written approval of the Authority.
3. To the fullest extent permitted by law, the Permittee shall indemnify, defend with counsel acceptable to the Authority, keep and save harmless the Authority and its board members, officers, representatives, contractors, agents, employees, successors, and assigns, in both their individual and official capacities, against all suits, claims, liabilities, damages, losses (including but not limited to loss of use resulting therefrom) and expenses, including but not limited to attorney's fees, caused by, arising out of or resulting from any work or activity under this Permit and/or act, omission, breach or default of the Permittee or of any contractor, subcontractor or vendor of the Permittee or 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.
4. The granting of this Permit shall in no way interfere with the rights of the Authority to exercise its existing rights in or over the permitted land. Permittee acknowledges that the Authority, within its sole discretion, may enter upon the permitted land at any time in order to carry out inspections, maintenance, repairs, replacements, or other activities.
5. The Authority may revoke this Permit at any time. The sale or disposition of the permitted land by its owner will cause this Permit to terminate without further notice. Permittee shall give the Authority at least 72 hours notice before commencing the operations as pursuant herein. This Permit shall not be assigned or transferred.
6. No blasting, drilling or other activity that could in any way affect the integrity or operability of the Authority's property or use of the permitted land shall be permitted without express prior written approval of the Authority.
7. The Permittee shall remove, at its own expense, within six months of the date of written notice from the Authority, any or all conduits and appurtenances installed by the Permittee under this Permit if, in the Authority's sole discretion, such removal is necessary for the operation, maintenance or replacement of the Authority's infrastructure.
8. To the fullest extent permitted by law, and in consideration of the issuance of this Permit, Permittee hereby releases the Authority and its board members, officers, representatives, contractors, agents, employees, successors, and assigns, in both their individual and official capacities, from all suits, claims, liabilities, damages, losses (including but not limited to loss of use resulting therefrom) and expenses, including but not limited to attorney's fees, caused by, arising out of or resulting from any work or activity under this Permit and/or act, omission, breach or default of the Permittee or of any

CONDITIONS (Cont'd)

contractor, subcontractor or vendor of the Permittee or 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. This release includes, but is not limited to, all suits, claims, liabilities, damages (including, but not limited to, direct, indirect, and consequential damages, economic loss, and loss of profits) and losses which are attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property, including the loss of use resulting therefrom, together with all attorneys' fees, costs and expenses.

9. The Permittee shall conduct design, construction, and excavation in accordance with all federal, state and local safety regulations, including but not limited to, federal OSHA regulations (29 CFR 1926) and Massachusetts Department of Public Safety regulations (520 CMR 14.00). During construction, Permittee shall take appropriate sheeting and shoring measures to protect the integrity of the Authority's water and/or sewer mains. Permittee shall submit design plans stamped by a professional engineer licensed in Massachusetts to the Authority for approval prior to the start of construction.
10. The Permittee shall adjust any or all Authority frames and covers to grade within the limits of work in accordance with the plans referenced in this Permit. The Authority will provide the Permittee with new replacement Authority frames and covers that have been deemed unusable by the Authority.
11. If the Permittee is proposing to take borings and/or place test pits within the permitted land, the Permittee shall mark the proposed boring and test pit locations on the ground using paint and/or stakes and submit engineering documents to the Authority showing the proposed boring and test pit locations. Authority staff will review all boring and test pit locations at the site. Upon written clearance of the proposed boring and test pit locations by Authority staff and subject to Permittee providing the Authority with seventy-two (72) hours prior notice, Permittee may commence work at the site.

The Permittee shall be responsible for the locations of proposed borings and test pits regardless of any act or omission of the Authority. The Permittee shall be responsible for repairing and/or replacing, at the Authority's election, the Authority's property or infrastructure, which is damaged as a result of the Permittee's, its contractors, agents, representatives, employees, and/or invitees activities pursuant to this Permit. The Permittee's obligations under this paragraph shall include payment to the Authority for all costs to repair all such damage caused to the Authority's property.



The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Maura T. Healey
GOVERNOR

Kimberley Driscoll
LIEUTENANT GOVERNOR

Rebecca L. Tepper
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1081
<http://www.mass.gov/eea>

December 22, 2023

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
NOTICE OF PROJECT CHANGE

PROJECT NAME : Magazine Beach Site Improvements
PROJECT MUNICIPALITY : Cambridge
PROJECT WATERSHED : Charles River
EEA NUMBER : 13117
PROJECT PROPONENT : Massachusetts Department of Conservation and Recreation
DATE NOTICED IN MONITOR : November 22, 2023

Pursuant to the Massachusetts Environmental Policy Act (MEPA; M.G. L. c. 30, ss. 61-62L) and Sections 11.06 of the MEPA regulations (301 CMR 11.00), I hereby determine that this project **does not require** an Environmental Impact Report (EIR).

Original Project Description

As described in the Environmental Notification Form (ENF) filed in 2003 (the "2003 ENF"), the original project consisted of both specific project components as well as the more general goals of the Magazine Beach Master Plan to improve and enhance the passive and active recreational resources located within Magazine Beach Park in Cambridge, MA. The original project was proposed to be completed over three phases (Phase 1A, Phase 1B, and Phase 2), with the Phase 1A and Phase 1B project areas being located east of the Memorial Drive/Magazine Street intersection, and the Phase 2 project area consisting of the remainder of the site to the west. Specific work associated with each phase was anticipated to consist of:

- Phase 1A – This phase would include improvements to the river edge, including reconstruction and relocation of stone riprap along the bank of Charles River; replanting and stabilization of

new riprap along the bank; realignment and reconstruction of the existing walkway; regrading to eliminate stormwater discharge directly into the river; and relocation and reconstruction of the parking lot and MWRA turn-around loop.

- Phase 1B – This phase would include the regrading and upgrading of the recreational playing fields and associated amenities; construction of stormwater BMPs; replacement of exercise equipment; and additional parking related to MWRA.
- Phase 2 – This phase would include the reconstruction and relocation of stone riprap along the bank of the Charles River; replanting and stabilization of new stone riprap along the bank; removal of the existing children's wading pool and construction of a new children's water spray play area; and upgrading the children's play equipment. Along Memorial Drive, this phase would include the removal of the existing driveway turn-around across from Magazine Street and realignment of the multi-use path abutting Memorial Drive. In addition, on the western end of the project area, this phase would include the construction of a new turn-around traffic loop at the boathouse driveway, reconfiguring boathouse parking spaces, and constructing a new picnic area adjacent to the boathouse.

According to the NPC filing, project elements associated with Phase 1A and Phase 1B were completed in 2009. These phases also included the minor reconfiguration of the playing fields to provide for one soccer field and a multipurpose open space area. The Certificate on the 2003 ENF issued on November 24, 2003 found that the filing did not require the preparation of an EIR.

Project Change

As detailed in the Notice of Project Change (NPC), the Proponent has made steady progress on implementing the work outlined in the 2003 ENF. The NPC indicates that Phase 2 has since been separated into smaller phases, though project components remain consistent with those described in the 2003 ENF. The NPC states that several significant Phase 2 subphases and project elements (Phase 2.1) were completed between 2018 and 2023, including:

- The construction of an observation deck and children's water spray play area, renovation of the kayak launch and the Powder Magazine building, and reconstruction of the internal turn-around loop and parking lot;
- The reconstruction and stabilization of the area along the bank of the Charles River; and
- The renovation of the Veterans Memorial Swimming Pool and bathhouse.

According to the NPC, the project change consists of Phase 2.2 and Phase 2.3, although only a few components of each phase differ from what was presented in the 2003 ENF. Phase 2.2 is currently planned to begin construction in the spring of 2024. Components of this phase are primarily located along the bank of the Charles River between the Powder Magazine building to the east and the Riverside Boat Club to the west. Major project components included in Phase 2.2 are anticipated to consist of the following:

- Construction of a dock located between the Powder Magazine and Veterans Memorial Swimming Pool;
- Construction of the west observation deck between the dock and the historic boathouse;

- Installation of additional amenities for the Veterans Memorial Swimming Pool, including picnic tables and bike racks;
- Restoration of the river edge, shoreline planting, and vegetation management;
- Repaving and striping a small portion of the existing drive for ADA-accessible parking; and
- Relocation of the overhead utility lines that travel from Memorial Drive to the Powder Magazine building into subsurface conduit.

According to the NPC, the remaining sections of the project area, including the portion along Memorial Drive, the central area north of the Powder Magazine building, and the far west end of the project site, are envisioned to be completed in a future phase (Phase 2.3) as funding becomes available and related infrastructure projects can be coordinated. Specific components of the future phase have not been fully designed but remain consistent with those described in the 2003 ENF and are anticipated to include the following:

- Removal of the existing driveway turn-around across from Magazine Street;
- Realignment and reconstruction of the multi-use path abutting Memorial Drive;
- Pathway realignment and reconstruction connecting park features;
- Construction of a children's play area;
- Construction of a new turn-around traffic loop near the Riverside Boat Club driveway;
- Reconfiguration and construction of parking spaces west of the pool;
- Stormwater feature improvements;
- Regrading and filling the portion of the relocated parking area for parkland and beach use; and
- Construction of a new picnic area adjacent to the Riverside Boat Club.

The specific project changes that are described in the NPC and are the subject of this review are the two new dock structures and the shoreline stabilization. I note that some of these changes were previously approved through M.G.L. c. 91 and wetlands permitting, prior to review of these changes through MEPA. However, because additional permitting is required, and for added transparency, the Proponent is filing this NPC to fully describe the changes made to the Magazine Beach Park plan and update mitigation commitments.

Project Site

The project site consists of a 750-foot (ft) long section of the Charles River's northern shore in Cambridge bounded by the Boston University Bridge to the east, Memorial Drive to the north, and the Riverside Boat Club to the west.

State and local wetland resource areas located within and adjacent to the project area include Bank, Land Under Waterbodies and Waterways (LUWW), Bordering Land Subject to Flooding (BLSF), and Riverfront Area (RA). According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) (Panel No. 25017C0576E, effective June 4, 2010), portions of the project site are located within a Zone AE with a Base Flood Elevation (BFE) of 4 ft NAVD88. The project site is also located within Charles River Basin Historic District, and contains several structures listed in the Massachusetts Historical Commission's (MHC) Inventory of Historic and Archaeological Assets of the Commonwealth. In addition, portions of the site are located within flowed and filled Commonwealth tidelands.

The project site is located within an Environmental Justice (EJ) Population characterized by Minority and within one mile of 80 EJ Populations. The site is located within five miles of numerous additional EJ Populations.¹ As described below, the EENF identified the “Designated Geographic Area” (DGA) for the project as one mile around EJ Populations, included a review of potential impacts and benefits to the EJ Populations within this DGA, and described public involvement efforts undertaken to date.

Environmental Impacts and Mitigation

As compared to the original project as reviewed in the 2003 ENF, the project change (Phase 2.2 and Phase 2.3) will increase the alteration of LUWW by 35 square feet (sf) (for a total of 5,035 sf) and BLSF by 560 sf (for a total of 104,570 sf).

Measures to avoid, minimize and mitigate impacts associated with the project change include the use of erosion and sedimentation controls during project construction; invasive species removal and vegetation management; use of a turbidity curtain during in-water work; and riverbank stabilization measures. The original project committed to additional mitigation that is incorporated herein, including stormwater management improvements.

Jurisdiction and Permitting

The original project was subject to MEPA review because it exceeded the MEPA review thresholds at 301 CMR 11.03(3)(b)(1)(b) for the alteration of 500 or more linear feet of inland bank; 301 CMR 11.03(3)(b)(1)(d) for the alteration of 5,000 or more sf of bordering or isolated vegetated wetlands; and 301 CMR 11.03(3)(b)(1)(f) for the alteration of ½ or more acres of any other wetlands. The project required Agency Actions in the form of a Chapter 91 (c.91) License from the Massachusetts Department of Environmental Protection (MassDEP) and an 8(m) Permit from the Massachusetts Water Resources Authority (MWRA). The project also required the submittal of a Pre-Construction Notification (PCN) to the U.S. Army Corps of Engineers (ACOE) seeking authorization under the General Permits for Massachusetts in accordance with Section 404 of the Clean Water Act and a National Pollutant Discharge Elimination System (NPDES) Construction General Permit from the U.S. Environmental Protection Agency (EPA).

As noted in the NPC, the project change continues to meet/exceed the aforementioned thresholds. As noted above, the project change erroneously proceeded to permitting prior to review through MEPA. The project change received a c.91 License (Waterways License #14608) from MassDEP February 21, 2018, which was amended on November 20, 2023 (Waterways License #15607) to reflect the revised location of the east observation deck. The project change also received an 8(m) Permit (8(m) Permit #22-10-1992M) from the MWRA. In addition, the project change received an Extension Permit to the Order of Conditions (DEP File No. 123-269) issued by the Cambridge Conservation Commission on November 14, 2022.

¹ The EEA EJ Mapper is available at: <https://www.mass.gov/info-details/environmental-justice-populations-in-massachusetts>

Because the project is being undertaken by an Agency (DCR), MEPA jurisdiction is broad in scope and extends to all aspects of the project that are likely, directly or indirectly, to cause Damage to the Environment as defined in MEPA regulations.

Review of the NPC

The NPC included a description of the original project, the project changes, estimates of impacts related to the project change, and an identification of measures to avoid, minimize and mitigate environmental impacts. While the NPC was filed prior to the January 1, 2022 effective date of MEPA EJ protocols and the October 1, 2021 effective date of the MEPA interim climate protocol, the filing voluntarily provided an analysis of existing unfair or inequitable Environmental Burden and related public health consequences impacting Environmental Justice (EJ) Populations in proximity to the project site and an output report from the Climate Resilience Design Standards Tool prepared by the Resilient Massachusetts Action Team (RMAT) (the “MA Resilience Design Standards Tool”).² As noted above, the changes to Phase 2 since the filing of the 2003 ENF result in a minor increase in impacts to wetland resource areas compared to those identified in the 2003 ENF, though several project phases (Phase 1A, Phase 1B, and Phase 2.1) have been constructed.

The Proponent provided supplemental information on December 11, 2023, which included additional analysis of existing environmental burdens impacting EJ Populations, a discussion regarding how the project change has incorporated climate resiliency measures, and a discussion of potential construction period measures, impacts, and mitigation. For purposes of clarity, all supplemental information provided by the Proponent are included in references to the “NPC,” unless otherwise indicated.

Environmental Justice (EJ) / Public Health

As noted above, the project site is located within an EJ Population characterized as Minority and within one mile of 80 EJ Populations. The site is located within five miles of numerous additional EJ Populations. The NPC identified the “Designated Geographic Area” (DGA) for the project as one mile around EJ Populations and described public involvement efforts undertaken to date. Within the census tracts containing the above EJ Populations within one mile of the project site, Chinese, French Creole, Russian and Spanish or Spanish Creole are identified as languages spoken by 5% or more of Limited English Proficiency (“LEP”) residents.

In keeping with the intent of the MEPA Public Involvement Protocol for Environmental Justice (EJ) Populations, Proponent sent advanced notification of the NPC to a list of community-based organizations (CBOs) and tribes/indigenous organizations (the “EJ Reference List”) provided by the MEPA Office. The Proponent also circulated an EJ Screening Form, including translations in Chinese, Haitian Creole, Russian, and Spanish, with an overview of the project to these entities and information on ways to request a community meeting. According to the NPC, public involvement activities date back to 1997 with the four most recent public meetings held on January 30, 2013, September 30, 2015, November 18, 2015, and October 20, 2016. In addition, public hearings were held by the Cambridge Conservation Commission on November 18, 2019, and November 14, 2022.

² Available at: https://resilientma.mass.gov/rmat_home/designstandards/

The NPC contains a baseline assessment of any existing unfair or inequitable Environmental Burden and related public health consequences impacting EJ Populations in accordance with 301 CMR 11.07(6)(n)1. and the MEPA Interim Protocol for Analysis of EJ Impacts. According to the NPC, the data surveyed show some indication of an existing “unfair or inequitable” burden impacting the identified EJ Populations. The DPH EJ Tool identifies one municipality (Boston) within the one mile DGA as exhibiting “vulnerable health EJ criteria”; this term is defined in the DPH EJ Tool to include any one of four environmentally related health indicators that are measured to be 110% above statewide rates based on a five-year rolling average.³ Specifically, within the project’s DGA, Boston meets the vulnerable health EJ criteria for the following parameters:

- Low birth weight
- Childhood asthma emergency department visits

In addition, the NPC indicates that the following sources of potential pollution exist within the one mile DGA based on the mapping layers available in the DPH EJ Tool:

- Major air and waste facilities: 28
- M.G.L. c. 21E sites: 24
- MassDEP sites with AULs: 54
- Wastewater treatment plants: 4
- Underground storage tanks: 21
- Energy generation and supply: 3

However, based on an independent review by the MEPA Office of the mapping layers available in the DPH EJ Tool, other potential sources of pollution (including “Tier II” toxics use reporting facilities, EPA facilities, Road infrastructure, MBTA rapid transit, and other transportation infrastructure) appear to exist within EJ block groups within the DGA.

The NPC states that while the EJ Populations within the DGA may exhibit some existing unfair or inequitable environmental burden, the project change is not expected to materially exacerbate such existing conditions. The main sources of potential construction period impacts are emissions from construction equipment, motor vehicles and fugitive dust emissions from disturbed soil surface areas. According to the NPC, the project change is set to bring about substantial benefits that will improve both environmental quality and public health conditions for both EJ and non-EJ Populations, such as river edge restoration, enhanced recreational spaces, and vegetation management. In addition, any minor construction adverse effects would be mitigated to the greatest extent practicable through use of construction period BMPs.

Wetlands and Fisheries

³ See <https://matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html>. Four vulnerable health EJ criteria are tracked in the DPH EJ Viewer by municipality (heart attack hospitalization, childhood asthma, childhood blood lead, and low birth weight), and two (childhood blood lead, and low birth weight) are also available on a census tract level.

As described above, the project change will increase alteration of LUWW by 35 sf (for a total of 5,035 sf) and BLSF by 560 sf (for a total of 104,570 sf). All other potential wetland resource area impacts associated with the project, including the alteration of 500 linear feet of Bank and 18,840 sf of RA, remain unchanged. Additional in-water impacts will result from the installation of 35 12-ft diameter piles associated with the construction of the dock and observation deck. The Cambridge Conservation Commission previously reviewed the project change for its consistency with the Wetlands Protection Act (WPA), the Wetland Regulations (310 CMR 10.00) and associated performance standards including the Massachusetts Stormwater Management Standards (SMS), and local bylaws, and issued an Extension Permit to the Order of Conditions (DEP File No. 123-269) on November 14, 2022.

As noted in comments provided by the Massachusetts Water Resources Authority (MWRA), Section 8(m) of Chapter 372 of the Acts of 1984 allows the MWRA to issue permits to build, construct, excavate, or cross within or near an easement or other property interest held by the MWRA, with the goal of protecting MWRA-owned infrastructure. MWRA owns and maintains existing infrastructure in the vicinity of Magazine Beach including sewer interceptors and the Cottage Farm Combined Sewer Overflow Facility. In addition, MWRA prohibits the discharge of groundwater and stormwater into the sanitary sewer system, pursuant to 360 C.M.R. 10.023(1). As the project site has access to separate sewer and storm drain systems, comments state the discharge of groundwater or stormwater to the sanitary sewer system associated with the project change is prohibited.

As noted in comments provided by the Massachusetts Division of Marine Fisheries (DMF), the Charles River supports diadromous fish, including alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), American shad (*Alosa sapidissima*), rainbow smelt (*Osmerus mordax*), white perch (*Morone americana*), Atlantic tomcod (*Microgadus tomcod*), and American eel (*Anguilla rostrata*). Comments provided by DMF state that a time-of-year (TOY) restriction should be observed for in-water silt-producing activities that take place from February 15 to July 15 and September 1 to November 15 of any year. If work must occur within the TOY restriction, DMF recommends that turbidity curtains be installed at least one week prior to any in-water work.

Waterways / Chapter 91

As stated above, the project change is subject to the jurisdiction of M.G.L. c. 91 and the Waterways Regulations at 310 CMR 9.00, as portions of the site consist of Commonwealth filled and flowed tidelands of the Charles River. The east and west observation decks and improvements to the stone dust path connecting the east dock were previously approved under Waterways License #14608 issued on February 21, 2018. This License was amended on November 20, 2023 by Waterways License #15607 to reflect the revised location of the east observation deck, as described and depicted in the NPC.

Comments provided by the MassDEP WRP state that based on the information provided, the project change constitutes a water-dependent use project pursuant to 310 CMR 9.12(2)(a)(4) and (11); however, some project change components appear to meet the requirements for a Minor Project Modification per 310 CMR 9.22, including but not limited to updates to a bituminous concrete path, removal of a stabilized stone dust near the water's edge, installation of one of two new picnic table with concrete pads and wood bench, shoreline stabilization consisting of the removal of invasive plants, native plantings, and installation of geese protection fencing. The Proponent is encouraged to confer

with the MassDEP WRP prior to submitting a request for approval of these changes pursuant to 310 CMR 9.22, specifically with regard to the proposed installation of the stacked pre-vegetated coir logs along the banks of the Charles River.

Climate Change

Adaptation and Resiliency

Effective October 1, 2021, all MEPA projects are required to submit an output report from the MA Resilience Design Tool to assess the climate risks of the project. Based on the output report attached to the NPC, the project has a “High” exposure rating based on the project’s location for the extreme precipitation (riverine flooding) and extreme precipitation (urban flooding) climate parameters. The project also has a “Moderate” exposure rating based on the project’s location for the sea level rise/storm surge and extreme heat climate parameters. The primary assets for this project are natural resources; therefore, the project received a standard recommendation of a 20-yr (5%) return period design storm as of 2030 for sea level rise/storm surge and a 25-yr (4%) return period design storm as of 2030 for extreme precipitation, which were provided as a consideration for users and not a formal standard. It also recommends planning for the 50th percentile for applicable extreme heat parameters.

According to the NPC, that the project site has a higher degree of resiliency against sea level rise due to its location within the Charles River Basin, where the elevation of the Charles River is actively managed through a series of high-volume pumps at the Charles River Dam. Prior phases have also implemented stormwater management improvements that include eliminating direct discharges of stormwater into the Charles River and the construction of subsurface infiltration chambers. Additional stormwater management improvements are planned as part of the future phase of the project (Phase 2.3); however, specific design details have not been developed. The project change will not add any impervious surfaces and will result in a reduction of impervious surface through the removal of a paved area adjacent to the Veterans Memorial Swimming Pool. As part of prior work, the project as a whole helps to mitigate against potential heat island impacts through enhancements to the Veterans Memorial Swimming Pool and bathhouse. In addition, the project change includes the planting of 14 trees.

Construction Period

According to the NPC, work on Phase 2.2 is anticipated to commence in the spring of 2024 and will take approximately nine months to complete. Prior to the commencement of work, erosion and sedimentation control measures will be implemented throughout the project site. A silt curtain will be installed in the Charles River around active work areas to contain turbid water and prevent its transport outside of the work zone, in accordance with the recommendations provided by DMF. In addition, construction of the in-water elements will be completed as expeditiously as possible, in order to best observe the TOY restrictions.

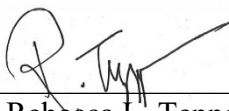
All construction and demolition activities should be managed in accordance with applicable MassDEP’s regulations regarding Air Pollution Control (310 CMR 7.01, 7.09-7.10), and Solid Waste Facilities (310 CMR 16.00 and 310 CMR 19.00, including the waste ban provision at 310 CMR 19.017). The project should include measures to reduce construction period impacts (e.g., noise, dust, odor, solid waste management) and emissions of air pollutants from equipment, including anti-idling

measures in accordance with the Air Quality regulations (310 CMR 7.11). I encourage the Proponent to require that its contractors use construction equipment with engines manufactured to Tier 4 federal emission standards or select project contractors that have installed retrofit emissions control devices or vehicles that use alternative fuels to reduce emissions of volatile organic compounds (VOCs), carbon monoxide (CO) and particulate matter (PM) from diesel-powered equipment. Off-road vehicles are required to use ultra-low sulfur diesel fuel (ULSD). If oil and/or hazardous materials are found during construction, the Proponent should notify MassDEP in accordance with the MCP (310 CMR 40.00). All construction activities should be undertaken in compliance with the conditions of all State and local permits. I encourage the Proponent to reuse or recycle construction and demolition (C&D) debris to the maximum extent.

Conclusion

The NPC has sufficiently described the nature and general elements of the project change for the purposes of MEPA review and described measures to avoid, minimize and mitigate the project’s environmental impacts. Accordingly, I find that an EIR is not required for this project change.

December 22, 2023
Date


Rebecca L. Tepper

Comments received:

- 12/12/2023 Massachusetts Water Resources Authority (MWRA)
- 12/12/2023 Massachusetts Division of Marine Fisheries (DMF)
- 12/12/2023 Massachusetts Department of Environmental Protection Waterways Regulation Program (MassDEP WRP)

RLT/NJM/njm



Department of Environmental Protection

100 Cambridge Street 9th Floor Boston, MA 02114 • 617-292-5500

Maura T. Healey
Governor

Kimberley Driscoll
Lieutenant Governor

Rebecca L. Tepper
Secretary

Bonnie Heiple
Commissioner

Memorandum

To: Nicholas Moreno, Environmental Analyst, MEPA/EEA

From: Ivan Morales, Waterways Regulation Program, MassDEP/Boston

Cc: Daniel Padien, Program Chief, Waterways Regulations Program, MassDEP/Boston

Re: **Magazine Beach Site Improvements, EEA #13117 NPC
Comments from the Chapter 91 Waterways Regulation Program**

Date: DUE December 12, 2023

The Department of Environmental Protection Waterways Regulation Program (the “Department”) has reviewed the above referenced Notice of Project Change (NPC) (EEA #13117), submitted by Stantec Consulting Services, Inc., on behalf of the Massachusetts Department of Conservation and Recreation (“the Proponent”) to propose changes in design and construction to the Magazine Beach Park site located on filled and flowed tidelands of the Charles River, at 621-668 Memorial Drive, in the City of Cambridge, Middlesex County (the “project site”).

Chapter 91 Jurisdiction:

The Department has determined that a portion of project site consists of Commonwealth filled and flowed tidelands of the Charles River and subject to jurisdiction pursuant to M.G.L Chapter 91 and the Waterways Regulations, per 310 CMR 9.04(1) and (2).

Water Dependency:

The Department has determined that this project is water-dependent use project pursuant to 310 CMR 9.12(2)(a)(4) and (11).

Chapter 91 Regulatory Analysis:

In the NPC, the Proponent proposes design changes to the existing layout of the Magazine Beach Park Improvement Project. The project consists of upgrading the active/passive recreational activities located within the park. Based on budget availability, the project was planned to be completed in various phases (1A, 1B and 2). The previous project was initially reviewed by MEPA and issued a

Magazine Beach Site Improvements, EEA #13117/NPC
Comments from the Chapter 91 Waterways Regulation Program

Secretary's Certificate on September 24, 2003. The Proponent also obtained Waterways License No. 14608 on February 21, 2018 for the initial phases of the project.

Proposed changes to the previously approved project as described in the NPC include:

- 1) re-pavement of a portion of the existing drive and parking area, construction of an accessible ramp, curb and ramp along with a mountable curb and new vehicle swing gate,
- 2) updates to a bituminous concrete path (partially located within Ch. 91 jurisdiction) to enhance connections among other project elements,
- 3) removal of a stabilized stone dust near the water's edge,
- 4) relocation of the existing east dock 70 feet downstream of its design location and improvements to a stone dust path connecting the said dock,
- 5) incorporation of an observation dock in the western edge of the project site,
- 6) installation of two (2) new picnic table, a wood bench and five (5) bike racks along with concrete pads,
- 7) shoreline stabilization consisting of the removal of invasive plants, native plantings, geese protection fencing and installation of stacked coir logs along the river's edge, and
- 8) undergrounding of overhead utility lines extending from Memorial Drive to the Powder Magazine Building.

Based on the Department's research, the east and west observation docks and improvements to a stone dust path connecting the east dock were previously approved under Waterways License No. 14608 issued on February 21, 2018. This License was amended on November 20, 2023 by License 15607 to reflect the design location of the east observation dock to the location depicted in the NPC.

After review of the information submitted with the NPC, the Department determines the proposed undergrounding of overhead utility lines, re-pavement of a portion of the existing drive and parking area, construction of an accessible ramp, curb and ramp along with a mountable curb and new vehicle swing gate, bike racks are located within uplands landward of the historic high water, a geographical area not subject to Chapter 91 jurisdiction. The remaining project components proposed at this time appear to meet the requirements for a Minor Project Modification per 310 CMR 9.22, including but not limited to updates to a bituminous concrete path, removal of a stabilized stone dust near the water's edge, installation of one of two new picnic table with concrete pads and wood bench, shoreline stabilization consisting of the removal of invasive plants, native plantings, and installation of geese protection fencing. The proponent is encouraged to confer with the Department prior to submitting a request for approval of these changes under 310 CMR 9.22 specifically with regard to the proposed installation of the stacked pre-vegetated coir logs along the banks of the Charles River.

If you have any questions regarding the Department's comments, please contact Ivan Morales at (857) 276-3013 or Ivan.Morales@mass.gov



The Commonwealth of Massachusetts Division of Marine Fisheries

(617) 626-1520 | www.mass.gov/marinefisheries



MAURA T. HEALEY
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KIMBERLEY DRISCOLL
Lt. Governor

REBECCA L. TEPPER
Secretary

THOMAS K. O'SHEA
Commissioner

DANIEL J. MCKIERNAN
Director

December 12, 2023

Secretary Rebecca L. Tepper
Executive Office of Energy and Environmental Affairs (EEA)
Attn: MEPA Office
Nicholas Moreno, EEA No. 13117
100 Cambridge Street, Suite 900
Boston, MA 02114

Dear Secretary Tepper,

The Massachusetts Division of Marine Fisheries (MA DMF) has reviewed the Notice of Project Change for the Magazine Beach Improvement Project located at 668 Memorial Drive along the Charles River in Cambridge, MA, submitted on behalf of the Massachusetts Department of Conservation and Recreation. The project was issued a Secretary's Certificate in 2003 but is being constructed in smaller phases due to available funding and coordination with other infrastructure projects. The current phase includes the installation of a dock and observation deck. These structures will be supported by 35 12" piles. We provide the following review of the project's potential impacts to marine fisheries resources and habitats with recommendations to avoid and minimize those impacts.

The Charles River supports diadromous fish, including alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), American shad (*Alosa sapidissima*), rainbow smelt (*Osmerus mordax*), white perch (*Morone americana*) Atlantic tomcod (*Microgadus tomcod*), and American eel (*Anguilla rostrata*). MA DMF has the following comments for your consideration:

- We recommend a time-of-year restriction (TOY) on in-water silt-producing work from **February 15 to July 15** and **September 1 to November 15** for the protection of the species listed above. If work cannot occur outside of these windows, we recommend that turbidity curtains be installed at least one week prior to any in-water work [1].

Questions regarding this review may be directed to Kate Frew in our Gloucester office at Kate.Frew@mass.gov.

Sincerely,

Daniel J. McKiernan
Director

Cc:

J. Yelen, S. Duffey (MA CZM)

K. Shaw (NMFS)

R. Helfeld (MA DCR)

C. Vonderweidt (Stantec)

J. Letourneau (Cambridge Conservation Commission)

References

[1] Evans, N.T., K.H. Ford, B.C. Chase, and J. Sheppard. 2011. Recommended Time of Year Restrictions (TOYs) for Coastal Alteration Projects to Protect Marine Fisheries Resources in Massachusetts. Massachusetts Division of Marine Fisheries Technical Report, TR-47.

DM/kf/sd



MASSACHUSETTS WATER RESOURCES AUTHORITY

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Frederick A. Laskey
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December 12, 2023

Rebecca Tepper, Secretary
Executive Office of Energy and Environmental Affairs
100 Cambridge St, Suite 900
MEPA Office, Nicholas Moreno
Boston, MA 02114

Subject: EOEEA #13117 – Notice of Project Change
Magazine Beach Site Improvements Project, Cambridge, MA

Dear Secretary Tepper,

The Massachusetts Water Resources Authority (MWRA) appreciates the opportunity to comment on the Notice of Project (NPC) submitted by the Massachusetts Department of Conservation and Recreation (the “Proponent” or “DCR”) for Magazine Beach Site Improvements Project (the “Project”) in Cambridge, Massachusetts. Magazine Beach is a multipurpose park within DCR’s Charles River Reservation located on Memorial Drive along the north side of the Charles River.

Section 8(m) of Chapter 372 of the Acts of 1984, MWRA’s Enabling Legislation, allows the MWRA to issue permits to build, construct, excavate, or cross within or near an easement or other property interest held by the MWRA, with the goal of protecting Authority-owned infrastructure. As noted in the NPC, MWRA owns and maintains existing infrastructure in the vicinity of Magazine Beach including sewer interceptors and the Cottage Farm Combined Sewer Overflow Facility. Therefore, as noted in the NPC, an 8(m) permit will be required for the Project. The Proponent should continue to coordinate with Kevin McKenna in the MWRA Water and Wastewater Permitting Group at (617) 305-5956 or Kevin.McKenna@mwra.com for assistance related to this matter. Additionally, MWRA is evaluating potential future projects in the area and seeks continued coordination with the Proponent in this planning process.

MWRA prohibits the discharge of groundwater and stormwater into the sanitary sewer system, pursuant to 360 C.M.R. 10.023(1) except in a combined sewer area when permitted by the Authority and the local community. The Project site has access to separate sewer and storm drain systems. Therefore, the discharge of groundwater or stormwater to the sanitary sewer system associated with this Project is prohibited.

On behalf of the MWRA, thank you for the opportunity to provide comments on this Project. Please do not hesitate to contact Katie Ronan of my staff at (857) 289-1742 with any questions or concerns.

Sincerely,

A handwritten signature in blue ink that reads "Colleen C. Rizzi".

Colleen Rizzi
Director
Environmental and Regulatory Affairs

cc: John Viola, MassDEP
Rich Raiche, City of Somerville

RECEIVED

JAN 16 2024

MASS. HIST. COMM

RC. 32788

APPENDIX A

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD
BOSTON, MASS. 02125
617-727-8470, FAX: 617-727-5128

PROJECT NOTIFICATION FORM

Project Name: Magazine Beach Improvement Project

Location / Address: 686 Memorial Drive
City / Town: Cambridge
Project Proponent
Name: Massachusetts Department of Conservation and Recreation (DCR)
Address: State Transportation Building, 10 Park Plaza Suite 6620
City/Town/Zip/Telephone: Boston, Massachusetts, 02116
Phone: (617) 626-1250

After review of the MHC's files and the materials you submitted, the MHC has determined that the proposed project will have "no adverse effect" on significant historic or archaeological properties.

Brona Simon 2/16/2024

Brona Simon
Executive Director
State Historic Preservation Officer
Massachusetts Historical Commission

Agency license or funding for the project (list all licenses, permits, approvals, grants or other entitlements being sought from state and federal agencies).

<u>Agency Name</u>	<u>Type of License or funding (specify)</u>
Cambridge Conservation Commission	WPA Order of Conditions (MassDEP File No. 123-269) issued on 11/14/16, Extension Order of Conditions granted through 11/23/25;
Massachusetts Department of Environmental Protection	MA DEP Ch.91 License No. 14608 issued on 2/21/18, Amended on 11/20/23.
Massachusetts Executive Office of Energy & Environmental Affairs	MEPA Certificate #13117 issued on 11/12/23, NPC issued on 12/22/23
City of Cambridge	Funding
Magazine Beach Partners	Funding
American Rescue Plan Act of 2021	Funding

Project Description (narrative):

MA DCR is proposing to complete projects at Magazine Beach Park which is located on a 750-foot long section of the Charles River's northern shore in Cambridge. Magazine Beach is located within the Charles River Reservation. This proposal represents Phase 2.2 of a multi-phase revitalization plan begun in 2003. The current phase of work includes:

- Construction of a dock located between the Powder Magazine and Veterans Memorial Swimming Pool;
- Construction of an observation deck between the dock and the boathouse;
- Installation of additional amenities at the Veterans Memorial Swimming Pool including picnic tables and bike racks;
- Repaving and striping of a portion of the existing driveway to provide ADA-accessible parking and installation of pathways;
- Relocation of the overhead utility lines that travel from Memorial Drive to the Powder Magazine building into subsurface conduit;
- Restoration of the river edge, shoreline planting, and vegetation management.

The goals of the proposed project are to restore and improve access to the Charles River within the Park, to provide updated visitor amenities, and to improve site drainage.

Does the project include demolition? If so, specify nature of demolition and describe the building(s) which are proposed for demolition.

Yes. Three picnic tables and associated concrete pads on the lawn located west of the pool will be removed; a portion of the bituminous concrete driveway located west of the pool will be removed; and the lawn will be removed to a depth of 6" – 12," as needed. Overhead utility poles and lines that travel from Memorial Drive to the Powder Magazine building will be removed.

Does the project include rehabilitation of any existing buildings? If so, specify nature of rehabilitation and describe the building(s) which are proposed for rehabilitation.

No.

Does the project include new construction? If so, describe (attach plans and elevations if necessary)

Yes, the proposed project includes new construction and the adaptation of existing features:

- The proposed new dock is "T" shaped in form consisting of an 8' x 40'-6" walkway and a 54' x 18'-6" deck. The dock features wood framing; timber piles one foot in diameter; and a concrete and a granite foundation at the shoreline.
- The west observation deck consists of a 5'-5" x 12'-3" walkway and a 20' x 20'-3" observation deck. The deck features wood framing; timber piles one foot in diameter; and a concrete and granite foundation at the shoreline.
- New benches and picnic tables will be located on new concrete pads to the south and to the east of the existing pool. Benches and picnic tables will be standard DCR in design and will feature wood slats and green painted steel to match existing. An additional bench featuring narrow wood slats will be located on the proposed new deck. A standard DCR bike rack will be installed northeast of the existing pool.
- A portion of the existing driveway just east of the proposed new deck will be repaved and re-lined to provide ADA-accessible parking. A bituminous concrete paved walkway will extend south from the parking area almost to the powder magazine. Curbs will be flush granite. A stone dust path will link the parking area with the new west observation deck; another stone dust path will connect the proposed new bituminous path with the new dock.
- Overhead utility lines will be relocated underground which includes the installation of a 17" deep x 40" wide concrete duct bank installed a minimum depth of 30" below grade and set upon a 6" deep sand bed. The duct bank will span almost from Memorial Drive to the Powder Magazine. Concrete handholds, 4' x 4' x 4', with 36" cat iron covers, will be installed at each end of the duct bank.
- Plantings include trees and shrubs which will be installed at a maximum depth of 12-18" and with a maximum width ground disturbance of 10'. Erosion control blankets will be anchored 6" below grade as needed.
- Seeding and 12" of high use lawn soil will be installed in the location of the excavated lawn to the west of the pool.

APPENDIX A (continued)

To the best of your knowledge, are any historic or archaeological properties known to exist within the project's area of potential impact? If so, specify.

The project area is located within the Charles River Basin Historic District (CAM.AJ), which is listed in the State and National Registers of Historic Places. Contributing resources within the Charles River Basin Historic District and located at Magazine Beach include the Metropolitan District Commission Swimming Pool (CAM.935, now known as Veterans Memorial Pool), Magazine Beach Bath House (CAM.1319, in the location of an 1818 powder magazine), Metropolitan District Commission Chlorination Plant (CAM.1320), and the Boston University Boat House (CAM.1327).

Magazine Beach includes a recorded ancient Native American archaeological site (19-MD-172) included in the MHC's Inventory of Historic and Archaeological Assets of the Commonwealth. However previous (Mair 2001, Kendall Street Interconnection Project; Deaton and Mair 2002, Cottage Farm CSO Storage Project), and recent (Harper 2022, Memorial Drive reconstruction) archaeological investigations, indicates that Magazine Beach possesses low archaeological sensitivity. This low archaeological sensitivity is due to extensive previous disturbance. Previous disturbances include the filling and modification of wetlands on and surrounding the former Captain's Island, and construction and modification of the existing street grid, MWRA sewer main, and structures at Magazine Beach throughout the early modern period. Therefore, in the opinion of DCR cultural resources staff, the project is unlikely to adversely impact intact, significant historic and archaeological resources.

What is the total acreage of the project area?

Woodland _____ acres	Productive Resources:
Wetland <u>0.10</u> acres	Agriculture _____ acres
Floodplain <u>0.17</u> acres	Forestry _____ acres
Open space <u>1.46</u> acres	Mining/Extraction _____ acres
Developed <u>0.90</u> acres	Total Project Acreage _____ acres

What is the acreage of the proposed new construction? N/A acres

What is the present land use of the project area?

Magazine Beach Park is a riverside park that includes an outdoor swimming pool, ball fields, exercise equipment, picnic areas, and other typical urban park features.

What has been the previous land use of the project area?

Magazine Beach was the site of a military powder magazine built on Captain's Island in 1818. The Olmsted firm laid out a park and bathing beach at the filled marshes in 1899, and the public beach remained open for swimming until the 1950s.

Please attach a copy of the section of the USGS quadrangle map which clearly marks the project location.

Attached

This Project Notification Form has been submitted to the MHC in compliance with 950 CMR 71.00.

Priscilla Geigis

1/10/24

Signature of Person Submitting this Form

Date

Name: Priscilla Geigis, Deputy Commissioner
Address: Department of Conservation and Recreation
State Transportation Building
City/Town/Zip: 10 Park Plaza, Suite 6480, Boston, MA 02116
Telephone: 617-626-1250

17

JACK Vaccaro
3 Mill & Main Place, Suite 250
Maynard, MA
01754



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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:
123-269
MassDEP File #
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Cambridge
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A. General Information

Please note:
this form has been modified with added space to accommodate the Registry of Deeds Requirements

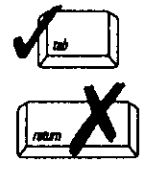
Important:
When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

1. From: Cambridge
Conservation Commission
2. This issuance is for (check one):
a. Order of Conditions b. Amended Order of Conditions
3. To: Applicant:

Matthew a. First Name Sisk b. Last Name
Massachusetts DCR c. Organization
251 Causeway Street, Suite 900 d. Mailing Address
Boston e. City/Town MA f. State 02114 g. Zip Code

4. Property Owner (if different from applicant):
a. First Name _____ b. Last Name _____
c. Organization _____
d. Mailing Address _____
e. City/Town _____ f. State _____ g. Zip Code _____

5. Project Location:
668 Memorial Drive a. Street Address Cambridge b. City/Town
274 c. Assessors Map/Plat Number 1G d. Parcel/Lot Number
Latitude and Longitude, if known: 42d35m52s d. Latitude -71d11m36s e. Longitude





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A. General Information (cont.)

6. Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):
 Middlesex South Ch. 371 Acts of 1929 Sect 2 Clause C
 a. County b. Certificate Number (if registered land)
 4412 169
 c. Book d. Page
7. Dates: 9/9/2016 10/24/2016 11/23/2014
 a. Date Notice of Intent Filed b. Date Public Hearing Closed c. Date of Issuance
8. Final Approved Plans and Other Documents (attach additional plan or document references as needed):
 Complete NOI with Plans
 a. Plan Title
- b. Prepared By c. Signed and Stamped by
- d. Final Revision Date e. Scale
- f. Additional Plan or Document Title g. Date

B. Findings

1. Findings pursuant to the Massachusetts Wetlands Protection Act:

Following the review of the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act (the Act). Check all that apply:

- a. Public Water Supply b. Land Containing Shellfish c. Prevention of Pollution
 d. Private Water Supply e. Fisheries f. Protection of Wildlife Habitat
 g. Groundwater Supply h. Storm Damage Prevention i. Flood Control

2. This Commission hereby finds the project, as proposed, is: (check one of the following boxes)

Approved subject to:

- a. the following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.



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B. Findings (cont.)

Denied because:

- b. the proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect the interests of the Act, and a final Order of Conditions is issued. **A description of the performance standards which the proposed work cannot meet is attached to this Order.**
- c. the information submitted by the applicant is not sufficient to describe the site, the work, or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the Act's interests, and a final Order of Conditions is issued. **A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).**
- 3. Buffer Zone Impacts: Shortest distance between limit of project disturbance and the wetland resource area specified in 310 CMR 10.02(1)(a) _____ a. linear feet

Inland Resource Area Impacts: Check all that apply below. (For Approvals Only)

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. <input checked="" type="checkbox"/> Bank	48 a. linear feet	48 b. linear feet	0 c. linear feet	0 d. linear feet
5. <input checked="" type="checkbox"/> Bordering Vegetated Wetland	1220 a. square feet	1220 b. square feet	1600 c. square feet	1600 d. square feet
6. <input checked="" type="checkbox"/> Land Under Waterbodies and Waterways	35 a. square feet	35 b. square feet	0 c. square feet	0 d. square feet
	0 e. c/y dredged	0 f. c/y dredged		
7. <input checked="" type="checkbox"/> Bordering Land Subject to Flooding	3450 a. square feet	3450 b. square feet	3500 c. square feet	3500 d. square feet
Cubic Feet Flood Storage	_____ e. cubic feet	_____ f. cubic feet	_____ g. cubic feet	_____ h. cubic feet
8. <input type="checkbox"/> Isolated Land Subject to Flooding	_____ a. square feet	_____ b. square feet		
Cubic Feet Flood Storage	_____ c. cubic feet	_____ d. cubic feet	_____ e. cubic feet	_____ f. cubic feet
9. <input checked="" type="checkbox"/> Riverfront Area	45,000 a. total sq. feet	45,000 b. total sq. feet		
Sq ft within 100 ft	4670 c. square feet	4670 d. square feet	4670 e. square feet	4670 f. square feet
Sq ft between 100-200 ft	_____ g. square feet	_____ h. square feet	_____ i. square feet	_____ j. square feet



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B. Findings (cont.)

Coastal Resource Area Impacts: Check all that apply below. (For Approvals Only)

	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
10. <input type="checkbox"/> Designated Port Areas	Indicate size under Land Under the Ocean, below			
11. <input type="checkbox"/> Land Under the Ocean	_____	_____		
	a. square feet	b. square feet		
	_____	_____		
	c. c/y dredged	d. c/y dredged		
12. <input type="checkbox"/> Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below			
13. <input type="checkbox"/> Coastal Beaches	_____	_____	_____ cu yd	_____ cu yd
	a. square feet	b. square feet	c. nourishment	d. nourishment
14. <input type="checkbox"/> Coastal Dunes	_____	_____	_____ cu yd	_____ cu yd
	a. square feet	b. square feet	c. nourishment	d. nourishment
15. <input type="checkbox"/> Coastal Banks	_____	_____		
	a. linear feet	b. linear feet		
16. <input type="checkbox"/> Rocky Intertidal Shores	_____	_____		
	a. square feet	b. square feet		
17. <input type="checkbox"/> Salt Marshes	_____	_____	_____	_____
	a. square feet	b. square feet	c. square feet	d. square feet
18. <input type="checkbox"/> Land Under Salt Ponds	_____	_____		
	a. square feet	b. square feet		
	_____	_____		
	c. c/y dredged	d. c/y dredged		
19. <input type="checkbox"/> Land Containing Shellfish	_____	_____	_____	_____
	a. square feet	b. square feet	c. square feet	d. square feet
20. <input type="checkbox"/> Fish Runs	Indicate size under Coastal Banks, Inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above			
	_____	_____		
	a. c/y dredged	b. c/y dredged		
21. <input type="checkbox"/> Land Subject to Coastal Storm Flowage	_____	_____		
	a. square feet	b. square feet		
22. <input type="checkbox"/> Riverfront Area	_____	_____		
	a. total sq. feet	b. total sq. feet		
Sq ft within 100 ft	_____	_____	_____	_____
	c. square feet	d. square feet	e. square feet	f. square feet
Sq ft between 100-200 ft	_____	_____	_____	_____
	g. square feet	h. square feet	i. square feet	j. square feet



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B. Findings (cont.)

* #23. If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.5.c (BVW) or B.17.c (Salt Marsh) above, please enter the additional amount here.

23. Restoration/Enhancement *:

a. square feet of BVW

b. square feet of salt marsh

24. Stream Crossing(s):

a. number of new stream crossings

b. number of replacement stream crossings

C. General Conditions Under Massachusetts Wetlands Protection Act

The following conditions are only applicable to Approved projects.

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
 - a. The work is a maintenance dredging project as provided for in the Act; or
 - b. The time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
 - c. If the work is for a Test Project, this Order of Conditions shall be valid for no more than one year.
5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order. An Order of Conditions for a Test Project may be extended for one additional year only upon written application by the applicant, subject to the provisions of 310 CMR 10.05(11)(f).
6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not extend the issuance date of the original Final Order of Conditions and the Order will expire on 3 years after date of signatures unless extended in writing by the Department.
7. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.



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C. General Conditions Under Massachusetts Wetlands Protection Act

8. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.
9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work.
10. A sign shall be displayed at the site not less than two square feet or more than three square feet in size bearing the words,

"Massachusetts Department of Environmental Protection" [or, "MassDEP"]
"File Number 123-269 .."
11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before MassDEP.
12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.
13. The work shall conform to the plans and special conditions referenced in this order.
14. Any change to the plans identified in Condition #13 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.
15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.
16. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.



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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.
18. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.
19. The work associated with this Order (the "Project")
- (1) is subject to the Massachusetts Stormwater Standards
- (2) is NOT subject to the Massachusetts Stormwater Standards

If the work is subject to the Stormwater Standards, then the project is subject to the following conditions:

- a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Construction General Permit as required by Stormwater Condition 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.
- b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that:
- i.* all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures;
 - ii.* as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized;
 - iii.* any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10;



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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

iv. all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition;

v. any vegetation associated with post-construction BMPs is suitably established to withstand erosion.

c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 18(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement") for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMP Operation and Maintenance Plan ("O&M Plan") and certifying the following:

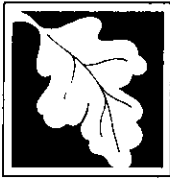
i.) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and

ii.) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.

d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Multi-Sector General Permit.

e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 18(f) through 18(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 18(f) through 18(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.

f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.



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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

- g) The responsible party shall:
 - 1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
 - 2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
 - 3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.

- h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.
- i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.
- j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.
- k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.
- l) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

Special Conditions (if you need more space for additional conditions, please attach a text document):
See Attachment

20. For Test Projects subject to 310 CMR 10.05(11), the applicant shall also implement the monitoring plan and the restoration plan submitted with the Notice of Intent. If the conservation commission or Department determines that the Test Project threatens the public health, safety or the environment, the applicant shall implement the removal plan submitted with the Notice of Intent or modify the project as directed by the conservation commission or the Department.



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D. Findings Under Municipal Wetlands Bylaw or Ordinance

1. Is a municipal wetlands bylaw or ordinance applicable? Yes No

2. The _____ hereby finds (check one that applies):

Conservation Commission

a. that the proposed work cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw, specifically:

1. Municipal Ordinance or Bylaw

2. Citation

Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order of Conditions is issued.

b. that the following additional conditions are necessary to comply with a municipal ordinance or bylaw:

1. Municipal Ordinance or Bylaw

2. Citation

3. The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.

The special conditions relating to municipal ordinance or bylaw are as follows (if you need more space for additional conditions, attach a text document):



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:
123-269
MassDEP File #
eDEP Transaction #
Cambridge
City/Town

E. Signatures

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

11/23/2014
1. Date of Issuance

Please indicate the number of members who will sign this form.

4
2. Number of Signers

This Order must be signed by a majority of the Conservation Commission.

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

Signatures:

[Signature]
Dorothy A. Pett
Adam L. Simmons

[Signature]
Edward W. Pulvering
[Signature]

by hand delivery on

by certified mail, return receipt requested, on 11/23/2014

Date

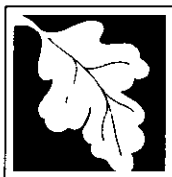
Date

F. Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate MassDEP Regional Office to issue a Superseding Order of Conditions. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request for Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Any appellants seeking to appeal the Department's Superseding Order associated with this appeal will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order, or providing written information to the Department prior to issuance of a Superseding Order.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40), and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal ordinance or bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
123-269
MassDEP File #
eDEP Transaction #
Cambridge
City/Town

G. Recording Information

Prior to commencement of work, this Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

Cambridge
Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

Cambridge
Conservation Commission

Please be advised that the Order of Conditions for the Project at:

668 Memorial Drive
Project Location

123-269
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

DEP File #123-269

**Magazine Beach – Landscape and Structural Enhancements
Memorial Drive along the Charles River
Cambridge, MA**

Notice of Intent Submittal:

September 9, 2016 – Notice of Intent Package including but not limited to WPA Form 3 and associated narrative with drawings and calculations

Cambridge Conservation Commission Actions:

September 26, 2016 – Public Hearing was duly advertised and held; the Commission and the Proponents agreed to schedule a site walk and continue the hearing until October.

October 4, 2016 – Site walk was duly advertised and held; members of the Commission as well as the public were in attendance.

October 24, 2016 – Public Hearing was duly advertised and held; the Commission unanimously issued an Order of Conditions with Special Conditions

Special Conditions:

18. Work shall conform to the Notice of Intent under the Massachusetts Wetlands Protection Act, M.G.L. ch. 131, sec. 40, submitted to the Cambridge Conservation Commission on **September 9, 2016**. Specifically, the proposed work shall conform to the most recent revisions to the Notice of Intent document and plans, received by the Commission as stated above.
19. Any further proposed or executed changes in the plans approved under this Order shall require the applicant to seek an amended Order of Conditions or to file a new Notice of Intent, or to inquire of the Cambridge Conservation Commission in writing whether the change or changes is/are substantial enough to require a new filing. Any errors in the plans or information by the applicant shall be considered changes and the above procedures shall be followed.
20. Prior to any work on the site, the applicant shall record this Order of Conditions at the Middlesex Registry of Deeds pursuant to Condition 8. Failure to do so shall be deemed cause to revoke this Order.
21. The applicant shall provide to the Conservation Commission copies of all other permits, variances, licenses or determinations which may be necessary for this project by other local, state and federal agencies, such as the Chapter 91 License, NPDES permit, Water Quality Certificate, Army Corps of Engineers permit, MEPA Certificate, building permits, and zoning board approvals. The applicant shall provide copies of all applicable permits to the Commission at least 2 weeks prior to commencement of work authorized under any such permit.
22. This Order of Conditions shall be included in all construction contracts and subcontracts dealing with ~~the work~~ proposed and shall supersede all conflicting contract requirements that are less protective of Wetland Resource Areas.

23. The applicant is responsible for submitting the 100% construction documents to the Commission.
24. The applicant and its contractor shall keep at least one copy of this Order at the project site until a Certificate of Compliance is issued for the project. The copy of the Order shall be kept at a location mutually acceptable to the applicant and the Commission, so that the order will be available for review during regular working hours. The sign with the DEP File Number for this project, required in condition 9, on DEP Form 5, shall remain posted at the site until a Certificate of Compliance is issued for this project.
25. All erosion control measures shall be installed before work commences and kept in working conditions until all areas are stabilized. After installation, a site visit shall be arranged with the Director to ensure that installation meets the intended standards.
26. The applicant or its agent shall specify to the Commission, prior to commencement of activity on the site, the name and telephone number of the person(s) designated by the applicant to be responsible for compliance with the conditions of this Order on the site and his/her alternate.
27. Prior to initiation of work on the site, the applicant shall convene a pre-construction site meeting with the Director of the Commission, a representative of the contractor performing the work, and the person responsible for compliance.
28. The applicant shall provide 72 hours written notice to the Commission prior to commencement of activity on the site.
29. The applicant shall provide to the Conservation Commission copies of project inspection reports during construction including but not limited to maintenance and operation and vegetation monitoring.
30. The applicant shall submit construction documents for approval by the Conservation Commission. These documents may be stand-alone or may be incorporated into a single document. The documents include but are not limited to the following:
 - Pollution Prevention Plan;
 - Soil Management Plan;
 - Sedimentation and Erosion Control Plan;
 - Dewatering Plan; and
 - Final Vegetation and Restoration Plan
31. The applicant shall submit a stand-alone copy of the Operation and Maintenance Plan to the Conservation Commission as approved in the Notice of Intent.
32. The members and agents of the Conservation Commission shall have the right to enter the site to verify compliance with this Order and to require the submittal of additional data deemed necessary by the Commission for that verification. The

Commission understands that construction-site safety procedures must be followed during site visits.

33. During project construction and operations the applicant or its contractors shall provide and maintain free and safe passage by pedestrians and bicyclists along the roads or walkways adjacent to the site.
34. If some unexpected or unforeseen event occurs, that needs to be addressed, all work shall stop until the event can be brought to the attention of the Director of the Commission and a decision made by the Director as to whether it needs to be brought before the Commission.
35. Prior to the use of herbicides, pesticides and/or fertilizer to aid in the planting plan and vegetation management, the applicant and/or representative must submit a proposal to be approved by the Commission including but not limited to a delineation of the subject area, reason for proposed application, chemicals to be used (including MSDS sheets), and all applicator licenses if needed.
36. The applicant shall take appropriate steps to insure that existing trees not to be removed are adequately protected at the perimeter of their dripline to prevent injury.
37. If a workday commences with heavy rain, no work shall take place in the buffer zone or resource area that day. If heavy rain commences after start of work, all work shall cease in the buffer zone or resource area for that day, and appropriate sedimentation and erosion control shall be in place, to prevent any sedimentation to the river and other resource areas.
38. All disturbed areas shall be stabilized during and after construction to prevent erosion and sedimentation. Upon completion of construction, all disturbed areas will be immediately stabilized, with mulching, planting or other means to prevent erosion, as specified in the project's Notice of Intent and Stormwater Management Plan. The project proponents are responsible for providing semi-annual reports to the Commission. Site landscaping in accordance with the Landscape and Planting Plan and the Operation and Maintenance Plan shall commence as soon as possible after construction is complete.
39. At the completion of work and after three growing seasons, a request for a certificate of compliance may be submitted to the Conservation Commission along with the following: An as-built plan prepared, signed, stamped and dated by a registered professional engineer or land surveyor and color photographs of the site. The photographs shall be labeled, dated and keyed to the as-built plans for ready identification. A report from a botanist or certified arborist is to be submitted, certifying that all replacement trees are alive and vigorous.
40. A Long-Term Vegetation Maintenance Plan must be submitted and approved by the Commission prior to the issuance of a Certificate of Compliance.

41. All structures and equipment used for temporary stormwater management during construction, such as silt curtain/hay-bale fences, silt booms, debris screens, and catch basins, shall be maintained in good working condition at all times. These structures shall be inspected weekly on a regular basis, and immediately after rainstorms or snowmelt events, and repaired and/or cleaned if necessary.
42. No untreated construction runoff shall be routed directly into any Wetlands Resource Area, surface water, or storm drain. Runoff and other discharges from construction areas shall be routed to sedimentation/erosion control structures or allowed to flow over land in a direction away from Wetlands Resource Areas at all times during construction.
43. The applicant, contractor, owner, successor or assignees shall be responsible for ensuring the lasting integrity of the surface cover on the site and site activities so as to prevent erosion, siltation, sedimentation, chemical contamination or other detrimental impact to the on-site and/or off-site resource areas so as to comply with this Order and the Wetlands Protection Act.
44. All drainage structures constructed per this Order shall be inspected and maintained as described in the applicant's approved Operation and Maintenance Plan, except as outlined in this Order. This condition shall remain in effect in perpetuity and shall not expire with a Certificate of Compliance for the project.
45. All soil stockpiling shall occur outside of resource areas, and refueling and maintenance activities during construction shall occur within a defined area outside of wetland resource areas and their buffer zones. A plan showing this defined area shall be submitted to the Commission prior to initiation of work on the site.
46. The applicant shall be prepared to effectively deal with spillage of fuel or hydraulic fluids from equipment. A quick-absorbent material, such as "Speedi Dry" or equivalent, shall be stored in a dry, readily available area and used in the event petroleum-based fluids are spilled or leaked. The spent material is then to be containerized and disposed of properly. Any release of fuel or lubricants at the work site shall be reported to the Commission immediately. There shall be no discharge or spillage of fuel, oil, or any other pollutant into any Wetland Resource Area.
47. No construction material debris, other debris or refuse from construction workers shall be allowed to enter or remain in any resource area. Any debris entering these areas must be removed immediately by hand.
48. The applicant shall take appropriate steps to control dust at the project site and prevent its spread by trucks leaving the site.
49. Trucks entering and leaving the site shall have their loads completely covered in compliance with M.G.L. Chapter 85 section 36. The applicant shall also instruct all

drivers on site that vehicles shall not idle for longer than 5 minutes in compliance with M.G.L. Chapter 90 section 16A.

50. A written report shall be submitted monthly detailing the day and time of sweeping and location of sweeping, to the Commission office.
51. There shall be no use of sodium de-icing agents on the site. The applicant shall submit to the Commission and the DPW a plan that identifies the method of de-icing which will have the least impact on water quality and function of pervious pavement areas.
52. The applicant must submit confirmation that the City Engineer has reviewed and approved the stormwater calculations and design prior to the start of work if necessary.
53. Prior to installing any plant material, a final landscaping plan must be submitted and reviewed by the Conservation Commission.



DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

September 23, 2024

Regulatory Division
File Number: NAE-2022-02546

Joseph Silveira
Massachusetts Department of Conservation and Recreation
10 Park Plaza Suite 6620
Boston, Massachusetts 02116
(Via Email): Joseph.Silveira@mass.gov

Dear Joseph Silveira:

This regards your application submitted to the U.S. Army Corps of Engineers (USACE) to permanently impact 1780 square feet of area within the Charles River and temporarily impact 2,915 square feet of wetlands adjacent to the river for the purposes of installing a pier, an observation deck, conduct invasive plant species control within the wetlands, and install coir logs for riverbank stabilization. The observation deck will be 20.25 feet X 20 feet (405 square feet). The deck will be accessed by a 12.25 feet X 5.42 feet walkway (67 square feet). The viewing deck will be anchored by 15 helical anchor piles. The pier will be 18.25 feet X 54 feet (985.5 square feet). The pier will be accessed by 8 feet X 40.5 feet walkway (324 square feet). The pier and its walkway will be anchored by 35 12-inch timber piles. The piles will be installed via impact hammer. Turbidity curtains will be installed for the duration of all in-water work. Within the 2,915 square feet of wetlands, herbicides will be used on invasive species via cut and apply method. Bubble curtains will be installed in the river to minimize the impact and spread of injurious sound pressure waves. The project is located in the Charles River, 668 Memorial Drive, Cambridge, Massachusetts 02139 at site coordinates 42.356772, - 71.116082. The work is shown on the enclosed plans titled "Commonwealth of Massachusetts Department of Conservation and Recreation Magazine Beach Improvement Project PCN Application" on 13 sheets and dated "2023.12.21".

Based on the information that you have provided, we verify that the activity is authorized under General Permit # 4 and # 9 of the June 2, 2023, federal permit known as the Massachusetts General Permits (GPs). The GPs are available at <https://www.nae.usace.army.mil/Missions/Regulatory/State-General-Permits/Massachusetts-General-Permit>.

Please review the enclosed GPs carefully, in particular the general conditions beginning on page 35, and ensure that you and all personnel performing work authorized by the GPs are fully aware of and comply with its terms and conditions. A copy of the GPs and this verification letter shall be available at the work site as required by General Condition 17. You must perform this work in compliance with the following special

condition(s):

- 1) You must complete and return the enclosed Work Start Notification Form to this office at least two weeks before the anticipated start date. The form shall be emailed to Maninder Singh at Maninder.Singh@usace.army.mil and cenae-r@usace.army.mil; or mailed to Maninder Singh, Regulatory Division, U.S. Army Corps of Engineers, New England District, 696 Virginia Road, Concord, Massachusetts 01742-2751.
- 2) You must complete and return the enclosed Compliance Certification Form to this office within one month of the completion of work. The form shall be emailed to Maninder Singh at Maninder.Singh@usace.army.mil and cenae-r@usace.army.mil; or mailed to Maninder Singh, Regulatory Division, U.S. Army Corps of Engineers, New England District, 696 Virginia Road, Concord, Massachusetts 01742-2751.
- 3) Impact pile driving shall commence with an initial set of three strikes by the hammer at 40% energy, followed by a one-minute wait period, then two subsequent 3-strike sets at 40% energy, with one minute waiting periods, before initiating continuous impact driving. In addition to using a soft start at the beginning of the workday for pile driving, a soft start must also be used at any time following a cessation of pile driving for a period of 30 minutes or longer.
- 4) Time of the Year (TOY) restrictions shall be applied from February 15th to July 15th and from September 1st to November 15th of any year. No in-water work shall take place within the TOY period. TOY restrictions will be waived if the turbidity curtains are installed one week prior to the beginning of the TOY period.
- 5) If the work is going to take place within the TOY period of any year, then the turbidity curtains shall be installed one week prior to the beginning of the TOY period and shall be maintained in working condition for the duration of all in-water work.

This authorization expires on June 1, 2028. You must commence or have under contract to commence the work authorized herein by June 1, 2028, and complete the work by June 1, 2029. If not, you must contact this office to determine the need for further authorization and we recommend you contact us *before* the work authorized herein expires. Please contact us immediately if you change the plans or construction methods for work within our jurisdiction as we must approve any changes before you undertake them. Performing work within our jurisdiction that is not specifically authorized by this determination or failing to comply with the special condition(s)

provided above or all the terms and conditions of the GPs may subject you to the enforcement provisions of our regulations.

This authorization does not obviate the need to obtain other federal, state, or local authorizations required by law. Applicants are responsible for applying for and obtaining any other approvals.

Your project is located within, or may affect resources within, the coastal zone. The Massachusetts Office of Coastal Zone Management (CZM) has already determined that no further Federal Consistency Review is required.

We continually strive to improve our customer service. To better serve you, we would appreciate your completing our Customer Service Survey located at <https://regulatory.ops.usace.army.mil/customer-service-survey>.

Please contact Maninder Singh of my staff at (978) 318-8967 or (978)-257-6884 or Maninder.Singh@usace.army.mil if you have any questions.

Sincerely,

Paul Maniccia

Paul Maniccia
Chief, Massachusetts Section
Regulatory Division

Enclosures:

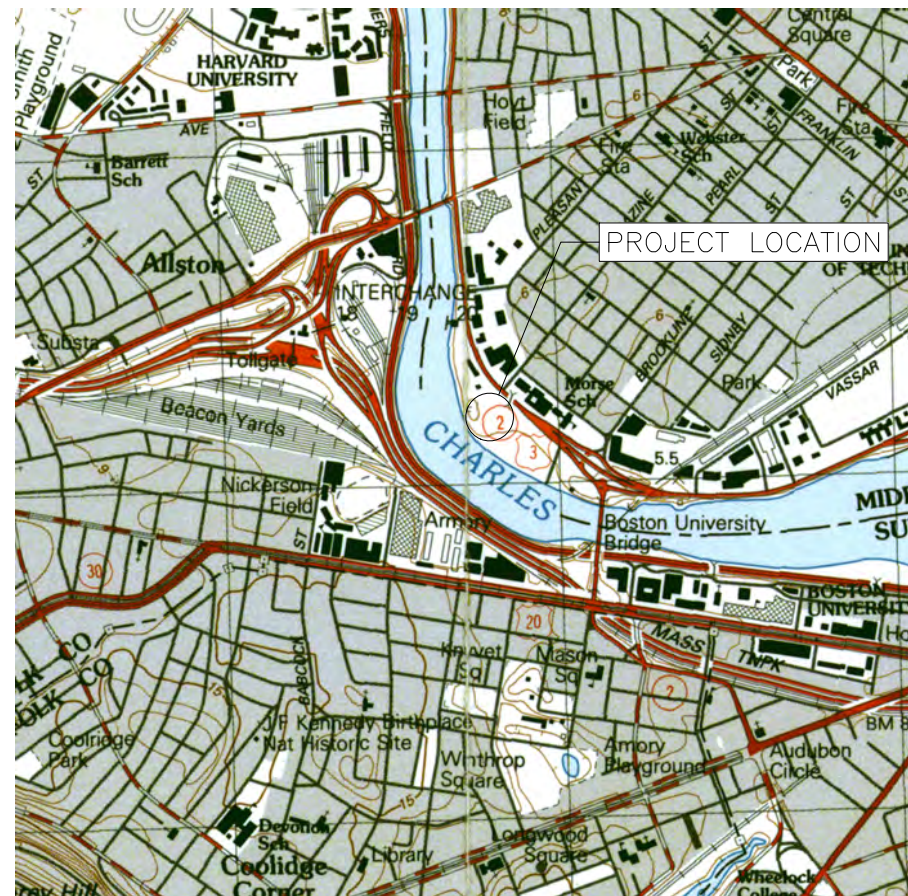
Shane Lougee, Stantec, Shane.Lougee@stantec.com
Ed Reiner, U.S. EPA, Region 1, Boston, MA, reiner.ed@epa.gov
Rachel Croy, U.S. EPA, Region 1, Boston, MA, croy.rachel@epa.gov
Kaitlyn Shaw, NMFS, Gloucester, MA; kaitlyn.shaw@noaa.gov
Alexa Cacacie, NMFS, Gloucester, MA; alexa.cacacie@noaa.gov
Sean Duffey, Coastal Zone Management, Boston, MA, sean.duffey@mass.gov
Patrice Bordonaro, Coastal Zone Management, Boston, MA,
patrice.bordonaro@mass.gov
Jill Provencal, DEP NERO, Wetland and Waterways, Wilmington, MA;
jill.provencal@state.ma.us
Kristin Divris, DEP NERO, Wetland and Waterways, Wilmington, MA;
Kristin.Divris@mass.gov
Philip Di Pietro, DEP NERO, Wetland and Waterways, Wilmington, MA;
philip.dipietro@mass.gov
David Robinson, MA Board of Underwater Archaeological Resources (BUAR);
david.s.robinson@mass.gov
Cambridge Conservation Commission, jletourneau@cambridge.ma.gov

Commonwealth of Massachusetts

Department of Conservation and Recreation

Magazine Beach Improvement Project PCN Application

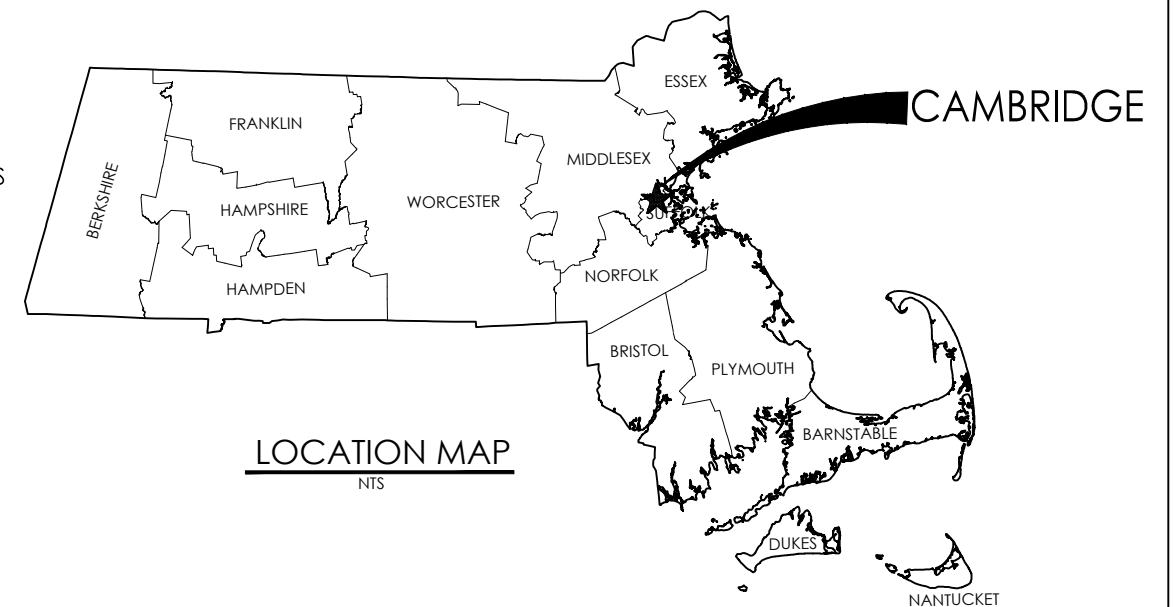
Charles River Reservation, Cambridge, Massachusetts



INDEX OF SHEETS

FIGURE NO.	TITLE
1	COVER SHEET
2	EXISTING CONDITIONS PLAN
3	ABUTTING PARCELS
4	EROSION AND SEDIMENTATION CONTROLS
5	PROPOSED CONDITION PLAN - OVERALL
6	PROPOSED CONDITION PLAN - WEST OBSERVATION DECK
7	PROPOSED CONDITION PLAN - DOCK
8	DOCK PLANS
9	WEST OBSERVATION DECK PLAN
10	DOCK & WEST OBSERVATION DECK SECTIONS & DETAILS
11	SECTIONS & DETAILS
12	LANDSCAPE PLANTING NOTES AND DETAILS
13	EROSION AND SEDIMENTATION CONTROL NOTES AND DETAILS

Pre-Construction
Notification to U.S. Army
Corps of Engineers

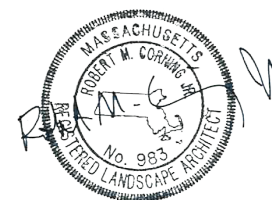


LOCATION MAP
NTS

LOCUS
NTS

Notes

- The survey was conducted by Meridian Associates, Inc. on March 30 - April 4, 2007; June 6-29, 2016; and August 1, 2018.
- Elevations are in feet and tenths and refer to the North American Vertical Datum of 1988 (NAVD88).
- Ordinary high water (OHW) and ordinary low water (OLW) elevations for the Charles River are based on the USGS Annual Water Data Report for above the Charles River Dam from 2013 and are converted to NAVD88.
- Vegetated wetlands were delineated as Bordering Vegetated Wetlands by Epsilon Associates, Inc for the Massachusetts Wetlands Protection Act.
- FEMA 100-year floodplain was based on Zone AE of Panels 25017C0576E (eff. 6/4/2020) and 25025C0076G (eff. 9/25/2009).



Client/Project

Commonwealth of Massachusetts
Department of Conservation and Recreation
Magazine Beach Improvement Project PCN
Application, Charles River Reservation
Cambridge, Massachusetts
Project No.
210400033

Title

COVER SHEET

Revision

-

Reference Sheet

Date

2023.12.21

Sheet No.

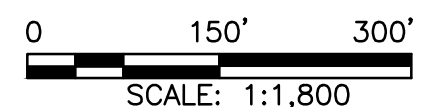
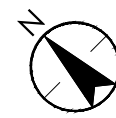
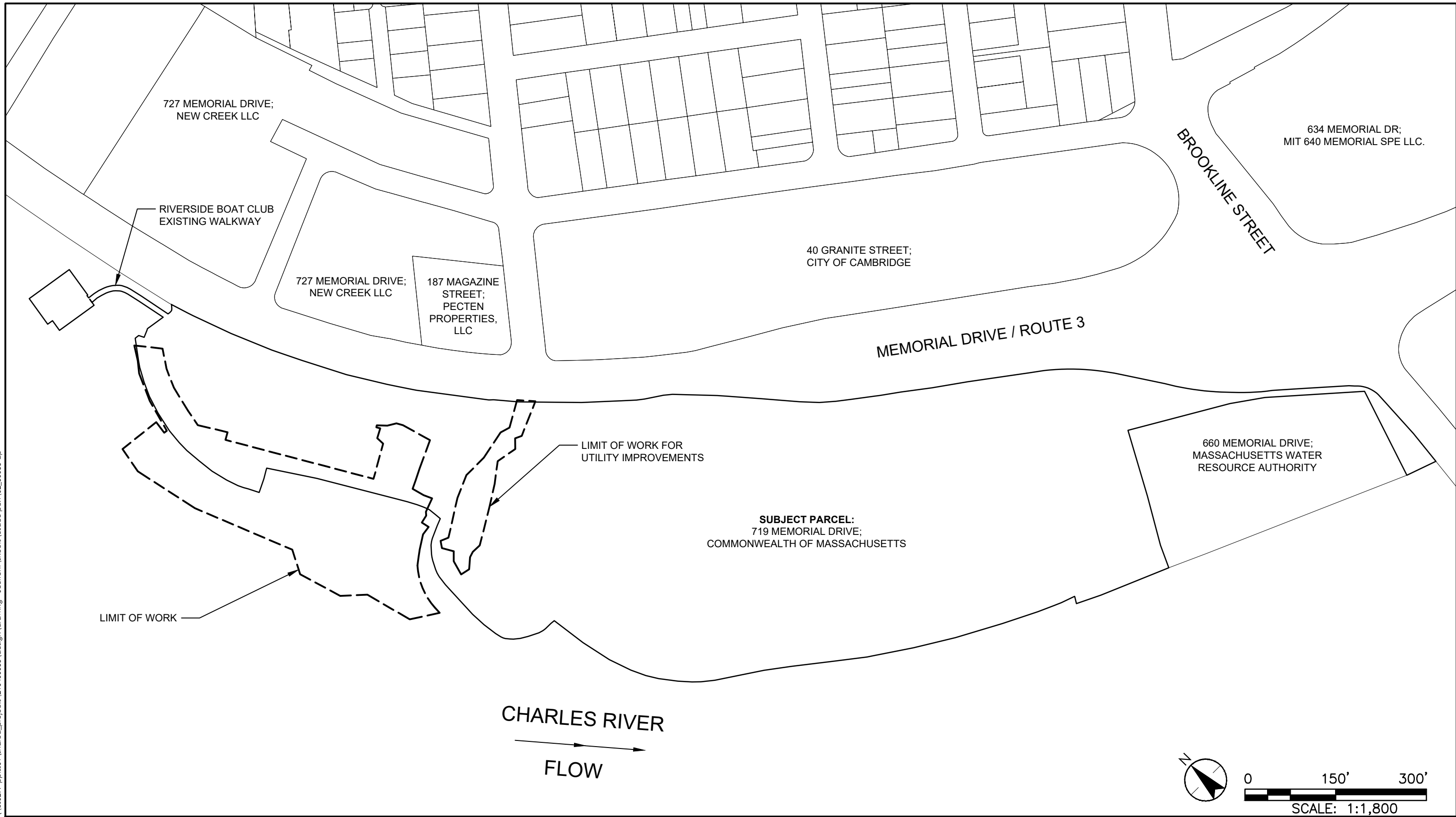
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Stantec
40 Water Street, Third Floor
Boston, Massachusetts 02109-3604
Tel: +1.617.234.3100
www.stantec.com

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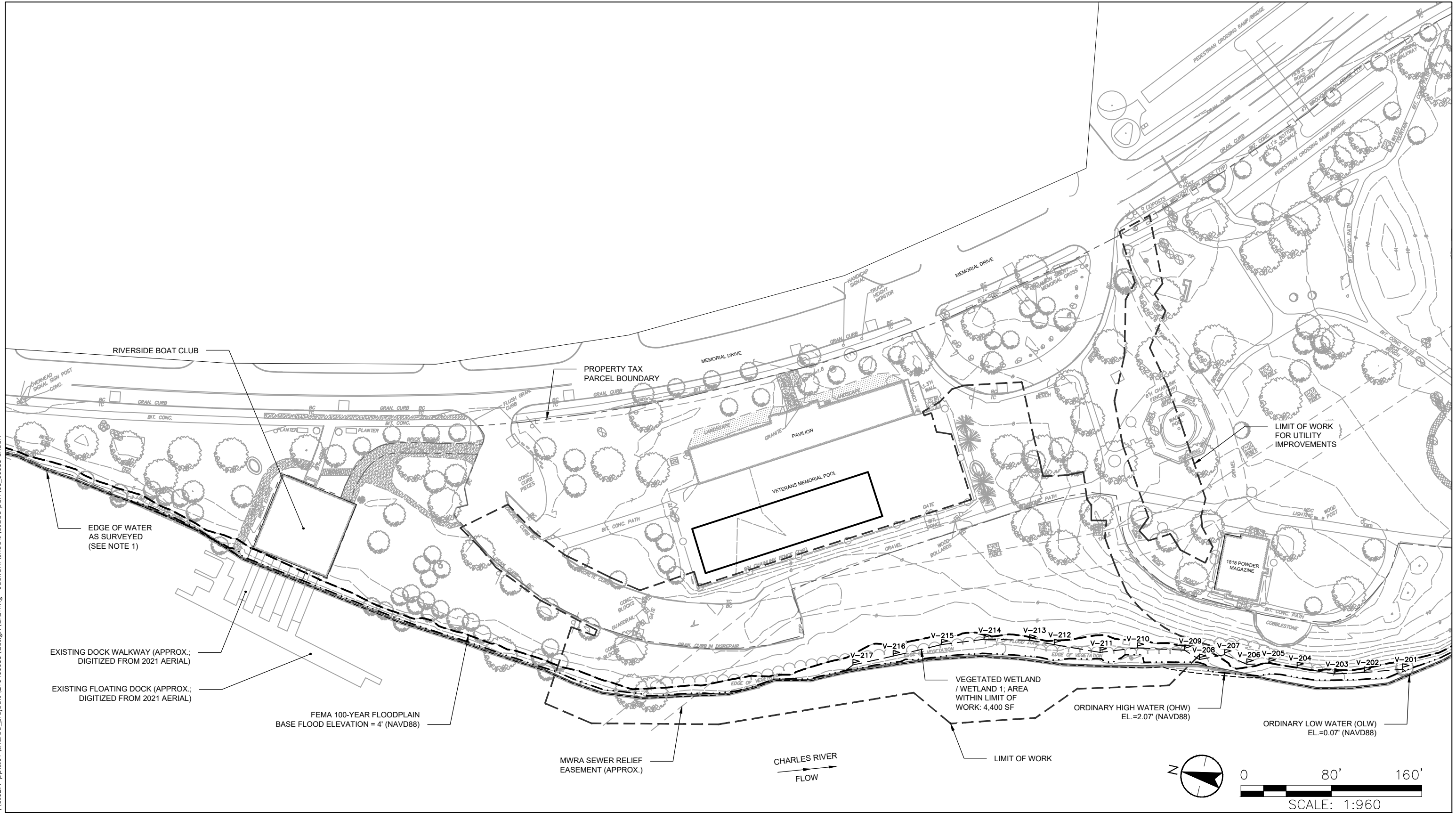
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Commonwealth of Massachusetts
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Magazine Beach Improvement Project PCN
Application, Charles River Reservation
Cambridge, Massachusetts
Project No.
210400033

Title ABUTTING PARCELS	
Revision -	Date 2023.12.21
Reference Sheet	Sheet No. 2

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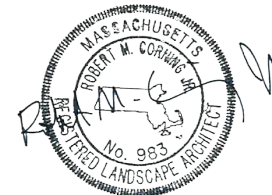
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Client/Project

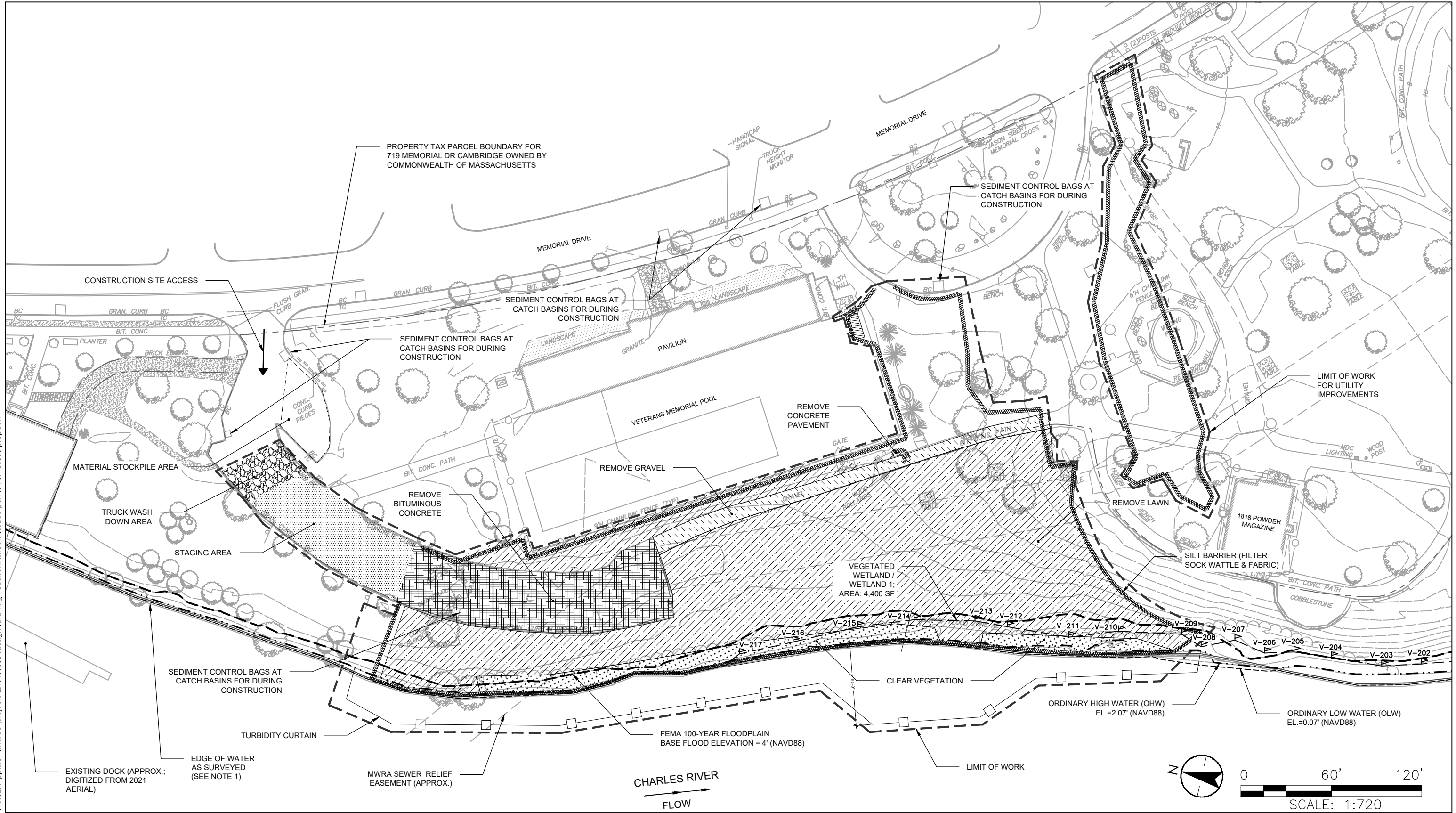
Commonwealth of Massachusetts
Department of Conservation and Recreation
Magazine Beach Improvement Project PCN
Application, Charles River Reservation
Cambridge, Massachusetts
Project No.
210400033

Title

EXISTING CONDITIONS
PLAN

Revision	Date
-	2023.12.21
Reference Sheet	Sheet No.
	3

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Boston, Massachusetts 02109-3604
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Notes

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Magazine Beach Improvement Project PCN
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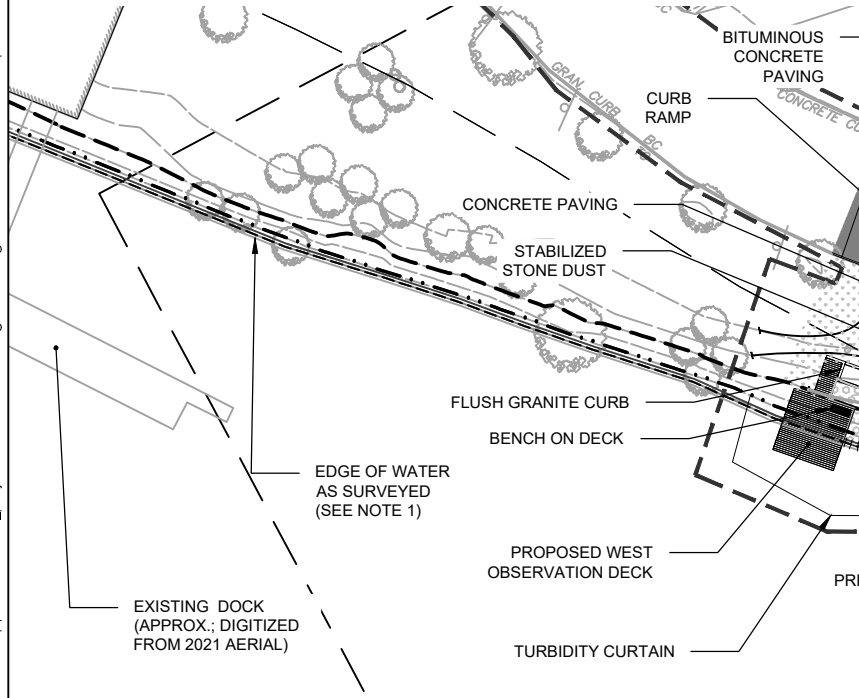
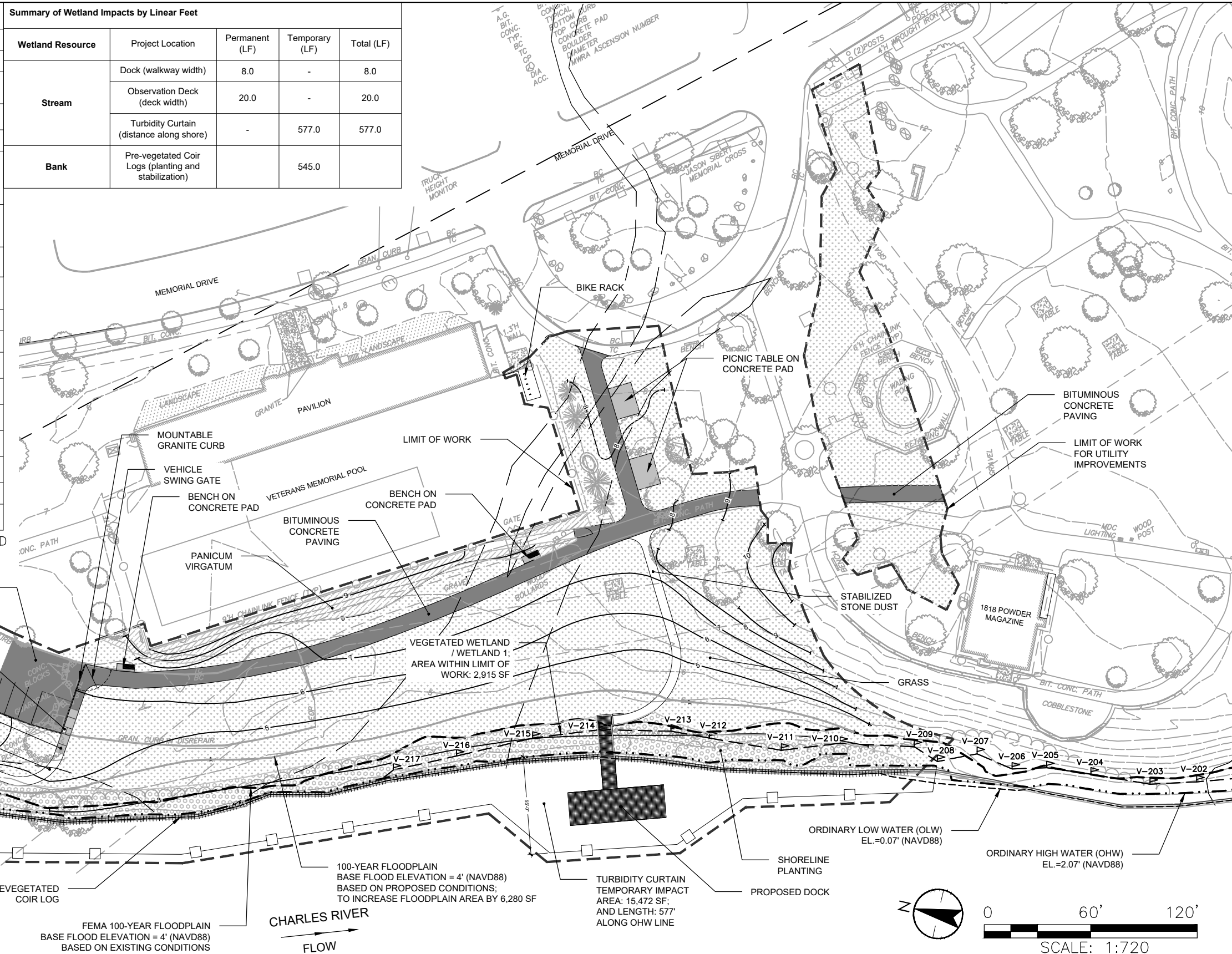
Title EROSION AND SEDIMENTATION CONTROLS	
Revision -	Date 2023.12.21
Reference Sheet	Sheet No. 4

Summary of Wetland Resource Impacts by Area				
Wetland Resource	Project Location	Permanent (SF)	Temporary (SF)	Total (SF)
Stream/River	Dock (pilings)	27.5	-	27.5
	Observation Deck (helical anchors)	0.7	-	0.7
	Turbidity Curtain Area	-	15,472.0	15,472.0
Vegetated Wetlands	Dock (landward pilings)	3.1	-	3.1
	Wetlands Vegetation Management (invasive species control and replanting)	-	2,915	2,915
Bank	Pre-vegetated Coir Logs (planting and stabilization)	-	545 LF	545 LF
Total		31.3	18,387 SF; 545 LF	18,418.3 SF; 545 LF

Summary of Wetland Impacts by Linear Feet				
Wetland Resource	Project Location	Permanent (LF)	Temporary (LF)	Total (LF)
Stream	Dock (walkway width)	8.0	-	8.0
	Observation Deck (deck width)	20.0	-	20.0
	Turbidity Curtain (distance along shore)	-	577.0	577.0
Bank	Pre-vegetated Coir Logs (planting and stabilization)	-	545.0	545.0

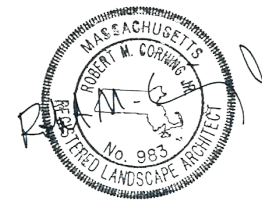
Summary of Indirect/Secondary Impacts			
Wetland Resource	Project Location	Unit	Permanent
Stream	Dock (shading)	SF	1,168.0
	Observation Deck (shading)	SF	260.0
	Dock pilings and caps in water column	CY	3.7
	Observation Deck helical anchors in water column	CY	0.0
	Dock pilings below mudline	CY	39.7
	Observation Deck helical anchors below mudline	CY	0.5
Vegetated Wetlands	Dock walkway (shading)	SF	100.0
	Deck walkway (shading)	-	-

NOTE: CONSTRUCTION ESTIMATED TO BEGIN ON AUGUST 19, 2024 AND END ON MAY 1, 2025 (255 DAYS).



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- Notes
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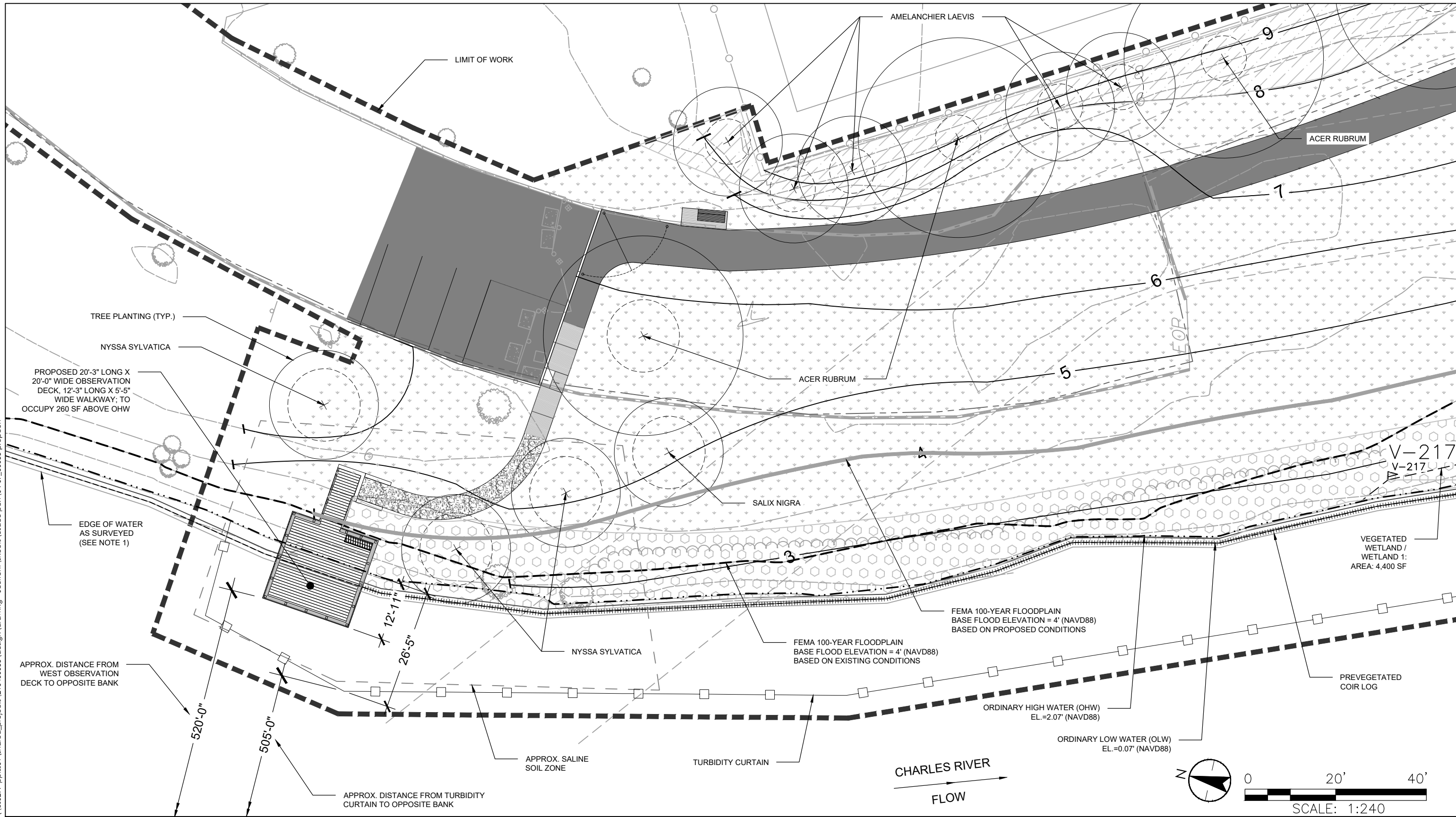
Client/Project
Commonwealth of Massachusetts
Department of Conservation and Recreation
Magazine Beach Improvement Project PCN
Application, Charles River Reservation
Cambridge, Massachusetts
Project No.
210400033

Title
PROPOSED CONDITIONS
PLAN - OVERALL

Revision	Date
-	2024.04.03
Reference Sheet	Sheet No.
	5

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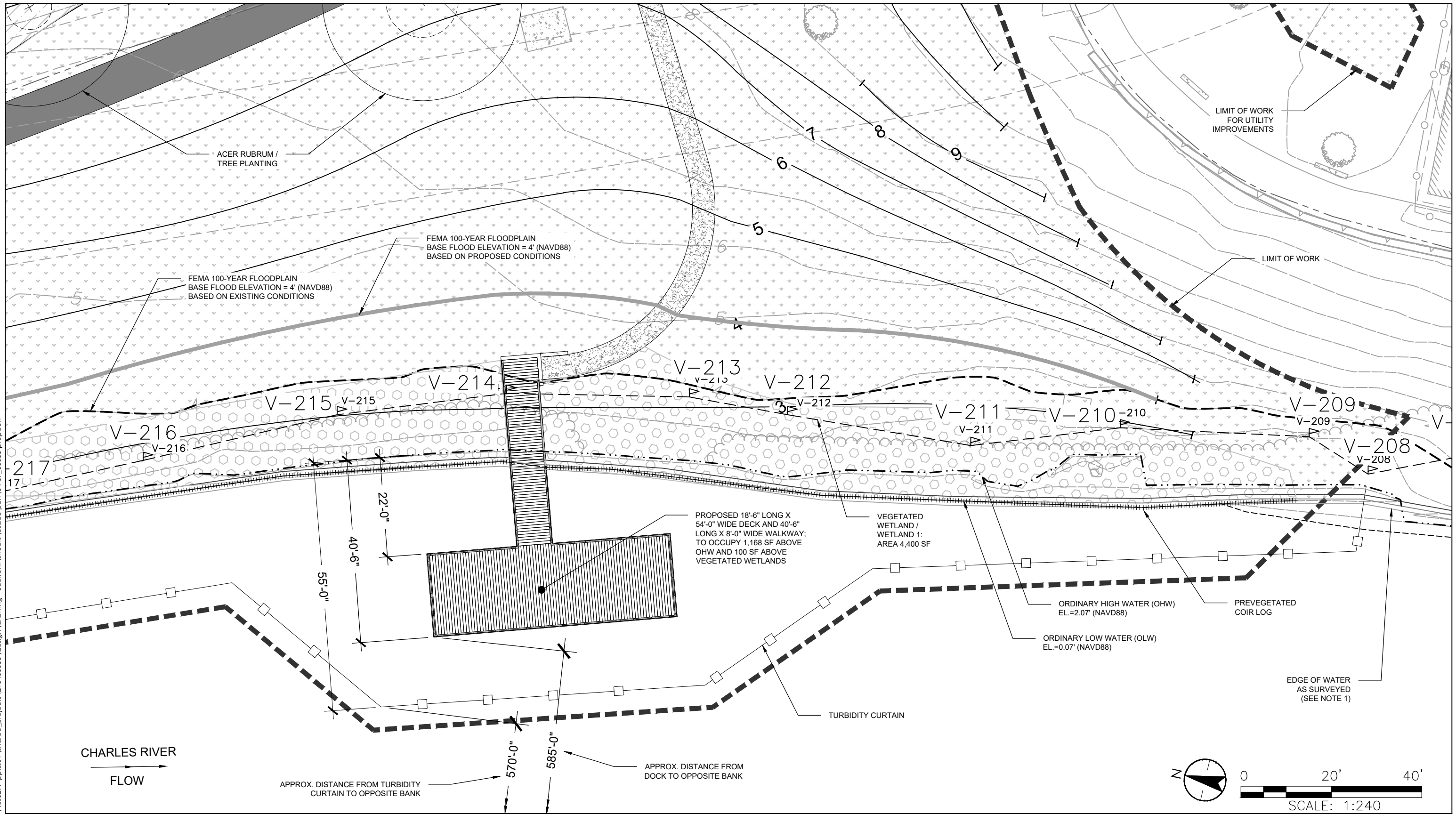
Commonwealth of Massachusetts
Department of Conservation and Recreation
Magazine Beach Improvement Project PCN
Application, Charles River Reservation
Cambridge, Massachusetts
Project No.
210400033

Title

PROPOSED CONDITIONS
PLAN - WEST OBSERVATION
DECK

Revision	Date
-	2023.12.21
Reference Sheet	Sheet No.
	6

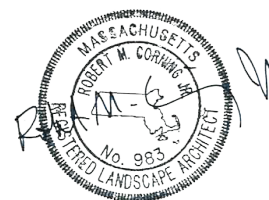
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Client/Project

Commonwealth of Massachusetts
Department of Conservation and Recreation
Magazine Beach Improvement Project PCN
Application, Charles River Reservation
Cambridge, Massachusetts
Project No.
210400033

Title

PROPOSED CONDITIONS
PLAN - DOCK

Revision

-
Reference Sheet

Date

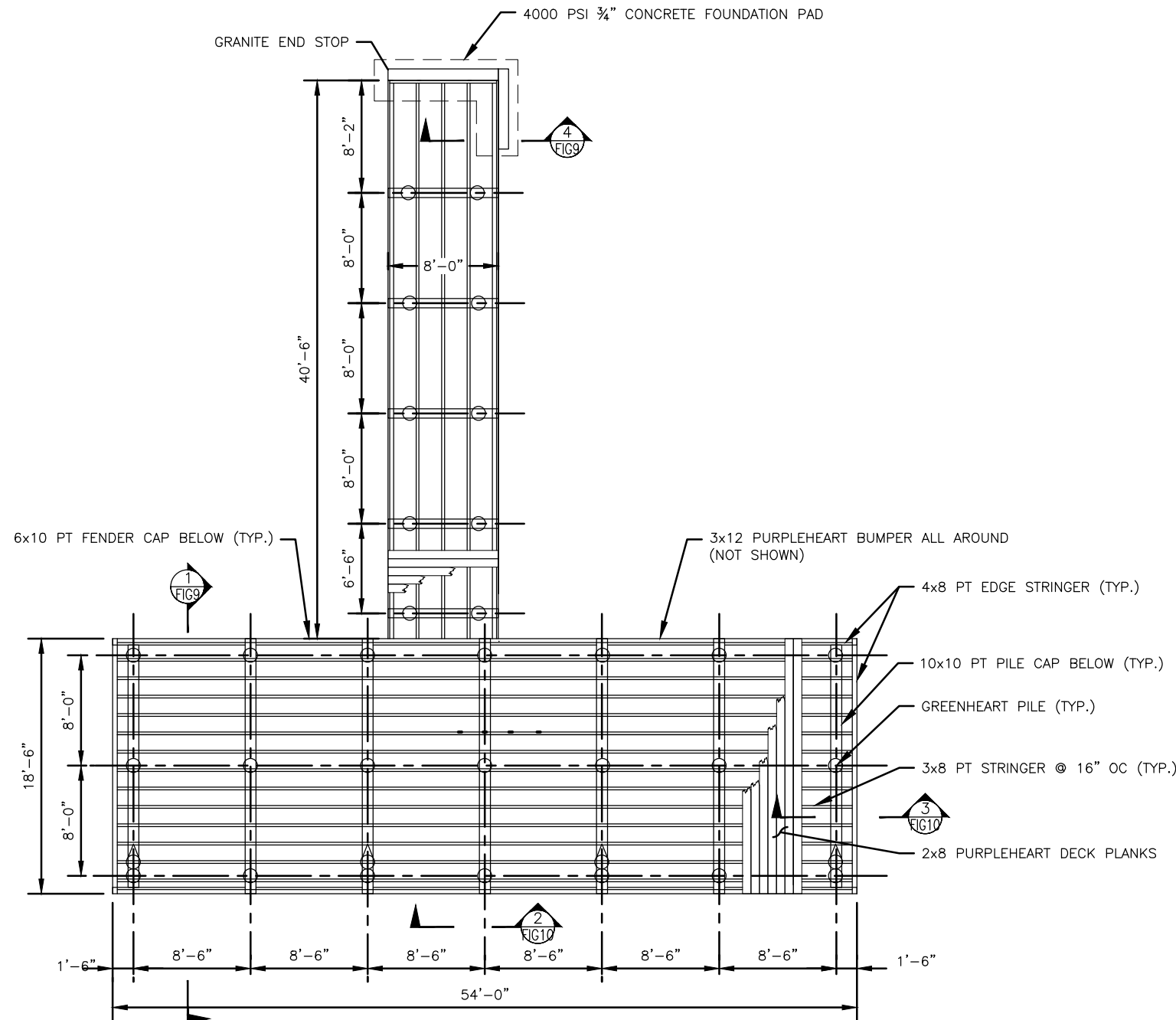
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Sheet No.

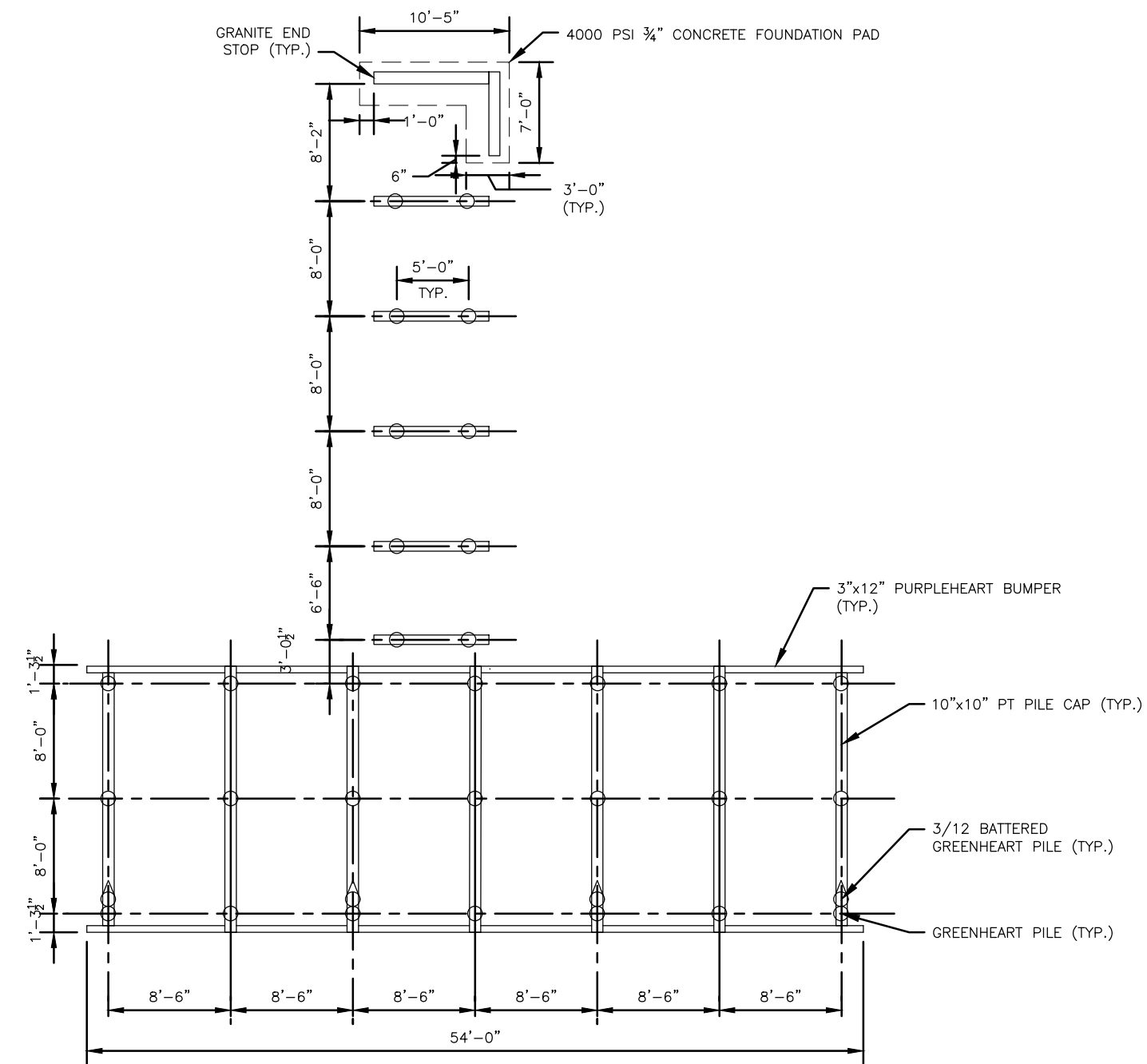
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DOCK - FRAMING PLAN
SCALE: $\frac{3}{32}$ " = 1'-0"



DOCK - PILE & PILECAP PLAN
SCALE: $\frac{3}{32}$ " = 1'-0"

GENERAL NOTES:

1. DESIGN IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL DESIGN SPECIFICATIONS FOR WOOD CONSTRUCTION, AASHTO LRFD 2009 GUIDE SPECIFICATION FOR THE DESIGN OF PEDESTRIAN BRIDGES AND AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION.
2. DESIGN LOADING:
LIVE LOAD = 100 PSF
DEAD LOAD = 15 PSF
3. THIRTY-FIVE (35) 12-INCH DIAMETER, GREENHEART TIMBER PILES INSTALLED USING IMPACT HAMMERING WITH SURROUNDING BUBBLE CURTAINS FOR SOUND ATTENUATION.
4. FRAMING LUMBER: FRAMING LUMBER CONSISTING OF 3x8, 4x8, 6x10 AND 10x10 SHALL BE NO. 1 DENSE SELECT, SOUTHERN YELLOW PINE LUMBER, TREATED WITH WATERBORNE PRESERVATIVES IN ACCORDANCE WITH AWPA STANDARD U1, COMMODITY SPECIFICATION A, TO THE REQUIREMENTS OF USE CATEGORY 2 (UC2). ALL LUMBER SHALL BE PROTECTED FROM DAMAGE DURING STORAGE, HANDLING AND INSTALLATION. FRAMING MEMBERS SHALL BE INSTALLED WITH THE CROWN UP AND ATTACHED AS SHOWN ON THE CONTRACT DRAWINGS. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

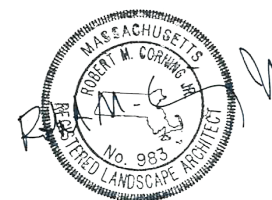
5. ALL CONNECTIONS BETWEEN TIMBERS AND CONNECTORS SHALL BE MADE WITH TYPE 304 STAINLESS STEEL BOLTS.
6. PURPLEHEART DECKING: DECKING SHALL BE AIR DRIED TO 19%MC AND PLANED SMOOTH BOTH SIDES WITH 4 EASED EDGES. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
7. BRIDGING/ BLOCKING NOT SHOWN FOR CLARITY. PROVIDE BRIDGING/ BLOCKING ACCORDING TO SPECIFICATIONS AND FIGURES 8 AND 9



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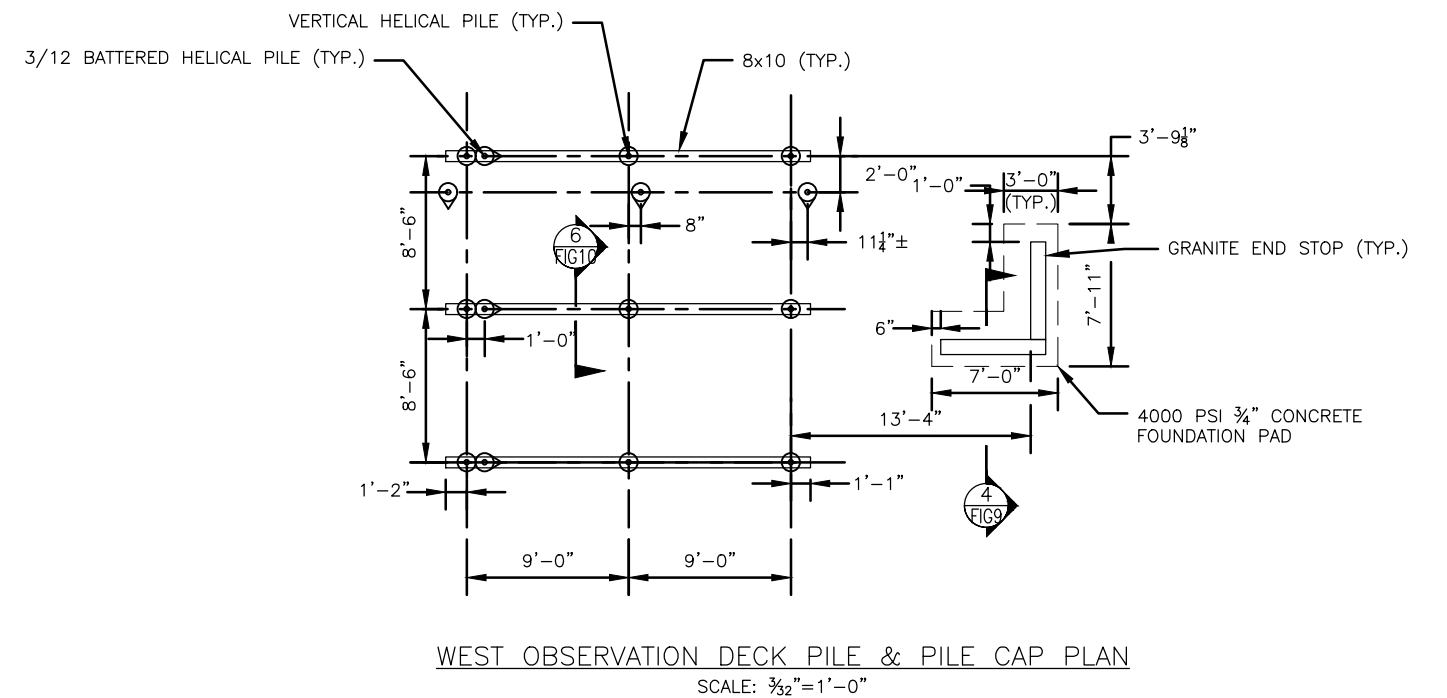
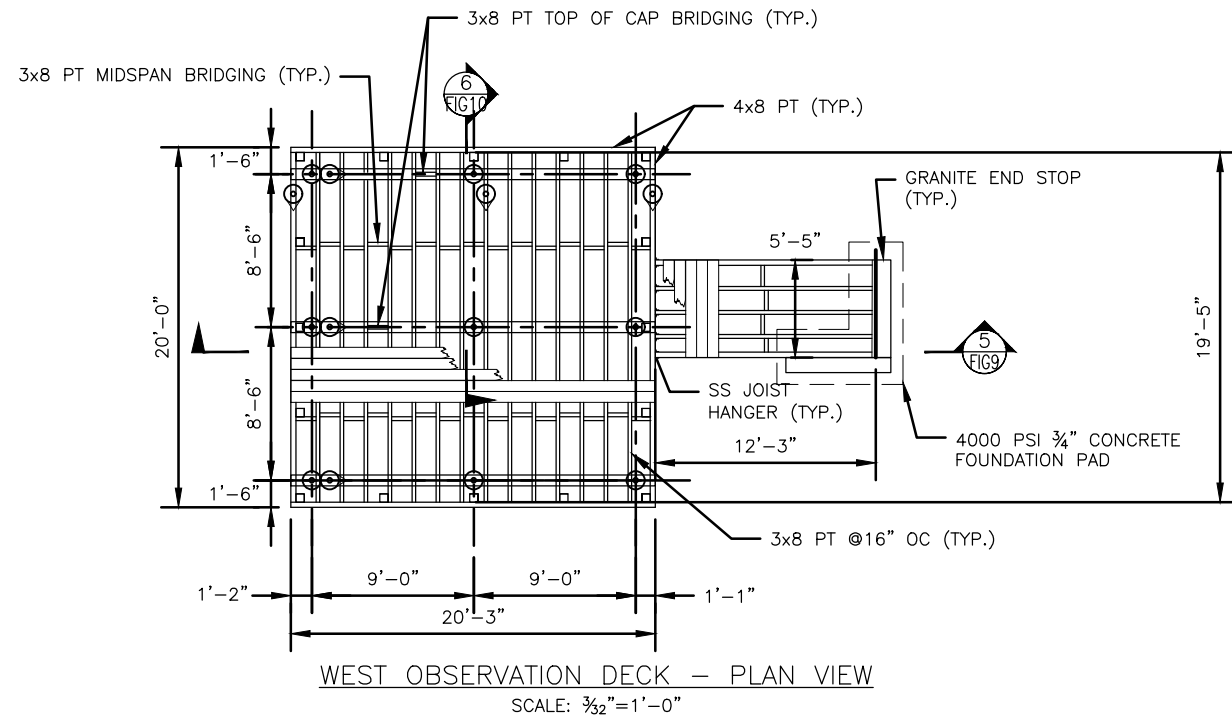
Title

DOCK PLAN

Revision	Date
-	2023.12.21
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GENERAL NOTES:

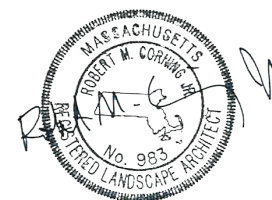
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2. DESIGN LOADING:
LIVE LOAD = 100 PSF
DEAD LOAD = 15 PSF
3. FIFTEEN (15) 2.875-INCH SQUARE STEEL HELICAL ANCHORS.
4. FRAMING LUMBER: FRAMING LUMBER CONSISTING OF 3x8, 4x8 AND 8x10 SHALL BE NO. 1 DENSE SELECT, SOUTHERN YELLOW PINE LUMBER, TREATED WITH WATERBORNE PRESERVATIVES IN ACCORDANCE WITH AWP STANDARD U1, COMMODITY SPECIFICATION A, TO THE REQUIREMENTS OF USE CATEGORY 2 (UC2). ALL LUMBER SHALL BE PROTECTED FROM DAMAGE DURING STORAGE, HANDLING AND INSTALLATION. FRAMING MEMBERS SHALL BE INSTALLED WITH THE CROWN UP AND ATTACHED AS SHOWN ON THE CONTRACT DRAWINGS. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
5. JOIST HANGERS: JOIST HANGERS SHALL BE SIMPSON STRONG TIE LUS 38SS AND 48SS TYPE 316 STAINLESS STEEL FOR ALL PERPENDICULAR CONNECTIONS BETWEEN THE 3x8 JOIST & 4x8 EDGE JOIST AS SHOWN ON THE PLANS. ALL CONNECTIONS BETWEEN TIMBERS AND CONNECTORS SHALL BE MADE WITH TYPE 316 STAINLESS STEEL NAILS PER THE MANUFACTURERS' RECOMMENDATIONS.
6. PURPLEHEART DECKING: DECKING SHALL BE AIR DRIED TO 19%MC AND PLANED SMOOTH BOTH SIDES WITH 4 EASED EDGES. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.



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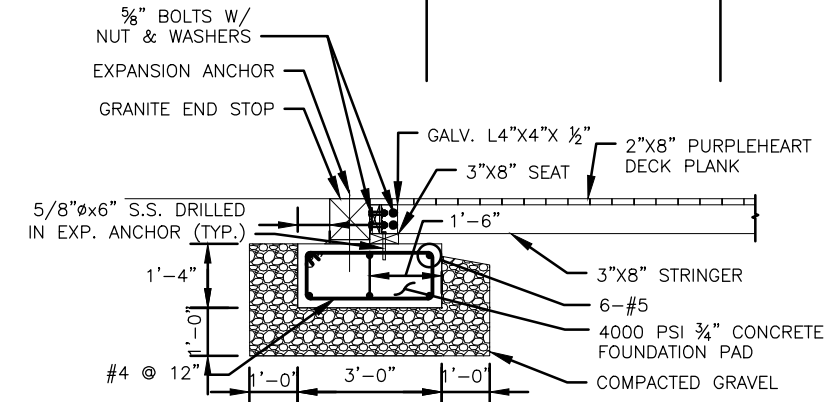
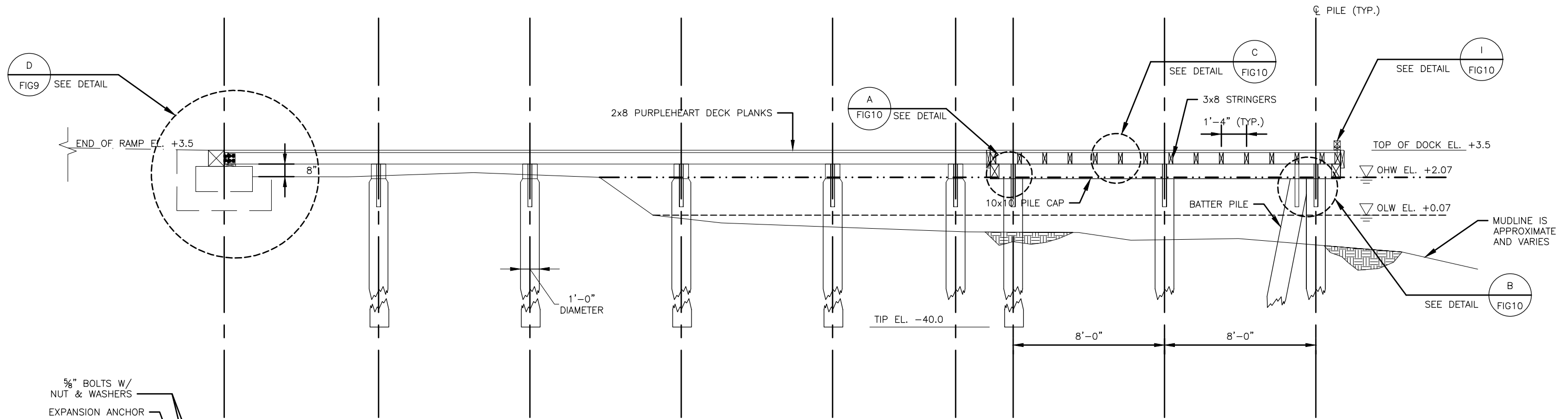
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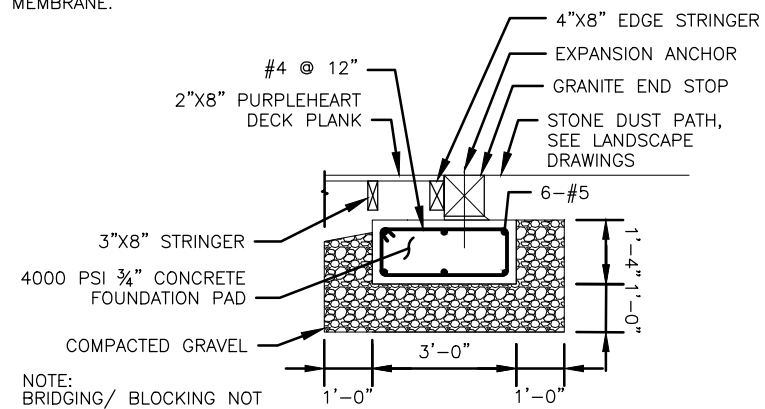
WEST OBSERVATION
DECK PLAN

Revision	Date
-	2023.12.21
Reference Sheet	Sheet No.
	9

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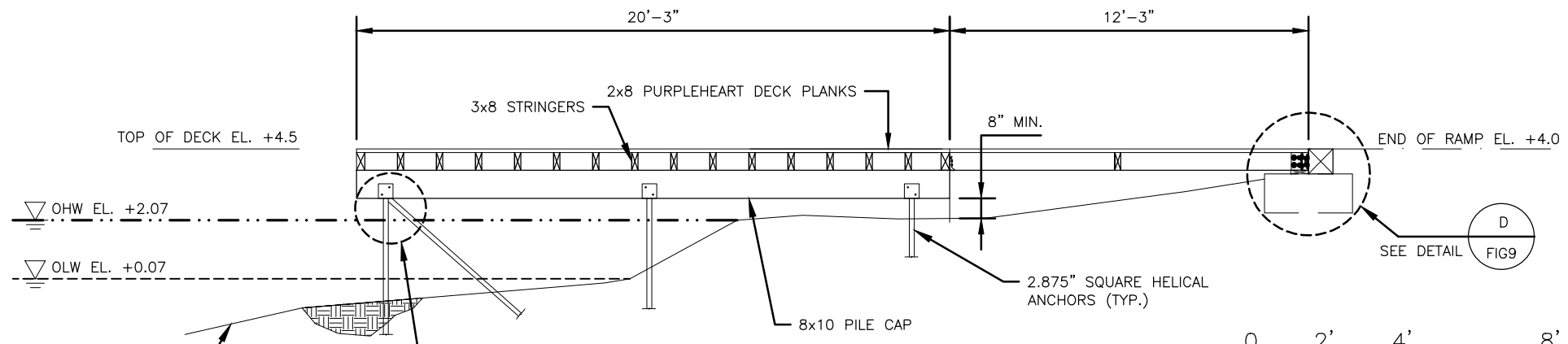


NOTE:
SEE SPECIFICATIONS
FOR INFORMATION ON
SELF-ADHERED
MEMBRANE.

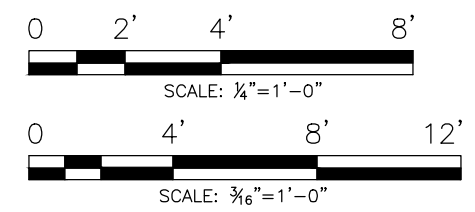


NOTE:
BRIDGING/ BLOCKING NOT
SHOWN FOR CLARITY.

DOCK - SECTION 1 (FIG 7)
SCALE: 3/16" = 1'-0"
(LOOKING DOWNSTREAM)

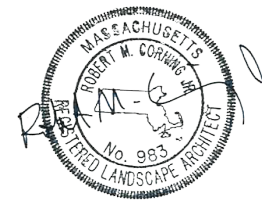


WEST OBSERVATION DECK - SECTION 5 (FIG 8)
SCALE: 3/16" = 1'-0"
(LOOKING UPSTREAM)



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Project No.
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DOCK & WEST
OBSERVATION DECK
SECTIONS & DETAILS

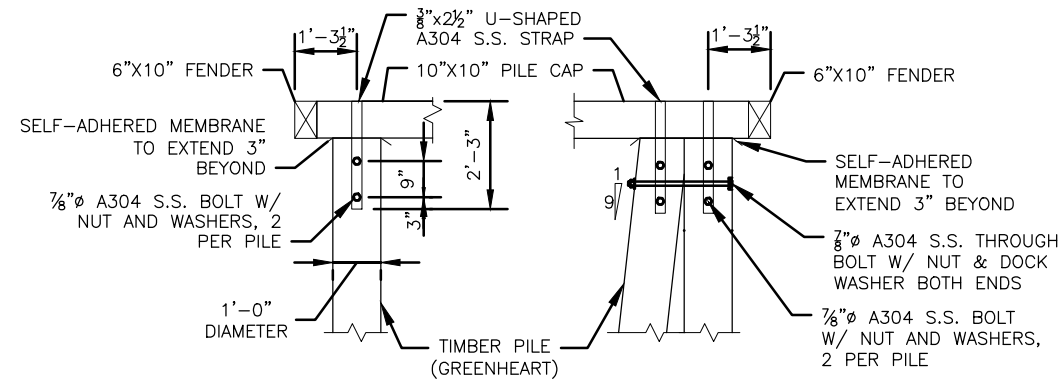
Revision	Date
-	2023.12.21
Reference Sheet	Sheet No.
	10



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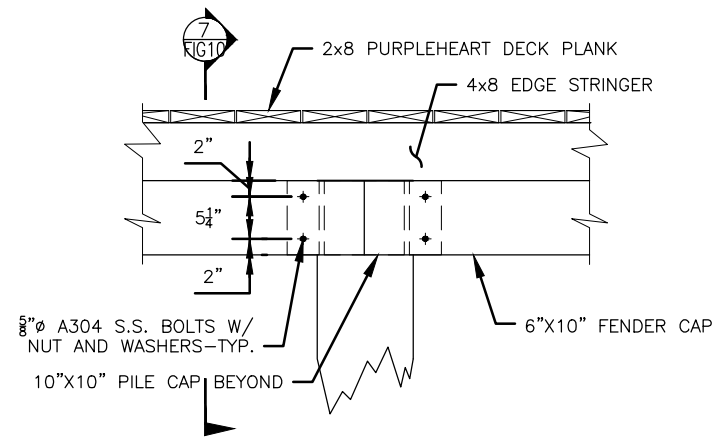
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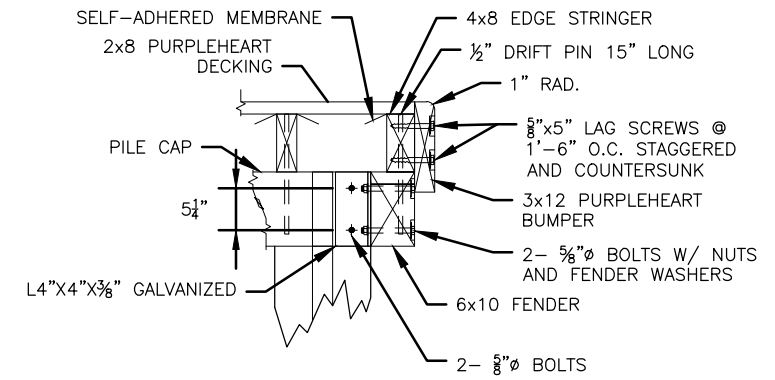


PILE - DETAIL (A)
SCALE: 1/4"=1'-0" (FIG7)

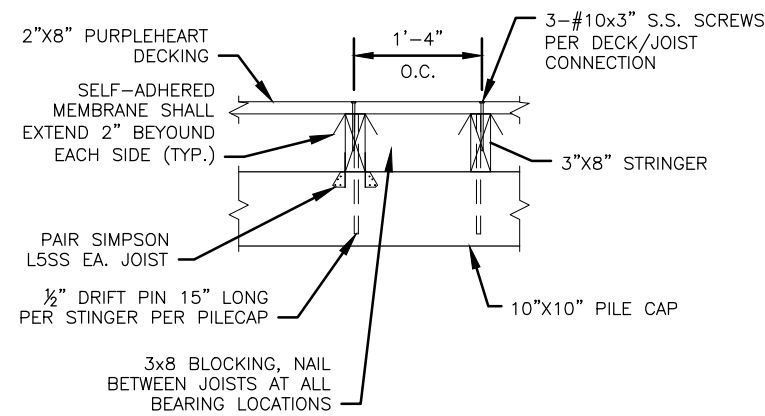
BATTER PILE - DETAIL (B)
SCALE: 1/4"=1'-0" (FIG7)



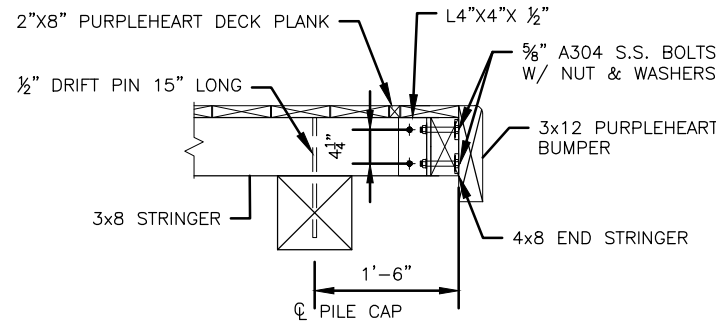
NOTE: SPLICE MUST OCCUR AT PILES.
FENDER CAP SPLICE - SECTION (2)
SCALE: 1/2"=1'-0" (FIG7)



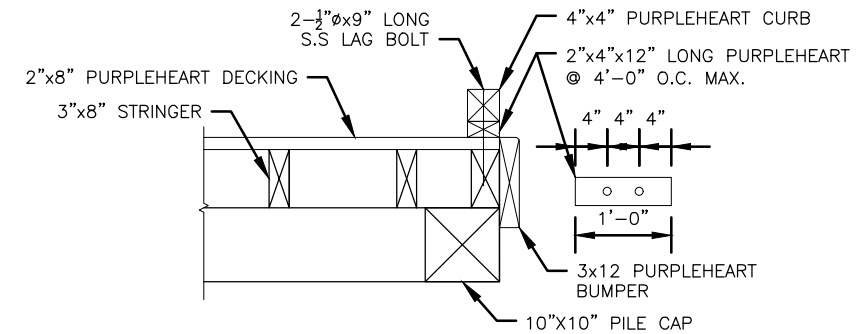
SECTION (7)
SCALE: 1/2"=1'-0" (FIG10)



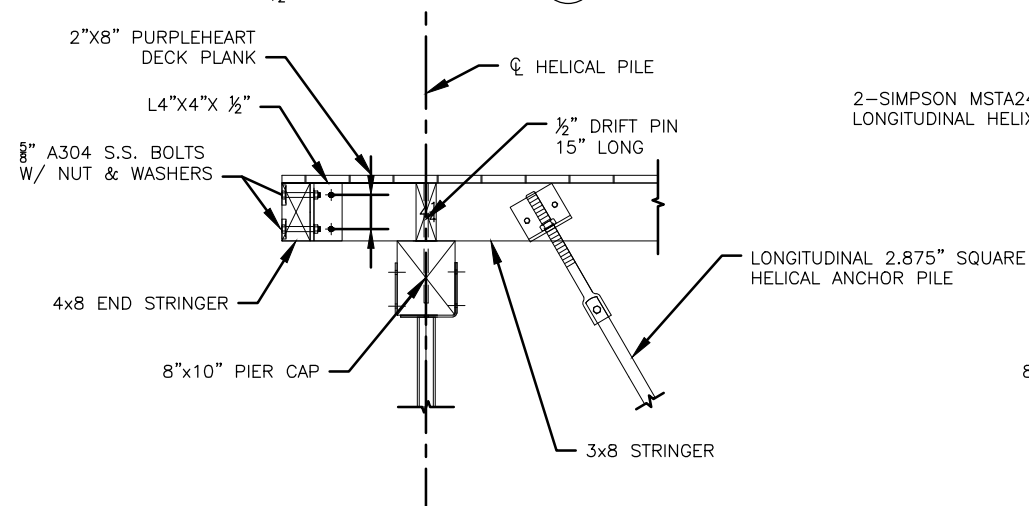
DECK/STRINGER CONNECTION - DETAIL (C)
SCALE: 1/2"=1'-0" (FIG9)



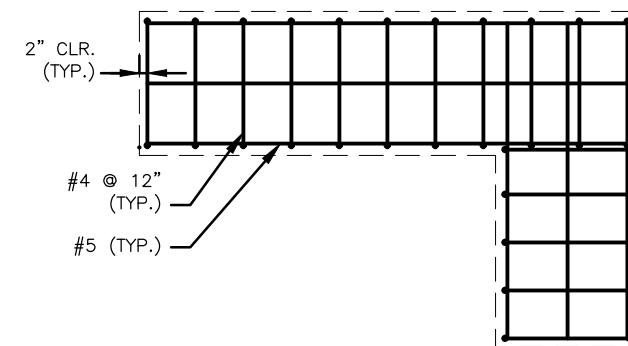
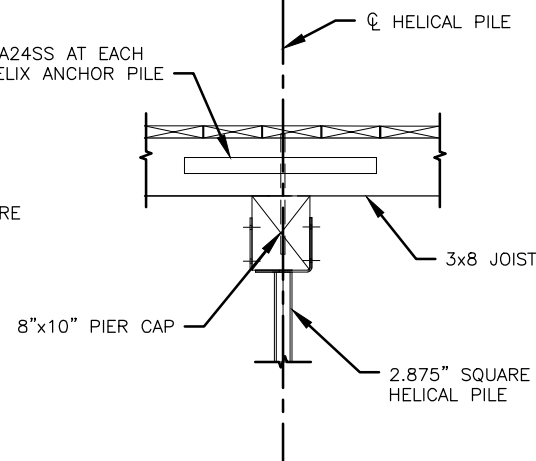
SECTION (3)
SCALE: 1/2"=1'-0" (FIG7)



CURBING - DETAIL (1)
SCALE: 1/2"=1'-0" (SD2)

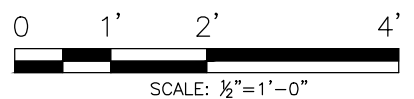
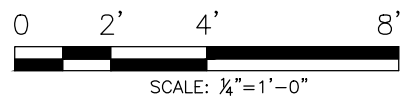


SECTION (6)
SCALE: 1/2"=1'-0" (FIG8)



NOTE: DIMENSIONS OF FOOTING VARIES, SEE FIGURES 7 AND 8

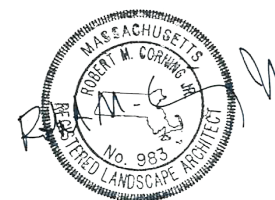
PLAN FOOTING REBAR
SCALE: 1/4"=1'-0"



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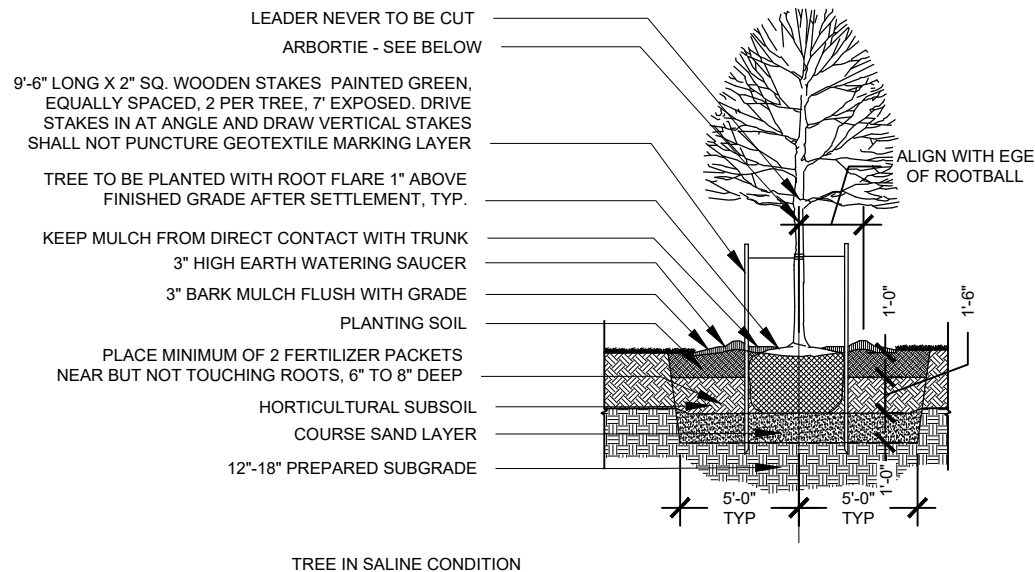
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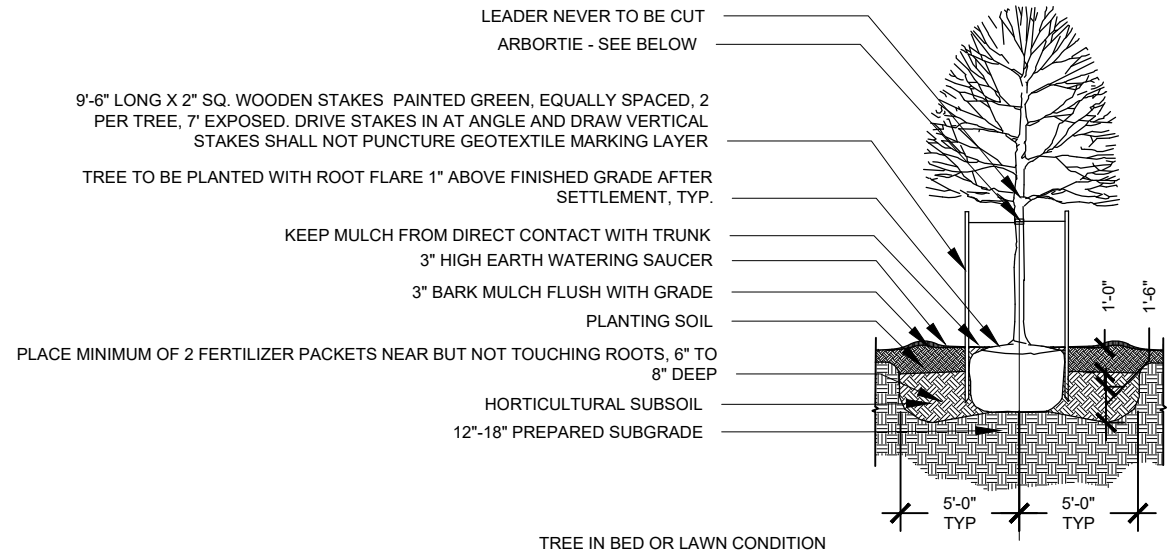
Title

SECTIONS & DETAILS

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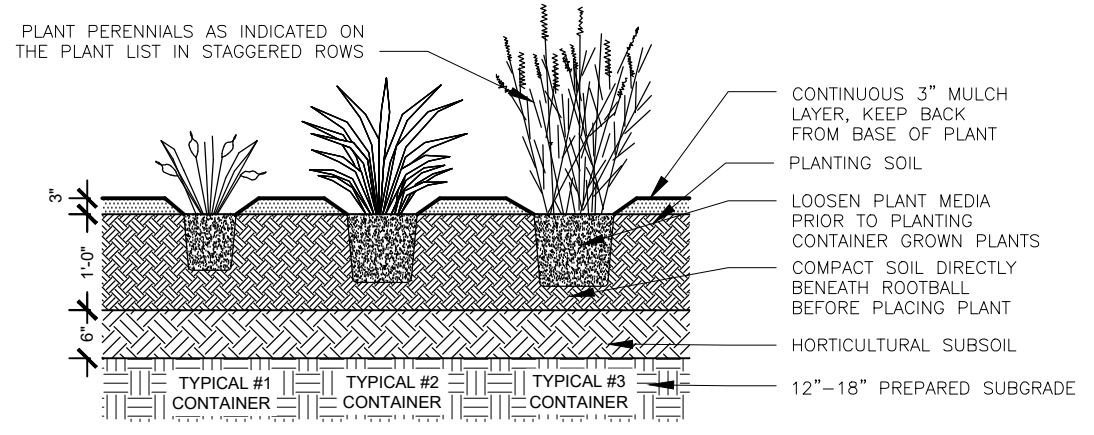


NOTE:
 1. CONTRACTOR SHALL PERFORM PERCOLATION TEST ON SUBGRADE PRIOR TO PLANTING. IF TEST IS NOT PASSING, CONTRACTOR SHALL LOOSEN FILLS AND BORROW TO LEVELS AS DETERMINED BY THE RESIDENT ENGINEER.
 2. REMOVE ROPE, WIRE AND BURLAP ENTIRELY. DISPOSE OF DEBRIS LEGALLY OFF-SITE.
 3. CONTRACTOR SHALL WATER TREE COMPLETELY WHEN TREE IS HALF BACKFILLED, AGAIN WHEN COMPLETELY BACKFILLED, AND AGAIN WITHIN 24 HOURS AFTER PLANTING.
 4. SEALS SHALL BE LEFT ON TREES & PLANTS UNTIL END OF GUARANTEE PERIOD.

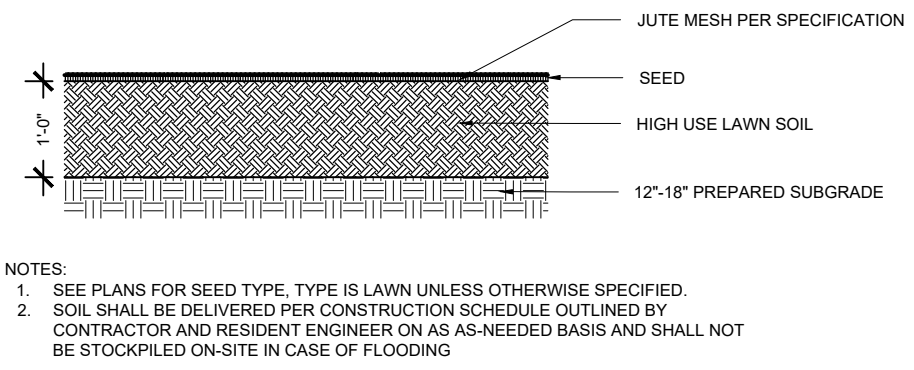


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1 TREE PLANTING
 SCALE: 1/8"=1'-0"

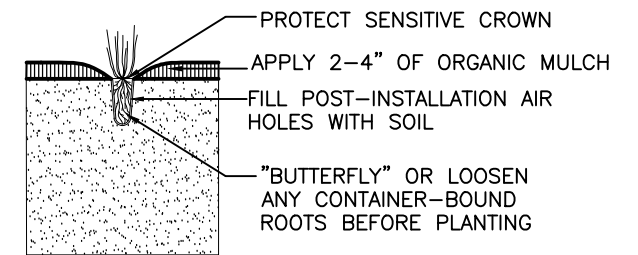


2 PANICUM VIRGATUM
 SCALE: 1/2"=1'-0"

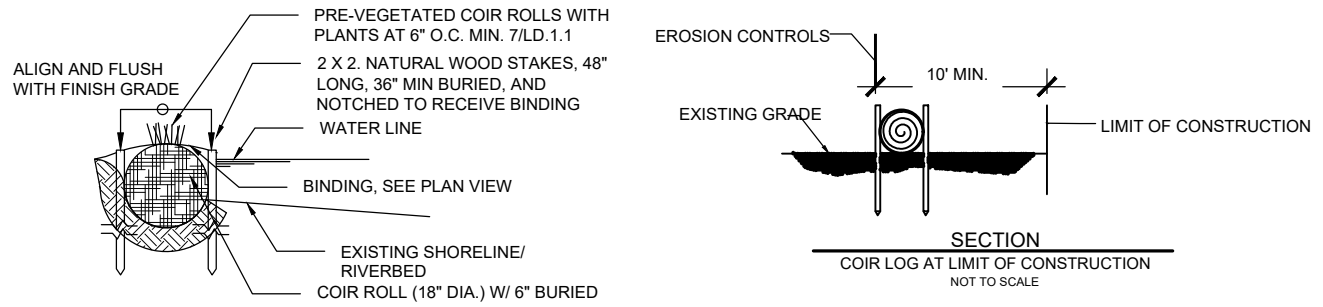


NOTES:
 1. SEE PLANS FOR SEED TYPE, TYPE IS LAWN UNLESS OTHERWISE SPECIFIED.
 2. SOIL SHALL BE DELIVERED PER CONSTRUCTION SCHEDULE OUTLINED BY CONTRACTOR AND RESIDENT ENGINEER ON AS AS-NEEDED BASIS AND SHALL NOT BE STOCKPILED ON-SITE IN CASE OF FLOODING

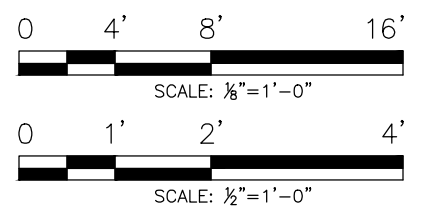
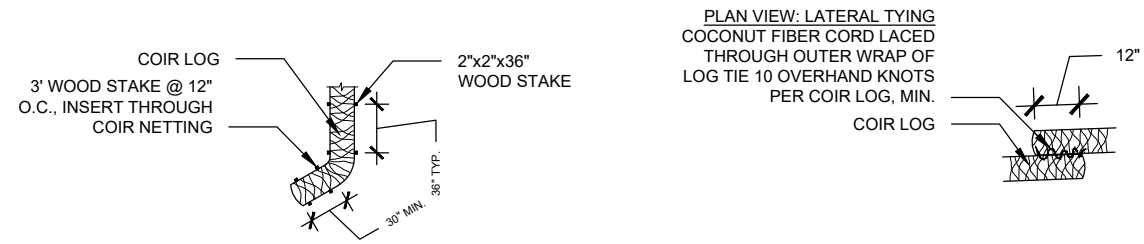
3 SEEDING LAWN
 SCALE: 1/2"=1'-0"



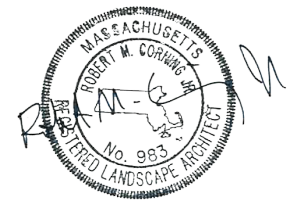
5 SHORELINE PLANTING
 SCALE: 1/2"=1'-0"



4 PREVEGETATED COIR LOG
 SCALE: 1/2"=1'-0"



Notes
 1. The survey was conducted by Meridian Associates, Inc. on March 30 - April 4, 2007; June 6-29, 2016; and August 1, 2018.
 2. Elevations are in feet and tenths and refer to the North American Vertical Datum of 1988 (NAVD88).
 3. Ordinary high water (OHW) and ordinary low water (OLW) elevations for the Charles River are based on the USGS Annual Water Data Report for above the Charles River Dam from 2013 and are converted to NAVD88.
 4. Vegetated wetlands were delineated as Bordering Vegetated Wetlands by Epsilon Associates, Inc for the Massachusetts Wetlands Protection Act.
 5. FEMA 100-year floodplain was based on Zone AE of Panels 25017C0576E (eff. 6/4/2020) and 25025C0076G (eff. 9/25/2009).



Client/Project
 Commonwealth of Massachusetts
 Department of Conservation and Recreation
 Magazine Beach Improvement Project PCN
 Application, Charles River Reservation
 Cambridge, Massachusetts
 Project No.
 210400033

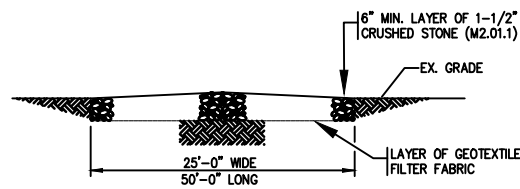
Title
 LANDSCAPE PLANTING
 NOTES AND DETAILS

Revision	Date
-	2023.12.21
Reference Sheet	Sheet No.
	12



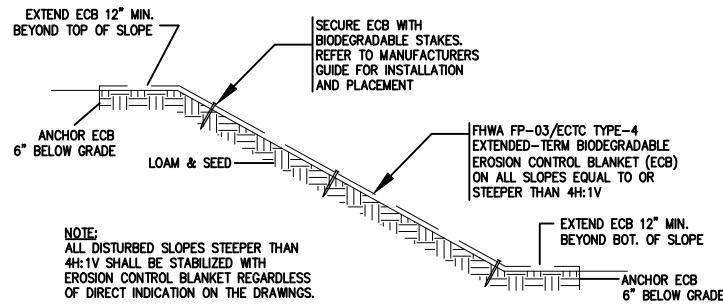
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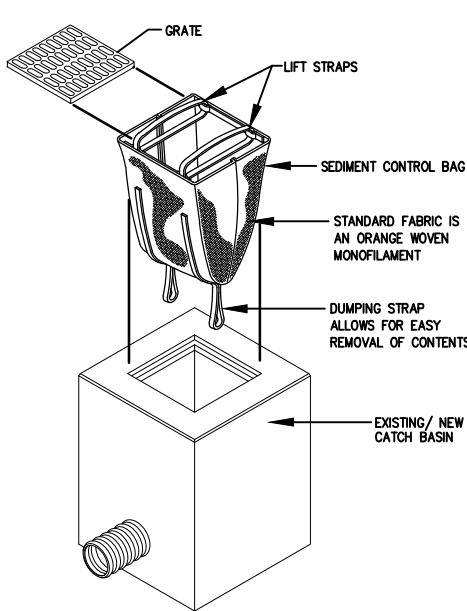


1 SITE ENTRANCE MAT DETAIL

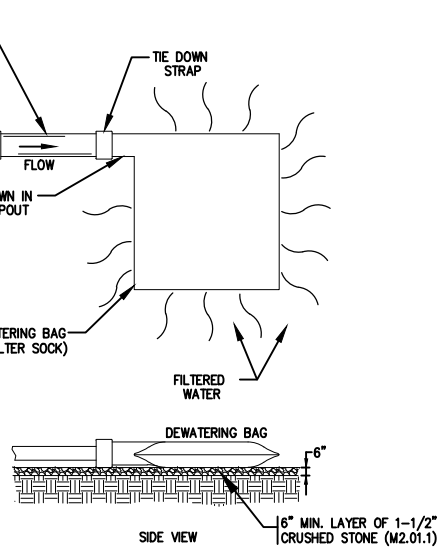
N.T.S.
 NOTE:
 THE LOCATION OF ENTRANCE MATS ON SITE SHALL BE PLACED IN A MANNER TO MAINTAIN PEDESTRIAN AND BICYCLIST TRAFFIC ALONG ROADS AND WALKWAYS ADJACENT TO SITE.



4 SLOPE PROTECTION TREATMENT DETAIL

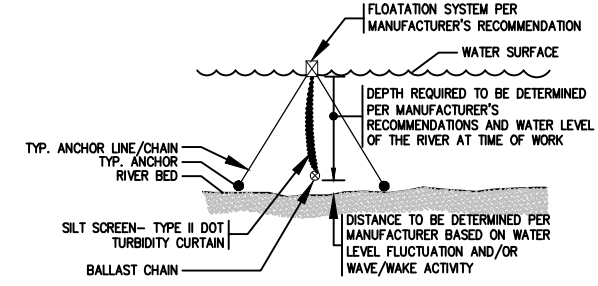


3 SEDIMENT CONTROL BAG



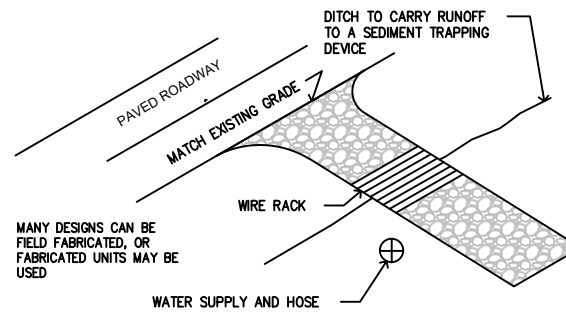
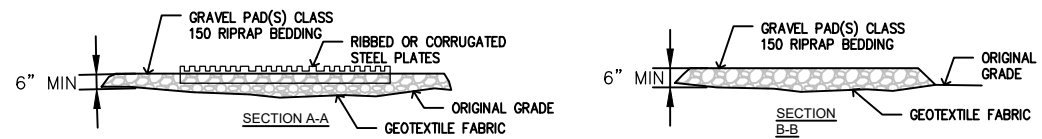
5 DETAIL OF DEWATERING BAG

SCALE: N.T.S.



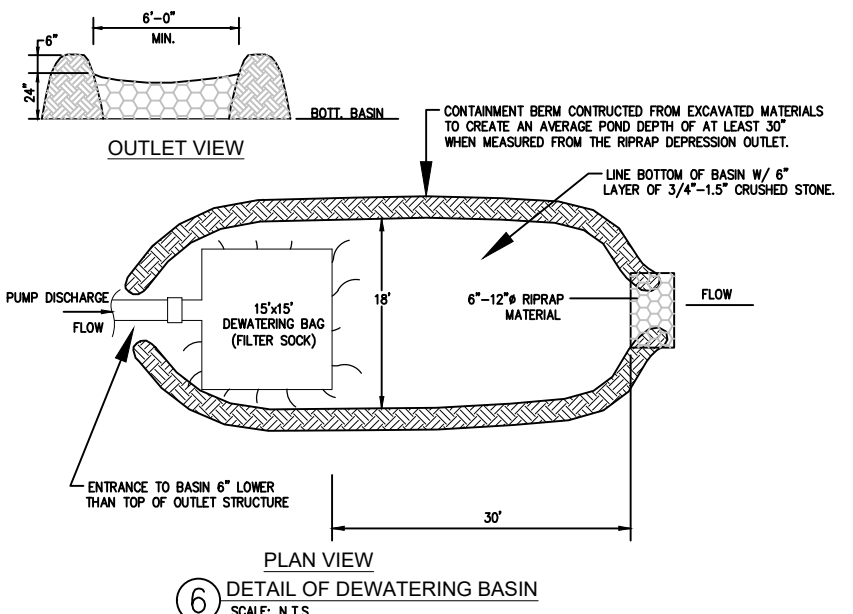
7 TYP. FLOATING TURBIDITY BARRIER INSTALLATION DETAIL

N.T.S.



8 TRUCK WASHDOWN STATION

SCALE: N.T.S.

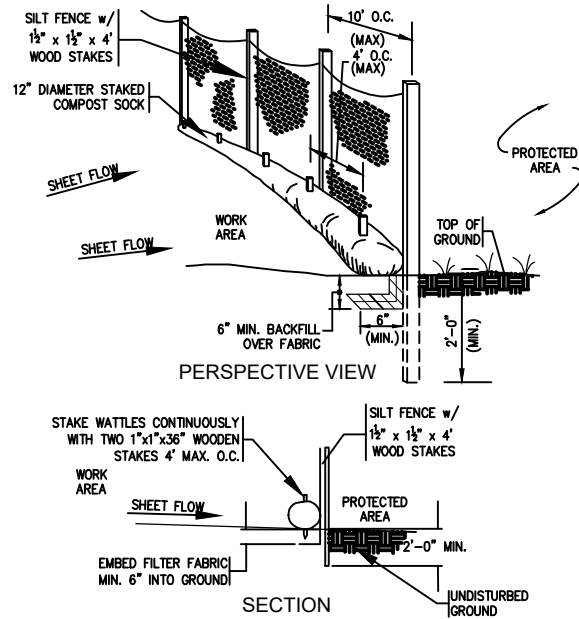


6 DETAIL OF DEWATERING BASIN

SCALE: N.T.S.

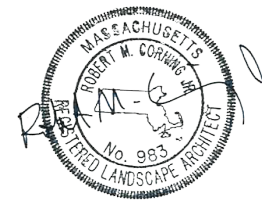
2 COMPOST FILTER SOCK & FABRIC DETAIL

N.T.S.
 NOTES:
 1. COMPOST SOCK SHALL BE 12" DIAMETER BY NORTH AMERICAN GREEN OR APPROVED EQUAL.
 2. SOCKS TO BE FILLED WITH SEED-FREE COMPACTED MATERIAL.
 3. COMPOST SOCK SHALL BE FULLY BIODEGRADABLE.



Notes

- The survey was conducted by Meridian Associates, Inc. on March 30 - April 4, 2007; June 6-29, 2016; and August 1, 2018.
- Elevations are in feet and tenths and refer to the North American Vertical Datum of 1988 (NAVD88).
- Ordinary high water (OHW) and ordinary low water (OLW) elevations for the Charles River are based on the USGS Annual Water Data Report for above the Charles River Dam from 2013 and are converted to NAVD88.
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Client/Project

Commonwealth of Massachusetts
 Department of Conservation and Recreation
 Magazine Beach Improvement Project PCN
 Application, Charles River Reservation
 Cambridge, Massachusetts
 Project No.
 210400033

Title

EROSION AND
 SEDIMENTATION CONTROL
 NOTES AND DETAILS

Revision	Date
-	2023.12.21
Reference Sheet	Sheet No.
	13



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 www.stantec.com



US Army Corps of Engineers®
New England District

WORK-START NOTIFICATION FORM
(Minimum Notice: Two weeks before work begins)

EMAIL TO: Maninder.Singh@usace.army.mil and cenae-r@usace.army.mil; or

MAIL TO: Maninder Singh
Regulatory Division
U.S. Army Corps of Engineers, New England District
696 Virginia Road
Concord, Massachusetts 01742-2751

Also, if the work is in the Massachusetts Coastal Zone (<https://www.mass.gov/service-details/czm-regions-coastal-communities-and-coastal-zone-boundary>), email this form to Sean.Duffey@mass.gov and patrice.bordonaro@mass.gov or mail it to: The Massachusetts Office of Coastal Zone Management, Project Review Coordinator, Suite 800, 251 Causeway Street, Boston, MA 02114.

Corps of Engineers Permit No. **NAE-2022-02546** was issued to **Joseph Silveira**. This work is located in Charles River, 668 Memorial Drive, Cambridge, Massachusetts 02139 at site coordinates 42.356772, -71.116082 and authorized to permanently impact 1780 square feet of area within the Charles River and temporarily impact 2,915 square feet of wetlands adjacent to the river for the purposes of installing a pier, an observation deck, conduct invasive plant species control within the wetlands, and install coir logs for riverbank stabilization. The observation deck will be 20.25 feet X 20 feet (405 square feet). The deck will be accessed by a 12.25 feet X 5.42 feet walkway (67 square feet). The viewing deck will be anchored by 15 helical anchor piles. The pier will be 18.25 feet X 54 feet (985.5 square feet). The pier will be accessed by 8 feet X 40.5 feet walkway (324 square feet). The pier and its walkway will be anchored by 35 12-inch timber piles. The piles will be installed via impact hammer. Turbidity curtains will be installed for the duration of all in-water work. Within the 2,915 square feet of wetlands, herbicides will be used on invasive species via cut and apply method. Bubble curtains will be installed in the river to minimize the impact and spread of injurious sound pressure waves.

The people (e.g., contractor) listed below will do the work, and they understand the permit's conditions and limitations.

PLEASE PRINT OR TYPE

Name of Person/Firm: _____

Business Address: _____

Phone & email: () _____ () _____

Proposed Work Dates: Start: _____ Finish: _____

Permittee/Agent Signature: _____ Date: _____

Printed Name: _____ **Title:** _____

Date Permit Issued: _____ **Date Permit Expires:** _____

FOR USE BY THE CORPS OF ENGINEERS

PM: _____ **Submittals Required:** _____

Inspection Recommendation: _____



**US Army Corps
of Engineers**®
New England District

COMPLIANCE CERTIFICATION FORM

(Minimum Notice: Permittee must sign and return notification
within one month of the completion of work.)

Permit Number: NAE-2022-02546
Project Manager: Maninder Singh
Name of Permittee: Joseph Silveira
Permit Issuance Date: September 23, 2024

Please sign this certification and return it to our office upon completion of the activity.

* E-MAIL TO: cenae-r-ma@usace.army.mil; & Maninder.singh@usace.army.mil *
* *
* MAIL TO: Massachusetts Section *
* Regulatory Division *
* U.S. Army Corps of Engineers, New England District *
* 696 Virginia Road *
* Concord, MA 01742-2751 *

Please note that your permitted activity is subject to a compliance inspection by an U.S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification, or revocation.

I hereby certify that the work authorized by the above referenced permit was completed in accordance with the terms and conditions of the above referenced permit, and any required mitigation was completed in accordance with the permit conditions.

Signature of Permittee

Date

Printed Name

Date of Work Completion

() _____
Telephone Number

() _____
Telephone Number

END OF SECTION



BID PACKAGE

PART V

TECHNICAL SPECIFICATIONS

SECTION 01019

CONTRACT CONSIDERATIONS

PART 1 - GENERAL

1.01 GENERAL INCLUDES

- A. Cash Allowances
- B. Contingency Allowance
- C. Inspection and Testing Laboratory
- D. Schedule of Values
- E. Application for Payment
- F. Change Procedures

1.02 RELATED SECTIONS

- A. General Conditions of this Contract
- B. Special Conditions of this Contract

1.03 ALLOWANCES

- A. Allowance for Police Services and a Traffic Safety Plan are included in the Contract. Services will be reimbursed to the Contractor, at cost. Services will be fully documented, and mark-ups will not be accepted. Services are to be as approved by the DCR Representative.

1.04 CONTINGENCY ALLOWANCE

None

1.05 INSPECTION AND TESTING LABORATORY

- A. See General Conditions and Special Conditions of this Contract.
- B. See Technical Specification sections for testing requirements for work.
- C. In addition to Contractor responsibility for testing, The Department of Conservation and Recreation Testing Lab, may carry out tests and inspection of

MAGAZINE BEACH IMPROVEMENTS – PHASE 2.2 GRASSY BEACH

concrete and paving to assure compliance with Department, ASTM, and other criteria as listed in each of the sections.

1.06 SCHEDULE OF VALUES

A. See General Conditions and Special Conditions of this Contract.

1.07 APPLICATION FOR PAYMENT

A. See General Conditions and Special Conditions of this Contract.

1.08 CHANGE PROCEDURES

A. See General Conditions and Special Conditions of this Contract.

PART 2 – MATERIALS Not Used

PART 3 – EXECUTION Not Used

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF PAYMENT

01019-1 Allowance for Police Services of Twenty Thousand Dollars is included in this Contract.

END OF SECTION 01019

MAGAZINE BEACH IMPROVEMENTS – PHASE 2.2 GRASSY BEACH

SECTION 01500

CONSTRUCTION FENCING

PART 1 - GENERAL

1.0 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and Technical Specification Sections apply to the work specified in this Section.

1.02 SCOPE OF WORK

- A. Provide all temporary construction fencing required as a result of work under this Contract.

1.03 FENCING

- A. Provide Construction Fencing to protect active work areas.
- B. Provide Safety Fencing as needed and as directed by DCR Representative
- A. Relocate Fencing as required during construction period to maintain public access routes designated and to ensure public safety.
- B. Provide Construction Fencing to protect sensitive resource areas.

1.04 REMOVAL OF FENCING

- A. Remove temporary fencing, prior to Final Application for Payment inspection.
- B. Clean and repair damage caused by installation or use of temporary work.

PART 2 - PRODUCTS

2.01 CONSTRUCTION FENCING

MAGAZINE BEACH IMPROVEMENTS – PHASE 2.2 GRASSY BEACH

- A. Provide six foot chain link Construction Fencing to protect active work areas and existing trees as shown on drawings.
- B. Provide six foot chain link Construction Fencing to the drip line of specimen trees to remain as shown on drawings and as directed by DCR Representative.
- C. Provide six foot chain link Construction Fence at sensitive resource areas as shown on the drawings.
- D. Provide six foot chain link Construction Fencing as needed and as directed by DCR Representative.

PART 3 - EXECUTION

3.01 PROTECTION OF LAND RESOURCES

- A. General: Land resources within the project boundaries and outside the limits of the work as may be affected under the work of this Contract shall be preserved in their present condition, or be restored to a condition, after completion of construction, that will appear to be natural. The Contractor shall confine his/her construction activities to areas defined by the plans or specifications.
- B. Prevention of Landscape Defacement: Do not deface, injure or destroy trees or shrubs, do not remove or cut them without special authority. No ropes, cables or guys shall be fastened to or attached to any existing nearby trees for anchorages.
- C. Restoration of Landscape Damage: Any trees or other landscape feature scarred or damaged by equipment or operations shall be restored as nearly as possible to original condition, as approved by DCR Representative.
- D. Post-Construction Clean-up or Obliteration: Obliterate all signs of temporary construction facilities caused by work under this Contract.

3.02 PROTECTION AND RESTORATION OF PROPERTY

- A. The Contractor shall, at his/her own expense, preserve and protect from injury all property either public or private along and adjacent to the proposed work and he/she shall be responsible for and repair at his/her own expense any and all damage and injury thereto, arising out of or in consequence of any act or omission, neglect or misconduct in the execution of the work, or in consequence of the non-execution hereof by the Contractor or his/her employees or subcontractors in the performance of the work covered by the Contract prior to completion and acceptance thereof. The

MAGAZINE BEACH IMPROVEMENTS – PHASE 2.2 GRASSY BEACH

Contractor will be solely responsible for any trespass upon adjacent property or injury thereto, resulting from or in connection with his/her operations. He/She will be liable for any claims that may be made on account of the deposit of debris of any kind upon private property. He/She shall exercise special care during his/her operations to avoid injury to underground structures and utilities.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

- A. CONSTRUCTION FENCE (CHAIN LINK) shall be measured for payment per LINEAR FOOT as specified herein including all installation materials, removing and re-setting fence as many times as necessary to protect active work areas and all other incidentals required. Note that chain link construction fence for tree protection is measured under Section 02100 – Site Preparation.

4.02 PAYMENT

- A. CONSTRUCTION FENCE (CHAIN LINK) will be paid for at the contract unit price as specified above. Note that chain link construction fence for tree protection is paid for under Section 02100 – Site Preparation.

4.03 PAYMENT ITEMS

Item	Description	Unit
01500-1	CONSTRUCTION FENCE (6' CHAIN LINK)	LF

END OF SECTION 01500

MAGAZINE BEACH IMPROVEMENTS – PHASE 2.2 GRASSY BEACH

SECTION 02100

SITE PREPARATION

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1 – GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.02 DESCRIPTION OF WORK

- A. This Section specifies:

1. Clearing, grubbing and disposing of vegetation, invasive plantings removal and disposal, topsoil stripping and stockpiling, and removal / recycling / disposal / stockpiling of pavements, concrete curb removal and disposal, and miscellaneous site elements within the indicated limits. All work shall comply with the City of Cambridge Conservation Commission's Order of Conditions, DEP Chapter 91 Waterways License and MWRA 8M Permit as attached to this specification.
2. Protection from injury or defacement objects indicated by the DCR Representative and the Landscape Architect to be preserved.

- B. The work of this section consists of all labor, materials, equipment, appliances, and services necessary to provide all Site Preparation within the Contract limit lines as required by the Drawings and as specified herein.

- C. The following list of items is to be used as a guide and shall not be considered limiting the scope of the work.

1. Layout, Lines and Levels
2. Protection of Property
3. Removal and Disposal of Picnic Tables, Concrete Pads, Bituminous Concrete Paving, Concrete Block Barriers and other miscellaneous site elements.
4. Saw-cutting Pavement
5. Tree and Shrub Removal
6. Stripping and Removal of Turf
7. Stripping and Stockpiling of Topsoil
8. Clearing and Grubbing

MAGAZINE BEACH IMPROVEMENTS – PHASE 2.2 GRASSY BEACH

9. Cut, clear and swipe – invasive plants treatment
10. Existing Tree Armoring & Pruning/Trimming
11. Existing Tree Protection Fencing
12. Arborist Services

1.02 RELATED WORK UNDER OTHER SECTIONS

- A. Section 02200 - EARTHWORK
- B. Section 02370 – EROSION AND CONTROL
- C. Section 02500 – BITUMINOUS CONCRETE PAVING
- D. Section 02650 – EXISTING UTILITIES
- E. Section 02930 – EXTERIOR PLANTS

1.03 REFERENCES

- A. NFPA 241 Safeguarding Building Construction and Demolition Operations.
- B. American National Standards Institute (ANSI) A300 Standard Practices for Tree, Shrub, and Other Woody Plant Maintenance Part 1, Pruning and Part 5, Construction Management Standard
- C. "AMERICAN STANDARD FOR NURSERY STOCK," latest edition, American Association of Nurserymen (ANSI Z60.1).
- D. National Arborist Association - Pruning Standards for Shade Trees, Revised 1988.
- E. American National Standards Institute (ANSI): A300 (Part 8)-2013 Root Management with special attention to Section 84.
- F. MassDOT Standard Specifications for Highways and Bridges and Supplemental Specifications to the Standard Specifications for Highways and Bridges (S.S.H.B)
- G. Massachusetts Department of Environmental Protection, Guide to Regulations for Using or Processing Asphalt, Brick, & Concrete Rubble.

1.04 SUBMITTALS

- A. Submit copies of requests for and certificates of severance of utility services to the DCR Representative prior to start of site preparation work.
- B. Submit copies of demolition and disposal permits to the DCR Representative prior to start of work of this Section.

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- C. Meeting with MWRA's construction representative and compliance with all Agency conditions prior to construction commencement. Compliance with MWRA 8M permit.
- D. Arborist's qualifications and experience. Submittal shall include copy of current certification and a resume summarizing specific construction experience (including relevant DCR projects) for a minimum of five projects.
- E. Arborist's Report documenting recommendations. An electronic copy shall be forwarded to the DCR Arborist.
- F. Proposed method of Tree Trunk Armoring.
- G. Proposed method of Tree Protection Fencing
- H. Tree Protections: Site Restoration
 - 1. Before the completion of the permitted work, the Contractor shall submit to DCR a site restoration plan, for DCR approval, which shall meet the following goals:
 - a. Removal of temporary protections: tree protection fencing and wrapping shall be removed with care, to ensure no damage to trees.
 - b. Establishment of healthy soils:
 - o De-compacting, such as with air spades or core aeration, as directed by the DCR Arborist
 - o Top-Dressing with compost, and slice-seeding or hydroseeding, as per DCR direction
 - o Watering as needed to establish healthy growth in seeded areas.
 - o Ensuring no change of grade between pre-construction and post-construction elevations, as documented by pre- and post-construction surveys, stamped by a Massachusetts Licensed Surveyor.
 - c. Mulching around trees: As directed by the DCR Arborist, provide three inches of aged dark pine bark mulch in a circle with a minimum three-foot radius from the trunk of each tree.

1.05 SCHEDULING

- A. Removal of pavements shall be coordinated with the DCR Representative and the Landscape Architect.
- B. When the Contractor submits his/her proposal, it will be interpreted to mean that he/she has examined the site, fully understands the existing and proposed conditions, and has made due allowance for them in his/her proposal.
- C. This contract is based upon surface elevations and materials as shown on the drawings and that no known rock or other underground obstructions, except those indicated, will be encountered.

1.06 REQUIREMENTS OF REGULATORY AGENCIES

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- A. All work shall conform to the Drawings and Specifications and shall comply with applicable codes and regulations.
- B. All work shall comply with all rules, regulations, laws and ordinances of the City of Cambridge, the Cambridge Conservation and the Commonwealth of Massachusetts, and of all other authorities having jurisdiction. All labor, materials, equipment and services necessary to make the work comply with such requirements shall be provided without additional cost to the Owner.
- C. All work shall comply with the MWRA 8M permit issued for this project.
- D. The Contractor shall, at his/her own expense, secure and pay for all permits, inspections, fees and give all legal notices that may be required in connection with his/her work, including the notification of local utility companies regarding location of subsurface water, gas, electric and other utility lines.
- E. All work shall comply with the City of Cambridge Conservation Commissions Order of Conditions, DEP Chapter 91 Waterways License and MWRA 8M Permit as attached to this specification.

1.07 PROTECTION OF PROPERTY

- A. The work of this Contract shall be executed in such a manner that no damage or injury will occur to the public, to all properties and structures off or on the site which may be in any way affected by the operations under the Contract. Any damage to on-site structures, streets, paving, gas, water, electric, or any other pipes, mains, conduits overhead or underground utility wire, fences, and any and all other property should be corrected at no cost to the Owner. Should any damage or injury be caused by the Contractor or anyone employed by him/her, or by work under this Contract, the Contractor shall, at his/her own expense, make good such damage and assume all responsibility for such damage and assume all responsibility for such injury without cost to the Owner.

1.08 PROTECTION OF SITE ELEMENTS

- A. No material shall be stockpiled, no equipment shall be parked or repaired and no oil, grease, gasoline, concrete or other debris dumped within 15 (fifteen) feet of plant materials or existing structures to remain.
- B. Active utilities existing on the site shall be carefully protected from damage. When an active utility line is exposed during construction, its location and elevation shall be plotted on the record drawings and both the DCR Representative and the Landscape Architect notified in writing.
- C. Inactive or abandoned utilities encountered during construction operations shall be removed, plugged or capped as directed by DCR Representative in accordance with

MAGAZINE BEACH IMPROVEMENTS – PHASE 2.2 GRASSY BEACH

Section 02650 EXISTING UTILITIES. The location of such utilities shall be noted on the record drawings and reported in writing to the DCR Representative.

- D. Any trees to remain that are damaged during construction shall be repaired by an arborist licensed in Massachusetts as approved by the DCR Representative.
- E. Where cuts expose or affect root systems of trees, the exposed roots shall be cut off cleanly and such areas shall be backfilled with topsoil as soon as practical and shall be watered and protected from further damage. Notify DCR Representative before backfilling.

1.09 TREE AND PLANT PROTECTION

- A. The purpose of the fence is to prevent damage to tree roots, tree trunks, soil, and all other vegetation within a delineated Tree and Plant Protection Zone (TPPZ) as shown on the plans, as directed by DCR Arborist and Landscape Architect, and as described herein.
- B. Protection shall be for the duration of the construction activities unless otherwise directed.

1.10 TREE TRUNK ARMORING

- A. Trunk armoring is for instances where construction activity (the use of heavy equipment) comes close enough to potentially damage the tree trunk or limbs. It is to be used where shown on the plans and as directed by DCR.

1.11 ARBORIST SERVICES

- A. This work is for the services of a Certified Arborist. Arborist shall be an International Society of Arboriculture (ISA) Certified Arborist or a Massachusetts Certified Arborist. The Arborist shall have at least 10 years of experience in tree care, including tree protection during construction, and shall demonstrate a familiarity with the American National Standards Institute (ANSI) A300 Standard Practices for Tree, Shrub, and Other Woody Plant Maintenance Part 1 Pruning, Part 5 Construction Management Standards, and Part 9 Tree Risk Assessment.
- B. The Arborist's general responsibilities include protecting trees within and adjacent to the project limits, staging areas, and access routes; recommending removal of diseased, damaged or otherwise unhealthy trees that pose a potential safety hazard; evaluating effects of construction on future health of trees close to proposed work; and recommending and/or overseeing tree work and care.
- C. The Arborist for this item shall not be from the same company as the company responsible for selective clearing or tree removal work, and their qualifications shall be reviewed and the Arborist approved by DCR.
- D. For projects with multiple phases, projects where construction activities (work or

MAGAZINE BEACH IMPROVEMENTS – PHASE 2.2 GRASSY BEACH

stockpiling) shifts, or when otherwise directed by DCR, the Arborist shall re-evaluate conditions and provide follow-up recommendations.

1.12 AIR EXCAVATION FOR ROOT PRUNING

- A. Air Excavation and Root Pruning is for the services of excavating soil with an air pressure tool in order to expose tree roots, and for associated services and materials necessary to complete the work of pruning, backfilling with existing soil, watering, mulching, and fertilizing. This work shall include furnishing and operating the air excavating tool.
- B. Trees to be air spaded shall be those shown on the plans and/or as determined necessary by the DCR per the recommendations of either the DCR Arborist, or an independent Arborist engaged by the Contractor.

PART 2 – MATERIALS

2.01 TREE & PLANT PROTECTION FENCING

- A. Temporary Fence shall be such that it provides a barrier that remains vertical and effective (not sagging) for the duration of period required. Chain Link Fence shall be six-foot-tall metal chain link set in metal frame panels on movable core-drilled concrete blocks of sufficient size to hold the fence erect in areas of existing paving to remain. Alternatively, the posts may be in-ground mounted, per the direction of the Engineer. Unless otherwise indicated, the following types of chain link fence are acceptable:
 - 1. New materials or previously used salvaged chain link fencing in good condition, subject to inspection and approval by the Engineer.
 - 2. Posts: Galvanized steel pipe of diameter to provide rigidity
 - 3. Fabric: Woven galvanized steel wire mesh. Provide in continuous lengths to be wire-tied to fence posts or prefabricated into modular pipe-framed fence panels.
- B. Panels shall be such that they create a barrier to encompass the entire root zone are to the extent possible.

2.02 TREE TRUNK ARMORING

- A. Trunk armoring shall be such that it prevents damage to the trunk from construction equipment. Selected material shall be such that installation and removal will not damage the trunk.
- C. Acceptable materials include 2x4 wood cladding with wire or metal strapping, or, for instances when duration of construction activities is less than three months, corrugated plastic pipe mounted with duct tape. Height of cladding shall be from base of tree, from

MAGAZINE BEACH IMPROVEMENTS – PHASE 2.2 GRASSY BEACH

just above the root flare, to the bottom of the first branch, eight feet above the ground, or as required by the Engineer. Armoring of the root flare may be required separately, to ensure no damage to the root flare. All materials and methods shall be approved by the DCR Arborist.

D. Other materials or methods may be acceptable if approved by DCR.

2.03 INVASIVE PLANT REMOVAL

A. Herbicide for invasive plant removal shall be environmentally safe Glyphosate, based and mixed with an approved marking dye to clearly mark application location on stalks. Herbicide and marking dye shall be approved for use by the DCR Representative.

PART 3 - EXECUTION

3.01 TREE & PLANT PROTECTION

A. Establishment of TPPZ

- Fencing shall be used for construction areas, staging areas, and stockpile areas as shown on the plans and as directed by the Engineer to establish the Tree and Plant Protection Zone (TPPZ).
- Fence shall be located as close to the work zone limit and as far from the trunk as possible to maximize the area to be protected. Fence shall run parallel and adjacent to construction activity to create a barrier between the work zone and the root zone or designated limit of plants and soils to be protected.
- When construction activities surround (or have the potential to surround) trees or plants to be protected, a circular enclosure shall be used. In these instances, the TPPZ limit shall be the Drip Line of each tree or as close as possible to the Drip Line, and as shown on the plans and details. The Drip Line is defined as the limit of tree canopy.
- The Contractor shall not engage in any construction activity within the TPPZ, including: operating, moving or storing equipment; storing supplies or materials; locating temporary facilities including trailers or portable toilets; and shall not permit employees to traverse the area to access adjacent areas of the project or use the area for lunch or any other work breaks.

B. Method of Work

1. Fence shall be installed prior to any construction work or staging activities and shall be installed and maintained in a vertical and effective position at all times.

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2. Fence shall be repositioned where and as necessary for optimum effectiveness. Repositioning shall be incidental to this item. Fence shall not be moved without prior approval by the Engineer.
3. The TPPZ shall be protected at all times from compaction of the soil; damage of any kind to trunks, bark, branches, leaves, and roots of all plants; and contamination of the soil with construction materials, debris, silt, fuels, oils, and any chemicals substance.
4. After construction activities are completed, or when directed by the DCR, fence, stakes, and other materials shall be removed and disposed off-site by the Contractor.

C. Required Work within the TPPZ

1. In the event that grading, trenching, utility work, or storage is unavoidable within the TPPZ, the DCR Arborist shall be notified. Measures may be required for tree protection and preservations, as determined by an Arborist, including air spading, the use of six-inch depth of wood chips or approved matting for root protection, pruning of branches, and/or trunk protection.
2. Landscaping work specified within the TPPZ shall be accomplished by hand tools. Where hand work is not feasible, with permission of the DCR Arborist, work shall be conducted with the smallest mechanized equipment necessary.

D. Tree and Plant Damages or Loss

1. If the TPPZ is intruded upon, at the discretion of DCR, the Contractor will be required to provide a more durable barrier (e.g., Jersey Barriers) to secure the area.
2. If the Contractor intrudes into a TPPZ without approval, soil will be considered compacted and tree root damage will be assumed. Action will be taken as specified below.
3. In the event that trees designated for protection under this item are damaged, including root damage from unapproved trespassing onto the root zone, the Contractor shall, at his own expense obtain an Arborist. The Arborist shall be approved by DCR.
4. In the event of spills, compaction or damage, the Contractor shall take corrective action immediately using methods approved by DCR's Arborist, in coordination with the Contractor's Arborist.
5. If, based on the recommendations of the Arborist, the DCR Arborist determines that damages can be remedied by corrective measures, such as repairing trunk or limb injury, soil compaction remediation, pruning, and/or watering, the damage will be repaired as soon as possible within the appropriate season for such work and according to industry standards, and as approved by the DCR Arborist.

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6. If the Arborist determines, or the DCR Arborist determines, that damages are irreparable, the Contractor shall pay for the damages in the amount of \$500.00 per diameter inch at breast height (DBH) per tree.
7. Additionally, if the Arborist or DCR Arborist determines that the damages are such that the tree is sufficiently compromised as to pose a future safety hazard, the tree shall be removed. Tree removal will include cleanup of all wood parts, grinding of the stump to a depth sufficient to plant a replacement tree or plant, removal of all chips from the stump site, and filling the resulting hole with topsoil.
8. Shrubs will be replaced with a plant of similar species and equal size or the largest size plants reasonably available, and as approved by the Landscape Architect. The Landscape Architect will approve the size and quality of the replacement plant. Replacement will include a minimum of one year of watering and care.

3.02 ARBORIST SERVICES

- A. Prior to the start of any work, the Arborist shall meet on site with the Contractor responsible for the work, and representatives from DCR, including the DCR Arborist and Landscape Architect. The limits of the proposed project area shall be reviewed to determine which trees might be impacted, and what protection measures shall be implemented, and other concerns. Where required for proper assessment of tree impacts, limits of work shall be staked or otherwise marked in the field prior to the site walk.
- B. Trees proposed to be removed shall be painted or otherwise marked with temporary markings. DCR must approve any removal of trees, and may direct the contractor to propose a revised work scope for the purpose of saving trees.
- C. Trees to be retained shall be marked such that it does not mar or damage the tree and such that marker is not easily removed. As applicable to the work and scope of the project, trees designated for removal or to be retained shall be noted on the plan and/or in the arborist's report and photographed.
- D. Trees designated to remain that are damaged or removed by construction activities shall be noted and photographed for inclusion in inspection reports submitted to DCR, and the contractor shall pay a fine as compensation.
- E. The Arborist shall be responsible for the following tasks; all recommendations and actions are to be approved before any are carried out:
 1. Initial Evaluation and Report
 - recommend and prioritize trees that require removal as appropriate to contract scope, project limits, and project intent (No trees shall be removed without the express consent of DCR)
 - modify the work scope and plans as needed to protect trees which DCR does not approve for removal
 - review and modify, if necessary, tree protection measures shown on the

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- drawings, and as directed by DCR
 - review and mark limits of protective fencing for trees and groups of trees to be retained;
 - review and recommend protection measures for high priority trees (six-inch dbh and greater)
 - submit a marked-up Construction Plan that summarizes all recommendations and decisions made in the field, for DCR approval
 - submit a corresponding report including photo documentation
2. Oversight
 - direct or execute pruning of branches and/or roots, air spading, and/or other tree care operations
 3. Monitoring and Inspections
 - periodically inspect fencing and ensure root zones are properly protected and clear of equipment and materials as required by the DCR Arborist
 - reevaluate tree protection measures for various phases of a project
 - submit inspection notes with relevant and dated photos to DCR.
 4. Special Care – proposed work to be approved in advance by the DCR Arborist:
 - oversee tree pruning for health and aesthetics
 - recommend fertilization and amendments
 - recommend and oversee pest control

3.03 AIR EXCAVATION AND ROOT PRUNING

- A. Air excavation and pruning work shall be performed by or overseen by the Arborist.
- B. Air excavation of soil and root pruning shall occur any time prior to equipment work within the root zone of trees to be protected.
- C. Air excavation shall be done along the limit of proposed excavation. Trench shall be of sufficient width to observe and cut roots and shall be to the depth of proposed excavation. Immediately following air excavation, roots shall be pruned.
- D. Following pruning, roots shall immediately be fully covered with backfill and immediately watered. Roots shall continue to be watered and fertilized as directed by the Arborist.

3.04 LAYOUT LINES & LEVELS

- A. In order to prevent unnecessary demolition or clearing, before demolition is started the site will be completely staked out for the work of this section for the DCR Representative's approval of layout and for the Landscape Architect's approval of elements to be relocated. This laying out shall be performed by a licensed engineer or surveyor. Grade stakes shall be set where spot elevations are shown as required to grade properly, establish and maintain benchmarks. Where proposed site work elevations are intended to closely represent existing conditions, the Contractor shall shoot spot grades for reference and establish elevational benchmarks for use in constructing the finished work.

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- B. Before installation of site improvements is started, locations shall be staked out for the DCR Representative and Landscape Architect's approval.
- C. The Drawings indicate existing grade elevations in addition to new finished grade elevations. The existing elevations are given for the convenience of the Contractor to aid him/her in arriving at the quantities of excavations, grading, back-filling, etc. However, neither the DCR nor the DCR Representative assumes any responsibility for the correctness of these existing elevations. The Contractor shall verify all elevations and satisfy himself as to their correctness by visiting the site of the proposed work and examining the actual condition prior to the bidding of the work. Contractor shall notify the DCR Representative in writing, prior to bidding, of any material discrepancies from plans.
- D. The layout shall be subject to possible modifications whether by inaccuracies in existing grades, by elements designated to remain or by other site conditions. Except in the case of substantial increase in the quantity of materials authorized in writing by the DCR Representative, these modifications shall not entitle the Contractor to additional compensation.
- E. When the Contractor submits his/her proposal, it will be interpreted to mean that he/she has examined the site, fully understands the existing and proposed conditions and he/she has made due allowance for them in his/her proposal.

3.05 DEMOLITION

- A. Demolish and remove all site elements, foundations, and paving as indicated on the Drawings or as directed by the DCR Representative.
- B. All demolished pavements and structures shall be removed from the site and disposed of in a legal manner, at no cost to the Owner. No asphalt, concrete, or brick materials are to be used for fill materials for on-site fill operations. All asphalt, concrete and brick materials are to be transported off-site for recycling to the greatest extent possible.
- C. Remove existing pavements as indicated on Drawings and as directed by the DCR Representative. Saw-cut pavement to be removed at pavement to remain. Locate and align saw-cut where shown on the drawings and as directed by the DCR Representative.
- D. Trees and stumps shall be removed completely unless indicated otherwise on the Drawings or in the Specifications. Contractor shall backfill hole with ordinary borrow to a depth of 12 (twelve) inches below finish grade in preparation for planting or installation of pavement.
- E. Invasive species shall be completely removed, bagged and legally disposed.
- F. All precautions shall be taken to protect the public from flying or falling debris. Prevent dust and dirt from rising by thoroughly wetting masonry, concrete, and other debris.

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- G. Upon completion, all debris created shall be removed from site. Burning of materials on the job site will not be permitted. All staging, scaffolding, protective devices and other equipment not required by other trades shall be removed. All surfaces will be swept clean and site will be left free of any and all debris.
- H. Work under this Section is to be carried on under the direction of the DCR Representative.

3.06 STRIPPING TOPSOIL

- A. Stripping shall consist of the removal of all loam to the full depth encountered below the original ground surface, as herein specified or directed by the DCR DCR Representative. Every effort shall be made to strip and stockpile all available loam on the site. See Drawings for extents of topsoil stripping and stockpiling (lawn removal area).
- B. All loam so removed shall be stockpiled on the site where directed by the DCR Representative. Loam shall be free of subsoil, stiff clay or hardpan and foreign material such as cinders, ashes, asphalt and wood. The suitability of stripped materials for use as loam shall be determined by the DCR Representative, and his/her decision shall be final. All loam shall remain the property of the Owner, and none shall be removed from the premises without the approval of the DCR Representative.
- C. Stockpiled loam shall be kept separate from other excavated materials and shall be screened; free of roots, stones larger than one half (1/2) inch and other undesirable material that would interfere with planting.
- D. Excess loam shall remain the property of the Contractor and shall be removed from the site at no additional cost to the DCR.
 - 1. Limit height of topsoil stockpiles to 72 inches (1800 mm).
 - 2. The stockpile location(s) should be such that the stockpiled topsoil will not be disturbed or be exposed to excessive water, wind erosion, or contaminants which would lessen its capability to support vegetation before it can be redistributed on terrain graded to final contour. Do not stockpile topsoil within tree protection zones.
 - 3. All topsoil stockpiles shall be protected from sediment transport by surface roughening, watering, and perimeter silt fencing.
 - 4. Any topsoil stockpile remaining longer than 30 days shall be seeded with a sterile temporary cover or the approved specified seed mixture.
 - 5. Stockpiled topsoil shall not be moved until it is moved for redistribution on a disturbed area.

3.07 TREE TRUNK ARMORING

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- A. Prior to construction activities, the Contractor, and DCR Landscape Architect and Arborist, shall review trees noted on the plans to be protected. Final decision as to trees armored and/or pruned shall be per the DCR Arborist.
- B. Care shall be taken to avoid damage to the bark during installation and removal of armoring. Trunk armoring shall be replaced and maintained such that it is effective for as long as required and shall be removed immediately upon completion of work activities adjacent to trees.
- C. Pruning of limbs shall conform to the techniques and standards of the most recent ANSI A300 standards.
- D. Damages & Penalties
 - 1. In the event that trees designated for protection under this item are damaged, including root damage from unapproved trespassing onto the root zone, the Contractor shall, at his own expense obtain an Arborist. The Arborist shall be approved by DCR.
 - 2. If, based on the recommendations of the Contractor's Arborist, DCR's Arborist determines that damages can be remedied by corrective measures, such as repairing trunk or limb injury, soil compaction remediation, pruning, and/or watering, the damage will be repaired as soon as possible within the appropriate season for such work and according to industry standards.
 - 3. If the DCR Arborist determines that damages are irreparable, the Contractor shall pay for the damages in the amount of \$500.00 per diameter inch at breast height (DBH) per tree.
 - 4. Additionally, if the DCR Arborist determines that the damages are such that the tree is sufficiently compromised as to pose a future safety hazard, the tree shall be removed. Tree removal will include clean-up of all wood parts, grinding of the stump to a depth sufficient to plant a replacement tree or plant, removal of all chips from the stump site, and filling the resulting hole with topsoil.

3.08 CLEARING AND GRUBBING

- A. The work shall be performed in accordance with Section 101 of S.S.H.B. and as directed by the DCR Representative and Landscape Architect.
- B. "Clearing and grubbing" shall be performed in all areas that require removal of all vegetation and debris, excluding trees removed under other items. This area shall be as shown in plans.
- C. All clearing within the RIVERFRONT AREA is to be done by hand and stumps (not including shrub roots) are to be left in place for slope bank stabilization, unless otherwise required by DCR Representative. Note that all invasive species removal

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shall be done in a matter consistent with Cambridge Conservation Commission requirements and shall fully eradicate the invasive species from the limit of work.

3.09 TREE AND SHRUB TRIMMING

- A. The work shall be performed in vegetated areas as shown on the drawings and as directed by the Landscape Architect. The work shall be performed by the project Arborist.

3.10 INVASIVE PLANT REMOVAL (CUT CLEAR AND SWIPE)

- A. Areas where invasive plants are to be removed are as shown on the plan or as directed by the DCR Representative.
- B. Work as shown on the plans as cut, clear and swipe shall be treated and removal performed in accordance with the Riverbank Vegetation Management Plan (RVMP) appended to the NOI. Work shall be performed by an Applicator licensed in Massachusetts.
- C. Stalks shall be cut with pruners or hand clippers. Power trimmers may be used for larger stems that cannot be cut with hand clippers.
- D. An environmentally safe herbicide will be applied to cut stalks of the plants by hand with a moistened cloth, paint brush or applicator. Herbicide will be applied directly to stalks and no neighboring plants shall be affected by the process.
- E. Work will be performed by licensed contractors under direct supervision of the DCR Representative.
- F. Work will be performed late Summer or Early Fall or as approved by DCR Representative.
- G. All work is to be done in conformance with the Cambridge Conservation Commission Order of Conditions and the Vegetation Management Plan.

3.11 DISPOSAL

- A. Disposal: Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.
 - Separate recyclable materials produced during site clearing from other non-recyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities.
 - Recyclable or re-usable materials include but are not limited to concrete and bituminous concrete pavements, gravel and other suitable base materials, granite blocks and cobbles.

3.12 REMOVAL AND STOCKPILE

- A. Items not wanted by the DCR shall be legally disposed of by the Contractor at his/her expense.
- B. Any items to be reused shall be safely and securely stockpiled in accordance with the Specifications.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

- A. SITE PREPARATION shall be measured for payment PER LUMP SUM and shall include all miscellaneous site preparation including, but not limited to removal of site furnishings, removal of shore stabilization fabric, removal of concrete blocks, lawn removal, miscellaneous removal and repair of pavements, removal of concrete curbing, root pruning, and all work items noted in the section which are not paid for under other pay items.
- B. TREE PROTECTION FENCE shall be measured for payment PER LINEAR FOOT and shall consist of furnishing, installing, removing and resetting, and maintaining fence in a vertical and effective position at all times, and final removal of temporary fence.
- C. REMOVE PICNIC TABLE AND CONCRETE PAD shall be measured for payment PER EACH
- D. TOPSOIL STRIP & STOCKPILE shall be measured per CUBIC YARD.
- E. CLEARING AND GRUBBING shall be measured for payment PER SQUARE YARD and shall be for all areas that require removal of vegetation and debris as shown on the plans or as designated by the Landscape Architect
- F. Allowance for INVASIVE PLANT REMOVAL (CUT CLEAR AND SWIPE) of Ten Thousand Dollars is included in this Contract.
- G. ARBORIST SERVICES shall be measured for payment PER LUMP SUM.
- H. TREE TRIMMING shall be measured for payment PER EACH and shall be for trimming trees and shrubs within the project area as shown on the plans and typical sections or as directed by the Landscape Architect and DCR Representative.
- I. BITUMINOUS CONCRETE PAVEMENT AND BASE REMOVAL shall be measured for payment PER SQUARE YARD

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- J. SAWCUT PAVEMENT shall be measured for payment PER LINEAR FOOT.
- K. REMOVE VEHICULAR SWING GATE AND FOOTING shall be measured for payment PER EACH.

4.02 PAYMENT

- A. SITE PREPARATION will be paid for at the contract unit prices for the quantities determined as specified above.
- B. TREE PROTECTION FENCE will be paid for at the contract unit prices for the quantities determined as specified above.
- C. REMOVE PICNIC TABLE AND CONCRETE PAD will be paid for at the contract unit prices for the quantities determined as specified above.
- D. TOPSOIL STRIP & STOCKPILE will be paid for at the contract unit prices for the quantities determined as specified above.
- E. CLEARING AND GRUBBING will be paid for at the contract unit prices for the quantities determined as specified above.
- F. INVASIVE PLANT REMOVAL (CUT CLEAR AND SWIPE) will be paid for at the contract unit prices for the quantities determined as specified above.
- G. ARBORIST SERVICES will be paid for at the contract unit prices for the quantities determined as specified above.
- H. TREE TRIMMING will be paid for at the contract unit prices for the quantities determined as specified above.
- I. BITUMINOUS CONCRETE PAVEMENT AND BASE REMOVAL will be paid for at the contract unit prices for the quantities determined as specified above.
- J. SAWCUT PAVEMENT will be paid for at the contract unit prices for the quantities determined as specified above.
- K. REMOVE VEHICULAR SWING GATE AND FOOTING will be paid for at the contract unit prices for the quantities as specified above.

4.03 PAYMENT ITEMS

Item	Description	Unit
02100-1	SITE PREPARATION	LS
02100-2	TREE PROTECTION FENCE	LF
02100-3	REMOVE PICNIC TABLE AND CONCRETE PAD	EA

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02100-4	TOPSOIL STRIP & STOCKPILE 6" APPROXIMATE DEPTH	CY
02100-5	CLEARING AND GRUBBING	SY
02100-6	INVASIVE PLANT REMOVAL (CUT CLEAR AND SWIPE)	AL
02100-7	ARBORIST SERVICES	LS
02100-8	TREE TRIMMING	EA
02100-9	BITUMINOUS CONCRETE PAVEMENT AND BASE REMOVAL	SY
02100-10	SAWCUT PAVEMENT	LF
02100-11	REMOVE VEHICULAR SWING GATE AND FOOTING	EA

END OF SECTION 02100

SECTION 02200

EARTHWORK

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1 – GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.
- B. Examine all other Sections of the Specifications for requirements which affect work of this Section, whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all other trades or contracts affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

1.02 DESCRIPTION OF WORK

- A. Provide all labor, material, equipment, appliances, and services necessary to complete the work specified in this Section and shown on the Drawings.
- B. The work of this Section includes, but is not necessarily limited to:
 - 1. Excavating, trenching, subgrade preparation, filling, backfilling, and compaction as required for the construction of footing foundations, utilities, pavement, seeded areas and site improvements specified herein and shown on the Drawings.
 - 2. Excavation of unsuitable materials, including all existing fill and organic soils below proposed spread footing foundations within the zone of influence below foundations defined by a 1 horizontal to 1 vertical (1H:1V) line sloping downward and outward from one foot outside the bottom edge of the footings and intersecting undisturbed natural soil.
 - 3. Provision of graded materials, as specified, for fills, base courses and backfills as required.

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4. Protection of all existing utilities, structures and associated facilities, roadways, pavements, lawns, and planting to remain, and other improvements from damage due to construction.
 5. Excavation and backfill for infiltration trenches.
 6. Excavation and backfill for electrical and drainage structures and lines.
 7. Dust control and clean up.
 8. Proof-rolling of foundation and pavement subgrades.
 9. De-compaction of subgrade in proposed lawn and planting areas.
 10. Removal of marsh soils (as required)
 11. Removal and satisfactory disposal or reuse of all debris and unacceptable material encountered throughout the site. Disposal of all excess material shall be performed in accordance with all local, state, and federal regulations.
 12. Obtain all required permits, licenses, and approvals of appropriate municipal and utility authorities, prior to commencing the work of this Section, and pay costs incurred therefrom.
 13. The removal, hauling and stockpiling of suitable excavated materials for subsequent use in the work. Stockpiling shall include protection to maintain materials in a workable condition (including covering suitable fill materials stockpiles with tarps, or other means, to mitigate water intrusion and keeping suitable material stockpiles segregated from other materials).
 14. Re-handling, hauling and placing of stockpiled materials for use in refilling, filling, backfilling, grading and such other operations.
 15. Providing products in sufficient quantities to meet the project requirements.
- C. Provide facilities, labor, materials, tools, equipment, appliances, and related work necessary to provide and maintain erosion control during construction operations. All erosion control measures shall be installed prior to earthwork operations and shall be maintained according to Drawings and other sections of the specifications.
- D. Contractor shall be responsible for notifying all affected utility companies including, but not limited to, MWRA and Dig Safe before starting work.
- E. Provide all labor, material, equipment, appliances, and services necessary to complete the work specified in this Section and shown on the Drawings.

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1.03 RELATED WORK UNDER OTHER SECTIONS

- A. Section 02100 - SITE PREPARATION
- B. Section 02370 – EROSION AND SEDIMENTATION CONTROL
- C. Section 02500 - BITUMINOUS CONCRETE PAVING
- D. Section 02730 – CEMENT CONCRETE PAVING AND STABILIZED STONEDUST
- E. Section 02740 – SITE UTILITIES
- F. Section 02800 - SITE FURNISHINGS
- G. Section 02910 – PLANTING SOILS
- H. Section 02930 – EXTERIOR PLANTS
- I. Section 02940 – LAWNS AND MEADOWS
- J. Section 03300 - REINFORCED CONCRETE
- K. Drawing E0.2 - ELECTRICAL

1.04 REFERENCES

- A. References herein to any technical society, organization, group or body are made in accordance with the following abbreviations and, unless otherwise noted or specified, all work under this Section shall conform to the latest edition as applicable:
- B. A.S.T.M. - American Society for Testing and Materials.
 - 1. ASTM C136 – Method for sieve analysis of fine and course aggregates.
 - 2. ASTM D1557 – Test methods for moisture-density relations of soils and soil-aggregate mixtures using ten-pound hammer (10 lb.) and eighteen-inch (18”) drop.
 - 3. ASTM D2922 – Test methods for density of soil and soil-aggregate mixtures in place by nuclear methods (shallow depth).
- C. A.A.S.H.T.O. - American Association of State Highway and Transportation Officials.

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- D. S.S.H.B. – Commonwealth of Massachusetts State Standards for Highway and Bridge Construction, Department of Public Works (Massachusetts Department of Transportation, MassDOT), Standard (and Supplemental) Specifications for Highways and Bridges.
- E. O.S.H.A. – Occupational Safety and Health Administration
- F. MassDEP – Massachusetts Department of Environmental Protection
 - A. Massachusetts Contingency Plan (MCP) 310 CMR 40.000
 - B. Air Pollution Control Asbestos 310 CMR 7.15
- G. EPA – United States Environmental Protection Agency
- H. Hazardous Waste Management (40 CFR 260-263, 268, and 270-272)

1.05 DEFINITIONS

- A. The words "finished grades", "finish grade", or "finish surface" as used herein mean the required final grade elevations indicated on the Drawings. Where not otherwise indicated, areas shall be given uniform slopes between points, for which finished grades are shown, or between such points and existing grade except that vertical curves or roundings shall be provided at abrupt changes in slope.
- B. Subgrade: Surface or elevation of subgrade soil remaining after completing excavation to the depth required to: remove unsuitable soil below spread footing foundations, construct pile caps, construct pavement subbase and base course, and install utilities, or the top surface of a fill or backfill immediately beneath planting soil.
- C. Trench: Trench shall be defined as an excavation of any length where the width is less than twice the depth. All other excavations shall be defined as open excavations.

1.06 EXAMINATION OF CONDITIONS

- A. The Contractor shall fully inform himself of existing conditions of the site before submitting his/her bid, and shall be fully responsible for carrying out all site work required to fully and properly execute the work of the Contract, regardless of the conditions encountered in the actual work. No claim for extra compensation or extension of time will be allowed on account of actual conditions inconsistent with those assumed, except those conditions described in the GENERAL CONDITIONS.

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- B. Plans, surveys, measurements and dimensions under which the work is to be performed are believed to be correct to the best of the Landscape Architect/Engineer's knowledge, but the Contractor shall have examined them for himself during the bidding period, as no allowance will be made for any errors or inaccuracies that may be found therein.

1.07 QUALITY ASSURANCE

- A. The Contractor shall retain and pay for the services of an independent testing and inspection firm and/or a Geotechnical Engineer to perform on-site observation and testing during the various phases of the construction operations. The scope of services will be determined by the DCR Representative and the independent testing and inspection firm and/or the Geotechnical Engineer and will be provided to the Contractor. The DCR Representative reserves the right to modify or waive the services of the independent testing and inspection firm and/or the Geotechnical Engineer. The services of a Geotechnical Engineer/Inspection and testing firm may include, but shall not necessarily be limited to, the following:
 - 1. Observation of all subgrades below unsuitable soils and foundation subgrades prior to placement of compacted fill or foundations.
 - 2. Laboratory testing and analysis of fill materials as specified herein and proposed by the Contractor for incorporation into the Work.
 - 3. Observation of excavation; foundation, utility, and pavement subgrade preparation, including proof-compaction and densification; and performance of water content, gradation and compaction tests at a frequency and at locations selected by the DCR Representative/Inspection and testing firm necessary to evaluate compliance with this specification.
- B. The Contractor shall make provisions for allowing observations and testing of Contractor's Work by the independent testing and inspection firm.
- C. The presence of the independent testing and inspection firm does not include supervision or direction of the actual work of the Contractor, his/her employees or agents. Neither the presence of the independent testing and inspection firm, nor any observations and testing performed by them, nor failure to give notice of defects shall excuse the Contractor from defects discovered in his/her work.
- D. Costs related to re-testing due to unacceptable qualities of work and failures discovered by testing shall be paid for by the Contractor at no additional expense to Owner.

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1.08 PROTECTION

- A. All rules and regulations governing the respective utilities shall be observed by the Contractor in executing all work under this Section. All work shall be executed in such a manner as to prevent any damage to existing buildings, streets, curbs, paving, service utility lines, structures and adjoining property.
- B. Locate and mark underground utilities to remain in service before beginning the work. Protect all existing utilities to remain during operations. Do not interrupt existing utilities except as authorized in writing by authorities having jurisdiction.
- C. When an active utility line is exposed during construction, its location and elevation shall be plotted on the record drawing by the Contractor, and both the DCR Representative and the Utility Owner notified in writing.
- D. Conduct earthwork operations to ensure minimum interference with streets, walks, and other adjacent facilities. Do not close or obstruct streets, walks, etc. without written permission from authorities having jurisdiction. Provide barricades, fences, signs and all other safety devices required for the protection of the public.

1.09 SAMPLES AND TESTING

- A. All operations under this Section of the Specifications will be subject to the continuous observation of the DCR Representative, and of a soils testing laboratory, engaged and paid directly by the Contractor. The DCR Representative shall direct testing to determine conformance of materials and workmanship, particularly compaction, to the requirements of this Specification.
 - 1. The laboratory shall make such tests of materials and compaction. Costs of the tests shall be borne by the Contractor. Test copies shall be submitted to the DCR Representative directly from the approved independent testing company.
 - 2. Contractor shall provide a 50 lb. minimum sample of each fill material from each proposed source including on-site. Additional samples shall be provided if a change in material type occurs at the borrow source. Allow minimum of three working days for testing evaluation before materials needed. **Do not deliver proposed fill materials to the site unless/until the Landscape Architect has approved of material testing results.** Submit samples from alternate sources if intended for use.

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3. The laboratory will defer testing on an area until the Contractor states that he/she has reached the specified compaction of the particular area. Areas for which tests indicate insufficient compaction shall be re-compacted and retested until the areas conform to the requirements of the Specifications. All costs for retesting material shall be borne by the Contractor.

B. Compaction Tests

1. At all new pavements. Tests will be provided for subgrade and base materials. Final locations will be coordinated with the DCR Representative.
2. At all structure footing locations. Tests will be provided for subgrade and base materials. Testing interval to be determined with the DCR Representative.
3. All bench and other site fixture pads/foundations. Tests will be provided for subgrade and base materials.

1.11 COORDINATION

- A. Prior to start of earthwork the Contractor shall arrange an on-site meeting with the DCR Representative, the Owner/Owner's Representative, the independent testing firm, and the Engineer for the purpose of establishing the Contractor's schedule of operations and scheduling observation and testing procedures and requirements.
- B. As construction proceeds, the Contractor shall be responsible for notifying the DCR Representative a minimum of three (3) working days prior to the start of earthwork operations requiring observation and/or testing.

1.12 SUBMITTALS

- A. Submit, in an airtight container to the Inspection/Geotechnical Engineer's and testing firm's designated testing laboratory, a minimum of a one-gallon bucket of each type of fill material that is to be used at the site. Submit samples a minimum of two weeks prior to use of proposed material at the site. Samples submitted for inspection by the DCR Representative shall be brought to the site. Submit samples to the testing laboratory and the DCR Representative. No fill material shall be delivered to the site or placed until the material has been approved.
- B. The DCR Representative will be responsible for the approval or rejection of the suitability of all materials.

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- C. Submit the name of each material supplier and specific type and source of each material. Any change in source throughout the job requires approval of the Owner or DCR Representative.
- D. All off-site material brought to the site shall be free of contaminants. The Contractor shall identify the source of the material and provide results of environmental testing performed on a representative sample of the material from each source. At a minimum, environmental testing shall include Total Petroleum Hydrocarbons (TPH) by ASTM D3328/EPA Method 8100, metals (RCRA 8) by EPA Methods 6010/7471A, semi-volatile organic compounds (SVOCs) by EPA Method 8270, Polychlorinated Biphenyls (PCBs) by EPA Method 8082, volatile organic compounds (VOCs) by EPA Method 8260 and asbestos.
- E. Despite review and comment by the DCR Representative, the Contractor shall remain solely responsible for the adequacy and safety of materials and methods used in construction.
- F. Product literature, Material Safety Data Sheets, and installation requirements for all products

1.13 BENCH MARKS AND ENGINEERING

- A. Lines and grade work in accordance with Drawings and Specifications shall be laid out by a registered Civil Engineer or Surveyor employed by the Contractor. The Contractor shall establish permanent bench marks, to which access can easily be had during the progress of the work. The Contractor shall maintain all established bounds and bench marks and replace, as directed, any which may be disturbed or destroyed. The selection of the registered Civil Engineer or Surveyor shall be subject to the DCR Representative's approval. The Contractor shall pay all costs of the services of the Civil Engineer or Surveyor.
- B. The Contractor shall verify dimensions and elevations on the ground and report any discrepancies immediately to the DCR Representative. Any discrepancies not reported prior to construction shall not be the basis for claims for extra compensation.

1.14 SUBSURFACE INFORMATION

- A. By submitting a bid, the Contractor affirms that the site and all conditions affecting the work under this Section have been carefully examined. No claim for additional costs will be allowed because of lack of full knowledge of existing conditions as indicated in the Contract Documents, or obvious from observations at the site.

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1.15 PROTECTION

- A. All rules and regulations governing the respective utilities shall be observed in executing all work under this Section.
- B. All work shall be executed in such a manner as to prevent any damage to existing streets, curbs, paving, service utility lines, structures and adjoining property. Contractor shall assume full responsibility for damages caused to such by his/her Subcontractor's equipment and personnel.
- C. The Contractor shall furnish all facilities and materials necessary to prevent the earth at the bottom of excavation from becoming frozen or unsuitable to receive footing or other load bearing units.
- D. The Contractor, under this Section, shall provide at his/her own expense adequate pumping and drainage facilities to keep the excavation sufficiently dry as not to affect adversely the quality or time of placement of concrete or other materials to be installed in the excavated areas.
- E. The work of this Section shall be performed in such a manner as to cause no interference with access by the Subcontractors or other Contractors to all portions of the site as is necessary for the normal conduct of their work.

PART 2 - PRODUCTS

2.01 FILL MATERIAL

- A. GRAVEL BASE (PROCESSED GRAVEL FOR SUBBASE) - Gravel Base as called for on the Drawings under and/or around pavement and miscellaneous site improvements shall consist of a well-graded sand and gravel, free from deleterious matter, loam and clay, meeting the following gradation requirements conforming to S.S.H.B., Section M1.03.1:

<u>U.S. Sieve Size and No</u>	<u>Percent Passing by Weight</u>	
	<u>Minimum</u>	<u>Maximum</u>
3 inches	100	--
1-1/2 inches	70	100
1/4 inch	50	85
No. 4	30	60
No. 200	0	10

- B. CRUSHED STONE - Crushed Stone shall be washed, graded free of organic materials one and one-quarter (1-1/4) inch to three quarters (3/4) inch size.

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Gradation shall conform to S.S.H.B., Section M2.01.1/M2.01.02, M2.01.03 and M2.01.4, as follows:

1-1/2 inch Crushed Stone (M2.01.1 & M2.01.2):

<u>U.S. Sieve Size and No.</u>	<u>Percent Passing by Weight</u>	
	<u>Minimum</u>	<u>Maximum</u>
2 inches	100	--
1-1/2 inches	95	100
1 - inch	35	75
3/4 inch	0	25

3/4 inch Crushed Stone (M2.01.4):

<u>U.S. Sieve Size and No.</u>	<u>Percent Passing by Weight</u>	
	<u>Minimum</u>	<u>Maximum</u>
1 inch	100	--
3/4 inch	90	100
1/2 inch	10	50
3/8 inch	0	20
No. 4	0	5

C. DENSE GRADED CRUSHED STONE - Use for pavement subbase and base material and shall meet the following requirements:

1. Dense graded crushed stone material shall comply with S.S.H.B. Section M2.01.7.
2. Coarse aggregate shall consist of hard durable particles or fragments of stone or gravel. Materials that break up when alternately frozen and thawed or wetted and dried shall not be used.
3. Coarse aggregate shall have a percentage of wear, by the standard Los Angeles abrasion test, AASHTO T96 or ASTM C 131 of not more than 45.
4. Fine aggregate shall consist of natural or crushed sand.
5. The composite material shall be free from clay, loam or other deleterious material, and shall conform to the following gradation requirements:

<u>U.S. Sieve Size and No.</u>	<u>Percent by Weight Passing</u>	
	<u>Minimum</u>	<u>Maximum</u>
2 inches	100	--

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1 1/2 inches	70	100
3/4 inches	50	85
No. 4	30	55
No. 50	8	24
No. 200	3	10

6. Sampling and testing shall be in accordance with the following standards AASHTO methods:

Sieve Analysis	T27
Passing No. 200 Sieve	T11

7. Dense graded crushed stone shall be provided to the compacted thicknesses shown on the Drawings.

D. COMMON FILL/ORDINARY BORROW

1. Use for general grading, embankment fill, and as backfill in areas outside of foundations, utilities, and pavement. Ordinary borrow shall be well graded, natural inorganic soil, approved by the DCR Representative and meeting the following requirements:
- It shall be free of organic materials, clay, roots, trash, ice, snow, tree stump or other weak or compressible materials, of frozen materials, and of stones larger than 6 inches maximum dimension.
 - It shall be of such nature and character that it can be compacted to the specified densities in a reasonable length of time.
 - It shall be free from highly plastic clays, from all materials subject to decay, decomposition, or dissolution and free from cinders or other materials which will corrode piping or other metal.
 - Materials from excavation on the site may be used as ordinary fill if it meets the above requirements and is approved by the DCR Representative.
 - The soil shall contain no more than 30 percent passing the #200 sieve.
 - Stones larger than twelve (12) inches shall be removed prior to compaction.

E. EXCAVATED MATERIAL

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1. Excavated materials without chemical contamination meeting the gradation limits for fill contained herein may be segregated and reused as accepted by the DCR Representative. It is not anticipated, however, that on-site materials will conform to the specified gradation requirements for the materials listed in this specification, except possibly for Ordinary Borrow.
2. All suitable material, as accepted by the DCR Representative, may be reused on the site, provided it meets the relevant provisions of this Article.
3. All material unsuitable for reuse will be disposed of at no cost to Owner.

2.02 NON-WOVEN GEOTEXTILE FABRIC/FILTER FABRIC

- A. Geotextile Fabric may be used as directed by the DCR Representative to prevent soil intrusion into drains and/or assist in stabilizing soil subgrades to be laid on approved soil subgrades prior to placement of fill materials.
- B. Contractor shall use Mirafi 140N or equivalent filter fabric acceptable to the DCR Representative between crushed stone and granular soils and where shown on the Drawings.

PART 3 – EXECUTION

3.01 PROTECTION AND SHORING

- A. Protect excavations as required so as to maintain them secure during construction.

3.02 DEWATERING

- A. Provide all necessary pumps, well points and pumping facilities, including attendants, to keep all excavations free of water from whatever source at all times when work is in progress and when necessary for protection and integrity of the work in place. Trenches shall be kept water-free during jointing and for sufficient time thereafter to allow the jointing material to become fully set and completely resistant to water penetration. Pump discharge to be in such a manner that it does not flood, interfere or damage any other area of work and meets with approval of Conservation Commission.

3.03 EXCAVATION

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A. General

1. Unclassified Materials – Unclassified excavation includes the satisfactory removal and recycling or disposal of all materials (except contaminated materials defined below) encountered regardless of the nature of the materials and shall be understood to include, but not be limited to, earth, boulders, cobbles, fill, asphalt pavement, and other man-made debris. Excavation and disposal of excavated bedrock shall be considered unclassified excavation.
2. Exercise care to preserve the material below and beyond the lines of excavation. Where excavation is carried out below indicated grade or beyond the limits of excavation, Contractor shall backfill and compact the over excavation with Gravel Borrow to the indicated grade, at no additional cost to the Owner and at the direction of the DCR Representative.
3. Excavate with caution in the area of existing utilities. Expose utilities by hand or other excavation methods that will prevent damage. Support excavations that may extend within a zone defined by a 1H:1V zone extending outward and below the outer edge of the base of existing utilities.
4. The Contractor shall obtain from the proper authorities locations of all utilities within the scope of this work so that there will be no damage done to such utilities. Neither the Owner nor the DCR Representative will be responsible for any such damage, and the Contractor shall restore any structure or utility so damaged without additional compensation. Written notifications to the appropriate utility agencies shall be made at least ten (10) days prior to the commencement of any work. All existing utilities servicing facilities must remain operational during construction.
5. Provide sheeting, shoring or bracing to complete and protect all excavated areas, as required for safety and compliance with OSHA. Costs for sheeting, shoring, and bracing shall be included as part of the contract price for completing the work and Owner shall make no separate payment for this work.
6. Excavate all materials to the elevations, dimensions and form as shown on the Drawings and as specified herein for the construction of foundations, piles, utilities, structures, and site improvements. All unsuitable materials within the indicated and specified limits shall be excavated and removed to the subgrade elevation as defined herein and on the Drawings.

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7. Unsuitable materials shall include the following:
- Existing pavement, utility structures, foundations and other man-made structures.
 - Organics such as topsoil, subsoil, peat, organic silt, stumps, debris, trash, other organic materials subject to decomposition, consolidation or decay
 - Material determined to be hazardous, and material determined by the DCR Representative to be unacceptable for incorporation into the work.
 - Miscellaneous fill including sand, gravel, cinders, ash, glass, wood, metal and ledge.
 - Cobbles, boulders and excavated rock except as specified for fills herein.

8. Excess Material

- a. All surplus fill other than that required to complete the intent of the Contract shall become the property of the Contractor and shall be legally disposed of off the property by the Contractor in accordance with the regulations and requirements of all municipalities or agencies having jurisdiction over the disposal sites and the route between the project and the disposal sites.
- b. All surplus loam other than that required to complete the intent of the Contract shall become the property of the Contractor and shall be legally disposed of off the property by the Contractor.

B. Excavation for Site Improvements

- 1. Excavate to the lines and grades shown on the Drawings and as specified to obtain the subgrades for the site improvements.
- 2. Excavation within the root zones of existing trees to remain shall be done carefully by hand. Root zones shall be determined by drip lines of existing tree canopies and/or through visual observation of exposed tree roots. Roots identified as belonging to trees to be removed shall be removed as completely as possible without causing damage to roots belonging to trees to remain. Contractor shall identify any tree roots of trees to remain that protrude above the proposed finish grade and shall

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bring them to the attention of the Landscape Architect. Do not remove any major tree roots without Landscape Architect's approval.

D. Excavation for Landscape Areas

1. In lawn areas, scarify subsoil a minimum depth of six inches. Subsoil shall also be cleared of debris and stones larger than four inches prior to topsoil spreading. All work adjacent to critical root zone of existing trees shall be done by hand under the supervision of a Massachusetts licensed Arborist and shall not damage existing tree roots.
2. In planting areas, scarify subsoil a minimum depth of six inches below the required root ball excavation prior to placement of plant backfill mixture.

E. Rock Excavation

1. Rock is defined for payment purposes as solid mineral material, including boulders over two cubic yards (2yd³) in volume in open areas, and one cubic yard (1yd³) in volume in trenches, or solid material that cannot be readily broken or removed by conventional mechanical excavation equipment (defined as a D-9 excavator, or equivalent, with ripper), or which requires continuous, systematic drilling, chemical expanders, hoe ramming or other special procedures.
2. When rock is encountered, it shall be uncovered and exposed, and the DCR Representative shall be notified in writing by the Contractor before commencement of rock removal. Rock removal quantities shall be based on measurements in their original position and to the limits of clearly defined vertical and horizontal construction lines. The rock shall be measured and quantities established and agreed upon by Contractor and DCR Representative. Excavation of material in question before agreement by the DCR Representative as to the character of the material, or failure to notify the DCR Representative, or failure to take measurements will forfeit the Contractor's right to payment for rock excavation. Measurements shall be made by a Registered Surveyor, paid for by the Contractor and accepted by the DCR Representative.
3. The quantity of rock to be removed shall be based on the following limits:
 - a. Foundations: Within the limits of the concrete lines as defined on the Drawings or by duly authorized modifications thereto, plus twelve inches (12") outside the vertical concrete lines and twelve inches (12") below base.

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- b. Utility Trenches: All parts of pipe, valves, and fittings to a depth of six inches (6”) below the bottom of the bell and for a width equal to the outside diameter on each side, provided that overlapping computed volumes of any ledge or boulder excavation shall be paid for only once.
 - c. Paved Areas: To the underside of the subbase.
 - d. Site Structures: Twelve inches (12”) outside of structure all around.
 - e. Any unforeseen rock or boulder encountered, as defined above, which must be removed for construction of the work defined on the Drawings or in modification thereto, shall be measured in its original position to the limits of clearly defined vertical construction lines and to the depth required for the defined construction.
- F. Blasting shall not be permitted.

3.04 SUBGRADE PREPARATION

A. Special Project Conditions

1. De-compact subgrade soils to 12 inches depth from proposed top of subgrade elevation prior to placing planting soils for lawns or plants. Thoroughly loosen and re-compact to 90%. Provide percolation testing of subgrade as per specification 02910 prior to placement of planting soils.
2. Where marsh soils are encountered within 18” of finish grade in lawn areas or within 18” of planting soils for trees and shrubs, replace marsh soil with 12” of coarse sand as directed by DCR Representative. Legally dispose of marsh soils off-site.

B. Proof Compaction (General)

1. Any weak or soft spots identified by the DCR Representative during proof compaction shall be over-excavated and replaced with Gravel Borrow, or lean concrete placed and compacted in accordance with these Specifications.
2. Soils at the bottom of the excavation may be susceptible to disturbance during excavation in wet conditions. Excavations shall be sequenced and conducted in such a way as to minimize disturbance of subgrades. Equipment (other than proof-compaction equipment) shall not operate directly on the natural subgrade to limit disturbance. Over excavation and

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backfill required to repair disturbed subgrades caused by Contractor's operations shall be at no additional cost to the Owner.

3. When near or below the water table, proof compaction should be at the discretion of the DCR Representative and may be performed using static (non-vibratory) equipment.
4. No construction equipment other than that used for placement and compaction of fill shall be allowed on any final subgrade and previously placed fill unless accepted by the Geotechnical Engineer.
5. Proof compact subgrades under the observation of the DCR Representative prior to placement of backfill or foundation.
6. Protect footing subgrades from frost at all times during construction. Fill shall not be placed over frozen soil.

B. Foundations and Footings

1. Proof compact the exposed ground at footing subgrades, above the groundwater table elevation, by making ten (10) passes with a vibratory drum roller having a minimum static weight of 10,000 pounds. Proof compaction in confined areas shall be performed with a minimum of ten (10) passes of a walk-behind vibratory drum roller or vibratory plate compactor acceptable to the DCR Representative.
2. If groundwater is near the footing subgrade, proof-rolling should be performed at the discretion of the DCR Representative, and should be performed using static (non-vibratory) equipment.

3.05 FILLS, BACKFILLS AND COMPACTION

A. Samples and Testing

1. All fill material and its placement shall be subject to quality control testing. A qualified laboratory will be selected by the Contractor to perform tests on materials. All costs of testing will be paid for by the Contractor. Test results and laboratory recommendations shall be available to the DCR Representative and Contractor.
2. Provide samples of each fill material from the proposed source of supply including on-site sources to the testing laboratory. Allow sufficient time for testing and evaluation of results before material is needed. Submit samples from alternate source if required.

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3. The DCR Representative will be sole and final judge of suitability of all material.
4. The laboratory will determine maximum dry density and optimum water content in accordance with A.S.T.M. D-1557, Method D and the in-place density in accordance with A.S.T.M. D-1556.
5. Tests of material as delivered may be made from time to time. Materials in question may not be used, pending test results. Tests of compacted materials will be made regularly. Remove rejected materials and replace with new, whether in stockpiles or in place.
6. Cooperate with laboratory in obtaining field samples of in-place materials after compaction. Furnish incidental field labor in connection with these tests.

B. Placing Fills and Compacting

1. After approval of foundation subgrades by the DCR Representative, backfill areas to contours and elevations with specified materials.
2. Fill material shall be placed in horizontal layers not exceeding six (6) inches under all pavements. Each layer shall be compacted to the percentage of maximum dry density specified for the particular type of fill and at a water content equal to optimum water content plus or minus two (2) percent. The maximum dry density and optimum water content shall be as specified herein.
3. Areas to be filled or backfilled shall be free of construction debris, refuse, compressible or decayable materials and standing water. Do not place fill when fill materials or layers below it are frozen.
4. Filling and backfilling shall not be started until conditions have been accepted by the DCR Representative.
5. In freezing weather, a layer of fill shall not be left in an un-compacted state at the close of a day's operations. Prior to terminating operations for the day, the final layer of fill, after compaction, shall be rolled with a smooth-wheeled roller to eliminate ridges of soil left by tractors, trucks and compaction equipment.
6. Where existing tree roots to remain fall within compaction zones, Contractor shall exercise caution in the immediate area to prevent compaction equipment from damaging or splitting roots. Hand tamping

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shall be employed in these areas. Compaction percentages in these areas may measure less than the requirements listed above.

7. After approval of subgrade by the DCR Representative, backfill areas to contours and elevations with specified materials.
8. Backfill shall not contain frozen lumps nor be placed on frozen ground.
9. Maintain fill materials with uniform moisture content, with no visible wet or dry streaking. The final filled soil mass shall be as uniform as practical in material characteristics, lift thickness, moisture content, and compactive effort required.
10. Place in layers not to exceed 12 inches in thickness when utilizing heavy compaction equipment, and 6 inches when utilizing light hand-operated compaction equipment. Compact with a minimum of 6 coverages of acceptable compaction equipment.
11. No rock in excess of three (3) inches in its largest dimension shall be incorporated in the top three (3) foot of fill immediately below the subgrade.
12. During fill operations, earth moving equipment shall be routed as evenly as possible over the entire width of the work.
13. At the close of each day's work the working surface shall be crowned, shaped, and rolled with smooth steel or pneumatic tired rollers to ensure proper drainage.
14. Do not backfill over porous, wet, frozen or spongy subgrade surfaces.
15. Grade and compact fill surface to readily shed water. All fill is to be placed in-the-dry.
16. Where horizontal layers meet a naturally rising slope, key layer into slope by benching into the slope.
17. Employ placement method that does not disturb or damage foundations, utilities, existing structures or utilities in trenches.
18. Maintain range of optimum moisture content of backfill materials to attain required compaction density. If wet fill cannot be adequately compacted, remove and replace with drier fill.
19. Obtain the permission of the DCR Representative prior to backfilling any portion of the permanent structure.

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20. Slope finished grades away from buildings and structures a minimum of two inches (2") in one foot (1'). Make grade changes gradual.
21. At completion of Work, leave fill material stockpile areas completely free of excess fill materials.

C. Deficiency of Fill Materials

1. Provide required additional fill materials as specified if a sufficient quantity of suitable materials is not available from the required excavation on the project site at no additional cost to the Owner.
2. Where water content of the fill must be adjusted to meet this Specification, the fill shall be thoroughly disked to insure uniform distribution of any water added.

3.06 COMPACTION

A. Compaction Requirements

1. The degree of compaction is expressed as a percentage of the maximum dry density at optimum moisture content as determined by ASTM Test D1557, Method C. The compaction requirements are as follows:

<u>Area</u>	<u>Degree of Compaction</u>	<u>Minimum</u>
Within bearing zone of footings ¹		95%
Beneath Pavement (upper two feet)		95%
More than 2 feet below pavement subgrade		92%
Adjacent to Foundations		92%
Pipe Bedding		95%
Beneath Landscape areas		90%

1. Bearing Zone of Footings is defined as 1 horizontal to 1 vertical (1H:1V) line sloping downward and outward from 1 foot outside the bottom exterior edge of footing.
2. Compaction percentages are based on the laboratory derived Maximum Density Values as determined by ASTM D 1557 Method C.
3. Crushed Stone shall be compacted to an unyielding surface.

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B. Moisture Control

1. Fill that is too wet for proper compaction shall be harrowed, or otherwise dried to a proper moisture content to allow compaction to the required density. If fill cannot be dried within 24 hours of placement, it shall be removed and replaced with drier fill.
2. Fill that is too dry for proper compaction shall receive water uniformly applied over the surface of the loose layer. Sufficient water shall be added to allow compaction to the required density.
3. Fill material shall not be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by heavy rains, fill operations shall not be resumed until the moisture content and the density of the previously placed fill are as specified.

C. Protection of Fill

1. Protection of compacted fill shall be the responsibility of the Contractor. Newly graded areas shall be protected from the actions of the elements and traffic. Any settlement or washing that occurs prior to acceptance of the work shall be repaired and grades shall be established to the required elevations and slopes. Damage to any compacted lift (including those lifts previously tested and accepted by the DCR Representative) occurring at any time during the course of construction, which is caused by equipment, moisture entering the embankment, or from any other cause, shall be fully repaired by the Contractor prior to placement of overlying materials, at no additional cost to Owner.
2. In the event of and prior to the commencement of heavy rains, the Contractor shall suspend fill operations as required and shall take all necessary steps to keep the site as well drained as possible. Fill operations shall not be resumed until the moisture content of the fill is such as to permit compliance with the Specifications.
3. All corrective work or operations necessary to maintain proper moisture control of the fill material shall be at the expense of the Contractor.

3.07 DUST CONTROL

- A. The Contractor shall employ all possible methods and/or materials to prevent the spread of dust. Chemical materials may not be used.
- B. Nuisance dust levels may be encountered during regrading activities and excavation. Dust levels shall be reduced by pre-wetting the surface soils and by

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establishing and maintaining clean access roads. The Contractor's Dust, Vapor, and Odor Control Plan shall describe the procedures and materials to minimize dust. At a minimum, the Contractor shall provide clean water, free from salt, oil, and other deleterious materials.

- C. Areas to be excavated shall be lightly sprayed with water before excavation. Additional water spray may be utilized only when any indication of excessive dust is observed. The Contractor shall minimize the use of water within the limits of excavation.
- D. Access roads shall be sprayed with water on a regular basis to minimize the generation of dust.

3.08 GRADING TOLERANCES

- A. Grading shall be completed to meet or exceed the following tolerances of uniformity*:

<u>Location</u>	<u>Tolerance</u>
Top of Subgrade Beneath Foundations	1/2 inch
Top of Subgrade Beneath Paving	1/2 inch
Top of Subgrade Beneath Landscape Areas	1 inch
Top of Gravel and Gravel Bases	1/4 inch

*Uniformity is defined as no variations in the surface materials, at the grades and slopes indicated on the drawings that exceed the listed tolerance over a length of ten (10) feet horizontally in any direction.

- B. The bottom of earth and rock excavations shall be formed to provide a smooth, uniform slope and grade. The bottom of the excavated grade shall be free of pockets, depressions or ridges that would collect or concentrate water, silts or other such objectionable material prior to the Application of Backfill or other Finish Materials.

3.09 CLEAN UP

- A. The Contractor shall remove all debris, construction equipment and scrap material from all areas within the limit of work prior to inspection for acceptance.
- B. The Contractor shall sweep any construction debris or earth materials on adjacent streets from the Construction.

PART 4 - MEASUREMENT AND PAYMENT

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4.01 MEASUREMENT

- A. EARTHWORK –including providing and placing borrow materials needed to meet proposed subgrade elevations, with the exception of items noted in B. EARTHWORK - SITE below, shall be measured for payment per LUMP SUM complete in-place as shown on the Drawings and as specified herein to consist of all excavating, disposal of materials, filling, compaction including all labor, materials, equipment, testing and all other incidentals.
- B. EARTHWORK – STRUCTURES for all structural components including the Dock and Overlook structures shall be shall be measured for payment per LUMP SUM complete in-place as shown on the Drawings and as specified herein to consist of all excavating, filling, compaction including all labor, materials, equipment, testing and all other incidentals.
- C. EARTHWORK - SITE including but not limited to stabilized stone dust paving, bituminous concrete paving, concrete paving, and site improvements including all site furnishings, lawns, and plantings and all drainage and electrical elements, shall be measured and paid for under the items for which it is required and shall consist of all excavating, disposal, backfilling, rough and fine grading, and compaction including all labor, materials, equipment testing and all other incidentals.
- D. CLASS A ROCK EXCAVATION shall be measured in place for payment per CUBIC YARD, complete in place including excavating, removal and disposal of materials including all labor, materials, equipment, testing and all other incidentals.
- E. REMOVAL AND REPLACEMENT OF MARSH SOILS WITH COARSE SAND as directed by the DCR Representative shall be measured for payment per CUBIC YARD and shall be only for unexpected locations within the proposed lawn area where such soils are encountered. This item shall include excavation, removal and diposal of materials including all labor, materials, equipment, testing and all other incidentals.

Removal and replacement of marsh soils with coarse sand within Tree Planting areas in saline conditions is part of the Planting Item.

4.02 PAYMENT

- A. EARTHWORK will be paid for at the contract unit price specified above.
- B. EARTHWORK - STRUCTURES will be paid for at the contract unit price specified above.

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- C. EARTHWORK – SITE including stabilized stone dust paving, bituminous concrete paving, concrete paving, and site improvements including all site furnishings, lawns, and plantings, and all drainage and electrical components, will be paid for at the contract unit prices as specified for each item. PAYMENT ITEMS for each site improvement component are provided in relevant sections for each component.
- D. CLASS A ROCK EXCAVATION will be paid for at the contract unit price as specified above.
- E. REMOVAL AND REPLACEMENT OF MARSH SOILS WITH COARSE SAND will be paid for at the contract unit price as specified above

4.03 PAYMENT ITEMS

Item	Description	Unit
02200-1	EARTHWORK FOR SITE	LS
02200-2	EARTHWORK – STRUCTURES	LS
02200-3	CLASS A ROCK EXCAVATION	CY
02200-4	REMOVAL AND REPLACEMENT OF MARSH SOILS WITH COARSE SAND	CY
02200-5	COMPACTED GRAVEL	CY

END OF SECTION 02200

SECTION 02370

EROSION AND SEDIMENTATION CONTROL

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1 – GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.
- B. Examine all other Sections of the Specifications for requirements which affect work of this Section, whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all other trades or contracts affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

1.02 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including, but not limited to, the following:
 - 1. The work to be performed is shown on the Drawings and as specified herein. The work shall be performed in accordance with the City of Cambridge Specifications, Massachusetts Department of Transportation (MassDOT) Standard Specifications for Highways and Bridges, Latest Edition. Said documents are by reference made a part of the Contract.
 - 2. Furnish and install all slope protection, sedimentation and erosion control measures as necessary to retain all erosion and sediments within the construction area, as shown on the Drawings and/or as specified herein, including, but not limited to:
 - a. Provide and maintain filter sock wattle and erosion control silt fence for control of soil runoff on exposed slopes, drainage structures and temporary stockpiles.
 - b. Provide and maintain sediment control bags at all existing or new catch basins.
 - c. Install all floating turbidity control curtains as indicated on the Drawings.
 - d. Seeding annual ryegrass, installing erosion control blankets, or temporary mulch as a temporary cover on all exposed slopes and stockpiled topsoil.

- e. Providing stone construction entrance pads to site and cleaning adjacent roadway surfaces of all accumulated sediment and debris as required or a minimum of once per week.
 - f. Temporary settling basins.
 - g. Erosion Control Blankets (ECB) on all key identified slopes.
 - h. Temporary seeding and lawn stabilization of disturbed areas.
 - i. Dust control.
 - j. Conform to Order of Conditions issued by the Local Conservation Commission.
 - k. Maintain all erosion control measures for the duration of the project.
3. At least 21 days prior to the start of the project (ground disturbance), the Contractor shall prepare a SWPPP in accordance with Section 03125 and submit to the EPA a Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity under the EPA National Pollution Discharge Elimination System (NPDES) General Permit. Contractor shall implement the Storm Water Pollution Prevention Plan (SWPPP) per the requirements of the EPA General Permit and Section 03125. At project completion submit a Notice of Termination (NOT) to the EPA.
- B. The following Related Work is specified under the designated Sections:
1. Section 02200 – EARTHWORK
 2. Section 02500 – BITUMINOUS CONCRETE PAVING & EDGING
 3. Section 02650 – EXISTING UTILITIES
 4. Section 02800 – SITE IMPROVEMENTS
 5. Section 02910 – LAWN & PLANTING SOILS
 6. Section 02930 – EXTERIOR PLANTS
 7. Section 02940 – LAWNS
 8. Section 03125 – STORMWATER POLLUTION PREVENTION PLAN

1.03 QUALITY ASSURANCE

- A. Material Standards and Standards of Workmanship: Equal to the Commonwealth of Massachusetts Guidelines for Soil Erosion and Sediment Control and Local Town Requirements.

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- B. Requirements specified and noted on drawings are minimum. Provide additional measures as required by the local, State or Federal authorities as a result of Contractor's specific scheduling and Work sequencing, or weather conditions at no additional cost to the Owner.
- C. Qualifications: Engaged firm shall be able to demonstrate experience in the installation of the erosion and sedimentation controls described in the Contract Documents.
- D. Refer to the Order of Conditions issued by the Cambridge Conservation Commission and perform all work in accordance thereto.

1.04 SUBMITTALS

- A. Product data for the following:
 - 1. Silt Barrier (Filter Sock Wattle and Fabric)
 - 2. Erosion control blankets.
 - 3. Soil stabilizers.
 - 4. Sediment Control Bag
 - 5. Turbidity Control Curtain

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Seed, Fertilizer and Lime: Deliver in original sealed, labeled, and undamaged containers, showing weighs, analysis, and name of manufacturer.
- B. Protect materials from deterioration during delivery and while stored at site.

1.06 COORDINATION AND SCHEDULING

- A. General: Sow lawn seed and install all stabilization measures as soon as possible in accordance with the Contractor's schedule.
- B. Weather Limitations: Proceed with lawn development only when existing and forecast weather conditions are suitable for work.
- C. Prior to ordering sedimentation and erosion controls submit representative samples, source, and/or product information to the DCR Representative for selection and approval. Do not order materials until DCR Representative's approval has been obtained. Delivered materials must closely match the approved samples.

- D. Erosion and Sedimentation Control Plan, meetings with Conservation Agent, communication with the City, and as per the City of Cambridge Conservation Commission Order of Conditions.

1.07 MAINTENANCE

- A. Begin maintenance of stabilized areas immediately after each area is stabilized and continue until project is accepted.
- B. Maintain and establish all disturbed areas by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations. Roll, regrade, and replant bare or eroded areas and re-mulch to produce a uniformly smooth lawn.
 - 1. Replant bare areas.
 - 2. Add new mulch and tackifier in areas where mulch has been disturbed by wind or maintenance operations sufficiently to nullify its purpose. Anchor as required to prevent displacement.

1.08 JOB CONDITIONS

- A. Existing Conditions: The Contractor shall examine all work that the work of this Section is contingent upon, and report any deficiencies to the DCR Representative. Commencement of the work will be construed to mean complete acceptance by the Contractor of the preparatory work of others. No adjustment will be made for discrepancies brought to the DCR Representative's attention after work has begun.
- B. Protection of Adjacent Lands:
 - 1. The Contractor shall be totally responsible for protection of any lands or properties as may be subject to any effect or by-product of his/her demolition/construction effort. Special care shall be taken to avoid erosion of fill or cut slopes onto adjacent properties or downstream siltation or diversion of existing surface drainage. Any damage is to be corrected immediately.
 - 2. Erosion control measures in the locations shown and as detailed and described in the Contract Documents shall be considered minimum requirements and the Contractor shall take whatever other erosion and sedimentation control steps necessary to accommodate his/her particular construction procedures.
- C. Schedule Procedure:
 - 1. Erosion control construction shall be done prior to the commencement of demolition, site preparation or earthwork operations. The initial method outlined herein is intended to route all practicable surface water from the excavation area into erosion control facilities. The Contractor shall install any additional protective measures as may be required to control siltation from the site.

2. The following sequence of construction shall be followed: Revisions shall be only with the approval of the DCR Representative and the responsible municipal governing agency.
 - a. Place sedimentation control measures along slopes, at catch basins and across swales and outfalls as shown on the Drawings, and where directed by the DCR Representative.
 - b. Proceed with construction of the remaining items of work in accordance with the approved project sequence and schedule. The Contractor shall be responsible for maintaining the integrity of all sediment and erosion control measures for the duration of the Contract.
 - c. Clean and maintain all sedimentation control components to achieve the intended purpose of both temporary and permanent erosion and sediment control facilities.

PART 2 - PRODUCTS

2.01 SEED (For Stockpile)

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with the Association of Official Seed Analysts' "Rules for Testing Seeds" for purity and germination tolerance.
 1. Seed Mixture: 50% Annual Ryegrass; clean with a minimum of 0.50% noxious weed seed; minimum 97% pure with a germination rate minimum of 80%.
 2. If seeding occurs after September 15, substitute winter rye for annual rye grass.
- B. Straw Mulch: Provide air-dry, clean, mildew and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.
- C. Fiber Mulch: Biodegradable dye-wood cellulose-fiber mulch, nontoxic, free of plant growth or germination-inhibitors, with maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.
- D. Nonasphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application, nontoxic and free of plant growth-or germination-inhibitors.

2.02 EROSION-CONTROL MATERIALS

- A. Filter Sock Wattle
 1. Shall consist of a linear, compost-filled tube for filtering suspended sediments from storm water flow or "Compost Filter Sock."

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- 2. Tubes for compost filters shall be a 12 inches in diameter and shall be jute mesh or approved biodegradable material.
 - 3. Material for the filter tubes shall be compost. Compost shall not contain any manure, bio-solids, kiln-dried wood or construction debris. Compost shall pass through a 3-inch sieve.
- B. Stakes: Shall be 2" x 2" x 3' – 0" long; pointed on one end.
 - C. Erosion Control Blanket: Federal Highway Administration Type FP-03/ECTC Type-4 extended-term biodegradable erosion control blanket with biodegradable stakes.
 - a Acceptable products include "C125BN BioNet" by North American Green, "ECC-2" by East Coast Erosion Control, and "TE-SC32 BD" by Titan Environmental Containment, or approved equal.
 - D. Temporary Mulch: Straw hydromulch or other approved product.
 - E. Fiber Mesh: Biodegradable twisted jute or spun-coir mesh, 0.92 lb. Per sq. yd. (0.5 kg per sq. m) minimum, with 50 to 65 percent open area. Include manufacturer's recommended steel wire staples, 6 inches (150mm) long.

2.03 SILTATION FENCE

- A. Silt fence shall consist of the following elements:
 - 1. Fabric for siltation fence shall be a minimum width of 3 feet and conforming to the following criteria:

MINIMUM ACCEPTABLE

Fabric Properties	Value	Test Method
Grab Tensile Strength (lbs)	124	ASTM D 4632
Grab Tensile Elongation (%)	15	ASTM D 4632
Mullen Burst Strength (psi)	300	ASTM D 3786
Puncture Strength (lbs)	65	ASTM D 4833
Flow Rate (gal/min/sf)	10	ASTM D 4491

Apparent Opening Size (sieve) 30 ASTM D 4751 Ultraviolet Stability (% strength retained) 70 ASTM D 4355

- 2. Acceptable fabric materials include "Mirafi Envirofence" by TenCate Mirafi, "Style 2130" by Amoco Fabrics Co., and "LS125-Super Grade" by ACF Environmental, or as approved by the Engineer.

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3. Silt fence posts shall be wood or metal. Wood posts shall be a minimum of 1¼ inch by 1¼ inch by 5 feet long hardwood stakes commonly used to support siltation fabric. Metal posts shall be a minimum of 1 inch diameter and 5 feet long. Posts shall be spaced at a maximum distance of 8 feet on center.
4. Furnish and install suitable nylon cord to secure abutting silt fence posts.

2.04 FLOATING TURBIDITY CURTAIN SYSTEM

- A. The curtain system shall be of a bright colored material (i.e. yellow, orange, etc.) to attract the attention of nearby boaters. Floating flashing marker lights constructed of PVC material shall be attached to the floating siltation curtain every 100 FT as shown on the construction drawings. Marine marker buoys with reflective markings shall be anchored in the waterway every 100 feet at a distance no less than 20 FT from the floating siltation curtain. The marine marker buoys shall be equipped with a flashing light and have an orange diamond symbol with black lettering that warns boaters of the construction area. All flashing lights shall be controlled by a photocell that turns the light on at dusk and off at dawn and shall be maintained while the curtain system is deployed in the waterway.
- B. The floating turbidity curtain shall be a Type II design to withstand moderate currents and wave action. The turbidity curtain shall be made of an impervious 22 oz – 500 lb/inch tensile strength PVC Fabric. All fabric seams shall be heat sealed and resistant to marine growth, ultraviolet light, and mildew. The curtain shall use a marine quality polystyrene flotation fully encased in 22 oz PVC Fabric. Horizontal loads shall be carried by galvanized steel cable to anchors. The curtain shall be ballasted with a galvanized steel chain and anchor points provided at least every 50-feet. An opening, no greater than 1-foot, shall be maintained between the bottom of the turbidity curtain and the river bottom. The curtain shall be secured using polypropylene rope and a danforth style anchor. The curtain shall have the ability to be furled for deployment and for adjusting to the waterway's bottom elevations.
- C. The curtain system shall be manufactured by:
 1. Elastec/American Marine, Inc.
 2. Parker System, Inc.
 3. Indian Valley Industries, Inc
 4. Or approved equal

2.05 CRUSHED STONE: CONFORM TO Mass DOT Standard Specifications, SECTION M2.01.1, GRADATION 1-1/2 INCH.

PART 3 - EXECUTION

3.1 PRECONSTRUCTION MEETING

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- A. Prior to the start of any construction activities on the site, a preconstruction conference shall be held to establish supervisory and inspection procedures for sediment and erosion control measures. This meeting shall be attended by the Contractor, the DCR Representative, the Local Sediment and Erosion Control Officer, the Local Conservation Commission Agent and the Owner.
- B. Submit detailed sequenced construction schedule for the DCR Representative's review and approval. Do not proceed until this schedule is approved.

3.2 CONSTRUCTION ENTRANCE

- A. Install construction entrances to each project work area and staging area. Location and number of entrances to be modified based on Contractor's specific sequencing of work and as approved by the DCR Representative. Maintain each entrance by regrading and providing additional stone as required to maintain a clean and open surface.
 - 1. Dimensions: 50' length minimum (typical), 6 inch depth of crushed stone. As directed by DCR Representative.
 - 2. Adjacent pavements are to be kept clean of construction generated sediment and debris. Sweeping shall occur once per week at a minimum or more frequently if so required.

3.3 TEMPORARY SETTLING BASINS

- A. Construct temporary settling basins and install erosion control devices where indicated and around existing and proposed drainage structures in accordance with manufacturer's installation and recommendations. Make any adjustment to location as required by field condition, the DCR Representative, or local City officials. Install erosion control at limits of grading and topsoil stripping elevations. Do not allow any sediment to enter existing drainage piping systems or wetlands.

3.4 FLOATING TURBIDITY CURTAIN SYSTEM

- A. The floating turbidity curtain, hereafter referred to as the "curtain system" shall be deployed together to minimize the disturbance from construction activities to the waterway. Deployment of the curtain system shall be in accordance to the sequence of construction and the construction drawings.
- B. The Contractor shall plan and execute all operations, particularly those associated with work within the Riverfront Area and shoreline, in such a manner as to prohibit silt or other foreign material to pass through the curtain system into the waterway. The water quality of waterway outside the area protected by the curtain system shall not be degraded due to construction operations.

- C. It is the intent of these Specifications to prevent the unnecessary migration of sedimentation or siltation within watercourses. In the event that sedimentation or siltation prevention measures used by the Contractor prove to be inadequate the Contractor shall be required to adjust their operations to the extent necessary to prevent any such sedimentation or siltation from occurring outside the curtain system. Any damage or degradation caused by inadequate controls must be restored by the Contractor at no additional cost to the Owner. The Contractor shall maintain the curtain system through the duration of construction. The Contractor shall have materials on hand to repair minor tears for both materials used in the curtain system.
- D. The curtain system shall be deployed in the waterway as shown on the Drawings. Deployment of the floating turbidity curtain system shall be at least 5 feet from outermost edge of the work. The angle of incidence with the curtain skirt and the direction of flow shall not exceed an angle of 45 degrees. The curtain system shall be installed per the requirements of the manufacturer. The curtain system shall be deployed furled and the method used shall prevent the disturbance of the waterway sediments.
- E. Sediment-laden water that is being pumped from the trenches or excavations for the construction shall be pumped directly into the constructed dewatering basin.

3.5 MAINTENANCE

- A. Maintain basins and erosion control devices by restaking and replacing as required. Remove buildup of silt as necessary or as directed by the DCR Representative. Maintain operations until all lawn/planted areas are stabilized and all paving is completed.

3.6 TEMPORARY SEEDING

- A. Seed all exposed slopes and stockpiled topsoil with winter or annual ryegrass at a rate of two (2) pounds/1,000 sq. feet of area. Seeding shall be done immediately after rough grading operations are complete and maintained until finish grading and seeding have begun.

3.7 HYDROMULCHING/HYDROSEEDING

- A. Hydroseeding: Mix specified seed, fertilizer, and maximum 10% of fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogenous slurry suitable for hydraulic application.
 1. Mix slurry with nonasphaltic tackifier.
 2. Apply slurry uniformly to all area to be seeded in a 2-step process. Apply first slurry application at the minimum rate of 500 lb. Per are (5.5 kg per 100 sq. m) dry weight but not less than the rate required to obtain specified seed sowing rate. Apply slurry cover coat of fiber mulch at a rate of 1200 lb. Per acre (11 kg per 100 sq. m).

3.8 TEMPORARY EROSION CONTROL FABRIC OR MULCH

- A. Temporary Erosion Control Fabric or Mulch: Immediately upon formation of rough grades, install on all key identified slopes as per manufacturer's recommendations or slopes steeper than one foot vertical to three feet horizontal or any areas and drainage swales which receive concentrated run-off water and areas that are susceptible to erosion as required by the DCR Representative. Overlap joint of erosion control blankets one foot and secure as recommended by the manufacturer. Maintain until permanent vegetative cover is established.

3.9 CLEAN UP

- A. Upon stabilization of all disturbed areas and the completing of construction activity, remove all erosion control devices including stone construction entrances and restore surrounding areas to acceptable conditions.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. STORM WATER POLLUTION PREVENTION PLAN AND NOTICE OF INTENT FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY shall be measured for payment LUMP SUM and shall include the preparation of the site specific Storm Water Pollution Prevention Plan as well as preparation and filing of the Notice of Intent for Storm Water Discharges Associated with Construction Activities under a NPDES General Permit.
- B. SILT BARRIER shall be measured for payment per LINEAR FOOT, complete in-place as shown on the Drawings and as specified herein to consist of the furnishing and installation of compost sock and erosion control silt fence for control of soil runoff on exposed slopes, drainage structures, temporary stockpiles washdown and refueling areas.
- C. SLOPE PROTECTION shall be measured for payment per SQUARE FOOT, complete in-place as shown on the Drawings and as specified herein to consist of preparing of surface materials, furnishing and installing all erosion control blankets for the retention of soils on slopes.
- D. SEDIMENT CONTROL BAGS shall be measured at for payment PER EACH complete in-place as shown on the Drawings and as specified herein to consist of furnishing, installing and maintaining of sediment control bags that construction area runoff will discharge to.

- E. FLOATING TURBIDITY CURTAIN shall be measured for payment per LINEAR FOOT, complete in-place as shown on the Drawings and as specified herein to consist of the furnishing and installation of floating turbidity curtain for control of suspended solids and floating debris within the area of work.
- F. SEEDING, MULCH & TACKIFIER shall consist of furnishing and placement of seed, mulch and tackifier materials to protect disturbed surfaces until such time that the surfaces are permanently stabilized. No separate measurement and payment shall be made. This work will be considered incidental to the project.

4.2 PAYMENT

- A. STORM WATER POLLUTION PREVENTION PLAN AND NOTICE OF INTENT FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY will be paid for at the contract unit prices for the quantities determined as specified above.
- B. SILT BARRIER will be paid for at the contract unit prices for the quantities determined as specified above.
- C. SLOPE PROTECTION will be paid for at the contract unit prices for the quantities determined as specified above.
- D. SEDIMENT CONTROL BAGS will be paid for at the contract unit prices for the quantities determined as specified above.
- E. FLOATING TURBIDITY CURTAIN will be paid for at the contract unit prices for the quantities determined as specified above.
- F. SEEDING, MULCH & TACKIFIER shall be considered incidental to the cost of the project.

4.3 PAYMENT ITEMS

Item	Description	Unit
02370-1	STORM WATER POLLUTION PREVENTION PLAN AND NOTICE OF INTENT FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY	LS
02370-2	SILT BARRIER	LF
02370-3	SLOPE PROTECTION	SF
02370-4	SEDIMENT CONTROL BAGS	EA
02370-5	FLOATING TURBIDTY CURTAIN	LF

END OF SECTION 02370

SECTION 02467

TIMBER PILES

PART 1 – GENERAL

1.1 GENERAL PROVISIONS

- A. General Provisions of the Contract, including GENERAL and SUPPLEMENTARY CONDITIONS AND GENERAL REQUIREMENTS (if any), apply to the work specified in this Section.
- B. Examine all other Sections of the Specifications for requirements which affect work of this Section, whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all other trades or contracts affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

1.2 DESCRIPTION OF WORK

- A. The work to be performed consists of the installation of 35 (thirty-five) untreated Greenheart (*Ocotea Rodiaei*) timber piles for the support of the new timber dock at the site as shown on the design plans. The piles to be provided shall meet the following requirements:
 - 1. All piles shall be 12" Min. Diameter @ 3' from Butt with an 8" Tip.
 - 2. Pile Lengths delivered to the site shall consist of thirty-one (31) piles @ 42'-4" and four (4) battered piles @ 43'-10".
 - 3. The Untreated Greenheart Timber Piles shall meet the standards and specifications required in Section 02467 TIMBER PILES, and M9.05.6 Timber Piles of the Standard Specifications.
- B. Related Work Specified Elsewhere
 - 1. 02100 - Site Preparation
 - 2. 02200 – Earthwork
- C. Reference Documents
 - 1. Standards listed by reference, including revisions by issuing authority, form a part of this specification section to the extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title, or other designation established by issuing authority. Standards subsequently referenced

herein are referred to by issuing authority abbreviation and standard designation. In case of conflict, the requirements of this specification shall prevail. The latest publication as of the issue of this specification shall govern, unless indicated otherwise.

2. American Association of State Highway and Transportation Officials (AASHTO).
 - a. AASHTO M-133. Specification for Preservative and Pressure Treatment Process for Timber.
3. American Society for Testing and Materials (ASTM):
 - a. ASTM D 25 Specifications for Round Timber Piles

CONSTRUCTION METHODS

The timber piles shall be driven at the locations shown on the plans and to a minimum tip depth of 40 feet below grade or to practical refusal. The piles shall achieve an ultimate capacity of 50 kips as determined from an appropriate pile driving formula. Practical refusal is defined as either a condition where the blow count exceeds two times the number of blows required in 1 foot or three times the number of blows required in 3 inches, achieving the required ultimate bearing capacity. The piles should be not driven beyond abrupt refusal which is defined as less than ½ inch of penetration after 10 blows.

Piles shall be driven to a vertical orientation and within 2” tolerance of their design location as shown on the plans. The Contractor will stake the location of all piles to be driven. The Engineer will inspect the pile driving operation as the pile driving work is accomplished by the Contractor. Pre-jetting of starter holes for pile installation is not allowed. Pre-augering of starter holes up to six feet deep may be allowed to facilitate the initial placement of the piles for subsequent driving if so, requested by the contractor. Piles set in pre-augered holes shall be immediately driven following placement and no piles set in pre-augered holes shall be allowed to remain at the site without full-time contractor supervision. Following driving, the top of the driven pile shall be cut off at the elevation required on the plans. A conical PVC pile cap shall be affixed to the top of each of the thirty-five timber piles supporting the dock.

PART 2 - MEASUREMENT AND PAYMENT

2.1 MEASUREMENT

- A. TIMBER PILES: To be measured in place per LF. This work will be as shown on the Drawings and as specified herein to consist of all labor, and materials including reinforcing steel, equipment, testing and all other incidentals shall be considered included in the price per LF.

2.2 BASIS OF PAYMENT

Under Item 02467 of the contract, the Contractor shall be paid the linear foot price, which price shall be full compensation for all materials, labor, equipment, transportation, and all

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incidental work necessary to complete the work under this item to the satisfaction of the Engineer, as shown on the plans, and as herein specified and directed.

2.3 PAYMENT ITEMS

Item	Description	Unit
02467-1	TIMBER PILES	LF

END OF SECTION 02467

SECTION 02468

HELICAL ANCHORS

PART 1 – GENERAL

1.1 GENERAL PROVISIONS

- A. General Provisions of the Contract, including GENERAL and SUPPLEMENTARY CONDITIONS AND GENERAL REQUIREMENTS (if any), apply to the work specified in this Section.
- B. Examine all other Sections of the Specifications for requirements which affect work of this Section, whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all other trades or contracts affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

1.2 DESCRIPTION OF WORK

- A. The Contractor shall be responsible for designing and furnishing all work and materials for installation of helical anchors (helical piles, helical piers) to support the deck structure of the Observation Deck. Helical anchor work includes but is not limited to the following:
 - 1. Furnish all labor, equipment, materials and incidentals required to design, deliver to the site, and install helical anchors as shown on the Drawings and as specified herein. The helical anchors shall be designed to provide the allowable capacities specified herein.
 - 2. Provide all equipment necessary for the installation of the helical anchors at the locations indicated on the Drawings. Each helical anchor shall be installed to the minimum length determined by the Contractor, subject to verification by static load testing, and using installation torque indicative of the design allowable capacities.
 - 3. Provide equipment and materials for the protection of existing utilities, railroad tracks, vehicles, pedestrians, and other facilities located within the work area.
 - 4. Install helical anchors through whatever material is encountered to the required depth to achieve design capacity. Predrilling may be required to install helical anchors through cobbles and boulders in the fill.
 - 5. Helical anchors shall be cut-off, as needed, at the elevations required to enable connection of bracket assemblies to the boardwalk decking as shown on the Drawings.
 - 6. Provide qualified personnel for design and onsite installation, inspection and record keeping as specified herein.

7. Perform two (2) compression and two (2) tension static load tests (i.e. pile load tests) on pre-production helical anchors as specified herein.

B. Related Work Specified Elsewhere

1. 02100 - Site Preparation
2. 02200 - Earthwork

C. Reference Documents

1. Standards listed by reference, including revisions by issuing authority, form a part of this specification section to the extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title, or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation. In case of conflict, the particular requirements of this specification shall prevail. The latest publication as of the issue of this specification shall govern, unless indicated otherwise.
2. American Society for Testing and Materials (ASTM):
 - a. ASTM A29/A29M - Steel Bars, Carbon and Alloy, Hot-Wrought and Cold Finished
 - b. ASTM A36/A36M - Structural Steel
 - c. ASTM A53 - Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
 - d. ASTM A123/A153 - Zinc Coating (Hot Dip) on Iron and Steel Hardware.
 - e. ASTM A252 - Welded and Seamless Steel Pipe Piles.
 - f. ASTM A320/A320M - Alloy-Steel Bolting Materials for Low Temperature Service
 - g. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
 - h. ASTM A500 – Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds, and Shapes
 - i. ASTM A536 Standard Specifications for Ductile Iron Castings
 - j. ASTM A572 HSLA Columbium-Vanadium Steels of Structural Quality
 - k. ASTM A618 Hot-Formed Welded and Seamless High-Strength Low-Alloy Structural Tubing.
 - l. ASTM A656 Hot-Rolled Structural Steel, High-Strength Low-Alloy Plate with Improved Formability

- m. ASTM A958 Standard Specification for Steel Castings, Carbon, and Alloy, with Tensile Requirements, Chemical Requirements Similar to Wrought Grades
 - n. ASTM A1018 Steel, Sheet and Strip, Heavy Thickness Coils, Hot Rolled, Carbon, Structural, High-Strength Low-Alloy, Columbium or Vanadium, and High-Strength Low-Alloy with Improved Formability
 - o. ASTM D1143 Method of Testing Piles Under Static Axial Compressive Load.
 - p. ASTM D3689 Method of Testing Individual Piles Under Static Axial Tensile Load.
3. American Welding Society (AWS):
- a. AWS D1.1 Structural Welding Code – Steel
 - b. AWS D1.2 Structural Welding Code – Reinforcing Steel
4. ASCE 20-96 Standard Guidelines for the Design and Installation of Pile Foundations
5. Society of Automotive Engineers (SAE) J429 Mechanical and Material Requirements for Externally Threaded Fasteners
6. Geotechnical Engineering Report entitled “Geotechnical Engineering Report, Neponset River Greenway Blue Hill Avenue to Central Avenue, Ryan Playground to Blue Hill Avenue, Proposed Mattapan Boardwalk, Canopy Walk and Railroad Bridge,” prepared by GZA GeoEnvironmental, Inc., dated July 7, 2014.

1.3 DEFINITIONS

- A. Contractor: The firm responsible for designing, load testing, and installing the helical anchors specified on the Contract Drawings.
- B. Coupling: Central steel shaft connection means formed as integral part of the plain extension shaft material. For SS helical anchors, couplings are internal or external sleeves, or hot upset forged sockets.
- C. Coupling Bolts: High-strength, structural steel fasteners used to connect helical anchor segments together. Coupling bolts shall be capable of transferring axial load.
- D. Helical Extension: Helical anchor component installed immediately following the lead section. This component consists of one or more helical plates welded to a central steel shaft.
- E. Helix Plate: Round steel plate formed into a ramped spiral. The helical shape provides the means to install the helical anchor, plus the plate transfers load to soil in end bearing.
- F. Installation Torque: The resistance generated by a helical anchor when installed in soil. The installation resistance is a function of the soil type, and the size and shape of the various components of the helical anchor.

- G. Lead Section: The first helical anchor foundation component installed into the ground, consisting of single or multiple helix plates welded to a central steel shaft, also referred to as starter section.
- H. Plain Extension (Riser): Central steel shaft segment without helix plates. It is installed following the installation of the lead section and helical extension (if used). The segments are connected with integral couplings and bolts. Plain extensions are used to extend the helix plates beyond the specified minimum depth and into competent load bearing soils.

1.4 QUALITY ASSURANCE

- A. Due to the special requirements for installation of helical anchors and the requirements for proper performance of the structural system, as a whole, helical anchors and bracket assemblies shall be installed by a specialized helical anchor contractor. The Helical Anchor Contractor shall have a minimum of 7 years of experience in designing and installing helical anchors of the type specified herein, including experience with similar subsurface materials, groundwater conditions, helical anchor sizes and techniques required.
- B. The Helical Anchor Contractor shall be trained and certified by the helical anchor manufacturer in the proper methods of design and installation of helical anchors. The Contractor shall provide names of on-site personnel materially involved with the work, including those who carry documented certification from the manufacturer. At a minimum, these personnel shall include foreman, machine operator, and project engineer/manager.
- C. The Helical Anchor Contractor shall employ a Registered Professional Engineer in the Commonwealth of Massachusetts to design the helical anchors; load test set-up and instrumentation for the pile load tests; monitor record, and evaluate the test results; and prepare the report of the pile load tests. The Engineer shall have at least five (5) years experience in helical anchor design, installation and pile load test setup, monitoring, and analysis.
- D. All helical anchors shall be installed in the presence of a designated representative of the DCR Representative. The designated representative shall have the right of access to any and all field installation records and test reports.
- E. Helical anchor components as specified herein and on the drawings shall be manufactured by a facility whose quality systems comply with ISO (International Organization of Standards) 9001 requirements. Certificates of Registration denoting ISO Standards Number shall be submitted to the DCR Representative for review and acceptance. Acceptance will be at the sole discretion of the DCR Representative and Owner.

1.5 SUBMITTALS

- A. Required submittals include Pre-construction Submittals, Post-construction Submittals, and Close-out Submittals.
 - 1. Pre-Construction Submittals

The Contractor shall prepare and submit to the DCR Representative, for review and acceptance, working drawings and design calculations for the helical anchors intended for use at least 14 calendar days prior to planned start of construction. All submittals shall be signed and sealed by a Registered Professional Engineer currently licensed in the Commonwealth of Massachusetts.

Pre-construction Submittals shall include:

- a. A detailed description of the construction procedures and equipment proposed for installation of the helical anchors. Include description of methods to maintain alignment of the anchors during installation and the required angle for inclined anchors. Procedures shall include a description of mitigating measures to be taken if the torsional strength rating of the central steel shaft and/or installation equipment has been reached prior to achieving the minimum overall length required and if the helical anchor is refused or deflected by a subsurface obstruction. Submittal shall include a description of proposed equipment, methods, and sequence of operations to remove and dispose of, or advance through cobbles and boulders prior to or during installation of helical anchors.
- b. Working drawings indicating:
 - Helical anchor number, location and pattern by assigned identification number
 - Helical anchor design load
 - Type and size of central steel shaft for helix segments and riser segments, including transition bars
 - Helix configuration (number and diameter of helix plates) on lead segment and extension segment(s), if required
 - Minimum effective installation torque
 - Minimum overall length
 - Inclination of helical anchor
 - Cut-off elevation
 - Helical anchor bracket assembly to boardwalk deck beams or abutments, including thread bars (if used)
- c. Working drawings for all helical anchor components shall include identification of manufacturer's catalog numbers.
- d. Example field log to be used for recording installation details for each helical anchor installation.
- e. Mill test reports for the central steel shaft for the materials delivered to the site for record purposes. The ultimate strength, yield strength, % elongation, and chemistry composition shall be provided.
- f. Procedures, equipment, locations and set up for pre-production static load testing for the helical anchors. Locations of the load tests shall be selected by the Contractor as accepted by the DCR Representative. Two load tests will be performed at the Mattapan Boardwalk (one near the west end and one near the east end), and one

test at the northern end of the proposed Canopy Walk structure. The purpose of the tests is to determine the load versus displacement response of the helical anchor and provide an estimation/confirmation of ultimate capacity. Both a tension and a compression load test will be performed on each of the helical anchors to be load tested. The load test proposal shall be in general conformance with ASTM D1143 for compression testing and ASTM D3689 for tension testing. The following minimum information shall be provided for review:

- Type and accuracy of load equipment
 - Type and accuracy of load measuring equipment
 - Type and accuracy of helical anchor head deflection equipment
 - Description of load reaction system, including description of reaction anchors
 - Calibration report for complete load test equipment, including hydraulic jack, pump, pressure gage, hoses, and fittings
- g. Copies of calibration reports for each torque indicator or torque motor, and all load test equipment to be used on the project. The calibration tests shall have been performed within forty-five (45) working days of the date submitted. Helical anchor installation and testing shall not proceed until the DCR Representative has received the calibration reports. These calibration reports shall include, but are not limited to, the following information:
- Name of project and Contractor
 - Name of testing agency
 - Identification (serial number) of device calibrated
 - Description of calibrated testing equipment
 - Date of calibration
 - Calibration data
- h. Qualifications of the helical anchor contractor and qualifications of the Contractor's Engineer who will design the helical anchors and design, monitor, evaluate and prepare report for pile load tests. Qualifications shall satisfy the requirements of Section 1.3 of these specifications.
- i. ISO9001 certificate or helical anchor manufacturer or complete description of product testing and manufacturing quality assurance programs used to assess and maintain product quality.
- j. Work shall not begin until all the submittals have been received and accepted by the DCR Representative. The Contractor shall allow the DCR Representative a reasonable time to review, comment, and return the submittal package after a complete set has been received. All costs associated with incomplete or unacceptable submittals shall be the responsibility of the Contractor.

2. Post-Installation Submittals

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- a. The Contractor shall provide the DCR Representative copies of helical anchor installation records within 24 hours after each installation is completed. Formal copies shall be submitted on a weekly basis. As a minimum, data shall include:
 - Name of project and Contractor
 - Name of Contractor's supervisor during installation
 - Date and time of installation
 - Name and model of installation equipment
 - Type of torque indicator used
 - Location of helical anchor by assigned identification number
 - Actual helical anchor type and configuration – including manufacturer's catalogue numbers for lead section (number and size of helix plates), number and type of extension sections, and associated hardware used to make shaft connections and bracket connections to deck
 - Helical anchor installation duration and observations
 - Total length of installed helical anchor
 - Cut-off elevation
 - Inclination of helical anchor
 - Installation torque at one-foot intervals for the final 10 feet
 - Comments pertaining to interruptions, obstructions, or other relevant information
 - Rated load capacities
- b. Submit load test report to the DCR Representative for review within 2 days following completion of each test. Installation of production helical anchors shall not begin until load test report has been reviewed and accepted by the DCR Representative. Allow at least three working days for review. Load test reports shall include the following:
 - All relevant test helical pile information specified for production helical anchors specified above, including a scale drawing of test helical anchors showing all relevant construction details and subsurface conditions encountered during installation of the test helical and reaction helical anchors.
 - Steps and duration of load increments
 - Description of calibrated testing equipment
 - Tabular and graphical summary of load-deformation data including cumulative pile-head movement at each load step.
 - Brief memorandum summarizing: type of test (i.e. tension or compression); testing procedures; equipment adjustments required during testing; test results; and recommended allowable design load. Memorandum shall be signed and stamped by the Contractor's engineer.

3. Closeout Submittals

- a. Submit Warranty documents as specified herein
- b. Submit, for Engineer’s Acceptance, manufacturer’s standard warranty document executed by authorized company official. Manufacturer’s warranty is in addition to, and not a limitation of, other rights the Engineer may have under Contract Document.

1.6 DESIGN REQUIREMENTS

- A. Design of the helical anchors shall be based on Allowable Stress Design (ASD) and conform to the following minimum design criteria:
 - 1. Helical anchor manufacturer shall furnish a guarantee for a period of ten (10) years from date of delivery against defects due to manufacturing of helical anchors and bracket assemblies. Helical anchor manufacturer must carry product liability insurance.
 - 2. Helical anchors shall be designed to provide the following minimum allowable design loads:

Load Type	Load (kips)
Compression	12
Tension	2

- 3. Vertical helical anchors are specified on the Contract Drawings. Two vertical helical anchors are specified at each bent to resist axial compression deck loads.
- 4. Anchors shall be designed so that the helices derive support entirely in the natural sand and gravel or glacial till soils underlying fill and organics/buried topsoil (if present). As a minimum, the top helix for all anchors shall extend at least 4 feet below final proposed grade to satisfy frost depth requirements plus an additional length extending into the natural soils to satisfy the requirements of Articles 3.4 and 3.5.
- 5. Minimum factor of safety shall be 2.0. The design loads shall be confirmed with pile load tests as specified herein.
- 6. Design and installation of helical anchors shall conform to the manufacturer’s recommendations. In the event of a conflict between these specifications and manufacturer’s recommendations, the more stringent shall govern.

1.7 PROJECT CONDITIONS

- A. The Contractor shall visit the site to review all details of the work and working conditions, to verify dimensions in the field and to advise the DCR Representative of any discrepancy before performing any work.
- B. The Contractor shall verify that all helical anchors may be installed in accordance with all pertinent codes and regulations regarding such items as underground obstructions,

right-of-way limitations, utilities, etc. The Contractor shall consult the Contract Drawings and official records of existing utilities, both surface and subsurface, and their connections to be fully informed on all existing conditions and limitations as they apply to this work.

1.8 ALLOWABLE TOLERANCES

- A. Helical anchors and bracket assemblies shall be installed at the locations shown on the Drawings.
 - 1. Centerline of helical anchors shall not be more than 3 inches from indicated plan location.
 - 2. Axial alignment tolerance shall be within 5° of design alignment, unless otherwise specified on the Drawings.
 - 3. The top elevations of helical anchors shall be within +1 inch to –2 inches of the design vertical elevation.
 - 4. Bracket assembly placement shall be within 1” in both directions perpendicular to the anchor shaft and ¼” in a direction parallel with the anchor shaft unless otherwise specified.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. It is the helical anchor installation Contractor’s responsibility to select the appropriate size and type of helical anchors and bracket assemblies to support the loads stated in these specifications. These specifications provide minimum requirements to aid the Contractor in making appropriate materials selections. The size and number of helical blades must be such that the helical anchors achieve the appropriate torque and capacity in the soils at this site. Failure to achieve proper torque and capacity shall result in contractor replacing helical anchors as appropriate to support the required loads. All installation procedures, materials, and replacements shall be acceptable to the DCR Representative.

2.2 HELICAL ANCHORS

- A. Contractor’s design of the helical anchors shall conform to the minimum material requirements stated below:
 - 1. Central steel shaft consisting of lead helical segments, helical extensions, and plain extensions (riser): use hot rolled solid steel bars meeting dimensional and workmanship requirements of ASTM A29. The bar shall be medium carbon steel grade with improved strength due to fine grain size and shall be at least 1.75 inches square and have a minimum yield strength of 85 ksi and a torque strength rating of at least 10,500 ft-lb.
 - 2. Helix bearing plate shall be hot rolled carbon steel sheet, strip or plate formed on matching metal dies to true helical shape and uniform pitch. Bearing plate material shall conform to ASTM A656 or A936 with minimum yield strength of 80 ksi. Plate thickness is 3/8 inch.

3. Bolts used to connect the central steel shaft sections together shall be 7/8 inch diameter per ASTM A193 Grade B7.
4. Coupling shall be formed as an integral part of the helical extension segment and riser segment as hot upset forged sockets.
5. Walkway vertical and angled bracket assembly plates shall be rated for the design loads specified herein and the strength of the structure they support. The bracket assembly for vertical helical anchors shall be bolted to the riser section to resist tension loading. Thread bars shall be used to form the connection between the riser section and angled brackets for inclined helical anchors. Bolts for the bracket assembly are specified on the Contract Drawings.

2.3 GENERAL

- A. Helical anchor shaft connections shall be in-line, straight and rigid and shall have a maximum tolerable slack of 1/16 inch or as otherwise accepted by the DCR Representative. All helical anchor bolts shall be securely snug tightened.
- B. All components of helical anchors shall be hot-dipped galvanized in accordance with ASTM A123 and/or A153, as applicable, after fabrication.
- C. The Contractor may be allowed to use materials that are structurally greater than or equal to those specified, based solely on the opinion of the DCR Representative.
- D. Helical anchors shall be designed for a Service Life of 50 years.
- E. Any cutting of extension section of central shaft to allow connection to pile cap or deck shall be painted using galvanized paint prior to making connections to reduce exposure to rust and corrosion to the helical anchor.

2.4 HELICAL ANCHOR LOAD TEST

- A. Conform to ASTM D1143 and ASTM D3689 for equipment type, reaction system, load instrumentation, and deflection monitoring.
- B. Provide reaction frame capable of safely supporting 125 percent of the maximum test load.

PART 3 - EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

- A. Contractor shall be responsible for selecting installation equipment, tooling and procedures for installing helical anchors. These specifications provide minimum requirements to aid the contractor in making appropriate selections.

3.2 INSTALLATION EQUIPMENT

- A. Contractor shall verify that site conditions will allow for access of proposed equipment and will support equipment for helical anchor installation.
- B. Each helical anchor shall be advanced into the ground by application of rotational force using a hydraulic torque converter. Installation equipment shall include a direct means of determining the installation torque being applied to the helical anchor. Percussion drilling methods shall not be permitted.
- C. Torque indicator shall be capable of providing continuous measurement of applied torque throughout the installation and shall be capable of providing measurements in increments of at least 500 ft-lbs.
- D. Where load capacity testing is required, installation equipment also shall include a means for applying and measuring loads and deflections of helical anchors. Acceptable methods of load testing include a calibrated hydraulic jack or other means acceptable to the DCR Representative. Current evidence of calibration of Contractor's load testing and torque monitoring equipment shall be provided upon request of the DCR Representative.
- E. Equipment shall be re-calibrated during helical anchor installation, if in the opinion of the DCR Representative and/or Contractor, reasonable doubt exists as to the accuracy of the torque measurements. Re-calibrations shall be at the cost of the Contractor.

3.3 INSTALLATION EQUIPMENT AND MATERIAL ACCEPTANCE

- A. All drive tools and equipment shall be in accordance with the manufacturer's written installation instructions.
- B. All helical anchor installation equipment and materials shall be acceptable to the DCR Representative prior to delivery to the site. Acceptance will be based upon submission of records and data, as discussed in this specification. Once accepted, changes in installation equipment and materials will not be permitted without additional acceptance, and will be considered only after Contractor has submitted any and all information requested by DCR Representative.

3.4 INSTALLING HELICAL ANCHORS

- A. Loads shown in Article 1.5 are factored allowable design loads. A minimum factor of safety of 2.0 shall be used to determine the required ultimate tensile and compressive capacity of the helical anchors with regard to their interaction with soil. Helical anchor capacity in soil depends on the geometric configuration of the helical blades about the lead section and the subsurface conditions. The torque applied during installation provides an indirect verification of axial capacity. Manufacturer's recommendations should be followed regarding the torque and the tensile/bearing capacity relationship for the particular helical anchor selected. The number and size of blades shall be determined by the Contractor so as to achieve the required torque and tensile/bearing capacity for the soil conditions at the site. However, the ratio of design allowable capacity to the total area of the helical blades shall not exceed the allowable subsurface material bearing capacity.

- B. Helical anchors shall be advanced into the ground until the required torque is achieved to accommodate the ultimate tensile and bearing capacity plus an additional distance to ensure proper embedment. For the helical anchors, the embedment length shall be achieved by continuing advancement while maintaining or exceeding the required torque for the last three (3) feet of penetration.
- C. Constant normal pressure shall be applied while screwing helical anchors into the ground. The pressure applied shall be sufficient to ensure that, during each revolution, the helical anchor progresses into the ground a distance equal to at least 80% of the blade pitch. Rate of helical anchor rotation shall not exceed 20 revolutions per minute.
- D. If the Helical Anchor is refused or deflected by a subsurface obstruction, the installation shall be terminated and the Helical Anchor removed. The obstruction shall be removed, if feasible, and the Helical Anchor re-installed. If re-installing an anchor in the same location, the top-most helix of the new helical anchor shall be terminated at least three (3) feet beyond the terminating depth of the original helical anchor. If the obstruction cannot be removed, the Helical Anchor shall be installed at an adjacent location(s), subject to review and acceptance of the DCR Representative.
- E. Helical anchors removed due to obstructions that have been permanently twisted during previous attempts to install the anchor shall not be reused without the acceptance of the DCR Representative. Shaft sections with visibly elongated coupling bolt holes caused by previous installation shall not be reused.
- F. Pre-drilling will be necessary at locations where helical anchors are not able to be penetrated through the existing fill and/or into the natural granular strata without difficulty. Helical anchor tip elevations should be at least 3 feet below the pre-drilling bottom elevation.
- G. Inclined helical anchors can be positioned perpendicular to the ground to assist in the initial advancement into the soil before the required batter angle is established.
- H. All helical anchor components including the shaft and bracket assembly shall be isolated from making a direct electrical contact with any concrete reinforcing bars or other non-galvanized metal objects since these contacts may alter corrosion rates.

3.5 NON-CONFORMING HELICAL ANCHORS

- A. Non-conforming helical anchors include anchors that are not installed within tolerances as specified in these specifications, are damaged, are not installed to the required torque, or the helical anchor is not installed in the specified bearing stratum. To mitigate and/or remedy non-conforming helical anchors, the Contractor may be required to provide additional helical anchors or supplement helical anchors to meet specified requirements at no additional cost to the Owner. Mitigating measures shall be submitted for review and acceptance by the DCR Representative. Re-use of components of helical anchors that had been previously installed and removed shall be at the acceptance by the DCR Representative.

3.6 FIELD MODIFICATIONS

- A. Field welding, if required, shall be in accordance with the “Code for Welding in Building Construction” of the American Welding Society. Welding of galvanized steel can produce toxic gases and should be done in adequate ventilation and with appropriate gas detection, breathing gear, and other safety equipment per OSHA regulations. Modification of manufactured helical anchor shaft, helical blades, bracket assemblies, and shaft connections is prohibited and shall not be performed without approval of product manufacturing company and acceptance by the DCR Representative.

3.7 QUALITY ASSURANCE OBSERVATION

- A. Installation of helical anchors shall be observed by DCR Representative to verify the length, final installation torque, and load capacity tests. Contractor shall notify DCR Representative at least 24 hours prior to installation work.

PART 4 - COMPENSATION

4.1 METHOD OF MEASUREMENT AND BASIS OF PAYMENT

- A. Measurement and payment for helical anchors shall be made based on a per foundation basis, including connection hardware. Payment will only be made for anchors that are installed in accordance with the requirements of these specifications, the accepted Contractor’s design submittal, and the opinion of the DCR Representative. No payment will be made for non-conforming helical anchors. No additional payment shall be made for helical anchors that are installed deeper than indicated in the Contractors’ accepted submittal unless accepted by the DCR Representative in advance.
- B. Removal of obstructions encountered during helical anchor installation will be INCIDENTAL TO THE COST OF THE ANCHOR. No additional payment will be made for the removal of obstructions.

4.2 PAYMENT ITEMS

Item	Description	Unit
02468-1	HELICAL ANCHORS	EA

END OF SECTION 02468

SECTION 02500

BITUMINOUS CONCRETE PAVING & EDGING

PART 1 – GENERAL

1.01 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1 – GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.02 DESCRIPTION OF WORK

- A. The scope of work consists of all materials, equipment, labor and services required for all paving, surfacing, and edging work, including all items incidental thereto, as specified herein and as shown on the Drawings.
- B. The following list of items is to be used as a guide and shall not be considered limiting the scope of the work.

- 1. BITUMINOUS CONCRETE PAVEMENT
- 2. GRANITE CURB

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02100 - SITE PREPARATION
- B. Section 02200 - EARTHWORK
- C. Section 02730 - CEMENT CONCRETE PAVING AND STABILIZED STONEDUST
- D. Section 02800 - SITE IMPROVEMENTS
- E. Section 02940 - LAWNS AND MEADOWS
- F. Section 03300 – REINFORCED CONCRETE

1.04 REFERENCE SPECIFICATIONS

- A. A.S.T.M. - American Society for Testing and Materials.

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- B. A.A.S.H.T.O. American Association of State Highway and Transportation Officials.
- C. S.S.H.B., Commonwealth of Massachusetts, Department of Public Works (Massachusetts Highway Department) Standard Specifications for Highways and Bridges, latest edition.

1.05 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.06 SUBMITTALS

- A. Provide material information for all paving materials and curbs.
- B. Provide Shop Drawings showing installation, jointing and layout of curbs and thresholds including re-installed existing curbing and thresholds.

1.07 STORAGE

- A. All materials shall be delivered, stored and handled to protect them from wetting, staining, chipping and any other damage. Any materials showing evidence of water or other damage will be rejected.

1.08 PROJECT CONDITIONS

- A. Cold Weather Protection: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting bed.
- B. Weather Limitations for Bituminous Setting Bed: Comply with following requirements:
 - 1. Apply asphalt primer coat when ambient temperature is above 50°F (10°C) and when temperature has not been below 35°F (1°C) for 12 hours immediately prior to application.
 - 2. Install bituminous setting bed only when atmospheric temperature is above 40°F (4°C) and when base is dry.

PART 2 - PRODUCTS

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2.01 GRAVEL BASES

- A. Gravel base materials are as specified in Section 02200, Earthwork, under Gravel Base.

2.02 DENSE GRADED CRUSHED STONE

- A. Dense graded crushed stone is as specified in Section 02200, Earthwork, under Dense Graded Crushed Stone for pavements and foundations.

2.03 BITUMINOUS CONCRETE

- A. All bituminous concrete shall be in accordance with the most recent edition of the MassDOT Standard Specifications for Highways and Bridges for Class I-1, Bituminous Concrete Pavements and Foundation Bases Sections 420, 460, 701 and M-3 where applicable, including the latest Supplemental Specifications and the Standard Special Provisions.
- B. All hot-mix asphalt mixes shall conform to Mass Highway Department “Type I” mixes (Base, Binder, Top) for Parkway and Primary Trail use & “3/8-inch State Top” for Sidewalk use.

Bituminous Concrete – Vehicular Depth

1-1/2” MHD-Type “I”-“3/8-inch State Top” surface course, minimum
3” MHD- Type “I” binder course, minimum

Bituminous Concrete – Pedestrian Depth

1-1/2” MHD-Type “I”-“3/8-inch State Top” surface course, minimum
2” MHD- Type “I” binder course, minimum

2.04 VERTICAL GRANITE CURB, AND TRANSITION CURBS

- A. Granite Curb shall be Type VA4 conforming to Section M9.04.1 S.S.H.B. to the size and dimensions shown on the plans. Straight curb shall be in standard lengths of six (6) feet, unless otherwise specified in the drawings. Curb on radius of one hundred (100) feet or less shall be cut in radius forms to the correct radius. (Radius measured from the outside face of the curb)

2.05 MORTAR

- A. All mortar mixes shall be in accordance with ASTM C270.
- B. Portland Cement, Type I ASTM C150, White Portland Cement. Cement shall be in accordance with ASTM C91, not more than 0.30 percent water-soluble alkali.

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- C. Hydrated Type S Lime for Masonry Purposes, ASTM C207. Do not use air entrained lime.
- D. Mortar Aggregate: Well graded sharp bagged mason's mortar sand in accordance with ASTM C144.
- E. Water shall be clean and free from deleterious materials. Only potable water shall be used.
- F. Mortar Pigments: Color shall be approved by the Landscape Architect/DCR Representative. Contractor shall submit samples. Do not exceed pigment to cement ratio by weight of 1 to 7.
- G. Proportion specification for mortar materials.

Type S Mortar

Portland Cement	1 Part by volume
Hydrated Lime	1/2 Parts by volume
Sand	4 Parts by volume (as measured damp)

2.06 PAVEMENT MARKING PAINT

- A. Striping and Pavement Marking shall be thermoplastic white and yellow traffic markings conforming to S.S.H.B., Division III, Sections M7.01.03 and M7.01.04.

PART 3 - EXECUTION

3.01 SUBGRADE FOR PAVEMENTS

- A. Grading - Do any necessary grading in addition to that performed in accordance with Section 02200, Earthwork, to bring subgrades, after final compaction, to the required grades and sections for pavements.
- B. Preparation of Subgrade - Loosen exceptionally hard spots and re-compact. Remove spongy and otherwise unsuitable materials and replace with stable material. Fill and tamp traces of utility trenches.
- C. Compaction of Subgrade - Compact the subgrade of all surface areas with appropriate equipment or other means to such a degree as will insure against settlement of the superimposed work.
- D. Checking Subgrade - Maintain all subgrades in satisfactory condition, protected against traffic and properly drained, until the surface improvement is placed.

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Place grade stakes spaced sufficiently to afford facility for checking the subgrade levels. Correct irregularities, compacting thoroughly any fill materials.

- E. Utility Structures - Check for correct elevations and position all utility structure covers, grates, valve boxes and similar structures located within areas to be paved or surfaced and make, or have made, any necessary adjustments in such structures.
- F. The finished grade of the base course shall be true to the lines and grades as shown on the Drawing, less thickness of pavement, including cross-sections. Grade evenly and smoothly between points called for, especially transition zones, and rounding vertical curves. The construction methods shall conform to the requirements of Section 405 of S.S.H.B., latest edition.

3.02 INSTALLATION

- A. General - This work shall consist of constructing courses of bituminous concrete on base course material to the required lines and grades as shown on the Drawings and as specified.
- B. Base course for pavement shall consist of material compacted to 95% in two layers consisting of: three (3) inch dense graded crushed stone layer on top of a eight (8) inch gravel base, compacted thickness upon the prepared and approved subgrade to a finished compacted thickness of eleven (11) inches.
- C. The dense graded crushed stone and gravel base shall be placed and spread in uniform layers from self-spreading vehicles or with power graders of approved types or by hand. Care shall be taken while spreading to rake forward and distribute the largest stones so that they will be at the bottom of the gravel course and be evenly distributed.
- D. Workmanship, transportation, spreading, finishing, compaction and all other relevant guidelines controlling construction methods for hot-mix asphalt work shall be in compliance with Section 460. of the MassDOT Standard Specifications for Highways & Bridges, (Class I Bituminous Concrete Pavement, Type I-1)
- E. Bituminous Paving Thickness:

	<u>Bottom Course</u>	<u>Top Course</u>
Vehicular:	3 inches min.	1 ½ inches min.
Pedestrian:	2 inches min.	1 inches min.

3.03 GRANITE CURB, AND TRANSITION CURBS

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- A. Furnish and install all granite curb sections with concrete as shown on the Drawings and as specified.
- B. Furnish and install curb on compacted 6” dense graded crushed stone as shown on the Drawings. Backfill the roadway side of the trench with the required amount of gravel and a minimum of six (6) inches of cement concrete.
- C. Mortar joints full depth and clean all exposed surfaces.

3.04 PAVEMENT MARKINGS

- A. Pavement markings shall be applied to the completed surface of the parking area. Pavement markings shall be in compliance with Section 860 of the S.S.H.B. and as directed by the DCR Representative, and shall be white thermoplastic reflectorized pavement markings, unless otherwise shown on the drawings.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

- A. BITUMINOUS CONCRETE PAVING – PEDESTRIAN DEPTH shall be measured for payment per SQUARE YARD complete in-place as shown on the Drawings and as specified herein to consist of all excavation, fine grading and compacting, gravel borrow, dense graded crushed stone, bituminous concrete pavement, labor, materials, equipment and all other incidentals.
- B. BITUMINOUS CONCRETE PAVING – VEHICULAR DEPTH shall be measured for payment per SQUARE YARD complete in-place as shown on the Drawings and as specified herein to consist of all excavation, fine grading and compacting, gravel borrow, dense graded crushed stone, bituminous concrete pavement, labor, materials, equipment and all other incidentals.
- C. GRANITE CURB shall be measured for payment per LINEAR FOOT, complete in-place as shown on the Drawings and as specified herein to consist of all excavation, fine grading and compacting, dense graded crushed stone, concrete haunch, labor, materials, equipment and all other incidentals.
- D. PAVEMENT MARKINGS shall be measured for payment as a LUMP SUM, complete in-place as shown on the Drawings and as specified herein to consist of all labor, materials and equipment and all other incidentals.

4.02 PAYMENT

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- A. BITUMINOUS CONCRETE PAVING – PEDESTRIAN DEPTH will be paid for at the contract unit prices for the quantities determined as specified above
- B. BITUMINOUS CONCRETE PAVING – VEHICULAR DEPTH will be paid for at the contract unit prices for the quantities determined as specified above
- C. GRANITE CURB will be paid for at the contract unit prices for the quantities determined as specified above
- D. FLUSH GRANITE CURB will be paid for at the contract unit prices for the quantities determined as specified above**
- E. PAVEMENT MARKINGS will be paid for at the contract unit prices for the quantities determined as specified above

4.03 PAYMENT ITEMS

Item	Description	Unit
02500-1	BITUMINOUS CONCRETE PAVING – PEDESTRIAN DEPTH	SY
02500-2	BITUMINOUS CONCRETE PAVING – VEHICULAR DEPTH	SY
02500-3	GRANITE CURB	LF
02500-4	FLUSH GRANITE CURB	LF
02500-5	PAVEMENT MARKINGS	LS

END OF SECTION 02500

SECTION 02650

EXISTING UTILITIES

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. The GENERAL CONDITIONS and general documents of Section 1 shall be included as part of this section.
- B. This Section specifies the maintenance, support, protection, relocation, restoration, cleaning, and updating of existing utilities affected by the construction work.
- C. For the purpose of this Section, utility means any public or private service, such as electric light and power systems; gas distribution systems; telephone, telegraph, cable television and other communication services; industrial waste disposal systems; water distribution; storm drain and sanitary sewer services; street lighting and traffic signs and signals; parking meters; and steam distribution systems.
- D. Adjustment and remodeling of existing sanitary sewer and drainage manholes, and adjustment of water gates, gas gates, electric handholes, and drainage structures as necessary.

1.02 RELATED WORK

- A. Section 02100 – SITE PREPARATION
- B. Section 02200 – EARTHWORK
- C. Section 02500 – BITUMINOUS CONCRETE PAVING AND EDGING
- D. Section 02738 – CEMENT CONCRETE PAVING AND STABILIZED STONEDUST
- E. Section 02740 – SITE UTILITIES
- E. Section 02800 – SITE FURNISHINGS
- F. Section 03300 – REINFORCED CONCRETE

1.03 REFERENCES

- A. ANSI/NFPA 241-Safeguarding Building Construction and Demolition Operations.
- B. OSHA Regulations 29CFR 1910/1926 - Construction Industry Safety and Health Standards.

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- C. AASHTO - American Association of State Highway and Transportation Officials (test or specifications).
- D. ASTM - American Society for Testing and Materials.
- E. The Commonwealth of Massachusetts, Department of Transportation (MassDOT) Standard Specifications for Highways and Bridges, 1988 edition; the latest versions of the Supplemental Specifications and the Interim Supplemental Specifications (S.S.H.B.).

1.04 SUBMITTALS

- A. Submit working drawings and, if applicable, shop drawings showing the details, procedures, and scheduling for performance of the existing utility work. Show actual location of existing utility facilities; interference which these facilities present to the new Work; location of settlement markers; method proposed to proceed with the construction; details of proposed support systems; and, if applicable, method of testing and procedure for restoration.
- B. Submit written evidence of affected utility owners' approval of the details, procedures, and scheduling.
- C. Provide written notice two weeks in advance of the intended date to commence operations to affected utility owners and parties having surface, subsurface or overhead structures in the construction area. Furnish the DCR Representative copies of all notices.
- D. If a settlement or movement monitoring system is required, submit copies of readings to the DCR Representative and affected utility owner within 24 hours of the reading.
- E. Submit to the DCR Representative certifications from the respective suppliers that the products to be incorporated in the work are in conformance with applicable requirements.

1.05 NOTIFICATION

- A. Notify the appropriate utility agencies, the MWRA and the DCR Representative at least 72 hours (excluding Saturdays, Sundays and legal holidays) prior to starting any work involving or adjacent to utility service facilities. Contractor must notify Massachusetts Dig Safe prior to starting work.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Products and materials shall be as specified by the affected utility owners.

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- B. Frames and grates for MWRA utilities will be provided by the MWRA (to be installed by Contractor).

2.02 SALVAGE MATERIAL

- A. Reuse materials designated to be salvaged, provided they are inspected and approved by the respective utility owner, the DCR Representative, and the Landscape Architect. Salvaged material not designated for reuse or returned to the owner shall become the property of the Contractor.
- B. Maintain and have available for inspection by the DCR Representative a detailed record, including signed vouchers and receipts, of new and salvaged materials received from, used, or returned to the various owners.

PART 3 - EXECUTION

3.01 GENERAL

- A. Conform to the specifications and standard practices of the affected utility owners for any work affecting existing utilities including but not limited to raising frames and covers. Coordinate with utility owners, which work shall be done by the Contractor and which work shall be done by utility owner at Contractor's expense. Ensure continuity of all existing utility services to all users except when the utility owner determines that temporary interruption is required.
- B. Unless otherwise indicated or authorized in writing by the DCR Representative, maintain all utility facilities complete in place.
- C. Abandoned Facilities
 - 1. Demolish and remove abandoned utility facilities in conflict with the work.
 - 2. Do not undertake demolition or removal of the service until written approval for such work has been obtained from the utility owner.
 - 3. When abandoned facilities are indicated to be left in place, plug or cap the ends of conduits and pipes, as indicated. Remove abandoned utility manholes, junction boxes, and similar structures to a minimum depth of two feet below finish grade and fill the remaining void with sand or select fill, as specified in Section 02200, after the plugging or capping of conduits and pipes has been completed. Puncture or break the bottom slabs of manholes and similar structures to provide drainage. Backfill and compact excavations resulting from removal of utility facilities, as required.
- D. Provide, install, and maintain all temporary facilities as required to provide interim utility service when a utility facility is to be relocated and when a utility facility to be replaced is abandoned prior to replacement.

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- E. Where an existing utility facility is encountered which is not indicated, or which is determined to be a different utility service than that indicated, promptly notify the DCR Representative and the Landscape Architect who will assist in determining the owner of the facility and the disposition of the facility.
- F. If, upon exposure, the condition or location of a facility to be supported complete-in-place is found by the Landscape Architect to be unsafe for support or for maintenance of service, replace or reconstruct the facility as required, with prior approval of the DCR Representative and the utility owner.

3.02 SETTLEMENT OR MOVEMENT

- A. Provide suitable settlement or movement monitoring systems where indicated or required by the affected utility owner.
- B. In case of settlement or other movement which might cause damage, take immediate remedial measures to correct the conditions and damages caused by the settlement.

3.03 ADJUSTMENT AND REMODELING

- A. Adjusting and remodeling of all utilities shall be in accordance with the applicable owner, such as the City of Cambridge, MWRA, Eversource, etc.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

- A. EXISTING SITE UTILITIES: No separate payment will be made. This work will be considered as incidental work to the project.

4.02 PAYMENT

- A. EXISTING SITE UTILITIES shall be incidental to the cost of the project.

END OF SECTION 02650

SECTION 02730

CEMENT CONCRETE PAVING AND
STABILIZED STONEDUST

PART 1 – GENERAL

1.1 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1 – GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. The scope of work consists of all materials, equipment, labor and services required for all Cement Concrete Paving and Stabilized Stonedust work, including all items incidental thereto, as specified herein and as shown on the Drawings.
- B. The following list of items is to be used as a guide and shall not be considered as limiting the scope of the work.
 - 1. Concrete Paving
 - 2. Stabilized Stone dust
- C. Cement concrete pads and footings - Cement concrete pads and footings shall be placed according to "Section 03300 - REINFORCED CONCRETE"- and the relevant provisions of the MassDOT Standard Specifications.

1.3 RELATED WORK UNDER OTHER SECTIONS

- A. Section 02100 - SITE PREPARATION
- B. Section 02200 - EARTHWORK
- C. Section 02500 – BITUMINOUS CONCRETE PAVING AND EDGING
- D. Section 02800 - SITE IMPROVEMENTS
- E. Section 02940 - LAWNS

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F. Section 03300 - REINFORCED CONCRETE

1.4 REFERENCES

A. Contractor shall comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern.

1. ASTM – ASTM International;
2. AASHTO - American Association of State Highway and Transportation Officials;
3. Standard Specifications – MassDOT “Standard Specifications for Highway and Bridges”, Latest Edition and all Supplements.

1.5 QUALITY ASSURANCE

A. Contractor shall comply with all regulations, laws, and ordinances required by all authorities having jurisdiction. All labor, materials, equipment, and services necessary to make the work comply with such requirements and the work specified in Drawings and herein shall be provided without additional cost to the Owner.

B. Installer of Stabilized Stonedust shall have a minimum of three (3) completed installations of Stabilized Stonedust using the approved stabilizer/binder material with a record of successful in-service performance. Contractor shall provide references for each installation.

1.6 SUBMITTALS

A. At least 30 days prior to intended use, Contractor shall provide the following samples and submittals for approval. Do not order materials until DCR Representative’s and/or Landscape Architect’s approval of samples, certifications and/or test results has been obtained. Delivered materials shall closely match the approved samples. Samples and approvals that are not obtained prior to the ordering of materials or the completion of work shall result in possible disapproval of obtained materials or completed work.

B. SHOP DRAWINGS - Submit 5 black line copies of detailed Shop Drawings for each item required to be fabricated or installed under these items. Include plans, sections and details as required to show all materials, layout, dimensions, jointing, method of connection and assembly, fabrication and tolerances for types of materials, types and details of connections and openings, cuts, holes, bolts

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and painting for all items required. Take all necessary field dimensions and verify dimensions as required. Shop drawings required are as follows:

1. Cement Concrete Paving showing typical sections, reinforcing, dimensions, finish, jointing and scoring pattern.
- C. MANUFACTURERS' LITERATURE OR TEST RESULTS - Submit five (5) copies of each of manufacturer's material descriptions and/or installation instructions for the following:
1. Concrete aggregate mix analysis for all concrete items.
 2. Sieve analysis of aggregate for Stabilized Stonedust showing that aggregate product meets the specifications.
 3. Geotextile.
 4. Manufacturer's material safety data sheet.
- D. SAMPLES - Samples of the following items for review and approval by the DCR Representative before construction.
1. 1 lb. bag of aggregate for stabilized aggregate paving
- E. MOCK-UPS
1. Schedule mock-up construction so that mock-up can be accepted a minimum of 30 days prior to the application of paving surfaces represented by the mock-up.
 2. Locate mock-up panels in areas as directed by DCR Representative.
 3. Continue to construct mock-ups until acceptable mock-ups are produced (at no cost to Owner). Acceptable mock-ups shall become the standard for texture, color and workmanship of all subsequent work.
 4. Use same setting bed and joint mixes used in accepted mock-ups in final work unless otherwise directed by DCR Representative.
 5. Protect accepted mock-ups from damage until completion and acceptance of the work represented by the mock-ups.
 6. Mock-up may become part of finished work. If located otherwise, remove mock-up panels from the site at completion of the project, unless otherwise instructed by DCR Representative.

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7. Construct mock-up panels or areas for each different type of paving system as specified herein to demonstrate ability to archive types of setting bed, joints, pattern, color and texture required herein.
8. Construct a 10' x 12' sample of stabilized stonedust surfacing of finished path to lines and grades of plan with correct crown.

PART 2 – MATERIALS

2.1 GENERAL

- A. Delivery: Materials shall be delivered in original packages with Manufacturers' labels. DCR Representative will have the right to reject materials delivered in damaged packages without labels.
- B. Storage: Materials shall be stored in a dry condition above ground on raised platforms, covered by opaque, waterproof tarpaulins or roofs, and shall be protected from damage and theft. Products delivered and stored for use shall match products submitted and approved by DCR Representative, or shall be rejected.

2.2 CEMENT CONCRETE PAVING

- A. Concrete shall be 4000 PSI DCR Portland Cement Concrete ("Department of Conservation and Recreation Portland Cement Concrete" Table)

DEPARTMENT OF CONSERVATION AND RECREATION

PORTLAND CEMENT CONCRETE

The following table of minimum cement contents for various minimum 28 days compressive strengths (6" x 12" cylinder) is based on air entrained and water reduced mixtures. The use of an approved additive other than air entraining and water reducing additives shall not affect the minimum cement content.

The Contractor shall submit to the DCR Representative, for approval, his/her proposed concrete supplier, source and type of materials, with current ASTM C-33 aggregate data, and concrete mix designs by an approved laboratory complete with trial mix data. Trial mixtures will be designed and tested at the maximum allowable slump and air content for each designated class of concrete.

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Minimum 28 day Compressive Strength	Minimum Cement Pounds/Cu. Yd. Max. Size C.A. Inches			In Place Slump Inches
	Lbs./Sq.In.	1 1/2	3/4	
2000	376	423	470	3-5
2500	423	470	517	3-5
3000	470	517	564	3-5
3500	517	564	611	3-5
4000	564	611	658	3-5
4500	611	658	705	3-5
5000	658	705	752	3-5
Air Content				
% ± 1 ½	5.0	6.0	7.5	

All concrete for sidewalks shall have a minimum compressive strength of 4000psi and contain 6% ± 1 ½ % entrained air.

All concrete exposed to sea water shall have a minimum compressive strength of 4500psi and contain 6% ± 1 ½ % entrained air.

Plant mixed cement concrete shall be the only concrete allowed to be used with all items requiring concrete in this contract. Hand mixing or other types of mixing will not be permitted.

B. MATERIALS:

Portland Cement: Shall conform to ASTM C150, latest edition.

Portland Cement used for concrete shall be the type designated on the plans and/or in the specifications for the particular work. If no type is specified, Type II will be furnished.

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When high early strength is required, it shall be attained by using Type III cement or by adding a non-chloride set accelerator.

C. FINE AGGREGATE:

Fine aggregate shall consist of natural sand, manufactured sand, or a combination thereof, conforming to the requirements of ASTM C33, Specifications for “Concrete Aggregates” latest edition. The Fineness Modulus of the fine aggregate shall be $2.80 \pm .20$ and the percent passing the #200 sieve shall not exceed 2 percent by dry sieving and 3 percent by wet sieving.

D. COARSE AGGREGATE:

Coarse aggregate of washed gravel, crushed gravel, crushed stone or a combination thereof conforming to ASTM C33 Specifications for “Concrete Aggregates” latest edition. Aggregate for Lightweight Concrete shall conform to ASTM C330 Specification for “Lightweight Aggregates for Structural Concrete”.

E. WATER:

Water for concrete shall be clear and apparently clean and shall not exhibit any deleterious effects upon the required concrete properties.

F. ADMIXTURES:

Air entraining and water reducing admixtures will be used in all concrete as specified. They shall be used in strict accordance with the manufacturer’s recommendations and added at the batch plant. Admixtures shall be a ready-to-use liquid material, and contain no calcium chloride. Super-plasticizers may be added at the plant or job site.

G. AIR ENTRAINING ADMIXTURE:

Shall conform to ASTM C260 Specification for “Air Entraining Admixtures for Concrete.”

H. WATER REDUCING ADMIXTURE:

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Shall conform to ASTM C494 Specification for “Chemical Admixtures for Concrete.”

All concrete for sidewalks shall have a minimum cement concrete of 564 lbs/cubic yard, contains a water reducing admixture and contains 6% ± 1% entrained air.

Reinforcing: Paving shall be reinforced with wire mesh conforming to AASHTO M55, with fusion-bonded epoxy coating conforming to ASTM A775.

Expansion Joints: Provide expansion joints 20 feet on center minimum or as shown on the Drawings.

Joint Filler: Transverse joints in concrete pavement shall have pre-formed joint filler composed of cellular fibers bonded together and uniformly saturated with asphalt conforming to AASHTO M213. Provide removable plastic joint cap with integral permanent plastic bond breaker. Cover depth shall match width of joint filler.

Filler and backer rod for joints abutting dissimilar materials shall consist of isomeric polymer foam meeting the physical requirements of AASHTO M153. Provide closed cell polyethylene backer rod of circular rod stock. Backer rod shall be one-third larger than joint width.

Sealant and Joint Primer: Use Primer recommended for sealant. Sealant shall be self-leveling, polyurethane-based elastomeric sealant, matching color of finished surfaces.

2.3 STABILIZED STONEDUST

- A. Aggregate binder shall be made from 100% naturally occurring materials and shall be designed to be blended with crushed aggregate. Material shall be “Organic-Lock for Organic-Lock stabilized pathway aggregate” provided by: Envirobond Products Corporation, 6191-2100 Bloor Street West, Toronto, Ontario, Canada or approved equal.
- B. Crushed Aggregate Material shall consist of inert materials that are sound, angular, durable, with stone free from surface coatings and deleterious materials. Color shall be selected by the Landscape Architect from the Manufacturer’s standard colors to match color of existing crushed stone. Gradation requirements, in accordance with ASTM C136 shall be as follows:

<u>U.S. Sieve No.</u>	<u>Percent Passing by Weight</u>
#3/8”	100%
# 4	80-100%
# 8	65-90%

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# 16	40-60%
# 30	25-55%
# 50	15-35%
# 100	10-20%
# 200	5-15%

- C. Geotextile Membrane shall be shall be a non-woven polyester or polypropylene fabric conforming to the following test requirements:

<u>Fabric Property</u>	<u>Test</u>	<u>Minimum Value</u>
Grab Tensile Strength	ASTM D-4632-86	140 lbs.
Tensile elongation	ASTM D-4632-86	70%
Burst strength	ASTM D-3786-87	175 p.s.i.
Trapezoid tear strength	ASTM D-4533-85	75 lbs.
Puncture resistance	ASTM 3787	50 lbs.

- D. Filter Fabric shall be manufactured according to: Model No. 680 as manufactured by American Engineering Fabrics, Inc. New Bedford, MA; model No. 140 NS as manufactured by TenCate Inc., Andrews, SC or Foss-65 as manufactured by Foss Manufacturing Co., Hampton, NH or approved equal.

PART 3 - EXECUTION

3.1 GENERAL

- A. All items located on the Drawings shall be fabricated and installed by Contractor as detailed on the Drawings, as per manufacturers' written installation procedures and as directed by the DCR Representative. All fabrication and installation work shall be accomplished using the highest standards of workmanship and shall include all excavation, compaction and fine grading of subbase and gravel base materials, labor, transportation and incidentals to make the work complete.
- B. Contractor shall schedule delivery of items and all necessary equipment and hardware so as to arrive at the site in a timely manner to comply with construction schedule and minimize on-site storage time. Contractor shall be ready to discuss the purchasing of site improvements with long lead times at the beginning of the Contract so suitable arrangements can be made to meet the date of completion. Items delivered to the site prior to scheduled installation time shall be stored in a secured staging area with all small components retained separately by Contractor. Protect all items from weather, careless handling, construction in the vicinity, and vandals or pilferers.

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- C. Stake locations of all items in the field for approval by DCR Representative before commencing any excavation.
- D. Contractor shall install all formwork for items level and with plumb vertical alignment, or as indicated otherwise on the Drawings.
- E. Contractor shall review with the DCR Representative all intended procedures including protection of completed surfaces from vandalism and graffiti until surfaces have sufficiently set.
- F. Any incidence of damage to any item during installation shall be reported immediately to the DCR Representative, remedial action shall be decided, and repairs made to the satisfaction of the DCR Representative.

3.2 EXCAVATION

- A. After approval of all Shop Drawings, execute all excavations according to specifications, proceeding within work area so as to avoid disruption of existing materials to remain or newly installed items. At bases of trees, carefully remove any materials to be excavated with minimal damage to tree roots. Any roots over 1-inch diameter that are damaged shall be cleanly cut by the Contractor's Arborist. Any items damaged by excavation which are to remain or are newly installed shall be replaced or repaired to existing conditions by Contractor at no cost to the Owner.

3.3 CEMENT CONCRETE PAVING

- A. Coordinate complete installation of other site improvements prior to installing concrete paving.
- B. Reinforcing: Wire mesh shall be flat and held firmly in place and centered in concrete pad. Where mesh is spliced, it shall be lapped a minimum of 12 inches, secured firmly in place by approved means.
- C. Concrete installation: Concrete shall be planned to be installed so as to complete finishing of surfaces within scheduled work times. Surfaces shall be evenly screed to slope per requirements of the Drawings. Any surface trowelling shall be minimal to complete the work, but not to excess which will result in causing fine particles and water to surface. When concrete is sufficiently set, broom finish in the direction of the slope. Protect adjacent plantings from construction of concrete paving.

3.4 STABILIZED STONEDUST

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- A. Contractor shall coordinate complete installation of all site improvements in the vicinity of paving prior to installing paving.
- B. Subgrade shall be compacted to 95% Modified Proctor Density using a single or double drum static roller or vibratory compactor.
- C. Make any corrections necessary to fine-graded and compacted sub-base. Geotextile fabric shall be placed on compacted subgrade immediately prior to placing dense graded crushed stone base. Roll out fabric so that seams are located perpendicular to the length of the path. Remove any folds, sags, or uneven areas in fabric by pulling taut. Overlap adjacent pieces of fabric a minimum of 12 inches.
- D. Geotextile fabric must not be exposed to natural light for more than 5 days. Contractor shall store fabric away from natural light until time of installation and shall not install more fabric than can be covered by gravel borrow and aggregate binder mixture in 2 days. Fabric exposed to natural light for more than 5 days shall not be accepted. Bring gravel base to the sections and elevations shown on the Drawings.
- E. Crowns and/or cross slopes must be incorporated into the compacted base material. If the slope is 2% or lower, a crown shall be incorporated. If the slope is greater than 2%, a cross-slop shall be incorporated.
- F. Spread the base material to approved depth in accordance with manufacturer's recommendations. Note that installation of base may require separate lifts depending on method of compaction.
- G. Aggregate binder shall be thoroughly pre-mixed with aggregate mix at the rate recommended by manufacturer, and as per manufacturer's instructions.
- H. SPREADING
 - a. A paving machine is highly recommended to evenly spread the stabilized pathway aggregate at the specified depth.
 - b. Spread the loose and uncompacted aggregate over the compacted base material.
 - c. Typically, a lift of 4 inches of loose, pre-wet pathway aggregate will compact to 3 inch depth.
- I. COMPACTION

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- a. Make 4-6 passes using a 1 ton double or single static drum roller, or equivalent. A pathway will typically require one lift, compacted to 4 inches.
- b. Compaction will vary with different aggregates due to particle shape and size. Compact to 95% Modified Proctor Density.
- c. Note: Vibratory compaction is acceptable for the base material but not suitable for the blended aggregate as it risks disassociating the bonds of the stabilized aggregate or allowing the fines and moisture to migrate to the surface, causing the surface to take on a smooth, concrete-like appearance. Pathway aggregates should be compacted using a single or double drum static roller wherever possible. For tight spaces that are not accessible by drum rollers, a hand tamper is recommended, however, in certain circumstances, a vibratory or plate tamper can be used where the installer deems it to be more effective.
- d. Provided the moisture content of the blended aggregate is adequate, additional hydration should not be necessary. On dry, sunny days, however, the surface layer may start to dry out while installing, in which case, a light misting would be appropriate to prevent surface cracks from appearing during compaction. Refer to manufacturer's instructions.

J. COMPLETING INSTALLATION

- a. Apply a light spray to the surface of the material to give a clean appearance. Apply water until the water begins to run-off.
- b. Do not allow any traffic on the newly installed pathway until fully cured

K. REPAIRS AND PROTECTION

- a. Excavate the damaged area and scarify exposed pathway aggregate.
- b. Pre-blend the replacement crushed stone aggregate material with binder at 28-34 lbs/ton or as recommended by the manufacturer. Apply the material to the excavated area and compact. Thoroughly water the material to achieve a 8-10% moisture content. Follow manufacturer's recommended testing to determine water content.
- c. Allow the newly installed pathway aggregate to cure, but not completely dry out.
- d. Re-compact the material, ensuring that the final grade and crown are maintained.

3.5 MAINTENANCE OF STABILIZED STONEDUST

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- A. Contractor shall engage an experienced product representative of material utilized during installation of the path paving. Product representative shall be experienced in work similar to that required for this Project and shall be approved by the DCR Representative.
- B. Contractor shall furnish and install construction fence around new paving as specified. Construction fence shall be installed after installation of paving in such a way as to prevent public access to the new paving. Fencing shall be kept in place for a minimum of 72 hours after completion of the paving installation, or as directed by the DCR Representative.
- C. During the first year, a minor amount of loose aggregate will appear on the paving surface (1/16 to 1/4 inch). If this material exceeds ¼ of an inch, remove all debris and organic materials, redistribute the material over the entire surface. Water thoroughly to the depth of 1 inch. Compact with power roller of no less than 1000 lbs. This process should be repeated as needed.
- D. If cracking occurs, simply sweep fines into the cracks, water thoroughly and hand tamp with an 8 inch – 10 inch hand tamp plate.
- E. Maintenance shall consist of the removal of debris such as paper, grass clippings, leaves or other organic material by mechanically blowing or hand raking the surface as needed. Any plowing program required during winter months shall involve the use of a rubber baffle on the plow blade or wheels on the plow that lift the blade 1/4 inch off the paving surface.

3.6 WARRANTY OF STABILIZED STONEDUST

- A. Contractor shall provide warranty as outlined by manufacturer for performance of product. Contractor shall warranty installation of product for the time of one year.
- B. Contractor shall provide for a period of 60 days, unconditional maintenance to include complete repairs to any area that fails, as determined by the DCR Representative. Repairs shall be as specified herein.
- C. Swell Volume: The paving material shall have 35% to 40% swell volume. Contractor shall provide proof of compliance to this performance value through the use of independent testing. The test, ASTM D4546 'One Dimensional Swell of Settlement Potential of Cohesive Soil' shall be performed by SW Cole Engineering at 10 Centre Road, Somersworth, NH 03878, 603-692-0088 or approved equal. Contractor shall provide a half-pound sample for testing the first 1,000 square feet for every 5,000 square feet thereafter.
- D. Content: Contractor shall provide proof of paving material's compliance to ASTM-F1647-95, Method B.

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- E. Once paving material has been blended with the appropriate aggregate and previous to installation, a one-gallon sample bag shall be sent to Protze Consulting Engineers, 1 Merchant Street Ste. 103, Sharon, MA 02067 781-784-4908 or approved equal. Contractor shall provide a sample for testing for the first 1,000 square feet and for every 5,000 square feet thereafter.

PART 4 – MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. CEMENT CONCRETE PAVING shall be measured per SQUARE YARD, complete and in place, including excavation, fine grading and compaction of base, gravel borrow, forming, saw-cutting, and all reinforcing, joint materials and sealer.
- B. STABILIZED STONEDUST shall be measured per SQUARE YARD, compacted and in place, including excavation, base, fine grading of base and stabilized stonedust, compaction of base and stabilized stonedust and water. Loam and seeding of edges is incidental to this item.

4.2 PAYMENT

Work under the Items listed above will be paid at the Contract prices, complete in place, which prices shall be full compensation for all materials and compaction, forms, reinforcing, water, filter fabric, labor, equipment and transportation and all incidentals required to complete the installations conforming to the Drawings and Specifications to the satisfaction of the DCR Representative and shall consist of the following:

- A. Payment for CEMENT CONCRETE PAVING will be made at the contract unit price per SQUARE YARD complete in place including all labor, materials (including base materials), equipment and all incidentals.
- B. Payment for STABILIZED STONEDUST will be made at the contract unit price per SQUARE YARD complete in place including all labor, materials, equipment and all incidentals.

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4.03 PAYMENT ITEMS

Item	Description	Unit
02730-1	CEMENT CONCRETE PAVING	SY
02730-2	STABILIZED STONEDUST	SY

END OF SECTION 02730

SECTION 02740

SITE UTILITIES

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1 – GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.
- B. Examine all other Sections of the Specifications for requirements which affect work of this Section, whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all other trades or contracts affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.
- D. Provide all facilities, labor, materials, tools, equipment, transportation, supervision, and related work necessary to complete the work specified in this section, and as shown on the Plans.
- E. The Contractor shall use all means necessary to protect the materials of this Section before, during, and after installation. In the event of damage, make all repairs and replacements necessary to approval of the Owner's Representative and at no additional cost to the Owner. All work shall be executed in such a manner as to prevent any damage to existing streets, curbs, paving to remain, existing plant materials, and adjoining properties.

1.02 SUMMARY

- A. This Section includes the following:
 - 1. All labor, materials, and operations in connection with the installation of the Site Utilities Work.
 - 2. The principal work of this Section includes, but is not necessarily limited to the following:
 - a. Storm Drainage Systems including subsurface infiltration bed.
 - b. Catch Basins including Frames and Covers.
 - c. Concrete Encasement for Electrical & Communications Duct Banks
 - d. Installation of Handholes provided by the Electrical Contractor

- B. The following related work is specified under the designated Sections:
 - 1. Section 02100 – SITE PREPARATION
 - 2. Section 02200 – EARTHWORK
 - 3. Section 02370 – EROSION AND SEDIMENTATION CONTROL
 - 4. Section 02500 – BITUMINOUS CONCRETE PAVING AND EDGING
 - 5. Section 02730 – CEMENT CONCRETE PAVING AND STABILIZED STONEDUST
 - 6. Section 16000 – ELECTRICAL

1.03 REFERENCE STANDARDS, SPECIFICATIONS, AND CODES

- A. The following are hereby made a part of this SECTION by reference thereto:
 - 1. All work installed under this SECTION shall comply with all Local, State, County and Federal Codes, Laws, Statutes, and Authorities having jurisdiction. Include any and all permit, connection, and/or inspection fees in the bid.
 - 2. Give all requisite notices and file all requisite plans relating to this work with the proper Authorities, secure all permits for this work, and pay all fees for same.
 - 3. All Site Utilities related materials and methods shall conform to the Massachusetts Department of Transportation (MassDOT) Standard Specifications for Highways and Bridges, Latest Edition and Cambridge Department of Public Works.
 - 4. Order of Conditions issued by Cambridge Conservation Commission.

1.04 SUBMITTALS

- A. Submit for approval Shop Drawings for the following:
 - 1. Precast Concrete Structures
 - 2. Piping of all descriptions
 - 3. Frames and Grates

1.05 RECORD DRAWINGS

- A. Maintain on the site at all times one (1) set of black or blue line on white Drawings which shall at all times be accurate, clear and complete, showing the actual location of all piping and structures as installed in colored pencil.

- B. The Contractor shall, as part of the application for substantial completion, provide the Owner a set of “As-Built” drawings for the scope of work provided under this section. “As-Built” drawings shall be prepared and endorsed by a Massachusetts Registered Professional Engineer or Land Surveyor and shall bear the seal of such professional. Drawings shall depict, in relationship to the design plan, the “As-Built” condition of all grading, utility systems including but not limited to: Drainage, Sewer, Electric, CATV, Telephone, Alarm, Data, Water and Underground Tanks. “As-Built” shall identify the location, elevations, pipe size, pipe material of all site utilities related to grade components.

1.06 CONTRACT DOCUMENTS

- A. It is the intent of these Specifications and Drawings to call for finished work, tested, and ready for operation. Any apparatus, appliance, materials, or work not shown on the Drawings but mentioned in the Specifications, or vice-versa, or any incidental accessories necessary to make the work complete and perfect in all respects and ready for operation, even if not particularly specified, shall be furnished, and installed.
- B. The Drawings are generally diagrammatic and are intended to convey the scope of work and indicate general arrangements of equipment, conduits, and piping. The locations of all items shown on the Drawings or called for in the Specifications that are not definitely fixed by dimensions or invert elevations are approximate only. If directed by the DCR Representative, make reasonable modifications in the layout as needed to prevent conflict with other work or for proper execution of work.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Material and equipment for installation under this Section of the Specifications shall be new, unused, free of defects, and the best quality of a manufacturer of established reputation. Any defective or damaged material shall be immediately removed from the Site.
- B. Each piece of pipe, fitting, valve, etc., delivered under this Section of the Specifications shall have indelibly cast or marked thereon the manufacturer's name, trademark, pressure rating, and the date of manufacture.
- C. Specifications for materials included herein are intended for the purpose of establishing minimum quality requirements, and all materials are subject to approval by the DCR Representative.

2.02 PIPING

- A. All piping installed for this job shall be marked with manufacturer's data indicating type, size, etc. Refer to Drawings for various pipe materials to be used on this project.

- B. Polyvinyl Chloride (PVC) Pipe: Pipe and fittings shall comply with the requirements of ASTM D3034, rated SDR 35. Pipe shall be continually marked with manufacturer's name, pipe size, cell classification, SDR rating, and ASTM D3034 classification.

2.03 CONCRETE

- A. Conform to the Concrete Section of the specification for 4,000 PSI 6% air entrained concrete for all concrete structures for the work of this section including reinforcing steel where detailed.

PART 3 - EXECUTION

3.01 GENERAL

- A. Furnish the services of a Registered Land Surveyor for layout of Site Utility Systems.
 - 1. Infiltration basins and drainage structures shall be established with offsets and grade. Establish line and grade for all piping. Provide additional control along the pipe runs by use of lasers. Grade stakes and batter boards are not acceptable except as may be used in conjunction with lasers.
- B. Verify inverts and locations of all existing utilities prior to installation of any work. Transmit above information to the DCR Representative who shall make any alterations to the Contract Drawings as required by the existing conditions. Proceed with construction only after written permission from the DCR Representative. If any work is installed without prior written notice of the DCR Representative, and said work requires alteration due to existing conditions, said alterations shall be made by the Contractor at his expense.
- C. Protect all pipe lines, sewers, drains, poles, wiring and the like that interfere in any way with the work whether or not they are specifically shown on the Drawings. Notify the proper Authorities that items are protected, supported and/or relocated as necessary to adjust them to the new work.
- D. Use adequate numbers of skilled workers who are trained in the necessary crafts and who are completely familiar with the specified requirements and methods needed for proper performance of the work of this Section.

3.02 PROTECTION, SHORING AND PUMPING

- A. Protect open excavations with steel plates, fencing, warning lights and/or other suitable safeguards and as may be additionally required by the Authorities having jurisdiction.

- B. Protect bottom of excavation from frost. Do not place new work on frozen ground. Shore and brace excavation and provide sheet piling, if necessary, to prevent cave-ins and to conform to Local, State, and Federal Safety Regulations. Remove shoring and piling before backfilling is completed, but not until permanent supports are in place.
- C. Provide all necessary pumps, well points and pumping facilities, including attendants, to keep all excavation free of water from whatever source at all times when work is in progress and when necessary for protection and integrity of the work in place. Trenches shall be kept water-free during jointing and for sufficient time thereafter to allow the jointing material to become fully set and completely resistant to water penetration. Pump discharge to be in such a manner that it does not flood, interfere or damage any other area of work and meets with approval of Conservation Commission.

3.03 INSTALLATION OF PIPE

- A. Trenches shall be opened only to such extent as approved by the DCR Representative and the total lengths of open trench shall be as short as practical at all times. Immediately upon opening of trench, pipe bedding shall be placed, compacted, and dressed as specified.
- B. Carefully examine each pipe length before laying, and do not lay defective or damaged pipe. Lay pipe lines to grades and alignment indicated. Provide proper facilities for lowering sections of pipe into trenches. Under no circumstances shall pipe be laid in water, and no pipe shall be laid when trench conditions or weather are unsuitable.
- C. Pipe laying shall proceed upgrade with spigot ends of bell-and-spigot pipe, and tongue ends of tongue-and-groove pipe pointing in direction of flow.
- D. Execute installation of flexible joints by placing gaskets and jointing materials in accordance with recommendation of particular manufacturer in regard to use of lubricants, cements, adhesives and other special installation requirements. Surfaces to receive lubricants, cements or adhesives shall be clean and dry. Affix gaskets and jointing materials to pipe not more than twenty-four (24) hours prior to installation of pipe and protect from sun, blowing dust, and other deleterious agents at all times. Gaskets and jointing materials so damaged shall be removed and replaced. Pipe shall be aligned with previously installed pipe and joint pulled together. If, while making joint, gasket or jointing material becomes loose and can be seen through exterior joint recess when joint is pulled up to within 1 inch of closure, pipe shall be removed and joint remade.

3.04 TESTS

- A. Provide all labor, materials, and equipment for performing all test as herein specified or required by Local Authorities.
- B. Storm sewers shall be tested as follows:

1. If any inspection of the completed sewer or any part thereof shown any manholes, pipes or joints which allow the infiltration of water in a noticeable stream or jet, the defective work shall be replaced or repaired as directed.
2. After the sewers have been laid and otherwise completed, infiltration or exfiltration test shall be made to demonstrate that the line will satisfactorily meet the conditions prevailing in place with no leakage.
3. Rate of infiltration shall be determined by means of V-notch weirs or pipe spigot in an approved manner and at such times and locations as may be directed by the DCR Representative during the progress of the work. Provide and install weir plates or other materials required and at such time and locations as may be directed by the DCR Representative.
4. Perform an air test as per manufacturer's recommendation and report result to DCR Representative and City of Cambridge.
5. All joints shall be inspected and inspection of line and grade shall be made with mirrors and lights. Alignment for both line and grade shall be true with full circles visible at manholes.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

- A. SITE UTILITY AS-BUILT shall be measured for payment as a LUMP SUM and shall include engagement of a Massachusetts Registered Professional Engineer or Land Surveyor to field locate new utilities as defined under Paragraph 1.05(B), preparation of the As-Built Drawing, and submitting to the Owner for record documentation of work performed under this Contract.
- B. 4" PVC DRAIN PIPE shall be measured for payment per LINEAR FOOT, complete in-place as shown on the Drawings and as specified herein to consist of trench excavation, furnishing & placing pipe bedding, furnishing & placing 4" PVC drain pipe, joining pipe, backfilling the excavation per the Contract Documents and legal disposal of the remaining excavated materials.
- C. PIPE & DRAIN STRUCTURE TESTING shall be measured for payment as a LUMP SUM and shall include the preparation for, equipment and testing of installed piping as shown on the Drawings and as specified herein.

4.02 PAYMENT

- A. SITE UTILITY AS-BUILT will be paid for at the contract unit prices for the quantities determined as specified above.

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- B. 4" PVC DRAIN PIPE will be paid for at the contract unit prices for the quantities determined as specified above.
- C. PIPE & DRAIN STRUCTURE TESTING will be paid for at the contract unit prices for the quantities determined as specified above.

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4.03 PAYMENT ITEMS

Item	Description	Unit
02740-1	SITE UTILITY AS-BUILT	LS
02740-2	4" PVC DRAIN PIPE	LF
02740-4	PIPE & DRAIN STRUCTURE TESTING	LS

END OF SECTION 02740

SECTION 02800

SITE FURNISHINGS

I. PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1 – GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.02 DESCRIPTION OF WORK

- A. The work of this section consists of all labor, material, equipment, appliances, appurtenances and services necessary to provide the following work within the Contract Limit Line as required by the drawings, as directed by the DCR Representative and as specified herein.
- B. The following list of items is to be used as a guide and shall not be considered as limiting the scope of the work.
 - 1. Bench on Concrete Pad
 - 2. Picnic Table on Concrete Pad
 - 3. Vehicular Swing Gate
 - 4. Bike Rack

1.03 RELATED WORK UNDER OTHER SECTIONS

- A. Section 02100 – SITE PREPARATION
- B. Section 02200 – EARTHWORK
- C. Section 02500 – BITUMINOUS CONCRETE PAVING AND EDGING
- D. Section 02730 – CEMENT CONCRETE PAVING AND STABILIZED STONEDUST
- E. Section 03300 – REINFORCED CONCRETE

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F. Section 05035 – GALVANIZING

1.03 QUALITY ASSURANCE

- A. Reference Standards: All metal work shall conform to ASTM, NAAM: Metal Finishes Manual and AWS: P1.1 Code for Welding in Building Construction.
- B. Contractor or Subcontractor shall be trained in the fabrication and erection of architectural ornamental metals.

1.04 STANDARDS AND DEFINITIONS

- A. Applicable specifications and publications, referred to herein, form part of these Specifications.
- A. Standard Specifications: The Commonwealth of Massachusetts, Department of Transportation, Standard Specifications for Highways and Bridges, latest edition.
- B. ASTM International: American Society of Testing and Materials International
- C. A36 Structural Steel
- D. A53 Pipe, Steel, Black, and Hot-Dipped, Zinc-coated
- E. A120 Standard Galvanized Steel Pipe
- F. A153 Zinc Coating (Hot-dip) on Iron and Steel Hardware
- G. A386 Zinc Coating (Hot-dip) on Assembled Steel Products
- H. A325 High Strength Bolts
- I. AISI: American Steel and Iron Institute
- J. AWS: American Welding Society D1.1 Structural Welding Code
- K. SSPC: Steel Structures Painting Council

1.04 REFERENCE SPECIFICATIONS

- A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.

1.05 SUBMITTALS

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- A. At least thirty (30) days prior to intended use, the Contractor shall provide the following samples and submittals for approval. Do not order materials until DCR Representative's approval of samples, certifications, and/or test results has been obtained. Delivered materials shall closely match the approved samples. Samples and Approvals which are not obtained prior to the ordering of materials or the completion of work, shall result in possible disapproval of obtained materials or completed work.

- B. SHOP DRAWINGS - Submit five (5) blackline copies of each detailed Shop Drawing for each item required to be fabricated or installed under this Section. Include plans, sections, and details as required to show all materials, layout, dimensions, jointing, and connections for all items required. Take measurements and verify dimensions at site before submitting Shop Drawings and constructing samples for approval by DCR Representative. Shop Drawings required are as follows:
 - 1. Benches
 - 2. Picnic Tables
 - 3. Bike Rack
 - 4. Vehicular Swing Gate

- C. SAMPLES - The Contractor shall submit samples of the following for approval by the DCR Representative:
 - 1. Wood slat for Bench (modified) and for Picnic Table – indicating finish
 - 2. Hardware for Bench & Picnic Tables
 - 3. Steel Finish sample for Bench & Picnic Tables supports
 - 4. Steel finish samples for Bike Rack
 - 5. Vehicular Swing Gate metal finish sample

1.06 QUALITY ASSURANCE

- A. The contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and materials and techniques specified.

1.07 PRODUCT HANDLING AND STORAGE

- A. Upon receipt at the job site, all materials shall be checked to ensure that no damages occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage, and to protect against damage, weather, vandalism and theft.

II. PART 2 - PRODUCTS

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2.01 BENCH

- A. Bench shall conform to the DCR standard “Charles River Bench”, modified as shown on the drawings.
- B. Model CFPB-010-01, Six (6) foot Bench with Back as shown on drawings and as manufactured by Custom Fabrication Inc. PO Box 4341 Harpursville, NY 607-693-3223, as shown on the drawings, or approved equal.
 - 1. Slats shall be 2” x 6” (nom.) vertical grain Douglas Fir with 1/8” radius at all edges, as shown on the details. Five (5) per bench.
 - 2. Wood shall be painted. Color shall be “Hunter Green”.
 - 3. Frame shall be 1-1/2” x 6” steel bar support
 - 4. All steel members shall be primed with a zinc-rich epoxy, then finished with a baked on polyester powder coating. Color shall be “Hunter Green”.
 - 5. ½” x 3 ¾” PLTD. expansion anchor bolts to be galvanized. Four (4) per bench.
 - 6. All welds shall be continuous and ground smooth

2.02 PICNIC TABLE

- A. Picnic Table shall be designed to conform to the DCR standard “Charles River Picnic Table”, Wood Top Picnic Table as shown on drawings

2.03 CONCRETE PAD

- A. Concrete mounting pads for both Bench and Picnic Table shall be in accordance with Specification Section 03300.

2.03 VEHICULAR SWING GATE

- A. Materials
 - 1. Steel Shapes: Steel shapes shall conform to the requirements of Standard Specifications for Structural Steel, ASTM A - 36. All necessary holes and sinkages shall be provided for attaching hardware or other items, and all anchorage for attachment to adjacent construction shall be included.
 - 2. Steel Tubing: ASTM A500 or A501, hot or cold rolled.
 - 3. Steel Pipe: ASTM A53, black schedule 40, 80 and 120 as indicated on drawings. Type and grade as required for design loading.

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4. Bolts and Fasteners: ASTM A307 and other types as appropriate and approved by Engineer.
5. Concrete: The cement concrete footing as shown on the plan shall conform to the applicable provisions of Section M4 of the Standard Specifications for 4000psi, 1.5 inch, 565 Cement Concrete, Air Entrained.
6. Shop Paint for Non-Galvanized Steel: Shop paint shall be zinc rich primer and epoxy intermediate coatings as specified below.
7. Chain shall be galvanized steel and have a diameter of 5/8" meeting the requirements of ASTM 413/A Grade 30 or better.

B. Fabrication

1. General Fabrication: Fabricate work to be straight and true, plumb, level and square and to sizes, shapes, and profiles indicated on approved shop drawings. Ease exposed edges. Cut, reinforce, drill and tap metalwork as necessary for proper assembly and use.
2. Work Exposed To View: Take special care in choosing materials that are smooth and free of blemishes such as pits, roller marks, trade names, scale and roughness. Fabricate work with uniform, hairline tight joints. Form welded joints and seams continuously and grind flush and smooth to be invisible after painting. For exposed fasteners, use hex head bolts or Phillips head machine screws.
3. Galvanizing: All steel to be installed including bolts and washers shall be coated by hot-dip process after fabrication in accordance with ASTM A 123. All hot-dipped galvanized steel shall be inspected for compliance with ASTM A 123 and shall be marked with a stamp that indicates the ASTM number and the number of ounces of zinc per square foot of steel. A notarized certificate of compliance shall be required from the galvanizer. Zinc for galvanizing shall be applied by a hot-dip process. The galvanizing bath shall contain high grade zinc and other earthly materials. Immediately before galvanizing, the steel shall be immersed in a bath of zinc ammonium chloride. The use of the wet kettle process is prohibited. Comply with ASTM A 123 for fabricated products and ASTM A 153 for hardware. Provide thickness of galvanizing specified in referenced standards. NOTE: All items of work noted or specified to be galvanized shall be galvanized after fabrication. Where size of assembly is too large for galvanizing, only these assemblies will be galvanized prior to fabrication.

2.04 BIKE RACK

- A. Bike racks shall be the Swerve Bike rack as produced by Dero, or approved equal.

1. MANUFACTURER

- a) Provide bicycle racks manufactured by DERO BIKE RACK CO., 5522 Lakeland Avenue N., Minneapolis, MN 55429, 1-888-337-6729. Fax: 612-331-2731 Website: www.dero.com

2. MATERIALS

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- a) 1.5" schedule 40 uncoated pipe (1.90" OD)
- b) Installation Method: Surface mounted with Flange mount via 2.5" x 6" x .25" feet - 4 anchors.

3. FINISHES

- a) Hot-dipped galvanized finish performed after fabrication.

4. SWERVE BIKE RACK

- a) Wall Setback: For Swerves set parallel to the wall, a minimum of 24" should be left between the wall and the rack. 36" is the recommended setback. For Swerves installed perpendicular to the wall, a 28" setback is the minimum distance. 36" is recommended.
- b) Distance Between Racks: 24" is the minimum distance between racks. 36" is recommended.
- c) Street Setback: 24" is the minimum distance between the street and the rack. 36" is recommended.
- d) The foot-mounted Swerve Rack has a 2.5" x 6" x .25" foot which is installed onto a concrete base with 4 masonry anchors. The foot-mounted Swerve Rack is generally less expensive to install and easier to remove than the in-ground mount model, while still maintaining the same degree of security.

PART 3 – EXECUTION

3.01 METAL WORKMANSHIP

- A. Form metal fabrications from material of sizes indicated but not less than that needed to comply with specified performance requirements. Work to dimensions indicated on accepted Shop Drawings, using proven details of fabrication and support. Use type of materials indicated or specified for various components of each metal fabrication.
- B. Form exposed work true to the lines and levels indicated, with accurate angles and surfaces and straight well defined edges.
- C. Allow for thermal movement resulting from change in ambient temperature of 100 degree F. in the design, fabrication and installation of metal assemblies to prevent buckling, opening of joints and overstressing of welds and fasteners.
- D. Shear and punch metal cleanly and accurately. Remove burrs. Countersink holes for screws.

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- E. Ease exposed edges, (e.g., on plates, pipe ends, and similar conditions) to a radius of approximately 1/32 inch. Unless otherwise indicated, form bent metal corners to smallest true radius possible without causing grain separation, change in cross-section, or otherwise impairing work.
- F. Remove sharp and rough areas on exposed surfaces. Grind all edges of bars and plates completely free from nicks and machine marks, prior to galvanizing or shop priming.
- G. Weld corners, seams and pipe circumferences continuously in compliance with AWS recommendations. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals. Welds shall be of the sizes indicated and uniform throughout. Remove welding flux immediately. Finish exposed welds and surfaces smooth and blend so that no roughness shows after finishing and so the contour of welded surface matches those adjacent. Welds shall be indiscernible after finishing. All welds shall be inspected by a Certified Welding Inspector.
- H. Provide anchorage of the types indicated; coordinate with supporting structure. Fabricate and space anchoring devices as indicated on the accepted Shop Drawings and to provide adequate support for intended use.
- I. Punch, cut, reinforce, drill and tap metal work as indicated to receive bolts, screws and other required items.
- J. All work shall be executed by experienced mechanics and shall conform to details, be clean and straight with sharply defined profiles. Unless otherwise particularly noted, finished surfaces shall have smooth finish.
- K. Shop connections shall be welded and field connections bolted unless otherwise indicated. Bolts shall be turned up tight and threads deformed to prevent loosening.
- L. Provide holes and connections as required to accommodate the work of other trades and for site assembly of metal work. Holes shall be drilled or punched and reamed in the shop. Show sizes and locations of all such holes on the Shop Drawings.
- M. Joints and connections exposed to weather shall be formed to exclude water.
- N. Shop-fabricate items wherever practical, accurately fitting all parts and making all joints tight.
- O. Draw up all threaded connections tightly, after buttering same with pipe joint compound to exclude water.

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- A. All steel shall be hot-dip galvanized after fabrication as per ASTM A120 and in accordance with Section 05035 of the Specifications

3.02 EXAMINATION

- A. Site Examinations: Examine areas to receive furnishings.
 - 1. Verify that substrates are stable and capable of supporting the weight of items covered under this section.
 - 2. Verify that substrates have been adequately prepared to securely anchor those items that will be anchored.
 - 3. Notify DCR Representative of conditions that would adversely affect installation or subsequent use.
 - 4. Do not begin installation until unacceptable conditions are corrected.

3.03 INSTALLATION

A. BENCHES ON CONCRETE PADS

- 1. Surface mount and bolt in concrete as shown in drawings and in locations as shown on plans.
- 2. Concrete pad shall be sloped to drain water toward turf areas.
- 3. All clearances shall meet Federal ADA Guidelines for Recreation spaces.

B. PICNIC TABLES ON CONCRETE PADS

- 1. Surface mount and bolt in concrete as shown in drawings and in locations as shown on plans.
- 2. Concrete pad shall be sloped to drain water toward turf areas.
- 3. All clearances shall meet Federal ADA Guidelines for Recreation spaces.

C. BIKE RACKS

- 1. Surface mount and bolt in concrete as shown in drawings and in locations as shown on plans.
- 2. Concrete pad shall be sloped to drain water toward turf areas.
- 3. All clearances shall meet Federal ADA Guidelines for Recreation spaces.

3.05 ADJUSTING

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- A. Finish Damage: Repair minor damages to finish in accordance with manufacturer's instructions and as approved by DCR Representative.
- B. Component Damage: Remove and replace damaged components that cannot be successfully repaired as determined by DCR Representative.

3.06 CLEANING

- A. The Contractor shall clean the jobsite of excess materials.
- B. Clean furnishings promptly after installation in accordance with manufacturer's instructions.
- C. Do not use harsh cleaning materials or methods that could damage finishes.

3.07 MAINTENANCE/PROTECTION

- A. Protect installed furnishings to ensure that, except for normal weathering, benches will be without damage or deterioration at time of Substantial Completion.

III. PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

- A. BENCH ON CONCRETE PAD shall be measured for payment PER EACH complete in-place as shown on the Drawings and as specified herein to consist of all excavating, backfilling, footings, concrete pad, including all labor, materials, equipment, testing and all other incidentals.
- B. PICNIC TABLE ON CONCRETE PAD shall be measured for payment PER EACH complete in-place as shown on the Drawings and as specified herein to consist of all excavating, backfilling, footings, concrete pad, including all labor, materials, equipment, testing and all other incidentals.
- C. VEHICULAR SWING GATE shall be measured by the actual gate installed and accepted by EACH
- D. BIKE RACK shall be measured by the actual Bike Rack installed and accepted by EACH

4.02 PAYMENT

- A. BENCH will be paid for at the contract unit prices for the quantities determined as specified above.

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- B. PICNIC TABLE will be paid for at the contract unit prices for the quantities determined as specified above.
- C. VEHICULAR SWING GATE will be paid for at the Contract unit bid price per EACH, which price shall include all labor, materials, equipment and incidental costs required to complete the work.
- D. BIKE RACK will be paid for at the contract unit prices for the quantities determined as specified above.

4.03 PAYMENT ITEMS

Item	Description	Unit
02800-1	BENCH ON CONCRETE PAD	EA
02800-2	PICNIC TABLE ON CONCRETE PAD	EA
02800-3	VEHICULAR SWING GATE	EA
02800-4	BIKE RACK	EA

END OF SECTION 02800

SECTION 02910

LAWN AND PLANTING SOILS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All of the Contract Documents, apply to the work of this Section and are hereby made a part of this Section.
- B. Examine all Drawings and other Sections of the Specifications for requirements therein affecting the work of this trade.

1.2 SCOPE OF WORK

- A. This Section specifies administrative and procedural requirements for manufactured Lawn and Planting Soils including, but not limited, to the following:
 - 1. Subgrade preparation.
 - 2. Planting soil material acquisition.
 - 3. Stripping, screening and amending existing soils.
 - 4. Testing and analysis for specification conformance.
 - 5. Preparation of mixes and testing for conformance.
 - 6. Installation and placement of soils.
 - 7. De-compaction and re-compaction of soils.
 - 8. Final in-place testing of soils.
 - 9. Coordination with other contractors.
 - 10. Clean-up.
- B. References to other Sections are given that would duplicate provisions in this Section.

1.3 RELATED WORK UNDER OTHER SECTIONS

- A. Section 02200 - EARTHWORK
- B. Section 02930 - EXTERIOR PLANTS
- C. Section 02940 - LAWNS

1.4 QUALITY ASSURANCE/DEFINITIONS

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A. Definitions:

1. Refer to Trees, Plants and Ground Covers
2. ASA: American Society of Agronomy.
3. Subgrade: Soil material and levels resulting from the approved rough grading work. Cultivation of all subgrade areas prior to placing planting soil is included in this Section.
4. Lawn and Planting Soils: Lawn and Planting Soils are composed of a blend of three base components: base loam or existing topsoil, organic material and sand. The quality of the blend depends on the quality of the original components. Locate and obtain approval of sources for base loam, organic material and sand that meet the Specification requirements. Contractor is then responsible for mixing the components. Approximate mixing ratios are provided, but may require adjustment, depending on the final materials and with the approval of the DCR Representative and Resident Engineer, in order to meet Specification requirements for each blend.
5. Existing Soil: In place soil at lawn and planted areas that will be stripped, screened and amended and re-used as a component of manufactured soil blends. The Contractor shall designate a staging area for screening, storage and blending of horticultural soils. Soil piles shall be segregated and protected for the duration of the work.
6. Tree Protection Zones: The zones identified by the DCR Representative or arborist or their subcontractor, beneath existing trees established to protect tree roots during reconstruction. Excavation at tree protection zones shall be conducted under the supervision of the Arborist.

B. Testing/Testing Agency

1. Refer to Earthwork.
2. Refer to this section, 1.5 .

C. Contractor is solely responsible for quality control of the Work.

D. The installer shall be a firm having at least 5 years of successful experience of a scope similar to that required for the Work, including the preparation, mixing and installation of custom planting mixes in urban locations.

1. Installer Field Supervision: Installer to maintain an experienced full-time supervisor on Project site when any Planting Soil preparation work is in progress.
2. The installer's crew shall be experienced in the installation of soil, grading and interpretation of grading plans.

E. Soil work shall be performed by a firm that has sufficient earthwork machinery at the job site simultaneously to amply provide for the vigorous execution of the site work

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without interruption or delay, except for unforeseen circumstances, such as weather. Machinery operators shall be well experienced in this type of work.

- F. Comply with applicable requirements of the laws, codes, ordinances and regulations of Federal, State and municipal authorities having jurisdiction. Obtain necessary approvals from all such authorities.
- G. Comply with all requirements for control of silt and sediment during soil installation work as indicated in the contract documents. Provide additional silt and sediment control to maintain silt and sediments within the working area as required by the progress of the work or as directed by the DCR Representative and Soil Scientist.
- H. Pre-installation Conference: Conduct conference at project site prior to the start of any work related to Planting Soil preparation and shall meet the requirements of this Section 3.1(D).
- I. Layout and Grading:
 - 1. Permanent benchmarks shall be established by a registered land surveyor or professional civil engineer, at the Contractor's expense. The Contractor shall maintain established bounds and benchmarks and replace them, if any are destroyed or disturbed.
 - 2. The Contractor shall maintain at the site, sufficient surveying equipment to accurately excavate to the required subgrade and install soil to the required finish grade. The Contractor shall be responsible to install soil profiles at the elevations and thickness shown on the Plans.

1.5 TESTING, SUBMITTALS, MOCK-UPS AND INSPECTIONS

- A. Testing for Subgrade, Planting Soil Components and Planting Soil Mixes: Testing is required at the following intervals:
 - 1. Testing of individual components (Stripped Existing Topsoil, Base Loam, Sand, and Compost) for planting soil mixes prior to blending of any soils for use at the Project Site. Tests are as described in this Section.
 - 2. After test results for components have been accepted, create sample blends of each planting soil mix and perform tests described in this Section.
 - 3. After the test results for each Planting Soil Mix have been accepted, and during the production of planting soils, test every 500 cubic yards of Lawn Soil Mix blended for: organic matter content, gradation, and pH. Before shipping of any Lawn Soil Mix, the Contractor shall confirm that the Soil Scientist has accepted the mix. Testing applies to all soil layers of the planting profile.
 - 4. After horticultural tests have been approved, contractor shall submit representative samples of Lawn Soil to a geotechnical testing laboratory for ASTM 698 Standard Proctor tests to obtain optimum moisture content and maximum dry density values.

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5. In-place tests: Compaction tests of each type of material (soil layer) placed shall be in accordance with this Section. Infiltration tests shall be in accordance with this Section.
 6. Testing of Subgrade: Prior to placement of the Lawn and Planting Soils profile, test the subgrade as described in this Section. Coordinate the testing of the subgrade with the Earthwork Contractor before the planting soil profile is placed.
- B. Test Reports: Submit certified reports for tests as described in this Section.
1. Mechanical gradation (sieve analysis) shall be performed for sand, silt, and clay content and compared to the USDA Soil Classification System using sieve size numbers: 10, 18, 35, 60, 140 and 270. The silt and clay (0.002 mm) content shall be determined by a Hydrometer Test (ASTM D-422-63) of soil passing the #270 sieve.
 2. Chemical analysis shall be undertaken for Phosphorus, Potassium, Calcium, Magnesium, Aluminum, Iron, Manganese, Lead, Cation Exchange Capacity, Soluble Salts, organic matter content, acidity (pH) and buffer pH.
 3. Tests shall be conducted in accordance with Recommended Soil Testing Procedures for the Northeastern United States, 2nd Edition, Northeastern Regional Publication No. 493; Agricultural Experiment Stations of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont and West Virginia. Tests include the following:
 - a. Test for soil Organic Matter by loss of weight on ignition, as described in Northeastern Regional Publication No. 493.
 - b. Test for soil CEC by exchangeable acidity method as described in Northeastern Regional Publication No. 493.
 - c. Test for soil Soluble Salts shall be by the 1:2 (v:v) soil:water Extract Method as described in Northeastern Regional Publication No. 493.
 - d. Test for Buffer pH by the SMP method as described in Northeastern Regional Publication No. 493.
 - e. Tests for pH shall be conducted on a 1:1 soil to distilled water ratio.
 4. Certified reports on analyses from producers of composted organic materials shall be required and new test reports shall be submitted when compost sources are changed. Analyses shall include all tests for criteria specified in 2.1, K.
 5. Testing Agencies: The following firms are acceptable testing agencies for the various components and blends.
 - a. Leaf Yard Waste Compost- Woods End Research Laboratory, P.O. Box 297, Mt. Vernon, ME, 04352, tel: 201.293.2457, fax: 201.293.2488, or approved equal STA certified laboratory by the US Compost Council.
 - b. Mechanical Gradation, Chemical Analysis and Organic Matter Content, All Soil Components and Planting Soil Mixes: University of

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Massachusetts, 203 Paige Laboratory, 161 Holdsworth Way, Amherst, MA 01003, <http://soiltest.umass.edu>, tel: 413.545.2311, fax: 413.545.1931 or approved equal.

6. Laboratory Density Testing: ASTM D698 - 12 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort
 - a. Density tests shall be performed on samples collected at the Soil Supplier's facility, to obtain the optimum moisture content and maximum dry density values.
- C. In-Place Testing
1. Density Tests: ASTM D1556 Density of soil and rock in place using ASTM D6938-08 Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth). ASTM D698 Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort. (Standard Proctor).
 - a. In-place density tests shall be carried out at a rate of one test per 1,000 square feet.
 - b. Soil density shall meet the requirements specified herein, see PART 3.
 2. In-place infiltration tests shall be performed using Turf-Tec IN2-W Infiltrometer utilizing manufacturer's operating instructions. Turf-Tech IN2-W Infiltrometer as manufactured by Turf Tec International, 1471 Capital Circle NW, Suite #13, Tallahassee, FL 32303. Order Line 800-258-7477, Phone 850-580-4026, Fax 850-580-4027.
 3. At the direction of the DCR Representative and Soil Scientist, in-place Lawn and Planting Soils shall be sampled and tested by the Owner for compliance with gradation and organic matter content as specified herein. Non-compliant materials shall be removed from the site or amended as specified by the Soil Scientist.
- D. Samples: Prior to ordering the below listed materials, submit representative composite samples to the DCR Representative and Soil Scientist for selection and approval. Representative composite samples shall be composed of at least five equal-sized subsamples mixed thoroughly and resampled for submittal. Do not order materials until DCR Representative's, and Soil Scientist's acceptance has been obtained. Delivered materials shall closely match the approved samples.
1. Components
 - a. Compost: duplicate samples of 1 gallon.
 - b. Base Loam: duplicate samples of 1 gallon.
 - c. Medium to Coarse Sand: duplicate samples 1 gallon.
 - d. Stripped and Stockpiled Existing Soil: duplicate samples 1 gallon.
 2. Test Blends

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- a. Planting Bed Soil: duplicate samples of 1 gallon.
 - b. Horticultural Subsoil: duplicate samples of 1 gallon.
 - c. Passive Use Lawn/Meadow Soil: duplicate samples of 1 gallon.
 - d. High Use Lawn Soil: duplicate samples of 1 gallon.
 - e. Bioinfiltration Soil and Bioinfiltration Subsoil: duplicate samples of 1 gallon.
3. Production Stockpiles
- a. Planting Bed Soil: duplicate samples of 1 gallon.
 - b. Horticultural Subsoil: duplicate samples of 1 gallon.
 - c. Passive Use Lawn/Meadow Soil: duplicate samples of 1 gallon.
 - d. High Use Lawn Soil: duplicate samples of 1 gallon.
 - e. Bioinfiltration Soil and Bioinfiltration Subsoil: duplicate samples of 1 gallon.
- E. Sources for Base Loam, Sand, and Compost: Submit information identifying sources for all soil components and the firm responsible for mixing of planting soil mixes.
1. DCR Representative, Soil Scientist, and Owner shall have the right to reject any soil supplier or mixing facility.
 2. Soil mix supplier shall have a minimum of five years experience at supplying custom planting soil mixes.
 3. Submit supplier name, address, telephone and fax numbers and contact name.
 4. Submit certification that accepted supplier/ mixer is able to provide sufficient quantities and qualities of materials for the entire project.
 5. Final approval of soil supplier/ mixer shall be made after on-site review of supplier's and mixer's facility(ies) by the Soil Scientist.
- F. Mock Up and Inspection
1. At the beginning of site work, the contractor shall demonstrate, in the presence of the Soil Scientist, subgrade preparations, including de-compaction, sand incorporation and re-compaction methods that achieve the requirements of this Section. All subsequent subgrade preparations shall be in accordance with approved methods.
 2. The Contractor shall not place Lawn and Planting Soil on prepared subgrade or placed soils prior to inspection and approval of DCR Representative and Soil Scientist for compliance with depth, compaction and percolation rate. The Contractor shall request inspection before proceeding at least ten working days prior to placement of soils.
 3. The Contractor shall not place sod prior to inspection and approval of DCR Representative and Soil Scientist for compliance with soil depth and compaction specifications. The Contractor shall request inspection before proceeding at least ten working days prior to placement of soils.

1.6 DELIVERY, STORAGE AND HANDLING

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- A. Soil Materials shall not be handled or hauled, placed or compacted when wet as after a heavy rainfall, early spring or if frozen. Soil shall be handled only when the moisture content is compliant with Section 02910 1.6.H. The DCR Representative and Soil Scientist, the Soil Scientist and the Owner shall be consulted to determine if the soil is too wet to handle.
- B. Store and handle packaged materials in strict compliance with manufacturer's instructions and recommendations. Protect all materials from weather, damage, injury and theft.
- C. Sequence deliveries to avoid delay. Deliver materials only after preparations for placement of planting soil have been completed.
- D. Prohibit vehicular and pedestrian traffic on or around stockpiled planting soil.
- E. Vehicular access to the site is restricted. Before construction, the Contractor shall submit for approval a plan showing proposed routing for deliveries and site access.
- F. Soil Moisture Content
 - 1. Contractor shall not move, blend or grade soil when moisture content is so great that free moisture is apparent, nor when it is so dry that dust will form in the air or that clods will not break readily, nor when it is frozen. Apply water, if necessary, or allow to dry to bring soil moisture between 60% of optimum moisture content and optimum moisture content as determined by ASTM D698 prior to compaction, grading or planting.
 - 2. Field Soil Moisture Test procedure is applicable for general soil moving and placement only and shall not be considered appropriate for compaction of soils, nor is a replacement for the above testing procedure.
 - a. Form soil in palm of hand, if soil retains shape and crumbles upon touching, the soil may be worked.
 - b. If the soil will not retain shape it is too dry and should not be worked.
 - c. If the soil retains shape and will not crumble, it is too wet and should not be worked.
 - d. If the soil glistens or free water is observed when the sample is patted in the palm of hand the soil is too wet and should not be worked.

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PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General

1. The extent of the existing soils to be re-used shall be carefully delineated in the field and then stripped and stockpiled without incorporation of the underlying subsoil or other undesirable soils.
2. The Contractor is responsible for stripping and stockpiling existing topsoil for re-use. The topsoil shall be stripped and stockpiled without incorporation of the underlying subsoil or other undesirable soils, and shall be tested and compared to pre-construction test data. A minimum of one composite sample per each 500 cubic yards of stripped topsoil is required for testing. The contractor is responsible for replacing topsoil that has been contaminated or commingled with subsoils or other deleterious material.
3. For manufactured amending existing soil and for off-site manufactured soil blends, samples of individual components in addition to the blended soil mixes shall be submitted by the Contractor for testing and analysis to the approved testing laboratory. Comply with specific materials requirements specified.
 - a. No base component material or soil components for soil mixes shall be used until certified test reports by an approved testing laboratory have been received and approved by the DCR Representative and Soil Scientist.
 - b. As necessary, make any and all soil mix amendments and resubmit test reports indicating amendments until approved.
4. The DCR Representative and Soil Scientist may request additional testing by Contractor for confirmation of mix quality and/or soil mix amendments at any time until completion. Changes in mix ratios may be required.
5. A Soil Testing Protocol flowchart is provided at the end of this Specification to assist the Contractor in Soil Testing Requirements in this Section.

B. Soil Testing and Soils Testing Report Submittal

1. All testing of the soil mix components shall be carried out by the Soils Testing Laboratory. Recommendations for amending and/or correcting the soil mix will be provided to the Contractor by the Soil Scientist after approval by the DCR Representative and Soil Scientist.
2. Failure of any material by testing and/or amendment procedure to meet Specification requirements shall require the Contractor to seek another source for the failed material and the initiation of all testing procedures for the new replacement material shall immediately take place.
3. The Contractor shall be responsible for recognizing that these critical project materials warrant timely and serious attention, that the testing process to

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achieve Approved materials should be considered a lead time item, and that under no circumstance shall failure to comply with all specification requirements be an excuse for “staying on project construction schedule.”

- C. Soil Samples: Contractor is responsible for paying costs for testing. Submit one gallon soil samples in two phases. Submit samples concurrent with horticultural soil test reports in both phases. Submit as Phase One, planting soil base components and stripped existing soil for approval. Only after approval of phase one components, submit as phase two, soil blend mixes / mediums for approval. All reports must be from recent analyses, less than 90 days old, and represent materials that are available for delivery to the site.

1. Phase One Submittals of Planting Soil Base Components:
 - a. Base Loam (if required)
 - b. Organic Amendment Materials (Compost)
 - c. Coarse Sand for Amending Soil
 - d. Stripped and Stockpiled Existing Soil
 - e. Turf Reinforcement Fibers (GeoFibers) (if required)
 - f. Sod Farm Soil Analysis (if required)
2. Phase Two Submittals – Soil Blends submitted in the same manner as bulk soils and will be prepared prior to delivery to site.
 - a. Planting Bed Soil: duplicate samples of 1 gallon.
 - b. Horticultural Subsoil: duplicate samples of 1 gallon.
 - c. Passive Use Lawn/Meadow Soil: duplicate samples of 1 gallon.
 - d. High Use Lawn Soil: duplicate samples of 1 gallon.
3. Phase Three Submittals shall be identical to Phase Two Submittals and be conducted for each 500 cubic yards of soil material prepared for the project site.
4. Submit reports for each of the above samples: Submit sample from each proposed source for testing and approval. Deliver samples to both the testing laboratory and the project soil scientist and pay costs. Send report directly to Owner’s Representative.
5. Soil Sample Submittals: Sampling of stripped topsoil shall be conducted by the Soil Scientist. Other soil material sampling shall be done by the Contractor. The size of the samples and method of sampling shall be as follows: Samples shall be representative of the material to be brought to the site. Each sample shall be a Composite Sample, which consists of 5 separate sub samples taken from a minimum of (5) different locations at each source and mixed together to make the test sample.
6. The Contractor shall schedule this testing in order to permit reasonable time for testing, evaluation, and approvals prior to scheduled installation. Allow for a minimum of 4 weeks to perform testing and obtain approvals.

- D. Imported Base Loam

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1. Imported Base Loam is not anticipated to be required for the project. All soil blends are intended to be manufactured from Stripped Existing Topsoil. Approximate mix ratios provided are based upon a pre-construction survey of existing topsoil. If Imported Base Loam is required, mix ratios may require adjustment.
2. Imported Base Loam (if required), as necessary for blending with sand and compost, shall be a naturally occurring A-Horizon soil formed from geologic soil forming processes without admixtures of sand or organic matter sources (composts). Base Loam, which has been contaminated by incorporation of subsoil, shall not be acceptable for use. Base Loam as required for the work shall be free of subsoil, large stones, earth clods, sticks, stumps, clay lumps, roots or other objectionable, extraneous matter or debris. Base Loam shall also be free of quack-grass rhizomes, Agropyron Repens, and the nut-like tubers of nutgrass, Cyperus Esculentus, and all other primary noxious weeds. Base Loam shall not be delivered or used for planting while in a frozen or muddy condition. Base Loam for mixing shall conform to the following grain size distribution for material passing the #10 sieve:

U.S. Sieve Size Number	Percent Passing	
	Minimum	Maximum
10	---	100
18	85	100
35	70	95
60	50	85
140	36	53
270	32	42
0.002mm	3	6

3. The ratio of the particle size for 80% passing (D₈₀) to the particle size for 30% passing (D₃₀) shall be 8 or less (D₈₀/D₃₀ < 8).
4. Maximum size shall be one-inch largest dimension. The maximum retained on the #10 sieve shall be 20% by weight of the total sample. Tests shall be by combined hydrometer and wet sieving in compliance with ASTM D422 after destruction of organic matter by ignition.
5. The organic content shall be between 4.0 and 8.0 percent by weight.
6. pH shall be between 5.8 and 7.0.

E. Coarse Sand

1. Sand for soil blends, protection of filter fabric and for incorporation into existing soils as required, shall be uniformly graded medium to coarse sand consisting of clean, inert, rounded to sub-angular grains of quartz or other durable rock free from loam or clay, mica, surface coatings and deleterious materials with the following grain size distribution for material passing the #10 sieve:

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U.S. Sieve Size Number	Percent Passing	
	Minimum	Maximum
10	100	--
18	60	80
35	25	45
60	8	20
140	0	8
270	0	3
0.002mm	0	0.5

2. Maximum size shall be one-inch largest dimension. The maximum retained on the #10 sieve shall be 20% by weight of the total sample.
3. The ratio of the particle size for 70% passing (D₇₀) to the particle size for 20% passing (D₂₀) shall be 2.8 or less (D₇₀/D₂₀ <2.8). Tests shall be by combined hydrometer and wet sieving in compliance with ASTM D422.
4. pH shall be less than 7.5.

F. Organic Amendment (Compost)

1. Organic Matter for amending planting soils shall be a stable, humus-like material produced from the aerobic decomposition and curing of Leaf Yard Waste Compost, composted for a minimum of one year (12 months). The leaf yard waste compost shall be free of debris such as plastics, metal, concrete or other debris. The leaf yard waste compost shall be free of stones larger than 1/2", larger branches and roots. Wood chips over 1" in length or diameter shall be removed by screening. The compost shall be a dark brown to black color and be capable of supporting plant growth with appropriate management practices in conjunction with addition of fertilizer and other amendments as applicable, with no visible free water or dust, with no unpleasant odor, and meeting the following criteria as reported by laboratory tests.
 - a. The ratio of carbon to nitrogen shall be in the range of 12:1 to 25:1.
 - b. Stability shall be assessed by the Solvita procedure. Protocols are specified by the Solvita manual (version 4.0). The compost must achieve a maturity index of 6 or more as measured by the Solvita scale. Stability tests shall be conducted by Woods End Research Laboratory, Mt. Vernon, Maine.
 - c. Organic Content shall be at least 20 percent (dry weight). One hundred percent of the material shall pass a 1/2-inch (or smaller) screen. Debris such as metal, glass, plastic, wood (other than residual chips), asphalt or masonry shall not be visible and shall not exceed one percent dry weight. Organic content shall be determined by weight loss on ignition for particles passing a number 10 sieve according to procedures performed by the West Experiment Station at the University of Massachusetts, Amherst or equal.
 - d. pH: The pH shall be between 6.5 to 7.4 as determined from a 1:1 soil-distilled water suspension using a glass electrode pH meter American Society of Agronomy Methods of Soil Analysis.

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- e. Salinity: Electrical conductivity of a one to five soil to water ratio extract shall not exceed 2.5 mmhos/cm (dS/m).
 - f. The compost shall be screened to 1/2-inch maximum particle size and shall contain not more than 3 percent material finer than 0.002mm as determined by hydrometer test on ashed material.
 - g. Chemistry testing shall be determined by the Woods End Testing Laboratory or equivalent laboratory and utilized to evaluate soil-required amendments for the mixed soils. Chemical analysis shall be undertaken for Nitrate Nitrogen, Ammonium Nitrogen, Phosphorus, Potassium, Calcium, Aluminum, Magnesium, Iron, Manganese, Lead, Soluble Salts, Cation Exchange Capacity, soil reaction (pH), and buffer pH.
- H. Filter Fabric, as required, shall be Mirafi 140N or approved equivalent.

2.2 PLANTING SOIL MIXES

A. Stripped Existing Topsoil

1. The existing topsoil resources at the site shall carefully be stripped and stockpiled at an area of the project site suitable for blending horticultural soils. During stripping of the topsoil, the contractor shall minimize the incorporation of subsoil or other undesirable soils into the topsoil. Contact the project Soil Scientist an advance of soil stripping for review of the process. The Soil Scientist will collect and analyze representative samples of the stripped and stockpiled topsoil for analysis. The Soil Scientist will make recommendations for proportions and types of soil amendments required to meet the requirements of this Specification for each of the soil blends. If the stripped topsoil contains excessive amounts of subsoil or is unsuitable for making soil blends, it may be rejected for re-use. If the stripped material is unsuitable, or if additional topsoil is required to manufacture the soil blends, it shall meet the requirements of 02910 2.1 (D) Base Loam.
2. All existing vegetation shall be removed from stockpiles prior to blending. Uniformly mix ingredients by windrowing/tilling on an approved hard surface area or by alternately processing materials through a screening plant. All soil components and Organic Amendment shall be maintained moist, not wet, during mixing. Amendments shall not be added unless approved to extent and quantity by the owner and additional tests have been conducted to verify type and quantity of amendment is acceptable. Percentages of components are approximate, and will be verified upon completion of individual test results for components of the various mixes. Due to variability of soil materials, mix ratios may require adjustment and re-submittal at the expense of the Contractor.

- C. After component percentages are determined by the Soil Scientist, each planting soil mix shall be tested for physical and chemical analysis. Component percentages may be modified at any time by the soil scientist dependent upon the results of testing of the various components or final blends.

D. Planting Soil

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1. Planting Bed Soil shall consist of a combination of approximately equal parts by volume Stripped Existing Topsoil, Coarse Sand and Organic Amendment/Compost (1L:1S:1C). The following gradation for material passing a Number 10 Sieve shall be achieved in the final mix.

U.S. Sieve Size No.	Percent Passing	
	Minimum	Maximum
10	100	
18	85	95
35	60	85
60	42	60
140	20	40
270	16	20
0.002 mm	2	4

2. Maximum size shall be one half-inch largest dimension. The maximum retained on the #10 sieve shall be 10% by weight of the total sample.
3. The ratio of the particle size for 80% passing (D₈₀) to the particle size for 30% passing (D₃₀) shall be 8 or less (D₈₀/D₃₀ <8).
4. The final mix shall have an organic content between 5 and 7 percent by weight.
5. The final mix shall have a hydraulic conductivity of not less than 1.5 inches per hour according to test procedure ASTM D5856-95 (2000) when compacted to a minimum of 86 percent Standard Proctor ASTM D 698.
6. Chemical analysis shall be undertaken for Phosphorus, Potassium, Calcium Magnesium, Aluminum, Iron, Manganese, Lead, Cation Exchange Capacity, Soluble Salts, acidity (pH) and buffer pH.
7. pH shall be between 6.2 and 6.8
8. Chemical analysis shall be undertaken for Phosphorus, Potassium, Calcium Magnesium, Aluminum, Iron, Manganese, Lead, Cation Exchange Capacity, Soluble Salts, acidity (pH) and buffer pH.

E. Horticultural Subsoil

1. Horticultural Subsoil for the lower layer of planting soil in Planting Beds shall consist of a combination of approximately 1.5 parts by volume Coarse Sand to one part by volume Stripped Existing Topsoil or Imported Base Loam. (1.5S:1L).
2. Gradation for material passing the #10 sieve:

U.S. Sieve Size No.	Percent Passing	
	Minimum	Maximum
10	100	--
18	85	95
35	55	80

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60	30	60
140	18	33
270	12	16
0.002mm	1	3

3. Maximum size shall be one-inch largest dimension. The maximum retained on the #10 sieve shall be 20% by weight of the total sample.
4. Ratio of the particle size for 80% passing (D₈₀) to the particle size for 30% passing (D₃₀) shall be 6.0 or less (D₈₀/D₃₀ <6.0).
5. Saturated hydraulic conductivity of the mix: not less than 2 inches per hour according to ASTM D5856-95 (2000) when compacted to a minimum of 86% Standard Proctor, ASTM 698.
6. Organic content: between 1.5 and 3.0 percent by weight.
7. pH shall be between 6.0 and 6.8

F. High Use Lawn Soil

1. Stripped Top Soil or Imported Base Loam, Sand and Compost, each as specified above, shall be combined in an approximate mix ratio of two parts by volume Sand to one part by volume Imported Base Loam to one part by volume Compost (2S:1L:1C) to create a uniform blend which meets the following requirements.
2. Gradation for Material Passing the Number 10 Sieve:

U.S. Sieve Size No.	Percent Passing	
	Minimum	Maximum
10	100	100
18	70	90
35	45	72
60	26	40
140	14	20
270	10	14
0.002mm	2	4

3. Maximum size shall be one-inch largest dimension. The maximum retained on the #10 sieve shall be 20% by weight of the total sample.
4. Ratio of the particle size for 70% passing (D₇₀) to the particle size for 20% passing (D₂₀) shall be 4.2 or less (D₇₀/D₂₀ <4.2).
5. Saturated hydraulic conductivity of the mix shall not be less than 4.0 inches per hour according to ASTM D5856-95 (2000) when compacted to a minimum of 88% Standard Proctor, ASTM 698.
6. Organic content shall be between 4.0 and 6.0 percent by weight.
7. pH shall be between 6.2 and 6.8

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8. Chemical analysis shall be undertaken for Phosphorus, Potassium, Calcium Magnesium, Aluminum, Iron, Manganese, Lead, Cation Exchange Capacity, Soluble Salts, acidity (pH) and buffer pH.

PART 3 – EXECUTION

3.1 PRE-INSTALLATION EXAMINATION AND PREPARATION

- A. Reference Other Sections as necessary.
- B. Coordinate activities with other project contractors so that there is no soil disturbance from traffic or other construction activities subsequent to placement.
- C. Pre-Installation Examination Required: The Contractor shall examine previous work, related work, and conditions under which this work is to be performed and shall notify DCR Representative and Soil Scientist in writing of all deficiencies and conditions detrimental to the proper completion of this work. Beginning work means Contractor accepts substrates, previous work, and conditions. The Contractor shall not place any Lawn and Planting Soils until all work in adjacent areas is complete and approved by the DCR Representative and Soil Scientist and Soil Scientist.
- D. Kickoff Meeting: At least 10 working days prior to the start of work, the contractor shall request a landscape construction kickoff meeting with the owners representative, DCR Representative, soil scientist and any other parties involved with landscape construction. The contractor must demonstrate familiarity with this Section 02910 Lawn and Planting Soils, and other relevant sections of the construction documents. The contractor shall articulate the means and methods of soil blending, subgrade preparation, soil placement and other steps outlined in the Specification.
- E. Examination of Subgrade: The subgrade shall be examined by the Contractor prior to the start of subgrade preparation, soil placement and planting. Any deficiencies shall be noted and related to the DCR Representative and Soil Scientist in writing prior to acceptance of the subgrade by the Landscape Contractor. Deficiencies include, but shall not be limited to the following:
 1. Construction debris present within the planting areas.
 2. The subgrade is at incorrect depths for installing the designed soil profile and drainage layer.
 3. Incomplete irrigation and/or subsurface drainage installation.
 4. Incomplete lighting and exterior electrical installation.
 5. Conflict with underground utilities.
 6. Subgrade contaminated with oils, compressible material, silt or clay

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7. Prepared subgrade must infiltrate water at the rate of at least two inches per hour.
- F. Confirm that the subgrade is at the proper elevation and compacted as required. Subgrade elevations shall slope parallel to the finished grade and/or toward the subsurface drain lines as shown on the drawings.
1. Slope sides of excavations to comply with local codes and ordinances having jurisdiction. Shore and brace slopes where required and maintain sides of slopes of excavations in safe condition until completion of backfilling. Provide protection measures as required for public safety.
 2. All subgrade areas to be filled with Lawn or Planting Soil shall be free of construction debris, refuse, vegetation, compressible or decay able materials, all stones greater than 6 inches, concrete washout or soil crusting films of silt or clay that reduces or stops drainage from the Lawn and Planting Soils into the subsoil; and/or standing water. Such material shall be removed from the site.
 3. Subgrade levels shall be adjusted as required to ensure that all planting and lawn areas have adequate drainage.
- G. Do not proceed with Subgrade Preparations or placement of Lawn and Planting Soils, until all utility work in the area has been installed.
1. The Contractor shall identify the locations of underground utilities prior to proceeding with soil work and shall protect all utilities from damage.

3.2 EXCAVATION AND REMOVAL

- A. Portions of the project site will require removal and replacement of existing soils and/or pavement and pavement base materials to accommodate the new soil profile. Other portions of the project site will require in situ de-compaction and amendment of soils.
- B. The Contractor is responsible for carefully delineating the limits of work, and excavating and removing the materials to the elevations shown on the plans to accommodate the new soil profile.
- C. Some of the stripped topsoil shall be re-used on the project site, as determined by soil testing, and after approval by the DCR Representative and Soil Scientist.
- D. The Contractor shall designate a staging area for screening, storage and blending of horticultural soils. Soil piles shall be segregated and protected for the duration of the work.

3.3 MIXING OF PLANTING SOIL MIXES

- A. Soil blends shall be produced with equipment that blends together each component in a thorough and uniform manner. This may be accomplished by a minimum of

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three handling events on a hard surfaced area with earth moving equipment or by alternately passing soil components through a screener.

- B. Base components and Soil Mix stockpiles should be protected from wind and rain and shall not be permitted to be stored in standing water.

3.4 WORKING AROUND UTILITIES

- A. Carefully examine the civil, record, and survey drawings to become familiar with the existing underground conditions before digging.
- B. Known underground and surface utility lines are indicated on the utilities drawings – See Civil and Architect’s plans. Contact the local Dig Safe organization and give them their required time to respond and mark the property. 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. Perform work in a manner that will protect utilities from damage. Hand excavate as required and provide adequate means of support and protection of utilities during soil installation operations. Maintain grade stakes set by others until parties concerned mutually agree upon removal. The Contractor shall repair all utilities damaged by soil operations at the Contractor’s expense.

3.5 SUBGRADE PREPARATION, INSPECTION AND PERCOLATION TESTING

- A. After subgrade levels have been reached, the DCR Representative or Soil Scientist shall observe de-compaction and preparation of the subgrade according to this Section and inspect soil conditions to evaluate subsurface drainage conditions.
- B. Coordinate the following scarification work to eliminate subgrade compaction and improve drainage conditions when located in lawn areas outside of tree protection zones. Maintain 12” clearance from any underground utilities during subgrade de-compaction.
 - 1. Heavy Site Subgrade Compaction Mitigation:
 - a. Heavily compacted subgrade areas such as, but not limited to, temporary parking areas, material stockpile areas, temporary roadways, construction areas and areas around structures and other similar areas.
 - b. Prior to establishing the final subgrade, these areas shall be dug up or ripped to a depth of (18) inches to break up the soil hard pan, then re-compacted with two passes of the tracks of a wide track bulldozer size D-6 or smaller, or other approved equipment. Vibratory compaction of subgrade in planted areas is prohibited.
 - 2. General Site Subgrade Preparation for Lawn Soil and Planted Areas:
 - a. Subgrade preparation shall be conducted after subgrade elevations have been established and approved and all utility and other construction activities have concluded. Notify the Soil Scientist and

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- DCR Representative within 10 days of subgrade preparation. Conduct the initial work of subgrade preparation in the presence of the Soil Scientist and DCR Representative and conduct all subsequent work according to approved methods.
- b. The entire subgrade shall be loosened to a minimum depth of 8-inches using the teeth of an excavator or other suitable equipment in a coarse manner. The object is to shatter the subsoil and relieve over-compaction.
 - c. The subgrade shall then re-compacted with two passes of the tracks of a wide track bulldozer size D-6 or smaller, or other approved equipment. Vibratory compaction of subgrade in planted areas is prohibited.
- C. After Subgrade has been prepared as described above, it shall be recompressed by using the tracks of a wide-tracked bulldozer, multiple passes of a skid steer loader, or the curled bucket of an excavator. Verify the subgrade passes water at or greater than the minimum requirement.
- D. Remove all stones or debris greater than 6” in any dimension from the subgrade prior to placing Lawn or Planting Soils.
- E. After the subgrade has been prepared, Percolation Tests shall be performed according to the following test procedures.
1. Utilize perforated canisters or buckets seven to ten inches in diameter and a minimum of six inches high.
 2. A test hole shall be hand dug at the soil horizon to be tested approximately one-inch larger than the diameter of the test canister and approximately six inches deep. The sides of the test hole shall not be smoothed.
 3. Place one-half inch of clean coarse sand in the bottom of the hole and place the canister firmly into the hole. The space around the canister shall then be filled with coarse sand. Tamp the coarse sand to firmly fill any void space around the test canister.
 4. Fill the canister with water to the soil horizon level and allow to drain until approximately one inch of water remains, or a minimum of 1 hour.
 5. Refill the canister to the soil horizon level. After the water level drops approximately one inch, start the test. Record time versus water level as the water level drops. The percolation rate is the length of time for the water level to drop per inch. The field scientist shall record the rate of percolation for a minimum of two hours or until the water level has dropped a minimum of three inches after the start of measurements.
 6. Prepared subgrade shall infiltrate water at a minimum rate of two-inches per hour in planting beds and lawn areas, and a minimum rate of four-inches per hour in bioinfiltration basins. If subgrade fails to pass water at the minimum rate, notify DCR Representative and soil scientist. Additional subgrade preparation may be required.

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3.6 PLACEMENT OF LAWN AND PLANTING SOILS

A. Soil Placement Preparation:

1. Verify that the subgrade preparations have been reviewed and accepted, including de-compaction, sand incorporation and removal of large stones.
2. Notify the DCR Representative and Soil Scientist of soil placement operations at least seven calendar days prior to the beginning of work.
3. Verify that the subgrade passes the minimum water infiltration requirement.
4. Do not proceed with the installation of Lawn or Planting Soils, until all utility work in the area has been installed.
5. The Contractor shall identify the locations of underground utilities prior to proceeding with soil work and shall protect all utilities from damage.
6. Do not begin Lawn and Planting Soil installation until all drainage, irrigation main lines, lateral lines, subgrade preparations and irrigation risers shown on the drawings are viewed and approved by the DCR Representative and Soil Scientist.
7. Protect adjacent walls, walks and utilities from damage or staining by the soil. Use plywood and/or plastic sheeting as directed to cover existing asphalt, concrete, metal and masonry work.
 - a. Clean up any soil or dirt spilled on any paved surface, including at the end of each working day.
 - b. Any damage to the paving or architectural work shall be repaired by the Contractor at the Contractor's expense.

- #### B.
- After the subgrade soils have been loosened, re-compressed and inspected, Lawn and Planting Soil may be spread by using a wide track bulldozer size D-5 or smaller or may be dumped and spread with the bucket of an excavator from the edge of the loosened area. No rubber-tired equipment or heavy equipment except for a small bulldozer shall pass over the subsoils (subgrade) after they have been loosened and recompressed. If the Contractor plans to utilize such areas for any use of heavy equipment, this work should be carried out prior to beginning the process of loosening soils or filling in that area.

C. Placement of Lawn and Planting Soils:

1. Lawn Soils shall be placed in lifts not to exceed 8 inches in thickness and compacted to meet minimum and maximum requirements as specified below:
 - a. Place Lawn and Planting Soils on prepared subgrade in a manner that does not over compact the prepared subgrade. Haul Roads are permitted, provided the Haul Roads are de-compacted and recompressed according to Section 3.5 (1), or soil may be dumped at

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- b. After inspection and approval of Horticultural Subsoil, place trees and shrubs in locations shown on the plans and at the proper elevations.
 - c. Create a transition layer as described in this Section. Place and compact Planting Bed Soil around trees and shrubs as described in this Section.
2. Planting Bed Soil, Lawn Soil, Bioinfiltration Soils and Horticultural Subsoil shall be placed in lifts not to exceed 8 inches in thickness and compacted to meet minimum and maximum requirements as specified below:
- a. A transition zone shall be formed between the prepared subgrade and Horticultural Subsoil, Bioinfiltration Soils and Planting Bed Soil by placing one inch of the upper-layer soil and raking into the lower soil to a two-inch thickness.
 - b. Horticultural Subsoil and Lawn Soils shall be compacted to between 84 and 87 percent Standard Proctor, except soils beneath the rootballs shall be compacted to between 87 and 90 percent Standard Proctor to create a firm pedestal and prevent settlement of the rootballs.
 - c. Planting Bed Soil and Bioinfiltration Soils shall be compacted to between 82 and 85 percent Standard Proctor.

3.7 LAWN SOILS AT TREE PROTECTION ZONES

- A. The Contractor shall to engage a board certified master arborist with a minimum of 5 years of experience, including experience with supersonic air tools such as the “Airsfade” for the project. All excavation, and backfilling within tree protection zones shall be by approved equipment by the arborist or under the supervision of the arborist.
1. Air Spading is a state of the art excavating tool that uses high volumes of compressed air to remove and break up soil without damaging roots. Air spading allows the contractor to examine the different root structures within construction zones and to maximize the amount of root area that can be saved during construction.
 2. Delineate the areas of soil disturbance within the tree protection zones. The Contractor’s arborist is to perform subsurface root exploration and evaluate root distribution in the area of the disturbance.
 3. As a guideline, the minimum tree protection zone is the distance from trunk of tree is established by taking the tree’s diameter at breast height in inches, and converting it to feet. (For example, 12” caliper tree translates into a 12’ offset from the edge of the trunk to the final cut line.) Site constraints may dictate that final cut line is closer to the trunk than guidelines will allow. Do not perform subsurface exploration near the trunk or within the drip line without the presence of the project arborist.
 4. Contact the project Soil Scientist for type and quantity of soil amendment in tree protection zones. At a minimum, arborist to

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incorporate 3-inches of 50/50 sand/compost blend into the existing soil at tree protection zones to a depth of six inches using air spade equipment. The Contractor and the arborist will minimize exposure of tree root systems during the exploration and construction activities. The type and quantity of soil amendments are subject to change based upon soil test results.

6. When root systems are potentially exposed for extended time periods of greater than one work day/8 hours, and during or between periods of excavation/construction activity, lay burlap over exposed roots, support edge of excavation and mulch to a depth approved by arborist. Saturate burlap and mulch with water and maintain the burlap in a damp condition during daylight hours as to not allow roots to dry out.
7. If necessary to achieve finish grades, approved lawn soil shall be hand placed in tree protection zones. The placed soil should be compacted using the tracks of a skid steer or mini excavator or by manual or foot tamping as necessary. No wheeled equipment shall be permitted to traverse the tree protection areas.

3.8 PROTECTION

- A. The Contractor shall protect landscape work and materials from damage due to landscape operations, operations by other Contractors or trespassers. Maintain protection during installation until acceptance. Treat, repair or replace damaged Lawn and Planting Soils installation work immediately.
- B. Provide all means necessary, including fences, to protect all soil areas from compaction and contamination by trash, dust, debris, and any toxic material harmful to plants or humans after placement. Any area that becomes over compacted, shall be de-compacted and tilled to the extent determined by the soil scientist and recompressed to the density ranges specified. Any uneven or settled areas shall be filled, re-graded and re-compacted to meet the requirements of this Specification. Soil that becomes contaminated shall be removed and replaced with specified soil material.
- C. Phase the installation of the Lawn and Planting Soil such that equipment does not have to travel over already installed soil. Use of haul roads is acceptable provided that the haul road is completely re-worked to meet the requirements of this Specification.
- D. Apply filter fabric covering and planking or other engineering controls over soil to minimize compaction and collect dust and debris in any area where the Contractor must work after the installation of Lawn and Planting Soil.
- E. Till compacted Lawn and Planting Soil and replace Lawn and Planting Soil that has become over compacted or contaminated as determined by the Soil Scientist or DCR Representative. Non-Compliant Lawn and Planting Soil shall be tilled or replaced by the Contractor at no expense to the Owner.

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3.9 CLEAN-UP

- A. During installation, keep pavements clean and work area in an orderly condition.
- B. Keep the site free of trash and debris at all times. Immediately dispose of wrappings or waste materials associated with products necessary for the completion of the work.
- C. All trash and debris shall be kept in a central collection container. Do not bury trash and debris in back-fill.
- D. Once installation is complete, remove any excess soil from pavements or embedded in fixtures.

3.10 COORDINATION AND EXCESS MATERIALS

- A. Coordinate activities with other project contractors so that there is no soil disturbance from traffic or other construction activities subsequent to placement.
- B. Excess Planting Soil Mixtures and Materials: Remove the excess planting soil mixture and materials from the site at no additional cost to the Owner unless otherwise requested.

3.10 POST-INSTALLATION TESTING

- A. In-place density testing is required in all areas. Placed Lawn and Planting Soil must be inspected for compaction level by the soil scientist or by ASTM D6938-10 Nuclear Methods, after ASTM D698 Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort. Density testing shall be conducted at a minimum of one test every 1,500 square feet.
- B. Placed Soils must be capable of infiltrating water at the minimum rate provided in this Specification.

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PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

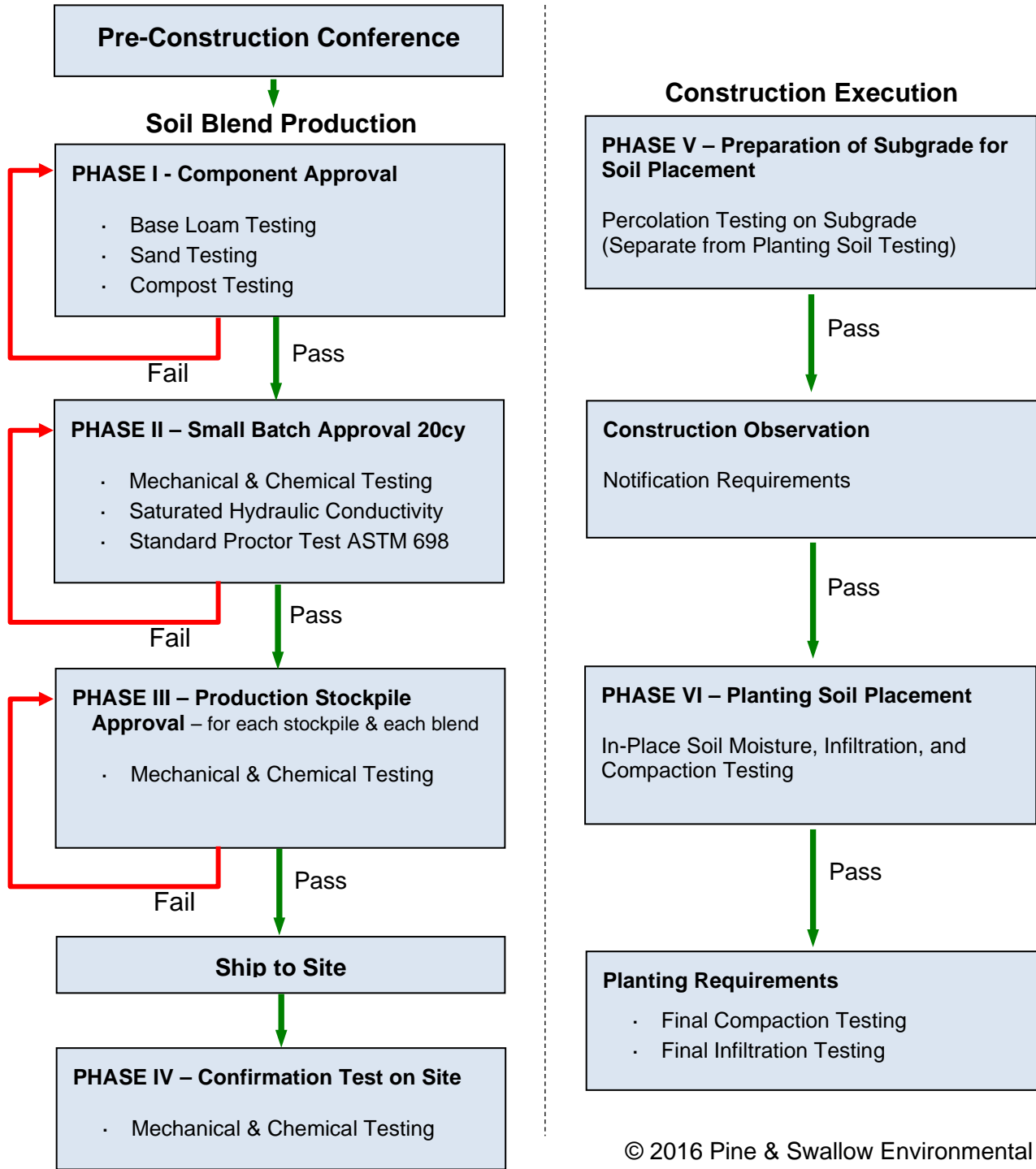
- A. No separate measurement will be made for PLANTING SOIL. PLANTING SOIL including stripped and stockpiled existing topsoil or imported base loam, sand, compost and amendments, preparing planting mixes as specified, complete and in place will be paid for under the items for which it is required including lawns and meadows, and plantings, and shall consist of all labor, materials and incidentals.

4.02 PAYMENT

- A. Payment for PLANTING SOIL and all associated labor and materials as specified in this section for will be included as part of the Contract price for the planting of which it forms a part.

END OF SECTION

APPENDIX: PLANTING SOIL TESTING PROTOCOL



SECTION 02930
EXTERIOR PLANTS

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1 – GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.02 DESCRIPTION OF WORK

The scope of work consists of all materials, equipment, labor and services required to supply and place EXTERIOR PLANTS as indicated on the Contract Documents and as specified.

Supplying and placement of exterior plants shall include, but not be limited to:

1. Plant Material Furnished
2. Plant Material Placed
3. River Edge Emergent Planting w/ Coir Rolls
4. Pruning New Plants
5. Geese Protection Fencing
6. Plant Material Guarantee and Acceptance
7. Maintenance
8. Extended Maintenance Period
9. Clean-up

1.03 RELATED WORK UNDER OTHER SECTIONS

- A. Section 02100 - SITE PREPARATION
- B. Section 02200 - EARTHWORK
- C. Section 02910 – LAWN AND PLANTING SOILS

D. Section 02940 - LAWNS

1.04 DEFINITIONS AND REFERENCES

- A. "AMERICAN STANDARD FOR NURSERY STOCK," latest edition, American Association of Nurserymen (ANSI Z60.1).
- B. ANSI 133.1 Safety Requirements for Pruning, Trimming, Repairing, Maintaining and Removing Trees.
- C. National Arborist Association - Pruning Standards for Shade Trees, Revised 1988.
- D. Balled and Burlapped Stock: Exterior plants dug with firm, natural balls of earth in which they are grown, with ball size not less than diameter and depth recommended by ANSI Z60.1 for type and size of tree or shrub required; wrapped, tied, rigidly supported, and drum-laced as recommended by ANSI Z60.1.
- E. Balled and Potted Stock: Exterior plants dug with firm, natural balls of earth in which they are grown and placed, unbroken, in a container. Ball size is not less than diameter and depth recommended by ANSI Z60.1 for type and size of exterior plant required.
- F. Bare-Root Stock: Exterior plants with a well-branched, fibrous-root system developed by transplanting or root pruning, with soil or growing medium removed, and with not less than minimum root spread according to ANSI Z60.1 for kind and size of exterior plant required.
- G. Container-Grown Stock: Healthy, vigorous, well-rooted exterior plants grown in a container with well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for kind, type, and size of exterior plant required.
- H. Fabric Bag-Grown Stock: Healthy, vigorous, well-rooted exterior plants established and grown in-ground in a porous fabric bag with well-established root system reaching sides of fabric bag. Fabric bag size is not less than diameter, depth, and volume required by ANSI Z60.1 for type and size of exterior plant.
- I. Finish Grade: Elevation of finished softscape surface (i.e. soil, mulch, planting bed, lawn, etc.).

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- J. Finish Surface: Elevation of finished installed hardscape surface (i.e. pavement surface, elevated walkway surface, etc.)
- K. Planting Soil Mix: Native or imported loam, manufactured loam, or surface soil modified to become Loam; mixed with soil amendments.

1.05 SUBMITTALS

- A. At least 10 days prior to intended use, the Contractor shall provide the following samples and submittals for approval in conformance with the requirements of Division 1 Section, SUBMITTALS. Do not order materials until DCR Representative's approval of samples, certifications or test results has been obtained. Delivered materials shall closely match the approved samples. Acceptance shall not constitute final acceptance. The DCR Representative reserves the right to reject on or after delivery any material that does not meet these Specifications.

- 1. Bark Mulch: Submit product literature & sample
- 2. Gypsum: Submit product literature
- 3. Fertilizer: Submit product literature

- B. At least 90 days prior to intended use, the Contractor shall provide the following samples and submittals for approval in conformance with the requirements of Division 1 Section, SUBMITTALS. Do not order materials until DCR Representative's approval of samples, certifications or test results has been obtained. Delivered materials shall closely match the approved samples. Acceptance shall not constitute final acceptance. The DCR Representative reserves the right to reject on or after delivery any material that does not meet these Specifications.

- 1. Planting List, Source and Quantities

1.06 QUALITY ASSURANCE

- A. Qualification of personnel

- 1. Qualification of Landscape Contractor: The work of this Section shall be performed by a landscape contracting firm which has successfully installed work of a similar quality, schedule requirement, and construction detailing with a minimum of five years' experience. Submit proof that the landscape contracting firm meets this requirement.
- 2. Qualification of Foreman or Crew Leader: All work of unloading, stockpiling, storing, transporting on-site, planting, staking and guying,

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fertilizing, and maintenance of trees, shrubs, vines, groundcover, and perennials shall be supervised by a foreman or crew leader who is a certified landscape professional or a certified horticulturist. Submit proof of certification. Foreman and Crew Leader shall remain on the project on a consistent basis from the beginning of planting through provisional acceptance.

- B. Material Sampling and Testing shall be specified, performed and paid for under this section.
- C. Soil Additives: Submit manufacturer's product data for all soil additives needed to amend specified soil in order to meet the requirements of this Division 2 Section "Exterior Plants".
- D. Provide quality, size, genus, species, and variety of exterior plants indicated, complying with applicable requirements in ANSI Z60.1, "American Standard for Nursery Stock."
- E. Selection of exterior plants purchased will be made by DCR Representative, who will tag plants at their place of growth before they are prepared for transplanting. The DCR Representative will make a reasonable number of tagging trips for all the plant material in the contract. The DCR Representative reserves the right to seek compensation for excessive tagging trips caused by the mismanagement of the Contractor.
- F. Contractor shall provide a list of plants and their source 90 days ahead of expected planting.
- G. Tree and Shrub Measurements: Measure according to ANSI Z60.1 with branches and trunks or canes in their normal position. Do not prune to obtain required sizes. Take caliper measurements 6 inches above ground for trees up to 4-inch caliper size, and 12 inches above ground for larger sizes. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip-to-tip.
- H. Observation: DCR Representative may observe plant material either at place of growth or at site before planting for compliance with requirements for genus, species, variety, size, and quality. DCR Representative retains right to observe planting material further for size and condition of balls and root systems, insects, injuries, and latent defects and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected plant material immediately from Project site.
 - 1. Notify DCR Representative of sources of planting materials 90 days in advance of scheduled planting date. Request for substitutions shall be

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made one 90 days in advance of scheduled planting date. Contractor is advised to start the search of plant material early.

2. Notify DCR Representative of plant material seven (7) days in advance of delivery to site.

I. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Coordination and Meetings"

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver exterior plants freshly dug.

B. Do not prune trees or shrubs before delivery, except as approved by DCR Representative. Protect bark, branches, and root systems from sun scald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie plant material in such a manner as to destroy their natural shape. Provide protective covering of exterior plants during delivery. Do not drop exterior plants during delivery.

C. Handle planting stock by root ball or container.

D. Deliver exterior plants after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after delivery, set exterior plants trees in shade, protect from weather and mechanical damage, and keep roots moist.

1. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.

2. Do not remove container-grown stock from containers before time of planting.

3. Water root systems of exterior plants stored on-site with a fine-mist spray. Water as often as necessary to maintain root systems in a moist condition.

1.08 COORDINATION

A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.

Spring: Deciduous materials - March 21 through June 1

Evergreen materials - April 15 through June 1

Fall: Deciduous materials - September 1 through November 15

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Evergreen materials - August 15 through November 1

If the construction completion date prohibits in-season planting, the Contractor shall report conditions and receive approval from the DCR Representative, complete his/her work within the project date and prepare himself for out-of-season planting, including wilt-proofing and extra watering. Plant guarantee periods remain as stated below. No frozen ground planting will be permitted. Only healed in plants will be permitted during summer planting.

- B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit.
- C. Coordination with Lawns: Plant trees and shrubs after finish grades are established and before planting lawns, unless otherwise acceptable to DCR Representative.
 - 1. When planting trees and shrubs after lawns, protect lawn areas and promptly repair damage caused by planting operations.

PART 2 - PRODUCTS

2.01 LOAM BORROW

- A. Loam borrow for planting shall be specified under the Division 2 Section 02910 PLANTING SOILS; provided, installed and paid for under the work of this Section 02930 EXTERIOR PLANTS.

2.02 SOIL ADDITIVES

- A. Soil additives shall be specified under the Division 2 Section 02910 PLANTING SOILS; provided, installed and paid for under this Section 02930 EXTERIOR PLANTS.

2.03 PLANTING SOIL MIX

- A. Planting soil mixes shall be approved as specified under the Division 2 Section 02910 PLANTING SOILS, provided, installed and paid for under this Section 02930 EXTERIOR PLANTS.

2.04 MYCORRHIZAL FUNGAL INOCULANT FOR NEW PLANTING

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- A. Mycorrhizal Fungal Inoculant shall be three (3) ounce packets or tablets of live spores. Each packet or tablet of inoculant shall be applied as per manufacturer's recommendation and contain the following:
 - 1. Live spores of VA Endomycorrhizal fungi: minimum 1,000 spores of Vesicular-Arbusculus fungi including: *Entrophosora columbiana*, *Glomus etunicatum*, *Glomus clarum*, and *Glomus* sp.
 - 2. Live spores of Ectomycorrhizal fungi: minimum 60 million spores of *Pisolithus tinctorius*.
 - 3. Acrylamide copolymer gel as a water absorbent gel.
 - 4. *Yucca schidigera*, a dry soluble yucca plant extract.
 - 5. Soluble sea kelp extract, *Ascophyllum nodosum*.
 - 6. Humic acids, leonardite humates.
- B. Mycorrhizal fungal inoculant shall be manufactured by Plant Health Care Inc. (800) 421-9051, JRM 1(800)962-4010, DieHard (800) 628-6373, or approved equal.

2.05 WATER STORING GRANULES

- A. Water storing granules shall be three (3) ounce packs of hydrophilic acrylic polymer particles. Each pocket of granules shall be applied as per manufacturer's recommendation.
- B. Water storing granules shall be Hydrophilic Acrylic Polymers of 99.7% acrylamide, acrylic acid, methyl acrylate, hydroxethyl methacrylate; and sodium of ammonium salts.
- C. Water Storing Granules shall be manufactured by JRM Chemical, Inc. "Soil Moist" 1 (800) 962-4010; Primary Products "P4" 1 (800) 841-6630; Debco-Marion Agricultural Services "Raindrops" (510) 651-4900 or approved equal.

2.06 PLANT MATERIALS

- A. Selection of the Nursery Stock
 - 1. At least thirty (10) days prior to the expected planting date, the Contractor shall request, in writing, that the DCR Representative, DCR Representative, and DCR DCR Representative provide representatives to select and tag stock to be planted under this Section. This request shall be made ten (10) days prior to the date on which stock selections are to be made. The Contractor shall arrange for and bear the cost of transportation, meals in transit, and overnight accommodations, if necessary, for the DCR Representative, DCR Representative, and DCR DCR Representative's representatives during the period of time required

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to select and tag the required number of sized stock. The letter of request shall also have attached a letter of certification from the supplier attesting to the fact that the stock to be selected from is, in fact, the patented tree or plant required under this Section. The Contractor shall supply the necessary tags or seals which shall be durable and capable of accepting weather-resistant ink or an embossed process. The tags or seals shall be attached directly and securely to each selected plant.

- B. The Contractor shall furnish and plant all plants shown on the drawings, as specified, and in quantities as listed on the PLANT LIST except where noted. All plants shall be nursery grown.
- C. Plants shall be in accordance with the USA Standard for Nursery Stock of the American Association of Nurserymen.
- D. All plants shall be typical of their species or variety and shall have a normal habit of growth and be legibly tagged with the proper name.
- E. All plants shall be sound, healthy, and vigorous, well branched and densely foliated when in leaf. They shall be free of disease, insect pests, eggs or larvae.
- F. All grasses shall be container grown. Stock shall have been grown in a container long enough for the root system to have developed sufficiently to hold its soil together, firm and whole. No plants shall be loose in the container. Groundcover plants must be in a moist, vigorous condition. Thin plants will not be accepted.
- G. The root system for all plants shall have an extensive, symmetrically balanced fibrous root system. In addition all plants shall meet the following:
 - 1. All trees must be moved with the root systems as solid units with balls of earth firmly wrapped with burlap. The diameter and depth of the balls of earth must be sufficient to encompass the fibrous root feeding system necessary for the healthy development of the plant. No tree shall be accepted when the ball of earth surrounding its roots has been badly cracked or broken preparatory to or during the process of planting or after the burlap, staves, ropes or platform required in connection with its transplanting have been removed. The trees and balls shall remain intact during all operations.
 - 2. All parts of the fibrous root system of all plants shall be moist and fresh with white color when washed of soil. When the plant is removed from the container, the visible root mass shall be healthy with white root tips. The root system of all plants shall be free of disease, insect pests, eggs, or larvae.

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3. Any root ball which shows signs of asymmetry, injury, or damage to the root system shall be rejected.
 4. Curling or spiraling of the roots along the walls of rigid containers will not be accepted.
 5. All trees shall be healthy and vigorous, as noted by healthy white roots, firm root ball, disease free trunk and leaves. All trees that are not planted once shall be protected from desiccation with mulch completely covering the root ball and watered in well. Contractor shall be responsible for trees and shrubs lost due to improper care and preparation.
 6. The diameter and depth of the balls of earth must encompass the fibrous and root feeding system necessary for the healthy recovery of the plant. Minimum root ball diameters and depths shall be in accordance with ASNS standards.
 7. No plants shall be loose in the container.
 8. Container grown plants which have roots growing out of the container shall be rejected.
- H. The height of the trees (measure from the crown of the roots to the tip of the top branch) shall be not less than the minimum size designated. The caliper measurement six (6) inches above ground level up to and including four (4) inch caliper size and twelve (12) inches above ground level for larger sizes. The branching height for shade trees next to walks shall be eight (8) feet. This may be obtained with permission of DCR Representative by pruning after delivery if this does not ruin the shape or form of the trees or cause unsightly scars. The trunk of each tree shall be (unless otherwise indicated on the drawings) a single trunk growing from a single un-mutilated crown of roots. No part of the trunk shall be conspicuously crooked as compared with normal trees of the same variety. The trunk shall be free from sun scale, frost cracks, or wounds resulting from abrasions, fire or other causes. No pruning wounds having a diameter exceeding two inches shall be present and such wounds must show vigorous bark on all edges. No trees which have had their leaders cut will be accepted.
- I. The Contractor shall take note that only tree stock grown specifically for hardiness in Zone 5 of the Hardiness Zones established by the Arnold Arboretum, Jamaica Plain, Massachusetts, will be accepted. The Contractor's suppliers must certify in writing that the stock has actually been grown under Zone 5 conditions and is hardy to the City of Cambridge or that the stock was asexually propagated from and grafted onto stock from a strain proven hardy to Zone 5 conditions. Trees and plants not so certified will not be accepted.

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2.07 MULCH

- A. Dark brown shredded hardwood bark mulch shall be fibrous pliable slices, not exceeding 1/2 inch in width or 3 inches in length. It shall be 98 percent organic matter with the pH range of 3.5 to 4.5 and a moisture content of packaged material not to exceed 35 percent.

2.08 STAKES AND GUYS

- A. Upright and Guy Stakes: Rough-sawn, sound, new hardwood, redwood, or pressure-preservative-treated softwood, stained dark brown, free of knots, holes, cross grain, and other defects, 2 by 4 inches by length indicated, pointed at one end.
- B. Guy: Woven polypropylene tree staking material shall be ArborTie or approved equal.

2.09 PRE-VEGETATED COIR ROLLS

- A. Restoration Mix Plugs and Restoration Mix Plugs for Pre-Vegetated Coir Mats and Pre-Vegetated Coir Rolls shall be appropriately sited as per DCR Representative, wetland status and nursery recommendation. All shall be 2” plugs, unless otherwise noted. Coir mats and rolls shall be as defined in Coir Fascine. Note that this list also applies to plugs installed intermixed with existing plants (not in coir mats).

Botanical Name	Common Name	Quantity	Wetland Plants
Carex lacustris	Lake Bank Sedge	20%	OBL
Eleocharis palustris	Creeping Spike Rush	20%	OBL
Glyceria striata	Fowl Manna Grass	20%	OBL
Juncus canadensis	Canada Rush	20%	OBL
Juncus gerardii	Saltmarsh Rush	20%	OBL
			Upland Plants
Carex stricta	Tussock Sedge (3 gal.)	10 total	UPL
Carex vulpinoidea	Fox Sedge	100%	UPL

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2.10 COIR FASCINE

- A. Constructed of 100% bristle and mattress coir fiber with a 12" and 16" diameter, density of 9.0 pounds per cubic foot, and an exterior of 200 pound tensile strength poly twine netting. Openings shall be 2 inches by 2 inches.
- B. Binding cord, minimum 1/8 inch diameter shall be used to tie the abutting ends of coir fascines together and interlace fascine edges together. The cord shall have a tensile strength of 90 pounds and shall comply with ASTM D 5035.

2.11 EARTH ANCHOR

- A. Earth anchor shall be a cast aluminum earth anchor with a three and one-half (3.5) foot long galvanized steel one-eighth (1/8) in cable, holding power in normal soil of 1100 lbs, and wear resistant thimble eye in top cable loop (Typical product is Foresight Products, Inc. Duckbill Anchor model 68-DB1).

2.12 WOODEN STAKES

- A. **Notched** wooden stakes for use with 12" and 16" diameter coir fascines shall be a full 2 inch x 2 inch width by 3 feet long or 2 inch x 2 inch width by 4 feet long as shown on the Contract Drawings, with a downward angled notch cut not less than 3 to 4 inches from the top, 3/8 to 1/4 inch wide and 3/4 inch deep. A second notch is required in the 4 foot long stake 12" below the upper notch.

2.13 BINDING CORD

- A. Cord for weaving and anchoring coir fascines, securing coir fascines together at ends, and attaching coir fascines to coir mesh RECB shall be a 100% bristle coir twine, with a minimum tensile strength of 90 lbs, minimum one-quarter (1/8) inch in diameter, and shall comply with ASTM D 5035.

2.14 WATER

- A. Water for plant establishment and maintenance shall be provide by DCR at existing hose connection. All plant materials or beds injured or damaged due to the lack of water, or the use of too much water, shall be the Contractor's responsibility to correct.
- B. Contractor shall obtain any necessary permits and written approvals from the client to use a municipal water source to water the plant material.
- C. Provide water schedule upon completion of planting. In case of deviating from schedule, Contractor shall notify the client's representative 24 hours before watering plant material.

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2.15 GEESE PROTECTION FENCING

- A. Materials for protection of new plantings from geese and wildlife are as shown on the contract drawings.

PART 3 - EXECUTION

3.01 PLANTING LOCATIONS

- A. All plant locations shall be staked out on the ground and the locations must be approved by the DCR Representative before any excavation is started. If it is necessary to adjust any of the locations, because of unforeseen problems, the changes shall be under the direction of the DCR Representative and there shall be no extra charges for these adjustments.

3.02 PLANT ARRIVAL

- A. Notify the DCR Representative and DCR Representative three working days prior to the proposed arrival of plant material on the site. All planting material shall be planted within five days of arrival on the site or will be rejected by the DCR Representative. Plant material stored on site shall be shaded from direct sunlight at all times and shall not be stored on paved surfaces. All plants delivered to the site and planted within twenty-four (24) hours of delivery shall have their root balls covered with mulch and shall be watered on a daily basis.

3.03 TREE PIT EXCAVATIONS

- A. Width and depth of tree pit shall be as shown in the construction documents.
- B. Width and depth of tree pit for plantings in saline conditions shall be as shown in the construction documents.

3.04 PLANTING TREES

- A. The planting excavation shall be filled with enough of the specified planting soil mix as shown in the drawings.
- B. The tree shall be lifted and set in place, being careful to not disturb the root ball and to keep it intact.
- C. The tree shall be set to line and grade shown in the drawings and plumbed straight. The tree shall be set at the same depth as they were previously grown.

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- D. If the root ball is wrapped in burlap and rope tied, the rope shall be cut off and removed and the burlap shall be completely removed from the ball. If the ball is in a metal basket, the metal must be completely removed.
- E. The planting trench shall be backfilled with planting soil mix. Trees planted in saline conditions shall be installed as shown on the drawings. Water tree completely when tree is half back filled, again when completely back filled and once more within 24 hours after planting.
- F. Mulch with material shown in planting detail.
- G. Seals shall be left on trees and /or plants until the end of the guarantee period.

3.05 PLANTING PERENNIALS

- A. Planting at Riverbank: Perennials are to be planted within existing bank area after preparation as per the contract drawings. Place perennials on compacted planting soil and back fill with planting soil. Where possible and where bank and existing planting will not be disrupted, soil is to be continuous.
- B. Place plants carefully, as shown on the contract drawing details, and position so that the plant will be at the same soil height as it was previously grown.
- C. Mulch as shown on planting details. Mulch entire length and width of continuous planting beds.

3.06 MYCORRHIZAL FUNGAL INOCULANT

- A. Inoculant shall be added after the plants are placed in their holes. Open the specified number of 3 ounce (.4 kilogram) packets for each plant and thoroughly mix the inoculant powder into the upper 10 inches (25 cm) of backfill soil.
- B. Mycorrhizal fungal shall be added to the plants depending on their size. The application rates shall be as recommended by manufacturer. Submit recommendations to DCR Representative.

3.07 WATER STORING GRANULES

- A. Granule Polymers shall be added to the soils before the plants are placed in their holes and mixed in with planting soil. Open the specified number of 3 ounce (.4 kilogram) packets for each plant and thoroughly mix the granule polymers into the lower 10 inches (25 cm) of backfill soil. A thorough initial soaking is required to insure polymer absorption of water.

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- B. Granule Polymers shall be added to the plants depending on their size. The application rates shall be as recommended by manufacturer. Submit recommendations to DCR Representative.

3.08 GUYING AND STAKING

- A. Upright Staking and Tying: Stake trees of 2- through 5-inch caliper. Stake trees of less than 2-inch caliper only as required to prevent wind tip-out. Use a minimum of 2 stakes of length required to penetrate at least 12 inches in undisturbed subgrade and to extend at least 72 inches above grade. Set vertical stakes and space to avoid penetrating root balls or root masses. Support trees with tree ties as required. Allow enough slack to avoid rigid restraint of tree. Use the number of stakes as follows:
 - 1. Use two (2) stakes for trees up to twelve feet 12' high and 2-1/2 inches or less in caliper; 3 stakes for trees less than fourteen feet (14') high and up to 4 inches in caliper. Space stakes equally around trees.
- B. Guying and Staking: Guy and stake trees exceeding 14 feet in height and more than three inches (3") in caliper, unless otherwise indicated. Securely attach no fewer than three (3) guys to stakes thirty inches (30") long, driven to grade.
 - 1. Contractor shall stake trees immediately upon planting of each tree is completed.

3.09 PRUNING NEW PLANTS

- A. Pruning of new plants shall be as directed by DCR Representative and Arborist.
- B. Each tree and shrub shall be pruned in accordance with American Nurserymen Association Standards and National Arborist Association to preserve the natural character of the plant. Work shall be performed by a specialist as approved by the DCR Representative.
- C. All dead wood or suckers and all broken or badly bruised branches shall be removed. In addition, up to one-third of the wood may be removed by thinning out to balance root loss due to transplanting providing the natural character and form of the tree is preserved. Never cut a leader.
- D. Pruning shall be done with clean, sharp tools.

3.10 INSTALLING COIR ROLLS, PLUGS AND EARTH ANCHORS

- A. Preparation: The grade shall be cleared of garbage, and yard debris that interferes with the installation. Two (2) trenches six (6) inches deep shall be created in the grade for the placement of the coir fascine.

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- B. Earth anchors must be installed prior to the placement of the coir fascines. Earth anchors shall be set five (5) feet on center. Follow manufacturer's instructions for installation in the ground. The anchor shall be proof loaded according to the installation instructions of the anchor to assure it is set. A cable in a plastic tubing shall run through the exposed loop of the earth anchor, and shall be wrapped around the coir fascine.
- C. Long wood stakes shall be inserted through the coir fascine nettings and staked into the subgrade as indicated on Contract Drawings. Long wood stakes shall be partially driven prior to lacing. Once the rope has been fastened to the stakes and pulled tight by hand, the stakes shall be driven to compress the coir fascine no less than 10% of the diameter of the fascine. Configuration of wooden stakes shall be as shown on the contract plans.
- D. Installation: The coir fascines shall be laced together end-to-end with cord to create a continuous length. End-to-end lacing may be completed before or after placement to facilitate handling. Where coir fascines are stacked, they shall be laced together laterally (side-to-side) as well as end-to-end. Refer to details. Lengths of the coir fascine shall be placed in position such that the upper surface of the coir fascine shall be parallel to the water surface. Cut and fill adjustments shall be made as needed to seat the coir fascine such that it lies smoothly and varies no more than three (3) inches from the correct elevation. Initial installation of the coir fascines shall be done under the supervision of the Owner's Representative.
- E. Upon completion of placement and anchoring/staking of coir fascines, backfill uniformly along coir fascines to the finished grade elevations, as shown in Contract Drawings
- F. Upon completion of backfilling, install pre-vegetated coir mat as approved by Owner's Representative.
- G. Install plant plugs in mats, rolls, or loose as directed by owner's representative.

3.11 MAINTENANCE OF PLANT MATERIAL

- A. Maintenance shall begin immediately after each plant is planted. The official maintenance period will commence upon the completion of all planting and shall continue for sixty (60) days minimum within the growing season (April 1 through December 1). Maintenance period may carry over to the following growing season or be extended into the non-growing season depending on the time of planting. Contractor shall submit a maintenance plan to DCR Representative.
- B. Maintenance shall consist of keeping the plants in healthy growing condition and shall include but is not limited to watering of planted areas, weeding, re-mulching,

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tightening and repairing of guys, removal of dead material, resetting plants to proper grades on upright position, edging, repairs of washouts and gullies, repairs to protecting fences and all other necessary works of maintenance.

- C. The work shall include watering all trees, shrubs, ground covers and perennials during the life of the contract.
- D. All plants during the maintenance period shall be watered at least twice each week for a minimum of twelve waterings. At each watering the soil around the planting material shall be thoroughly saturated. If sufficient moisture is retained in the soil, as determined by the DCR Representative, the required watering may be reduced. Contractor shall submit a maintenance plan before the completion of planting.
- E. Trees will require a minimum of 10 gallons of water, each; shrubs – a minimum of 5 gallons, each; and a minimum of 1500 gallons per acre on areas planted or seeded with meadow mix.
- F. Planting beds and individual plant pits shall be kept free of weeds and mulch shall be replaced as required to maintain a three-inch (3") layer of mulch. Beds and individual pits shall be neat in appearance and maintained to the lines originally laid out.
- G. Plants that die or are destroyed by geese or other animals during the maintenance period shall be replaced during that growing season as directed by the DCR Representative.
- H. Spraying for both insect pests and diseases shall be included during the maintenance period as required and as directed by the DCR Representative.
- I. Tree ties shall be adjusted as needed and as directed by the DCR Representative. During the maintenance period, any decline in the condition of existing trees and new plantings shall require the Contractor to take immediate action to identify potential problems and undertake corrective measures. If required, the Contractor shall engage professional arborists and/or horticulturalists to inspect plant materials and to identify problems and recommend corrective procedures. The DCR Representative shall be immediately advised of such actions. Inspection and recommendation reports shall be submitted to the DCR Representative.
- J. Pre-vegetated Coir Rolls shall be inspected and re-staked or otherwise re-secured as necessary throughout the maintenance period.

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3.12 EXTENDED MAINTENANCE OF PLANT MATERIAL

- A. The Extended Maintenance Period shall begin immediately after 60 maintenance period is completed. The period shall be for six (6) months during planting season outlined in the section. Maintenance period may carry over to the following growing season or be extended into the non-growing season depending on the time of planting. Contractor shall submit a maintenance plan to DCR Representative. All maintenance requirements under paragraph 3.11 shall be followed during the Extended Maintenance Period.

3.13 PLANT MATERIAL ACCEPTANCE

- A. Upon completion of the maintenance period, the Contractor shall request in writing that the DCR Representative and the DCR Representative formally inspect the planting work.
- B. If plant material and workmanship are acceptable, written notice will be given by the DCR Representative to the Contractor stating that the work has received provisional acceptance, and that the guarantee period has commenced from the date of provisional acceptance.
- C. If a number of plants are sickly or dead at the time of inspection, or if in the DCR Representative's opinion, workmanship is unacceptable, written notice will be given by the DCR Representative to the Contractor in a form of a punch list, which itemizes necessary planting replacements and/or other deficiencies to be remedied. The Contractor's responsibility for maintenance of all the plants shall be extended until replacements are made or other deficiencies are corrected. All dead and unsatisfactory plants shall be removed promptly from the project. Replacements shall conform in all respects to the Specifications for new plants and shall be planted in the same manner.
- D. Acceptance of the planting work shall be established by the DCR Representative in writing, following the completion of all maintenance work requirements as specified herein and following the correction of all punch list deficiencies by the Contractor.

3.13 GUARANTEE

- A. Plants shall be guaranteed for a period of **two (2) growing seasons** after written notification of acceptance and shall be alive in satisfactory growth at the end of the guarantee period.
- B. During the guarantee period, the Contractor shall replace, at his/her expense, in accordance with the Contract Plans and Specifications, any plants that are dead, or in the opinion of the DCR Representative in an unhealthy or unsightly condition

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and/or have lost their natural shape due to dead branches, excessive pruning, or other cause, including damage by animals.

- C. At the end of the guarantee period, a final inspection will be held to determine whether any plant material replacements are required and that all coir mats and coir rolls are intact. Each plant shall show at least 75% healthy growth and shall have the natural character of its species as determined by the DCR Representative. Plants found unacceptable shall be removed promptly from the site and replaced during the planting season and maintained for 60 days as noted above. A final inspection for acceptance of replacement plantings will be made after the replacement plantings have lived through one (1) year.
- D. All replacements shall be plants of the same kind and size specified in the PLANT LIST. Replacement cost shall be borne by the Contractor, except for possible replacements due to vandalism or neglect on the part of others.
- E. During year of installation, Contractor shall repair or replace any pre-vegetated coir rolls that have been damaged by environmental conditions

3.14 SEQUENCE FROM PLANTING THROUGH FINAL ACCEPTANCE

- A. Plant material tagging by DCR Representative.
- B. Plant locations are staked and flagged by Contractor and inspected by DCR Representative.
- C. DCR Representative is notified in advance of plant material arrival.
- D. Plant material arrives at the site and is inspected by the DCR Representative for damage.
- E. Contractor locates plants at the site and DCR Representative approves location prior to installation.
- F. Completion of all planting work.
- G. Contractor requests an inspection by the DCR Representative and/or DCR Representative.
- H. Start of official maintenance period begins after DCR Representative's and/or DCR Representative inspection and written approval.
- I. Contractor submits maintenance plan to DCR Representative.
- J. Completion of maintenance period.

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- K. Contractor shall request in writing inspection of planting.
- L. Provisional acceptance by DCR Representative given if work is accepted.
- M. Start of **two (2) growing season** guarantee period (date of DCR Representative's letter marks the beginning of the guarantee period).
- N. Inspection (after **one** year).
- O. Replacement planting if necessary.
- P. One year after replacement plantings have been installed. Final inspection of replacement plantings.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

- A. PRE-VEGETATED COIR ROLLS shall be measured for payment as shown on the Drawings and as specified herein PER LINEAR FOOT to consist of all labor materials and equipment including plant plugs (in rolls, or intermixed with existing plants), installation, staking and anchoring, maintenance and guarantees and all other incidentals to complete the work.
- B. TREES AND PERENNIALS shall be measured for payment as shown on the Drawings and as specified herein PER EACH to consist of all labor materials and equipment including excavation, sand layer under trees planted in saline conditions, planting soils, testing, preparation and placement as per Division 2 Section 02910 PLANTING SOILS, mulch, soil amendments and fertilizers, staking, maintenance and guarantees and all other incidentals to complete the work.
- C. GEESE PROTECTION FENCING shall be measured for payment as shown on the Drawings and as specified herein PER SQUARE YARD to consist of all labor, materials, and equipment including placement, maintenance and repair, and final removal at the direction of the DCR Representative at complete of the warranty period and as part of final acceptance of the planting material.

4.02 PAYMENT

- A. PRE-VEGETATED COIR ROLLS shall be paid for at the contract unit prices for the quantities determined as specified above.

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- B. TREES, SHRUBS AND PERENNIALS shall be paid for at the contract unit prices for the quantities determined as specified above.
- C. GEESE PROTECTION FENCING shall be paid for at the contract unit prices for the quantities determined as specified above.
- D. EXTENDED MAINTENANCE OF PLANT MATERIAL shall be paid for as a lump sum

4.03 PAYMENT ITEMS

<u>Item</u>	<u>Description</u>	<u>Unit</u>
02930-2	PRE-VEGETATED COIR ROLL	LF
02193-3	Acer rubrum (3.5"-4" cal.)	EACH
02930-4	Amelanchier laevis (10' ht)	EACH
02930-5	Nyssa sylvatica (3.5"-4" cal.)	EACH
02930-6	Carex crinita var. crinita (plug)	EACH
02930-7	Carex stricta (plug)	EACH
02930-8	Juncus canadensis (plug)	EACH
02930-9	Juncus effuses ssp. solutus (plug)	EACH
02930-10	Iris versicolor (plug)	EACH
02930-11	Pontedaria cordata (plug)	EACH
02930-12	Panicum virgatum (1 GAL)	EACH
02930-13	GEESE PROTECTION FENCING	SY
02930-14	EXTENDED MAINTENANCE OF PLANT MATERIAL	LUMP SUM

END OF SECTION 02930

SECTION 02940

LAWNS

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1 – GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.02 DESCRIPTION OF WORK

- A. The scope of work consists of all materials, equipment, labor and services required to supply and place LAWNS as indicated on the Contract Documents and as specified.
- B. Supplying and placement of lawns shall include, but not be limited to:

- 1. Lawn Seeding
- 2. Maintenance and Protection

1.03 RELATED WORK UNDER OTHER SECTIONS

- 1. Section 02200 - EARTHWORK
- 2. Section 02370 – EROSION AND SEDIMENTATION CONTROL
- 3. Section 02910 – LAWN & PLANTING SOILS
- 4. Section 02930 – EXTERIOR PLANTS

1.04 DEFINITIONS

- A. Finish Grade: Elevation of finished softscape surface (i.e. soil, mulch, planting bed, lawn, etc.).
- B. Finish Surface: Elevation of finished installed hardscape surface (i.e. pavement surface, etc.)
- C. Turf or Lawn: An area covered with grass.

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1.05 SUBMITTALS

- A. At least 10 days prior to intended use, the Contractor shall provide the following samples and submittals for approval in conformance with the requirements of Division 1 Section, SUBMITTALS. Do not order materials until DCR Representative's approval of samples, certifications or test results has been obtained. Delivered materials shall closely match the approved samples. Acceptance shall not constitute final acceptance. The DCR Representative reserves the right to reject on or after delivery any material that does not meet these Specifications.
1. Material Sampling and Testing of Loam Borrow from Off-Site Sources shall be specified, performed and paid for under this Section.
 2. Material Sampling and Testing of On-Site Loam: On-site loam shall be sampled, tested and all work paid for under this Section.
 3. Fertilizer:
 - i. Submit product literature of seeding fertilizer and certificates showing composition and analysis.
 - ii. Submit the purchasing receipt showing the total quantity purchased for the project prior to installation.
 4. Seed: Submit a manufacturer's Certificate of Compliance to the Specifications with each shipment of each type of seed. These certificates shall include the guaranteed percentages of purity, weed content and germination of the seed, and also the net weight and date of shipment. No seed may be sown until the Contractor has submitted the certificates.
- B. Hydroseeding: Prior to the start of hydroseeding, submit:
1. Qualifications for hydroseeding installer
 2. Certified statement for approval as to the number of pounds of materials to be used per 100 gallons of water.
- C. Seeding Schedule: Indicating anticipated planting dates for each type of seeding, including erosion control seeding.
- D. Wood Cellulose Fiber Mulch: Submits product literature.

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1.06 QUALITY ASSURANCE

A. Qualification of personnel.

1. Qualification of Landscape Contractor: The work of this Section shall be performed by a landscape contracting firm which has successfully installed work of a similar quality, schedule requirement, and construction detailing with a minimum of five years experience. Submit proof that the landscape contracting firm meets this requirement.
2. Qualification of Foreman or Crew Leader: All work of unloading, stockpiling, storing, transporting on-site, planting, staking and guying, fertilizing, and maintenance of trees, shrubs, vines, groundcover, and perennials shall be supervised by a foreman or crew leader who is a certified landscape professional or a certified horticulturist. Submit proof of certification. Foreman and Crew Leader shall remain on the project on a consistent basis from the beginning of planting through provisional acceptance.

1.07 EXAMINATION OF CONDITIONS

- A. All areas to be improved shall be inspected by the Contractor before starting work and any defects such as incorrect grading, or drainage problems shall be reported to the DCR Representative prior to beginning this work. The commencement of work by the Contractor shall indicate his/her acceptance of the areas to be improved, and he/she shall assume full responsibility for the work of this Section.
- B. The Contractor shall be solely responsible for judging the full extent of work requirements involved.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Seed: Deliver seed in original sealed, labeled, and undamaged containers.

1.09 COORDINATION

- A. The season for seeding shall be as follows:

Spring: April 1st to June 1st

Fall: August 15th to October 15st

- B. The actual planting of seed shall be done, however, only during periods within this season which are normal for such work as determined by weather conditions and by accepted practice in this locality. Seed loam areas within 5 Days of spreading the loam to prevent loss of soil via water and wind erosion and to prevent the flow of sediment, fertilizer, and pesticides onto roadways, sidewalks, and into catch basins.

PART 2 - PRODUCTS

2.01 LOAM

- A. Loam borrow shall be specified, provided, installed as per Division 2 Section 02910, PLANTING SOILS. Loam borrow for all Lawn areas shall be paid under this Section for the planting of which it forms a part.

2.02 SOIL ADDITIVES

- A. Soil additives shall be specified and provided as per Division 2 Section 02910, PLANTING SOILS. Soil additives shall be paid under this Section for the planting of which it forms a part.

2.03 LONG-TERM PLANT ESTABLISHMENT FENCE AND GATE

- A. Long-term Plant Establishment Fence, shall be equal to the following:
 - 1. 4' height, high-density polyethylene laminar netting. Mesh dimensions shall be 1-3/4"x 2-1/8" with 1/2" strands. Fabric color shall be black.
 - 2. 2" diameter by 8' height, powder coated 20 wt. posts. Color shall be black.
 - 3. Malleable galvanized tension wire with black vinyl coating.

2.04 LAWN SEED

- A. Seed shall be fresh, clean, new crop seed. Grass shall be of the previous year's crop and the weed seed content shall not exceed 1% by weight. The seed shall be furnished and delivered, in the proportion specified, in new, clean, sealed, and properly labeled containers. All seed shall comply with State and Federal seed laws. Submit manufacturer's Certificates of Compliance. Seed which has become wet, moldy or otherwise damaged shall not be acceptable. The Contractor shall take care to handle and store the wildflower seed according to grower's recommendations and shall not subject the seed to extremes of heat, cold or moist conditions. Submit seed mixtures to DCR Representative for acceptance.
- B. Seed Species: Contractor shall submit weight by seed count for each seed mixture. State-certified seed of grass species, as follows:
 - 1. Lawn Seed Mix Application Rate: 8.0 lbs per 1,000 SF.

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Name	Composition %	Germination (Min)	Purity (Min)
Fury Tall Fescue (or approved equal)	27%	90%	90%
Coronado Tall Fescue (or approved equal)	27%	90%	90%
Endeavor Fescue (or approved equal)	26%	90%	90%
IQ Perennial Ryegrass (or approved equal)	10%	90%	90%
Brooklawn Kentucky Bluegrass (or approved equal)	10%	85%	90%

2.05 WOOD CELLULOSE FIBER MULCH

- A. Mulch to cover hydroseeded areas with slopes less than three to one (3:1) shall be fiber processed from whole wood chips and clean recycled newsprint in a 1:1 proportion manufactured specifically for standard hydraulic mulching equipment. Fiber shall not be produced from recycled material such as sawdust, paper, or cardboard.
- B. Moisture content shall not exceed 10 percent, plus or minus 3 percent as defined by the pulp and paper industry standards. Fiber shall have a water holding capacity of not less than 900 grams water per 100 grams fiber.
- C. The mulch shall be of such character that the fiber will be dispersed into uniform slurry when mixed with water. It shall be nontoxic to plant life or animal life.

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- D. The mulch shall contain a non-petroleum based organic tackifier and a green dye to allow for easy visual metering during application but shall be non-injurious to plant growth.

2.06 LIMESTONE

- A. Ground limestone for adjustment of loam borrow pH shall contain not less than 85 percent of total carbonates and shall be ground to such fineness that 40 percent will pass through 100 mesh sieve and 95 percent will pass through a 20 mesh sieve. Contractor shall be aware of loam borrow pH and the amount of lime needed to adjust pH to specification in accordance with testing lab recommendations.

2.07 FERTILIZER

- A. Fertilizer shall be a commercial product complying with the State and United States fertilizer laws suitable for installation near wetlands, rivers, and waterways. Deliver to the site in the original unopened containers that shall bear the manufacturer's certificate of compliance covering analysis. Fertilizer shall contain not less than the percentages of weight of ingredients as recommended by the soil analysis.
- B. Nitrogen fertilizer shall be slowly soluble urea formaldehyde, methylene urea, or isobutyridene diurea; or slow release sulfur-coated urea.
- C. Phosphorus shall be superphosphate or treble superphosphate.
- D. Potassium shall be sulfate of potash, K₂SO₄.
- E. Salt indexes per unit of nutrient for nitrogen, phosphorous, and potassium shall be less than 1.0 when compared to sodium nitrate (6.3).

2.08 HERBICIDE, CHEMICALS AND INSECTICIDE

- A. Provide treatments as needed for fungus or pest control. All treatments shall be approved by the DCR Representative and the Massachusetts Department of Food and Agriculture for the intended uses and application rates.
- B. Provide post emergent crab grass control throughout the maintenance period to ensure a germinated and mown lawn free of crab grass.
- C. All treatments shall be pre-approved, in writing, by the DCR Representative and shall conform to all Cambridge Conservation Commission Order of Conditions as included in this Specification.

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2.09 WATER

A. The Contractor shall be responsible for furnish his/her own supply of water to the site for establishment and maintenance of lawns and meadows. Water for lawns and meadows shall be paid for at the contract unit price for Water for Plantings as noted in Specification Section 02930 – Exterior Plants. All plant materials or beds injured or damaged due to the lack of water, or the use of too much water, shall be the Contractor’s responsibility to correct. Water shall be potable.

1. Contractor shall not assume that any existing irrigation system on site will be available or in working order.
2. Contractor shall obtain any necessary permits and written approvals from the client to use a municipal water source to water the plant material.
3. Provide water schedule upon completion of planting. In case of deviating from schedule, Contractor shall notify the client’s representative 24 hours before watering plant material.

2.10 Erosion Control / Cover Crops

A. The Contractor shall be responsible for establishing meadow and lawn plantings on smooth, uneroded, loam. All areas damaged by erosion shall be the Contractor’s responsibility to correct.

1. Cover crops shall be installed for areas with any of the following: slopes 3’ horizontal to 1’ vertical or steeper, or where slope stabilization is shown on drawings.
2. Cover crop type shall depend on time of year as follows:

Season	Cover Crop
Summer/Fall (Mid July – Early Sept)	Oats (<i>Avena sativa</i>)*
Fall/Frost (Mid Sept. – Hard Winter Frost)	Regreen** (triticum x agropyron)
Spring: (Mar 15-Early July)	Oats (<i>Avena sativa</i>) *

*Oats shall be planted with meadow mix and wet meadow mix

**Regreen is available from Prairie Moon Nursery: www.prairiemoon.com 800.417.8156. Other products/suppliers may be accepted if approved as equal.

B. Erosion control matting shall be Geo-Jute Erosion Control Fabric or approved equal. The jute is to be constructed in an open weave which allows hydroseeding before or

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after installation. The jute is completely natural, undyed, unbleached and contains no toxins or synthetic fibers and is completely biodegradable within two years. Hugs all ground surfaces to hold soil and seed in place.

PART 3 - EXECUTION

3.01 FILLING AND COMPACTION

A. Filling and compaction of loam shall be specified, performed and paid for under the work of the Division 2 Section 02200 EARTHWORK of this Specification.

3.02 FINE GRADING

A. Fine grading shall be specified and performed as per Division 2 Section 02910, PLANTING SOILS. Fine grading for all Lawn areas shall be paid under this Section for the planting of which it forms a part.

1. Contractor shall request and receive a letter from the DCR Representative stating that all fine grading has been accepted before doing any seeding.
2. Lawn shall be installed immediately after finish grading has been completed.

3.03 EXAMINATION

A. Examine areas to receive lawns and grass for compliance with requirements and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.04 GENERAL PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other objects.
1. Protect adjacent and adjoining areas from hydroseeding overspray.
- B. 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.

3.05 SEEDING

A. Contractor shall request and receive written approval of fine grading from the DCR Representative.

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- B. Limit of grading and earthwork shall be limit of seeding unless otherwise indicated on the Contract Documents. All lawn areas disturbed outside the limit of seeding shall be prepared and seeded as specified herein at no additional cost.
- C. Conventional Seeding:
 - 1. Application rate for seeding shall be as described in Part 2 - PRODUCTS, above.
 - 2. Seeding shall be done in two directions at right angles to each other. Sow the seed with approved seeding device. No seeding shall be done in windy weather.
 - 3. For slopes not as steep as one vertical foot to three horizontal feet seed shall be lightly raked into the ground, after which the ground shall be rolled and compacted. After compacting spread a light layer of salt marsh hay mulch over the entire seedbed, and thoroughly and evenly water with a fine spray the entire bed to penetrate the soil to a depth of at least 2 inches. Hay which is not salt marsh hay or which is not certified weed-free straw, shall not be used.
- D. For all slopes steeper than or equal to three to one (3:1) immediately install erosion control matting as described in this Section.
- E. Seed only when the bed is in a friable condition, not muddy or hard.
- F. Restore areas if eroded or otherwise disturbed after finish grading and before planting.

3.06 HYDROSEEDING

- A. Prior to the start of work, furnish a certified statement as to the number of pounds of materials to be used per 100 gallons of water. This statement shall also specify the number of square feet of hydroseeding that can be covered with the quantity of solution in the hydroseeder. Water for hydroseeding is included in the cost of the seeding and shall be incidental to the work.
- B. For the hydroseeding process, a mobile tank with a capacity of at least 500 gallons shall be filled with water and the mixture noted above in the specified proportions. The resulting slurry shall be thoroughly mixed by means of positive agitation in the tank. At no time shall the mobile tank or tank truck be allowed onto the prepared hydroseed beds. Only hose application shall be permitted. The hose shall be equipped with a nozzle of a proper design to ensure even distribution of the hydroseeding slurry over the area to be hydroseeded and shall be operated by a person thoroughly familiar with this type of seeding operation.

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- C. Hydroseeding shall be a multi-step process.
1. Step one shall consist of spreading 100 percent of the required seed uniformly over the prepared loam bed so that the seed comes into direct contact with the soil. To mark the progress of the hydroseeding operation the Contractor shall add the following to the slurry:
 - a. For slopes less steep than three to one (3:1) add 300 lbs. per acre of the wood cellulose fiber mulch to the slurry.
 - b. For slopes less steep than three to one (3:1) step two shall consist of a separate application of wood cellulose fiber mulch immediately following the first step of hydroseeding noted above. Apply the wood cellulose fiber mulch at a rate of 1,700 pounds per acre. (Total wood cellulose fiber mulch cover shall be 2000 lbs. per acre.)

3.07 MAINTENANCE

- A. Begin maintenance immediately after each area is seeded for the following time period:
1. Seeded Areas - A 90 day active growing period or until Final Acceptance, whichever is longer.
 2. In the event that seeding operations are completed too late in the Fall for adequate germination and growth of grass, then maintenance shall continue into the following Spring for the minimum 60 Day period. In addition, install blankets or netting to prevent loam degradation and movement over the winter. Submit product literature and samples to the DCR Representative for review. Blankets and netting shall be placed in a timely manner at no additional cost to the Owner.
- B. Maintenance shall include reseeding, mowing, watering, weeding, fertilizing a minimum of two times in addition to the fertilizer incorporated by harrowing into the spread loam, and resetting and straightening of protective barriers. Lawn work maintenance shall also include fungus and/or pest control (treatment as required and approved by DCR Representative).
- C. During the maintenance period, any decline in the condition of seeded areas shall require immediate action to identify potential problems and to undertake corrective measures.
- D. Watering shall be done in a manner that will provide uniform coverage, prevent erosion due to application of excessive quantities over small areas, and prevent damage to the finished surface by the watering equipment.

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1. The Contractor shall provide all labor and arrange for all watering necessary to establish an acceptable lawn. In the absence of adequate rainfall, watering shall be performed daily or as often as necessary to maintain moist soil to a depth of at least 2 inches for seeded areas and 4 inches for sodded areas. At no time shall a tank truck be allowed on the seeded and/or sodded surface.
2. Watering shall be done in a manner that will provide uniform coverage, prevent erosion due to application of excessive quantities over small areas, and prevent damage to the finished surface by the watering equipment. The Contractor shall furnish sufficient watering equipment to apply water to the required soil depths each 8-hour period.

E. Protection

1. Long-term Plant Establishment Fence, shall be equal to the following:
 - a. 4' height, high-density polyethylene laminar netting. Mesh dimensions shall be 1-3/4"x 2-1/8" with 1/2" strands. Fabric color shall be black.
 - b. 2" diameter by 4' height, powder coated 20 wt. posts. Color shall be black.
 - c. Malleable galvanized tension wire with black vinyl coating.
2. Barriers must be raised immediately after lawn construction and shall be maintained until Acceptance. Barriers shall be removed and discarded as directed by the ownership.
3. Bird and animal control shall be installed as necessary to establish lawn and meadow areas as specified herein. Contractor shall propose legal bird and animal control methods for approval by DCR Representative. Controls shall be maintained in place until seeded areas are established, including repairs needed within turf areas, at no additional cost to owner.

F. Establishment:

Lawn

After the grass in seeded areas has germinated, reseed all areas and parts of areas that fail to show a uniform stand of grass. Reseed such areas and parts of areas repeatedly until all areas are covered with a satisfactory growth of grass with no less than 20 grass shoots per square inch and 2880 grass shoots per square foot. Reseeding together with necessary grading, fertilizing, and trimming shall be done at the Contractor's expense.

G. Mowing Seeded Lawn

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1. The Contractor shall keep lawn areas within project areas mowed until Acceptance of the contract by cutting to a height of 2 inches when growth reaches 3 inches or as directed by the DCR Representative.
2. At each mowing, all edges of walks, drives, plant beds and other border conditions shall be edge trimmed by hand or machine to produce straight and uniform edge conditions.
3. Remove and discard from paved areas only clippings and debris generated by each mowing and edging operation legally off-site. DCR Representative, if practical and aesthetic, may allow sweeping (not blowing) clippings back into grass. Mowers shall be equipped with mulching blades. Do not remove from grass areas any clippings that have been generated by mowing operations. Do not mow grass when wet.

H. Fertilizing:

1. For Seeded Areas: All fertilization is specified, provided, performed and paid for under this Division 2 Section, 02940 LAWNS AND SEEDING. The first application of fertilizer shall be applied at installation. A second application of fertilizer shall be applied to seeded areas at the time of the first mowing. This second application shall be applied at a rate that ensures that one-half pound of nitrogen is applied per 1,000 square feet. Phosphorus and potassium shall be applied proportionally in accordance with the recommendations of the soil tests and the quantities previously integrated into the soil during the first application. A third application of nitrogen fertilizer shall be applied to seeded areas approximately two months after the second application and shall be paid for under this Section. This third application shall correspond to the following application rates dependent upon the month of application.
2. May 1-15: Apply 1.0 pound of nitrogen per 1,000 square feet.
3. June 15-30: Apply 1.0 pound of nitrogen per 1,000 square feet.
4. August 15 through September 15: Apply 1.0 pound of nitrogen per 1,000 square feet.
5. November 1-15: Apply 1.5 pounds of nitrogen per 1,000 square feet
6. Nitrogen fertilizer shall be composed of 50 percent slow release nitrogen fertilizer.

I. Erosion Control

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1. The Contractor shall be responsible for establishing meadow and lawn plantings on smooth, uneroded, loam. All areas damaged by erosion shall be the Contractor's responsibility to correct.
2. Cover crops shall be installed for areas with any of the following: slopes 3 feet horizontal to 1 foot vertical or steeper, or where slope stabilization is shown on drawings.
3. Cover crops shall be planted during the following seasons with the following seed types and rates:
 - i. Summer/Fall (Mid July – Early Sept.) Oats (*Avena sativa*) applied at 96 lbs/Acre
 - ii. Fall/Frost Regreen* (triticum x agropyron) applied at 10 lbs/Acre
 - iii. Spring (Mar 15-Early July) Oats (*Avena sativa*) applied at 10 lbs/Acre

3.08 ACCEPTANCE

- A. Following the minimum required maintenance periods for lawns, the Contractor shall request the DCR Representative in writing for a formal inspection of completed work. Request for inspection shall be received by the DCR Representative at least 10 Days before anticipated date of inspection.
- B. Acceptance Requirements
 1. At the end of the maintenance period, seeded areas shall have a close stand of grass as defined above with no weeds present and no bare spots greater than 3 inches in diameter over greater than 5 percent of the overall seeded area. At least 90 percent of the grass established shall be permanent grass species. If seeded areas are deficient, the Contractor's responsibility for maintenance of all seeded areas shall be extended until deficiencies are corrected. Seeded areas to be corrected shall be prepared and reseeded in accordance with the requirements of this Section.
 2. At the time of acceptance, the Contractor shall remove temporary barriers used to protect lawn areas.
- C. Furnish full and complete written instructions for maintenance of the lawns to the DCR Representative at the time of acceptance in conformance with Submittals requirements.
- D. DCR Representative's inspection shall determine whether maintenance shall continue.

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3.09 CLEANUP AND PROTECTION

- A. Absolutely no debris may be left on the site. Excavated material shall be removed as directed. Repair any damage to site or structures to restore them to their original condition, as directed by the DCR Representative, at no cost to the Owner.
- B. Promptly remove soil and debris created by lawn work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
- C. Erect barricades, protection, and warning signs as required to protect newly planted areas from traffic and animals. Maintain barricades throughout maintenance period and remove after lawn is established.

3.10 SEQUENCE FOR SEEDING THROUGH FINAL ACCEPTANCE

- A. Submittals
- B. Certificates of products and installers.
- C. Submit letter of final grading acceptance.
- D. Installation of seeding.
- E. Contractor requests in writing inspection of seeding.
- F. Provisional acceptance by DCR Representative given if work is accepted.
- G. Start of Maintenance Period.
- H. Contractor requests final inspection.
- I. Final acceptance by DCR Representative given if work is accepted.
- J. End of maintenance period. Removal of animal controls.
- K. Mowing of lawns continues as specified until acceptance of final contract.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

- A. SEEDED LAWN shall be measured for payment per SQUARE YARD complete in-place as shown on the Drawings and as specified herein to consist of all labor materials and equipment, planting soils, testing, preparation and placement as per

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Division 2 Section 02910 PLANTING SOILS, maintenance, bird and animal protection and fencing, and all other incidentals.

4.02 PAYMENT

A. SEEDED LAWN shall be paid for at the contract unit prices for the quantities determined as specified above.

4.03 PAYMENT ITEMS

Item	Description	Unit
02940-1	SEEDED LAWN	SY

END OF SECTION 02940

SECTION 03125

STORM WATER POLLUTION PREVENTION PLAN

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. This Section specifies requirements for the preparation and implementation of the Storm Water Pollution Prevention Plan (SWPPP) which shall be prepared by the Contractor and periodically updated during construction by the Contractor.
- B. The Contractor shall prepare a SWPPP using the latest EPA SWPPP template and additional guidance provided on the EPA's NPDES website <https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates>
- C. The Contractor shall follow additional EPA guidance on SWPPP preparation which is available at the EPA's website <https://www.epa.gov/npdes/developing-stormwater-pollution-prevention-plan-swppp>
- D. The storm water pollution prevention measures contained in the SWPPP template are the minimum measures required to be followed by the contractor. The Contractor shall provide additional measures as needed to prevent pollution from storm water discharges associated with the construction activities in compliance with the NPDES permit and all other local, state and federal requirements.
- E. For construction areas greater than 1-acre in size, the Contractor, serving as project Operator, shall NOT begin construction without first submitting evidence that a "National Pollution Discharge Elimination System" (NPDES) Notice of Intent governing the discharge of storm water from the construction site for the entire construction period has been filed at least 3 weeks prior to ground disturbance or construction. It is the Contractor's responsibility to complete and file the NPDES Notice of Intent. If filing electronically on the EPA website, and Operator is authorized to discharge stormwater from construction activities under the terms and conditions of the CGP permit fourteen (14) calendar days after acknowledgment of receipt of your complete NOI is posted on EPA's NPDES website <https://www.epa.gov/npdes/2022-construction-general-permit-cgp>. The Operators must include a copy of the EPA active status notification in the SWPPP as soon as it becomes available.
- F. The Contractor shall conduct the storm water management practices outlined in the plans and SWPPP in accordance with local regulations and governing authorities, the Federal NPDES permit requirements and any enforcement action taken or imposed by Federal or State agencies. The cost of any fines, construction delays and remedial actions resulting from the Contractor's failure to comply with all provisions of local regulations and Federal NPDES permit requirements shall be paid for by the Contractor at no additional cost to the Owner.
- G. As a requirement of the EPA's NPDES permitting program, each Contractor and

Subcontractor shall execute a Certification and Notification form, a copy of which should be included in the SWPPP to be prepared by the contractor and provided to the Owner.

- H. A site is considered finally stabilized when soil disturbing activities have been completed and either a uniform perennial vegetative cover with a density of at least 70% of the native background vegetative cover for the disturbed area has been established on all unpaved areas and areas not covered by permanent structures, or equivalent stabilization measures have been employed. The Contractor/Operator(s) must complete and file a Notice of Termination (NOT) with the EPA. The form can be downloaded at EPA's website at <https://www.epa.gov/system/files/documents/2022-01/2022-cgp-final-appendix-i-not.pdf>
- I. The contractor shall comply with all provisions and conditions described in the Order of Conditions (DEP file No. 123-300) dated 2/14/2020 from the Cambridge Conservation and the approved extension dated 11/14/2022.

1.02 RELATED SECTIONS

A. Sections which directly relate to the work of this Section include:

1. Site Preparation
2. Earthwork
3. Erosion and Sedimentation Control
4. Storm Drainage System
5. Lawns

1.03 REFERENCES

- A. Guidance Manual "Storm Water Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices" (EPA 832-R-005).
- B. Summary of Guidance Manual "Storm Water Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices" (EPA).
- C. Massachusetts Stormwater Management Policy Handbook (Volume I) and Technical Handbook (Volume II) issued by the Massachusetts Department of Environmental Protection, March 2008.
- D. Massachusetts Sediment and Erosion Control Guideline for Urban and Suburban Areas, March, 1997.
- E. NPDES Construction General Permit Resources, Tools, and Templates website: <https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates#inspection>

1.04 SUBMITTALS

- A. Proof of submittal of an NOI to the EPA and, as it becomes available, a copy of the EPA active status notification.
- B. A copy of the Contractor's SWPPP document including all appendices and required forms.
- C. Contractor's Certification for Contractor and each Subcontractor copy of which is included within the SWPPP to be provided to Contractor.
- D. Copies of Contractor's inspection reports.
- E. Copies of Inspector qualifications.
- F. Copies of all Corrective Action Logs.
- G. Copies of any required follow up submittals with other local, state or federal agencies
- H. Names, addresses, and telephone numbers of Contractors and Subcontractors responsible personnel who can be contacted under emergency conditions.
- I. A construction schedule which indicates specific activities related to the SWPPP.
- J. A Supplemental Plan indicating location of laydown and staging areas, etc., and their incorporation into the SWPPP.
- K. Copies of a Notice of Termination at the end of the project.

1.05 INSPECTIONS

- A. The Contractor shall conduct required inspections to verify compliance with the NPDES permit. Inspect disturbed areas of the site at least once per week and within 24 hours of a storm of 0.25 inches or greater. Such inspections must be performed by a qualified person who has either: (1) completed the EPA construction inspection course (<https://www.epa.gov/npdes/construction-general-permit-inspector-training>) and passed the exam, or (2) holds a current construction inspection certification or license from a program that covers the same core material as EPA's inspection course. Proof of inspector qualifications must be provided to Owner and documented in the SWPPP prepared by the contractor. Inspections must also comply with any additional provisions for maintenance of Erosion Control Measures in Section 02370. The Contractor shall also designate a qualified person who will fill in for the inspector during absences.
- B. Inspection reports shall be prepared after each inspection and documented in the SWPPP.

1.06 MAINTENANCE

- A. The Contractor shall conduct routine maintenance and take corrective actions to fix problems with stormwater controls or discharges during construction. These individuals shall be trained in all maintenance and inspection practices necessary for keeping the sediment and erosion control measures in proper working order.

1.07 DOCUMENTATION

- A. The Contractor shall identify individual(s) who will be responsible for conducting inspections and preparing the reports. The contractor shall follow the EPA Construction General Permit Routine Maintenance/Corrective Action Determination Guidelines available at the EPA website <https://www.epa.gov/system/files/documents/2022-07/Routine-Maintenance-Corrective-Action-Determination-Guidelines.pdf>
- B. The Contractor shall use Inspection and Corrective Action log templates provided at the EPA website <https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates#inspection> as needed to document inspections and corrective actions as required.

PART 2 - PRODUCTS

- A. (Not Used)

PART 3 - EXECUTION

3.01 EROSION CONTROL DEVICES

- A. Erosion Control Devices shall be constructed as shown on the site plans and SWPPP and as specified in Section 02370.

3.02 STORMWATER POLLUTION PREVENTION PRINCIPLES (SWPPP)

- A. The following general principles shall be followed by the Contractor during the construction phase:
 - 1. Protect and maintain existing vegetation wherever possible.
 - 2. Minimize the area of disturbance.
 - 3. To the extent possible, route unpolluted flows around disturbed areas.
 - 4. Install mitigation devices as early as possible.
 - 5. Minimize the time disturbed areas are left unstabilized.
 - 6. Maintain siltation control devices in proper condition.

3.03 STORMWATER POLLUTION PREVENTION PLAN

- A. The Contract drawings and specifications identify a portion of the required facilities and temporary erosion and sedimentation control devices. The Contractor shall prepare a SWPPP and update the project SWPPP in accordance with NPDES requirements which identifies the location of construction facilities and proposes additional erosion and sedimentation control measures as required to minimize pollution in accordance with the NPDES permit. The SWPPP shall include provisions for but not be limited to the following:

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1. Construction Trailers
 2. Laydown Areas
 3. Equipment Storage Areas
 4. Stockpile Areas
- B. Reproducible copies of one or more of the Contract Drawings will be provided to the Contractor to serve as a resource for the Contractor's SWPPP preparation and updates.

END OF SECTION

SECTION 03300

REINFORCED CONCRETE

PART 1 - GENERAL

1.01 REFERENCES

- A. The GENERAL DOCUMENTS, as listed on the Table of Contents, and applicable parts of Division 1, GENERAL DOCUMENTS, shall be included in and made a part of this Section.
- B. Examine all Drawings and all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all trades affecting, or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

1.02 DESCRIPTION

- A. Provide all labor, materials, equipment and supervision necessary to complete work specified in this Section.
- B. Scope of work includes, but is not necessarily limited to, furnishing and installing the following:
 - 1. Cast-in-place concrete
 - 2. Forms
 - 3. Falsework for forms
 - 4. Form ties
 - 5. Reinforcing steel
 - 6. Cutting and patching
 - 7. Expansion and/or Control Joints
 - 8. Finishing
- C. Related work and materials specified elsewhere includes:
 - 1. Section 02200 – EARTHWORK
 - 2. Section 02500 - PAVING AND EDGING
 - 3. Section 02730 - CEMENT CONCRETE PAVING AND STABILIZED STONEDUST
 - 4. Section 02800 - SITE IMPROVEMENTS
 - 5. Section 06100 – STRUCTURAL LUMBER

1.03 QUALITY ASSURANCE

- A. Except as noted, work shall conform to the latest edition of the following codes: specifications and standards:
1. American Society for Testing and Materials (ASTM)
 2. American Concrete Institute (ACI):
 - a. "Building Code Requirements for Reinforced Concrete", ACI 318.
 - b. "Specifications for Structural Concrete for Buildings", ACI 301.
 - c. "Recommended Practice for Measuring, Mixing, and Placing Concrete", ACI 304.
 - d. "Recommended Practice of Cold (Hot) Weather Concreting", ACI 306 and ACI 307.
 - e. "Recommended Practice for Concrete Formwork", ACI 307.
 3. Concrete Reinforcing Steel Institute (CRSI):
 - a. Reinforced Concrete - "A Manual of Standard Practice".
 - b. "Recommended Practice for Placing Reinforcing Bars".
 - c. "Recommended Practice for Placing Reinforcing Bars".
 4. Standard Specifications: Commonwealth of Massachusetts, Department of Public Works (Massachusetts Highway Department), Standard Specifications for Highways and Bridges, latest edition.

1.04 SUBMITTALS

- A. See Section 01300, SUBMITTALS, for submittal requirements.
1. Shop Drawings
 - a. Reinforcing steel shop drawings shall be such detail and completeness that all fabrication and placement at the site can be accomplished without the use of contract drawings for reference. Reinforcing steel shop drawings shall include number of pieces, sizes, and grade of reinforcing steel, accessories, and any other information required for fabrication and placement.
 - b. Contractor shall check structural, and site drawings for anchor bolts, anchors, inserts, conduits, sleeves, and any other items which are required to be embedded in concrete,

and shall make necessary provisions as required so that reinforcing steel will not interfere with the placement of such embedded items.

2. Concrete mix designs
3. Concrete bonding agent - manufacturer's literature
4. Grout manufacturer/design mix
5. Concrete test results
6. Reinforcing steel specifications

1.05 TESTING OF CONCRETE

- A. All inspection and testing shall be performed by the DCR. See Section 01300 SUBMITTAL for further requirements.
- B. Quality Control
 1. **Test Specimens:** The Contractor will be required to provide concrete to make, cure and have tested, a minimum of one set of four test specimens from the concrete of each day's pour and for each fifty cubic yards of concrete cast in accordance with ASTM Designations C172, C31 and C39. Two cylinders shall be broken after seven days and two cylinders after twenty-eight days.
 2. **Slump:** Contractor shall allow a slump test for each truckload of concrete in accordance with ASTM Designation C143. Slumps greater than design mix limit will be grounds for rejection of the concrete.
 3. **Air Content:** The DCR shall make an air content test from each day's pour of concrete and for each fifty cubic yards of concrete by the pressure method in accordance with ASTM Designation C231. Air contents above or below the limits specified will be grounds for rejection of the concrete.
 4. In the event the compressive strength of the cylinders, when tested, is below the specified minimum, the DCR Representative may require test cores of the hardened structure to be taken by the Testing Laboratory in accordance with ASTM C-42. If such test indicates that the core specimen is below the required strength, the concrete in question shall be removed and replaced without cost to the Owner. Any other work damaged as a result of this concrete

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removal shall be replaced with new materials to the satisfaction of the DCR Representative at no additional cost to the Owner. The cost of coring will be deducted from the contract amount. Where core cylinders have been taken by the Testing Laboratory and the concrete proves to be satisfactory, core holes shall be filled in a manner satisfactory to the DCR Representative at no additional cost to the Owner.

- C. The Contractor shall coordinate the date and location of tests with the DCR Representative before any concrete work is started.

The following table of minimum cement contents for various minimum 28 days compressive strengths (6" x 12" cylinder) is based on air entrained and water reduced mixtures. The use of an approved additive other than air entraining and water reducing additives shall not affect the minimum cement content.

The Contractor shall submit to the Engineer, for approval, his proposed concrete supplier, source and type of materials, with current ASTM C-33 aggregate data, and concrete mix designs by an approved laboratory complete with trial mix data. Trial mixtures will be designed and tested at the maximum allowable slump and air content for each designated class of concrete.

Minimum 28 day Compressive Strength	Minimum Cement Pounds/Cu. Yd.			In Place Slump Inches
	Max. Size C.A. Inches			
Lbs./Sq. In.	1 1/2	3/4	3/8	
2000	376	423	470	3-5
2500	423	470	517	3-5
3000	470	517	564	3-5
3500	517	564	611	3-5
4000	564	611	658	3-5
4500	611	658	705	3-5
5000	658	705	752	3-5
Air Content				
% ± 1 ½	5.0	6.0	7.5	

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

Reinforcing steel shall be transported to the site, stored, and covered in a manner which will ensure that no damage shall occur to it from moisture, dirt, grease, or any other cause that might impair bond to concrete. A sufficient supply of approved reinforcing steel shall be stored on the site at all times to ensure that there will be no delay of the work. Identification of steel shall be maintained after bundles are broken.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Portland Cement: ASTM C 150, latest edition, Type II of U.S. manufacture. Only one brand of cement shall be used on the project.

Portland Cement used for concrete shall be the type designated on the plans and/or in the specifications for the particular work. If no type is specified, Type II will be furnished.

When high early strength is required, it shall be attained by using Type III cement or by adding a non-chloride set accelerator.

- B. Aggregates:

1. Fine aggregate:

Fine aggregate shall consist of natural sand, manufactured sand, or a combination thereof, conforming to the requirements of ASTM C33, Specifications for "Concrete Aggregates" latest edition. The Fineness Modulus of the fine aggregate shall be $2.80 \pm .20$ and the percent passing the #200 sieve shall not exceed 2 percent by dry sieving and 3 percent by wet sieving.

2. Coarse aggregate:

Coarse aggregate of washed gravel, crushed gravel, crushed stone or a combination thereof conforming to ASTM C33 Specifications for "Concrete Aggregates" latest edition. Aggregate for Lightweight Concrete shall conform to ASTM C330 Specification for "Lightweight Aggregates for Structural Concrete".

- C. Admixtures

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Air entraining and water reducing admixtures will be used in all concrete as specified. They shall be used in strict accordance with the manufacturer's recommendations and added at the batch plant. Admixtures shall be a ready-to-use liquid material, and contain no calcium chloride. Super-plasticizers may be added at the plant or job site.

1. Air Entraining Agent

Conforming to ASTM C 260 for Air-Entraining Admixtures for Concrete.

2. Water Reducing Admixture

Conforming to ASTM C 494 Type A for "Chemical Admixtures for Concrete".

All concrete for sidewalks shall have a minimum cement concrete of 564 lbs/cubic yard, contains a water reducing admixture and contains 6% ± 1% entrained air.

D. Water

Clean and potable, free of impurities detrimental to concrete.

E. Reinforcing Bars

New, deformed billet steel bars, conforming to ASTM A 615, Grade 60.

F. Accessories

Reinforcement accessories, consisting of spacers, chairs, ties, and similar items shall be provided as required for spacing, assembling, and supporting reinforcement in place. All accessories shall be dielectric coated steel or approved plastic accessories, conforming to the applicable requirements of the CRSI Standards hereinbefore specified.

G. Tie wire for reinforcement shall be 16 gauge or heavier dielectric coated steel or approved plastic accessories, conforming to the applicable requirements of ASTM A-82.

H. Form Ties and Spreaders

Standard metal form clamp assemble and plastic cone, of type acting as spreaders and leaving no metal with 1 inch of concrete face. Inner tie rod shall be left in concrete when forms are removed. No wire ties or wood spreaders will be permitted. Use ½" x 1" C.T. plastic cones for sinkages.

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I. Form Coatings

Non-grain raining and non-staining type that will not leave residual matter on surface of concrete or adversely affect proper bonding of subsequent application of other material applied to concrete surface, "Nox-Crete Form Coating" as manufactured by Nox-Crete Company, or approved equal. Coating containing mineral oils or the non-drying ingredients will not be permitted.

J. Grout

Type A: A high strength, nonshrink cement-based grout pourable for underwater placement which shall be:

"Five Star Structural Concrete Underwater PG" as supplied by Five Star Products, Inc., Fairfield, CT

"Conbextra UW" as supplied by FOSROC Inc., Plainview, NY

or approved equal

Type B: A high-strength non-shrink grout shall be:

"Five Star Grout" as supplied by Five Star Products, Inc., Fairfield, CT

"Conbextra S" as supplied by FOSROC, Inc., Plainview, NY,

or approved equal

Type C: Epoxy grout being a clear two part epoxy resistant to salt water attack and suitable for mixing with stone chips.

or approved equal

K. Bonding Agent

Concrete bonding system shall be an epoxy resin bonding agent for steel and concrete meeting ASTM C-881 Bond Strength Requirements and shall be Armatec 110 as manufactured by SIKA or equivalent.

L. Joint sealant shall be polyurethane-based, one component elastomeric sealant complying with Fed. Spec. TT-S-00230C, Class A, Type 2.

1. Sealant shall be a non-sag, gun grade sealant equal to the following, and as approved by the Engineer.

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- a. Vulkem 116, as manufactured by Mameko International, Cleveland, OH
- b. Sikaflex 1-A, as manufactured by Sika Corp., East Hartford, CT
- c. Dynatrol 1, as manufactured by Pecora Corporation

2.02 CONCRETE STRENGTHS AND PROPORTIONS

- A. Cast-in-place concrete shall have the following minimum compressive strength at 28 days and shall be proportioned within the following limits in accordance with DCR standard concrete table enclosed.

Class	Minimum Strength of 28 days	Maximum Size of Aggregate	Minimum Cement Factor
C	4000 psi	$\frac{3}{4}$ "	611

- B. The exact proportions for the mix, including amounts admixture (if any), and water, shall be determined by the concrete supplier.
- C. The proportions of aggregate to cement for any concrete shall be such as to produce a mixture which will work readily into the corners and angles of the forms and around reinforcement with the method of placing the work, but without permitting the materials to segregate or excess free water to collect on the surface.
- D. Air-Entrainment

The air content in all concrete shall be maintained at 6 percent +/- 1.5 percent.

PART 3 - EXECUTION

3.01 CAST-IN-PLACE

- A. Falsework for Forms
1. The contractor shall build and maintain necessary falsework for the forms.
- B. Construction of Forms
1. General

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- a. Wood forms shall be constructed of sound material, shall be of the correct shape and dimensions, mortar tight, of sufficient strength, and so braced and tied together that the movement of men, equipment, materials, or placing and vibrating the concrete will not throw them out of line or position.
2. Embedded Items
 - a. Provisions shall be made for pipes, sleeves, anchors, inserts, reglets, anchor slots, mailers, waterstops, and other features. No wood other than necessary nailing blocks shall be embedded in concrete. Complete cooperation shall be extended suppliers of embedded items in their installation. Obtain information for embedded items from other trades as required. All embedded items shall be securely anchored in correct location and alignment prior to placing concrete.
 3. Openings for Items Passing Through Concrete
 - a. Contractor shall establish exact locations, sizes, and other conditions required for openings and attachment of work specified under other sections. Contractor shall be held responsible for proper coordination of all work of this nature in order that there will be no unnecessary cutting and patching of concrete. Any cutting and repairing to concrete required as a result of failure to provide for such openings shall be paid for by the Contractor at no additional expense to the Owner.
- C. Removing Forms and Falsework
1. Wood forms shall not be removed for at least 72 hours after concrete has been placed.
 2. Forms shall not be removed until the concrete has attained sufficient strength to ensure stability.
- D. Reinforcing Steel
1. General
- Reinforcing steel shall be placed in accordance with the drawings and approved shop drawings and the applicable requirement of the "Codes and Standards" hereinbefore specified. Install reinforcement accurately and secured against movement,

particularly under the weight of workmen and the placement of concrete. Welded wire mesh reinforcing shall be in flat sheet form, not in roll form.

2. Reinforcing Steel Supports

Bars shall be supported on approved plastic or dielectric-coated metal chairs or spacers, accurately placed and securely fastened to forms or steel reinforcement in place. Additional bars shall be supplied, whether specifically shown on the drawings or not, where necessary to securely fasten reinforcement in place. Support legs of accessories in forms without embedding in form surface. Spacing of chairs and accessories shall conform to CRSI's "Recommended Practice for Placing Bar Support". Hooping and stirrups shall be accurately spaced and wired to the reinforcement. No wood will be permitted inside forms. Lifting of welded wire fabric into proper position while concrete is being poured rather than supporting fabric on chairs will not be permitted.

3. Placing and Tying

All reinforcement shall be set in place, spaced, and securely tied with tie wire at all splices and at all crossing points and intersections in the positions shown, or as directed. Rebending of bars on the job to accommodate the job to accommodate existing conditions will not be permitted without the written approval of the DCR Representative. Point ends of wire away from forms.

4. Spacing

Minimum center to center distance between parallel bars shall be in accordance with the details on the drawings, or, where not shown, the clear spacing shall be 2 times the bar diameter but in no case less than 1-½ inches or less than 1-½ times the maximum size aggregate.

5. Splices shall be in accordance with the following:

- a. Maximum 50% of steel spliced occurring within a splice length.
- b. Top bars as identified on the Drawings shall be 1.4 times values given in 3.D.5.c.
- c. Splice lengths: 40 bar diameters (Min. 12")

6. Protective Concrete Covering

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- a. Except where shown otherwise on drawings, the minimum concrete coverage for steel reinforcement shall conform with the applicable revisions of the "Codes and Standards" hereinbefore specified.

7. Dowels and Sleeves

- a. Install expansion dowels and sleeves perpendicular to and across all expansion joints in the concrete paving at two feet (2') on center minimum, or as shown on the Drawings. Core drill existing pavements where required and grout non-sleeved end of dowel in place. After grout has set, bend dowel and sleeve as required to level before pouring new concrete.

E. Mixing of Concrete

1. All concrete shall be ready-mixed concrete, and shall be mixed and delivered in accordance with the "Specification for Ready-Mixed Concrete", ASTM C-94. The batch plant of the concrete producer shall be certified for compliance with the standards established by the National Ready-Mixed Concrete Association.
2. In the event concrete is mixed at a central batching plant, the delivery shall be arranged so that intervals between batches are kept to a minimum, and in any event not more than thirty (30) minutes. Trucks shall be in first class condition and kept in constant rotation during delivery.
3. Concrete shall be placed within 90 minutes after cement has been mixed with aggregate or 45 minutes after addition of water and admixtures.
4. No admixtures, except those mentioned in paragraph 2.01 shall be used. Calcium chloride will not be permitted.
5. Truck delivery slips of all concrete delivered to the job shall indicate the quantity and quality of concrete, additives, date and time of batching and delivery, and the location of placement. Delivery slips shall be forwarded to the DCR Representative at the end of each week.
6. Plant mixed cement concrete shall be the only concrete allowed to be used with all items requiring concrete in this contract. Hand mixing or other types of mixing will not be permitted.

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F. Cold Weather Requirements:

1. Concrete shall not be mixed or placed when the temperature is below 40 degrees F., or when conditions indicate that the temperature will fall below 40 degrees F. within 72 hours unless precautions are taken to protect the concrete.
2. Concrete temperature shall be maintained, when deposited, at not less than 60 degrees F. Reinforcement, forms, and ground which concrete will contact must be completely free of frost.
3. Concrete and formwork must be kept at a temperature of not less than 50 degrees F. for not less than 96 hours after placing.
4. Calcium chloride shall not be used.

G. Hot Weather Requirements:

1. The maximum temperature of the concrete, when deposited, shall be 90 degrees F. If the weather causes the placing temperature to exceed 80 degrees F., The use of a set retarding mixture shall be used.
2. No concrete shall be deposited when the air temperature is greater than 90 degrees F.

H. Conveying and Placing Concrete

1. Notification
 - a. Before placing concrete, forms shall be thoroughly inspected. All chips, dirt, etc., shall be removed, all temporary bracing and cleats taken out, all openings for pipes, etc., properly boxed, all forms properly secured in their correct position and made tight, all reinforcement, anchors, and embedded items secured in their proper places. Concrete which may be on the forms or reinforcement, and which is set and dry, shall be cleaned off, and the forms and steel washed off before proceeding. Remove all foreign matter from forms and excavations.
2. Water shall be removed from place of deposit before concrete is placed unless otherwise permitted by the Owner. Any flow of water into an excavation shall be diverted through proper side drains into a sump, or shall be removed by other approved methods which will avoid washing away the freshly deposited concrete.

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3. Soil on which concrete will be poured shall be thoroughly wetted (except in freezing weather).
4. Anchors and Embedded Items
 - a. Anchors, bolts, sleeves, inserts, wood blocking, and any other items to be embedded in concrete shall be accurately secured in position before the concrete is placed. Aluminum shall not be embedded in concrete.
5. Handling and Depositing
 - a. Before any concrete is placed, the Contractor shall notify all whose work is in any way connected with or influenced by the concrete work, and give them reasonable time to complete all portions of their work that must be completed before concrete is deposited.
 - b. Immediately before concrete is placed, the Contractor shall inspect all forms to be sure that they are in proper position, sufficiently rigid, thoroughly clean, properly oiled and free from foreign materials, and that all reinforcement is in proper position.
 - c. Concreting, once started, shall be carried on as a continuous operation until the section of approved size and shape is completed.
 - d. Concrete shall be conveyed as rapidly as practicable from the mixer to the place of final deposit by methods which prevent the separation or loss of ingredients. It shall be deposited, as nearly as practicable, in its final position to avoid re-handling or flowing.
 - e. Concrete shall not be dropped freely where reinforcement will cause segregation, nor shall it be dropped freely more than six (6) feet. Concrete shall be deposited to maintain a plastic surface approximately horizontal.
 - f. Concrete that has partially hardened shall not be deposited in the work.
6. Pumping
 - a. Concrete may be placed by pumping if first approved in writing by the Owner for the location proposed.
 - b. Equipment for pumping shall be of such size and design as to ensure a practically continuous flow of concrete at the delivery end without separation of materials.

- c. The concrete mix shall be designed to the same requirements as hereinbefore specified, and may be richer in lubricating components in order to allow proper pumping.
- d. Concrete shall not be pumped through aluminum pipes.
- e. All pumping operations must have full-time inspection by a recognized testing laboratory approved by the Owner and paid for by the Contractor. The cost of this full-time inspection shall be included in the contractor's bid proposal if the option of pumping is elected.

7. Vibrating and Compacting

- a. All concrete shall be thoroughly consolidated and compacted by suitable means during the operation of placing, and shall be thoroughly worked around reinforcement, embedded items, and into the corners of the forms. All concrete against forms shall be thoroughly spaded. Internal vibrators shall be used under experienced supervision, and shall be kept out of contact with reinforcement and wood forms. Vibrators shall not be used in a manner that forces mortar between individual form members.
- b. Vibrators shall be flexible electric type or approved compressed air type, adequately powered and capable of transmitting to the concrete not less than seven thousand (7,000) impulses per minute. Vibration shall be sufficiently intense to cause the concrete to flow or settle readily into place without separation of the ingredients. A sufficient number of vibrators shall be employed so that complete compaction is secured throughout the entire volume of each layer of concrete. At least one (1) vibrator shall be kept in readiness as a spare for emergency use. Vibrators shall be such that the concrete becomes uniformly plastic with their use.
- c. Vibration shall be close to the forms but shall not be continued at one spot to the extent that large areas of grout are formed or the heavier aggregates are caused to settle. Care shall be taken not to disturb concrete which has its initial set.
- d. Where conditions make compacting difficult, or where the reinforcement is congested, batches of mortar containing the same proportions of cement to sand as used in the concrete shall be deposited in the forms, to a depth of at least one inch.
- e. The responsibility for providing fully filled out, smooth, clean, and properly aligned surfaces free from objectionable pockets shall rest entirely with the Contractor.

I. Construction Joints

Construction joints shall be located a maximum of 40 feet apart. If, for any reason, the Contractor feels a change is necessary, he shall prepare a placing plan and submit it to the Owner for approval. Where a joint is to be made, the surface of the concrete shall be sandblasted or thoroughly picked, thoroughly cleaned, and all laitance removed. In addition to the foregoing, joints shall be thoroughly wetted, but not saturated, and slushed with a coat of grout immediately before the placing of new concrete. Approved keys shall be used at all joints, unless detailed otherwise. Forms shall be retightened before placing of concrete is continued. There shall be an interval of at least 48 hours between adjacent pours.

J. Expansion Joints

Expansion joints shall be located a maximum of 25' on center or as shown on contract drawings or as directed by DCR Representative. The joint shall include a joint filler, a bond breaker, dowels and sleeves, and joint sealant and installed as indicated on contract drawings.

K. Patching

Immediately after stripping forms, patch minor defects, form-tie holes, honeycombed areas, etc., before concrete is thoroughly dry. Repair gravel pockets by cutting out to solid surface, form key, and thoroughly wet before placing patching mortar consisting of 1 part cement to 2 parts fine sand; compact into place and neatly finish. Honeycombed areas or gravel pockets which, in the Owner's opinion are too large and unsatisfactory for mortar patching as described above, shall be cut out to solid surface, keyed, and packed solids with matching concrete to produce firm bond and surface.

1. The Contractor shall do all the cutting as required by himself or other trades. All such work shall be of the minimum size required. No excessive cutting will be permitted, nor shall any structural members or reinforcement be cut.
2. The Contractor shall do all patching after work by other trades has been installed, where required, using Portland Cement Mortar 1:2 mix.

L. Protection and Curing

1. Protect concrete from injurious action of the elements and defacement of any nature during construction operations.

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2. Keep concrete in a thoroughly moist condition from the time it is placed until it has cured, for at least (7) days.
3. Carefully protect exposed concrete corners from damage.
4. Allow no slabs to become dry at any time until curing operations are complete. In general, slabs shall be cured with non-staining curing paper, hosing or fog spray; vertical surfaces shall be curing with Burlene or fog spray or an approved curing compound. Protect fresh concrete from drying winds, rain, damage, or spoiling. Curing paper shall be lapped 4 inches minimum at joints and sealed with waterproof tape.

M. Concrete Finishes

1. Unexposed Surfaces
 - a. All unexposed surfaces shall have any form finish, at the Contractor's option.
2. Wearing Surface Finish
 - a. The wear surface shall receive a monolithic steel trowel finish. Surfaces shall be finished with a screed, float or steel trowel. Trowel shall be vigorously used at an angle under pressure by the finisher until troweling gives evidence of shine or gloss as required to make a smooth, hard, dense, impervious surface, free of defects. Finishers shall work from knee boards laid flat upon the surface. Mechanical troweling machines may be used if the desired finish and level tolerances can be obtained by their use, but finishing shall be by hand troweling.
 - b. Finish texture and control joint for pavement shall be as indicated on plans, or in the applicable specification section, or as directed by DCR Representative.
3. Addition of Material
 - a. The addition of cement, sand, water, or mortar to slab surfaces while finishing concrete is strictly prohibited.

N. Defective Work

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1. The following concrete work shall be considered defective and may be ordered by the Owner to be removed and replaced at Contractor's expense:
 - a. Incorrectly formed.
 - b. Not plumb or level.
 - c. Not specified strength.
 - d. Containing rock pockets, voids, honeycomb, or cold joints.
 - e. Containing wood or foreign matter.
 - f. Otherwise not in accordance with the intent of the Drawings and Specifications.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

- A. CONCRETE: Concrete for dock and observation deck to be measured in place per CY. This work will be as shown on the Drawings and as specified herein to consist of all labor, and materials including reinforcing steel, equipment, testing and all other incidentals shall be considered included in the price per CY.
- B. Foundation slabs, bench and picnic table pads and all concrete footings & foundations for site furnishings shall be paid for under their respective items.

4.02 PAYMENT

- A. CONCRETE for dock and observation deck shall be paid per CY in place including all labor and formwork.
- B. Concrete for site improvements shall be paid for under their respective items. No additional payment will be made for this work under this section.

Item	Description	Unit
03300-1	REINFORCED CONCRETE - WEST OBSERVATION DECK AND DOCK	CY

END OF SECTION 03300

SECTION 04431

DIMENSIONAL GRANITE

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

- A. Include GENERAL CONDITIONS and applicable parts of Division 1 as part of this Section.
- B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all other trades affecting, or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

1.02 WORK INCLUDED

- A. Perform all work required to complete the work of the Section, as indicated. Such work includes, but is not limited to, the following:

- 1. Granite End Stop

1.03 REFERENCES

- A. Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirement shall govern.

- 1. American Society for Testing and Materials (ASTM):
 - C 91 Masonry Cement
 - C 144 Aggregate for Masonry Mortar
 - C 150 Portland Cement
 - C 207 Hydrated Lime for Masonry Purposes
 - C 270 Mortar for Unit Masonry

1.04 SOURCES OF SUPPLY

- A. All granite shall be obtained from quarries having adequate capacity and facilities to meet the specified requirements. Cutting and finishing shall be done by a firm equipped to process the material promptly on order and in strict accord with specifications.
- B. Granite shall conform to the requirements of ASTM C 615, Architectural Grade and National Building Granite Quarries Association, Inc. "Specifications for Architectural Granite".

1.05 CONSTRUCTION TOLERANCES FOR STONE WORK

- A. Variation from Plumb: for lines and surfaces do not exceed ½ inch in 10 feet.

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- B. Variation from Level: For grades shown and other conspicuous lines, do not exceed 1/8 inch for individual grades or 1/8 inch in 10 feet for level line. All abutting sections shall be flush.
- C. Bottoms of all pieces to be set in mortar shall be sawn or split to approximately true planes. Maximum variation from that drawn shall not exceed 1.2 inch. Mortar contact surfaces shall be cleaned of all rust stains and iron particles.

1.06 SAMPLES

- A. Construct samples before start of any work. Sample panels shall exhibit proposed backup construction, texture, finish, anticipated range of color and veining, fastening, jointing, and workmanship of all elements of the construction.
- B. Size of curb samples shall be a minimum length of 4 ft.
- C. Sample sections shall be inspected by the DCR Representative. If the sample section is not acceptable, construct additional sections at no cost to the Owner until an acceptable sample is constructed. Accepted sample shall become the standard for the entire job and shall remain undisturbed until completion of all work.

1.07 TESTING AND INSPECTION

- A. The Owner reserves the right to have tests made of mortar materials and mortar, at his option, as the job progresses. Tests will be performed by a recognized Testing Laboratory, selected by the Architect, with all costs paid by the Owner. The Contractor shall agree to abide by the results of the tests; he shall make all adjustments and changes to mortar and materials to meet the specification requirements at no additional cost to the Owner.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver manufactured products in manufacturer's original, unopened, and undamaged containers with labels intact and legible.
- B. Store and handle manufactured products to prevent damage and deterioration.

1.09 SUBMITTALS

- A. Shop Drawings: Supply shop drawings at an approved scale for location, installation and erection of all parts of the work under this section including but not limited to the following items:
 - 1. Granite End Stop
- B. Shop drawings shall accurately show the dimensions, sections and jointing of all granite work.
- C. Shop drawings shall show the setting number of each pieces and each piece shall bear

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the corresponding number in a non-staining paint.

- D. Samples: Samples shall fully demonstrate color, shade, veining, texture range, and finish of each type. Each type in each proposed finish: approximately 6-inch length by 6-inch width by ½ inch depth pieces.

PART 2 – PRODUCTS

2.01 GRANITE END STOPS

- A. Granite shall be standard architectural grade, free of cracks, seams, or starts which may impair its structural integrity or function. Color or other visual characteristics indigenous to the particular material and adequately demonstrated in the sampling or mock-ups will be accepted provided they do not compromise the structural or durability capabilities of the material. Texture and finish shall be within the range of samples approved.
- B. All exposed surfaces shall be Thermal or as indicated on drawings
- C. Granite shall be clean and show no trace or evidence of any rust or iron particles. Test samples shall conform to the requirements of ASTM C615-85.
- D. Cut granite to the dimensions and patterns shown on the plans.
- E. Granite shall be as follows:
 - 1. "Chelmsford Grey" as provide by Swenson Granite <https://swensongranite.com/> or approved equal.
- F. Cement Concrete for footing and wall backing shall conform to Section 03 30 00.

2.02 Mortar Grout

- A. Mortar for setting and for pointing shall be Type N, as defined in ASTM C270-03 (Standard Specification for Mortar for Unit Masonry). All mixing, handling, and pacing procedures shall be in accordance with ASTM C270-03
- B. Mortar Grout for Pointing
 - 1. Mortar grout for pointing of joints shall consist of one (1) part white Portland cement, two (2) parts sand, mortar coloring additive, gauged with latex polymer additive.
 - 2. White Portland cement; ASTM C 150, complying with the staining requirements off ASTM C 91 for not more than 0.03% water soluble alkali. Furnish Type I, except Type III may be used for setting masonry in cold weather.
 - 3. Color pigment shall not exceed 10% of the Portland cement in the mortar.
 - 4. Latex polymer additive shall be equal to "Laticrete 3701", manufactured by Laticrete International, Inc., Woodbridge CT 06525. Mix according to manufacturer's

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instructions.

A. Mortar Grout Coloring Additive

1. Coloring additive shall be equal to SGS Colors, manufactured by Solomon Colors, 800-624-0261; www.solomoncolors.com.
2. Color shall be approved by the DCR Representative, submit samples for initial selection; construct (3) mock-ups in field for final selection and approval.
3. Mortar coloring additive shall have mineral oxide pigment and shall be certified by the supplier to be resistant to alkali, light, and weather, and shall be of a chemical composition unaffected by cement and free of water and soluble salts.
4. Color shall compliment color of granite.

2.03 ANCHORS

- A. Anchors shall be Type 316L stainless steel devices conforming to ASTM A666 to the size and dimensions as indicated on the drawings.

PART 3 – EXECUTION

3.01 GRANITE INSTALLATION

- A. Install granite per the drawings.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

- A. GRANITE END STOP shall be measured for payment PER LINEAR FOOT complete in-place as shown on the Drawings and as specified herein to consist of all excavating, backfilling, footings, concrete pad, including all labor, materials, equipment, testing and all other incidentals.

4.02 PAYMENT

- A. GRANITE END STOP will be paid for at the contract unit prices for the quantities determined as specified above.

4.03 PAYMENT ITEMS

Item	Description	Unit
04431-1	GRANITE END STOP	LF

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END OF SECTION 02800

SECTION 05035

GALVANIZING AND METAL COATINGS

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. The GENERAL CONDITIONS and general documents of Section III shall be included as part of this section.
- B. Work under this section shall include but is not necessarily limited to the following:
 - 1. Hot dip galvanizing for fabricated and furnished metal and steel items.
- B. Consult applicable Drawings for additional technical requirements.

1.02 RELATED WORK UNDER OTHER SECTIONS

- A. Section 02800 - SITE FURNISHINGS

1.03 SUBMITTALS

- A. Certificates of Compliance: Submit notarized Certificates of Compliance from galvanizer, fabricator, and coating manufacturer as specified in this Section. Do not engage galvanizer, fabricator, or coating manufacturer who will not provide notarized Certificate of Compliance as specified.
- B. Certificate of Compliance from Galvanizer: Galvanizer shall submit notarized Certificate of Compliance indicating compliance with requirements of specifications prior to application for payment. Include scope of services provided and quantity and itemized description of items processed. Certificate of Compliance shall also contain the following:
 - 1. Quality Assurance: Include evidence that galvanizer meets requirements of ANSI Q90.
 - 2. Independent Laboratory Analysis: Submit notarized independent laboratory analysis indicating compliance with specified percentage of nickel in kettle prior to, during and after galvanizing of materials at no additional cost to Owner.

1.04 QUALITY ASSURANCE

- A. Galvanizer's Quality Assurance Program and Identification: For quality assurance, maintain records of humidity, air temperature, steel temperature, and wet film thickness for nonferrous metal coatings. For galvanized surfaces, provide visual stamp on fabrications indicating galvanizing process and

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applicable ASTM number. For factory-primed or factory-finished surfaces, galvanizer shall tag fabrications indicating process used.

- B. Coating Performance in Adhesion: Factory applied coatings applied over galvanizing shall be selected and applied to achieve and maintain a pull-off strength of 500 psi (average of 3 tests) when tested in accordance with ASTM D4541.
- C. Testing of Coating Adhesion: As directed by the Owner, the Contractor shall engage an independent professional testing company to perform adhesion tests for primer and/or topcoat(s) in accordance with ASTM D4541. A maximum of 6 passing tests may be required. Copies of test results may be sent directly to Owner.
- D. Paint: Paint or coatings other than those specified used for touch-up, to cover bare spots or the galvanizing process are unacceptable and will be rejected.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Provide suitable packaging to prevent damage to surfaces and distortion of materials. Handle and protect materials from damage. For factory-primed or factory-finished materials use nylon slings or padded cables for handling.
- B. Store in a suitable location protected from high heat, freezing or water immersion. Provide free circulation of air around surfaces.

PART 2 - PRODUCTS

2.01 HOT-DIP GALVANIZING

- A. Hot-Dip Galvanizing: Provide hot-dip galvanizing with 0.05 to 0.09 percent nickel in the galvanizing kettle. Comply with ASTM A123-89 for fabricated products and ASTM A 153-87 for hardware. Provide thickness of galvanizing specified in referenced standards.
- B. Following galvanizing, each item shall receive surface grinding to remove lumps, sags or spikes resultant from the galvanizing process. The finished surface following grinding shall be hand smooth and without irregularities. Take care not to damage the galvanized surface coating.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Galvanizing Application: Galvanize materials in accordance with specified requirements. Galvanizing shall provide a visually acceptable substrate for applied coatings, and be free of lumps, globules, or heavy deposits which will interfere with intended use or aesthetic appearance of materials.

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- B. Metal Coating Application: Apply metal coatings in accordance with specified requirements and recommendations of galvanizer and coating manufacturer. Metal coatings shall be free of lumps, runs, or sags which will interfere with intended use or aesthetic appearance of materials.
- C. Installation: Install materials, fabrications, and assemblies in accordance with requirements of Sections in which they are specified. Comply with fabricator's and galvanizer's requirements for installation, including use of nylon slings or padded cables for handling factory-primed or factory-finished materials.

3.02 TOUCH-UP, REPAIR AND PROTECTION

- A. Touch-Up and Repair: For damaged and field-welded metal coated surfaces, clean welds, bolted connections and abraded areas. At galvanized surfaces, apply organic zinc repair paint at these areas to comply with ASTM A780. Galvanizing repair paint shall have 95 percent zinc by weight. Thickness of applied galvanizing repair paint shall be not less than coating thickness required by ASTM A123 or A153 as applicable. Touch-up of galvanized surfaces with aerosol spray, silver paint, bright paint, brite paint, or aluminum paints is not acceptable.
 - 1. At factory-primed or factory-finished surfaces, touch-up finish in conformance with manufacturer's recommendations. Provide touch-up such that repair is not visible from a distance of 6 feet.
- B. Protection: Protect materials, fabrications, and assemblies with metal coatings from damage during construction using methods approved by fabricator, galvanizer, and coating manufacturer.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

No separate measurement will be made for the Work of this Section.

4.02 PAYMENT

Payment for the Work in this Section will be included as part of the Contract price for the structure, system, or item of which it forms a part.

END OF SECTION 05035

SECTION 06100
STRUCTURAL LUMBER

PART 1 - GENERAL

1.1 Furnish all labor, materials, tools, equipment and services for Structural Lumber, as indicated, in accordance with provisions of Contract Documents, including but not limited to the following:

(a) Structural Lumber – West Observation Deck

(b) Structural Lumber – Dock

2. Section Includes:

a. Framing with dimension lumber.

b. Framing with heavy timber, including but not limited to pile caps, fenders and stringers.

c. Wood blocking, and nailers.

1.2 REFERENCES:

A. American Society of Mechanical DCR Representatives (ASME):

1. B18.2.1: Square and Hex Bolts and Screws (Inch Series).

2. B18.6.1: Wood Screws (Inch Series).

B. American Society for Testing and Materials (ASTM):

1. A153: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

2. A307: Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.

3. A563: Specification for Carbon and Alloy Steel Nuts.

4. A666: Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.

5. B633: Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.

6. E488: Standard Test Methods for Strength of Anchors in Concrete Elements.

7. F593: Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.

8. F594: Specification for Stainless Steel Nuts.
 9. F1667: Specification for Driven Fasteners: Nails, Spikes, and Staples.
- C. American Wood Preserver's Association Standard (AWPA):
1. M4: Standard for the Care of Preservative-Treated Wood Products
 2. U1: User Specification for Treated Wood
 3. T1: Processing and Treatment Standard
- 1.3 RELATED WORK SPECIFIED ELSEWHERE
- A. Section 02460 – HELICAL ANCHOR
 - B. Section 03300 – REINFORCED CONCRETE
 - C. Section 06101 – PURPLEHEART LUMBER
- 1.4 DEFINITIONS:
- A. Exposed Framing: Framing not concealed by other construction.
 - B. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal in least dimension.
 - C. Timber: Lumber of 5 inches nominal or greater in least dimension.
 - D. Lumber grading agencies, and the abbreviations used to reference them, include the following:
 1. NeLMA: Northeastern Lumber Manufacturers' Association.
 2. NLGA: National Lumber Grades Authority.
 3. RIS: Redwood Inspection Service.
 4. SPIB: The Southern Pine Inspection Bureau.
 5. WCLIB: West Coast Lumber Inspection Bureau.
 6. WWPA: Western Wood Products Association.
- 1.5 SUBMITTALS:
- A. Submit the following shop drawings in accordance with Section 01300.
 - B. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

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1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
 2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
 3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.
- C. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.
- D. Evaluation Reports: For the following, from ICC-ES:
1. Wood-preservative-treated wood.
 2. Engineered wood products.
 3. Power-driven fasteners.
 4. Expansion anchors.
 5. Metal framing anchors.
- 1.6 QUALITY ASSURANCE:
- A. Comply with the requirements specified in Section 01400 .
 - B. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.
- 1.7 DELIVERY STORAGE AND HANDLING:
- A. Comply with the requirements specified in Section 01610.
 - B. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL:

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.
 - 2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece
 - 3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
 - 4. Provide dressed lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER:

- A. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
- B. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
- C. Application: Treat all structural lumber unless otherwise indicated.
 - 1. Wood stringers, fenders and pile caps.
 - 2. Wood nailers, equipment support bases, blocking, stripping, and similar members.
 - 3. Wood sills, sleepers, blocking, and similar concealed members in contact with masonry or concrete.
- D. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent.
- E. Application: Treat all structural lumber unless otherwise indicated

2.3 TIMBER MATERIALS:

- A. General: All timber pile caps, fenders and, stringers shall be Southern Yellow Pine No. 1 and be free from all detrimental defects and dressed four sides.

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- B. All southern yellow pine shall be treated with ACQ (Alkaline Copper Quaternary) preservatives and conform to AWWA Standards. Joist Hangers and shall be stainless steel type 316.
- C. Beam Saddles (post base) shall be hot dipped galvanized according to the manufacturer's recommendations.
- D. Beam Saddles shall be stainless steel according to the manufacturer's recommendations.

2.4 MISCELLANEOUS LUMBER:

- A. General: Miscellaneous lumber for support or attachment of other construction, including blocking, nailers and other miscellaneous lumber shall be Southern Yellow Pine; SPIB No. 1.
- B. Miscellaneous lumber used for attachment of other construction shall be selected and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

2.5 FASTENERS:

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 - 1. Material: Stainless steel Type 316 shall be used for all bolts, nuts, washers, joist hangers and nails.

2.6 METAL FRAMING ANCHORS:

- A. Manufacturers:
 - 1. Cleveland Steel Specialty Co.
 - 2. KC Metals Products, Inc.
 - 3. Phoenix Metal Products, Inc.
 - 4. Simpson Strong-Tie Co., Inc.
 - 5. USP Structural Connectors.
 - 6. Or acceptable equivalent product.
- B. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer that meet or exceed those of products of manufacturers listed. Manufacturer's published values shall be determined from empirical data or by rational DCR Representativeing analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL:

- A. Set structural lumber to required levels and lines, with members plumb, true to line, cut, and fitted. Fit structural lumber to other construction; scribe and cope as needed for accurate fit.
- B. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- C. Metal Framing Anchors: Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.
- D. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- E. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
 - 1. Use copper naphthenate for items not continuously protected from liquid water.
- F. Securely attach structural lumber work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. NES NER-272 for power-driven fasteners.
 - 2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
- G. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

3.2 TIMBER INSTALLATION, GENERAL:

- A. General
 - 1. All timber shall be handled carefully by means of rope slings, care shall be exercised to avoid bruising, penetration of surfaces with tools, or other damage to the outer fibers. Cant hooks or pike poles shall not be used. All fasteners shall be stainless steel including deck screws, joist hangers, and nails. Post caps shall be hot-dipped galvanized.
- B. Materials Handling and Preparations
 - 1. Prior to storage, all cut or damaged surfaces of treated items shall be given two (2) brush coats of ACQ and in such quantity as will fill all shakes and thoroughly penetrate the cut surface.

2. Proper care shall be exercised in handling and installing of all materials to prevent damage to the finished surfaces.
3. Timber shall be cut as indicated to permit fitting of piles and other timbers members.
4. Holes for bolts shall be drilled near in size. In general, holes shall be drilled perpendicular to the face of the timber.
5. All timber that is to be secured by bolts, spikes, nails, stainless steel screws etc. shall be pre-drilled in significant diameter to allow the fastener to be installed without the straining, splitting or otherwise damaging or potentially damaging the timber.
6. All timber damaged during the installation shall be immediately removed and replaced with a suitable replacement, at the sole expense of the Contractor.
7. Field cuts and holes bored into timbers shall receive two coats of ACQ, applied by brush; the second coat shall not be made until the first coat is completely absorbed.
8. Field cutting over water shall only be performed for final fitting of members and saw dust shall be contained and immediately removed from waterway.
9. Contractor shall place self-adhered membrane between all horizontal timber to timber interfaces. Membrane shall extend as shown on the plans and shall be approximately 25 mil thickness and consist of rubberized asphalt bonded to a HPDE membrane.

3.3 WOOD SLEEPER, BLOCKING, AND NAILER INSTALLATION:

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
- C. Where wood-preserved-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

3.4 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
- B. Protect structural lumber from weather. If, despite protection, structural lumber becomes sufficiently wet that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. All treated timber used will be measured by the thousand feet board measure, in place. No allowance will be made for waste or cut-off.

4.2 PAYMENT

- A. Treated timber will be paid for at the contract unit price per thousand feet board measure under the item Structural lumber. INCLUDED AS INCIDENTAL ALL FRAMING CONNECTORS, BOLTS AND NAILS and REINFORCED CONCRETE PAD FOUNDATIONS as indicated on the drawings and specified.

4.3 PAYMENT ITEMS

Item	Description	Unit
06100-1	STRUCTURAL LUMBER – WEST OBSERVATION DECK	MBM
06100-2	STRUCTURAL LUMBER – DOCK	MBM
06100-3	DOCK HARDWARE	EA

END OF SECTION 06100

SECTION 06101

PURPLEHEART LUMBER

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Furnish all labor, materials, tools, equipment and services for Purpleheart lumber, as indicated, in accordance with provisions of Contract Documents, including but not limited to the following:

1. Purpleheart Lumber Decking – Dock
2. Purpleheart Lumber Decking – Overlook (West Observation Deck)
3. Purpleheart Lumber Rail
4. Purpleheart Lumber Bench
5. Purpleheart Lumber Wood Curb
6. Purpleheart Lumber Bumpers

1.2 RELATED WORK UNDER OTHER SECTIONS

A. Section 06100 – STRUCTURAL LUMBER

1.3 REFERENCE STANDARDS

A. Work shall conform to codes and standards of the following:

1. Standard Specifications for Highways and Bridges Massachusetts Department of Transportation (MassDOT), Commonwealth of Massachusetts, dated 2022, and referred to hereinafter as the MassDOT Standard Specifications.
2. Supplemental Specifications to the MassDOT “Standard Specifications” dated June 30, 2022.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer who has completed (type of work) similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

B. Source Limitations: Obtain each variety of (material) from a single (source) with resources to provide materials of consistent quality in appearance and physical properties without delaying the work.

1.5 SUBMITTALS

- A. Product Data: For each material and manufactured product specified.
 - 1. Manufacturer's standard product literature.
 - 2. Data on physical properties required by referenced ASTM standards.
- B. Shop Drawings
 - 1. For Decking and Bumper Layout and installation
 - 2. For Wood Rail
 - 3. For Wood Bench
- C. Samples / Mockups
 - 1. One section of decking and bumper measuring 18" long, dried, seasoned and sealed and having edges and surfaces finished as per the specifications.
 - 2. One mockup of Rail & Post with 12" long railing, including all connections, hardware, etc.
 - 3. One mockup of Bench End showing connections between support and seating surface and mounting connection to boardwalk decking

1.6 PROJECT CONDITIONS

- A. Protection: The Contractor shall use all means necessary to protect the materials of this Section before, during and after installation. In the event of damage, make all repairs and replacements necessary to approval of the DCR Representative and at no additional cost to the Owner. All work shall be executed in such a manner as to prevent any damage to existing streets, curbs, paving to remain, existing plant materials, and adjoining properties.
- B. The Contractor shall remove all debris, construction equipment and waste material from areas within the limit of work prior to inspection for acceptance.
- C. The Drawings indicate, in general, the alignment and finished grade elevations. The Landscape Architect, however, may make minor adjustments in grades and alignment as are found necessary.

1.7 DELIVERY, STORAGE, HANDLING

- A. All timber shall be handled carefully by means of rope slings; care shall be exercised to avoid bruising, penetration of surfaces with tools, or other damage to the outer fibers. Cant hooks or pike poles shall not be used.

PART 2 - PRODUCTS

2.1 PURPLEHEART LUMBER

- A. Purpleheart tropical hardwood shall conform with the International Conventions and National Forestry Regulations relating to the management of forestry concessions
- B. Purpleheart shall be supplied by a company that operations in the Guiana Shield countries are in conformity with the International Conventions and National Forestry Regulations relating to the management of forestry concessions. Company shall enforce the protection of the endangered species listed by CITES (Convention on Trade in Endangered Species) and the bio-diversity of the ecosystems. It respects the Intellectual Property Rights of the Indigenous Peoples, whose communities are the beneficiaries of the Company's field operation.
- C. Purpleheart shall be supplied by a company that stresses the need for low impact forestry operations, ensuring that its forestry extraction is state of the art while constantly monitoring the effect of its logistics systems on watershed management and its use of biodegradable wood preservatives.
- D. Purpleheart deck must exceed ADA requirements for Static Coefficient of friction in a wet environment, ASTM C1028.
- E. Deck screws and shall be stainless steel type 316.
- F. Connection Brackets & Hardware for Wood Rail and Bumpers shall be Stainless Steel
- G. Anchoring Hardware for Bench shall be Stainless Steel

PART 3 - EXECUTION

3.1 GENERAL

- A. All fasteners shall be stainless steel including deck screws, and nails. Proper care shall be exercised in handling and installing of all materials to prevent damage to the finished surfaces. The cost of all hardware is included
- B. Timber shall be cut as indicated to permit fitting of piles and other timbers members.
- C. Holes for bolts shall be drilled near in size. In general, holes shall be drilled perpendicular to the face of the timber.
- D. All timber that is to be secured by bolts, spikes, nails, stainless steel screws etc. shall be pre-drilled in significant diameter to allow the fastener to be installed without the straining, splitting or otherwise damaging or potentially damaging the timber.
- E. All timber damaged during the installation shall be immediately removed and replaced with a suitable replacement, at the sole expense of the Contractor.

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- F. Air dried decking should be allowed to acclimate prior to installation to minimize extensive shrinking after installed.
- G. Allow a 1/4" gap between standard deck boards for drainage and airflow.
- H. Purpleheart lumber should be kiln dried or seasoned with a moisture content not exceeding 15% to minimize further shrinking after installation.
- I. All Purpleheart end grain shall be sealed with a wax-based hardwood end sealer to prevent checking within 24 hours of cutting to dimension.
- J. Finished walking Surface shall comply with the ADA Standards; specifically with Chapter 3 for firmness, stability, openings, changes in level and slip resistance.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. PURPLEHEART LUMBER DECKING - DOCK will be measured PER SQUARE FOOT installed as shown on the drawings, including all labor and materials required. The quantity shall be determined in accordance with dimensions shown on the plans and such alterations of the plans as specifically ordered by the DCR Representative, in writing.
- B. PURPLEHEART LUMBER DECKING – OVERLOOK (WEST OBSERVATION DECK) will be measured PER SQUARE FOOT installed as shown on the drawings, including all labor and materials required. The quantity shall be determined in accordance with dimensions shown on the plans and such alterations of the plans as specifically ordered by the DCR Representative, in writing.
- C. PURPLEHEART LUMBER WOOD CURB will be measured PER LINEAR FOOT installed as shown on the drawings, including all labor and materials required. The quantity shall be determined in accordance with dimensions shown on the plans and such alterations of the plans as specifically ordered by the DCR Representative, in writing.
- D. PURPLEHEART LUMBER RAIL will be measured PER LINEAR FOOT installed as shown on the drawings, including all labor and materials required. The quantity shall be determined in accordance with dimensions shown on the plans and such alterations of the plans as specifically ordered by the DCR Representative, in writing.
- E. PURPLEHEART LUMBER BENCH will be measured PER LUMP SUM installed as shown on the drawings, including all labor and materials required.
- F. PURPLEHEART LUMBER BUMPERS will be measured PER LINEAR FOOT installed as shown on the drawings, including all labor and materials required. The quantity shall be determined in accordance with dimensions shown on the plans and such alterations of the plans as specifically ordered by the DCR Representative, in writing.

4.2 PAYMENT

- A. PURPLEHEART LUMBER DECKING - DOCK will be paid for at the Contract Unit Price per SQUARE FOOT. Compensation shall include payment for all labor, equipment, materials, including all stainless steel fasteners, survey, supervision and all incidentals necessary to complete the work under this section to the satisfaction of the Specification, the Contract Drawings and to the Department.
- B. PURPLEHEART LUMBER DECKING – OVERLOOK (WEST OBSERVATION DECK) will be paid for at the Contract Unit Price per SQUARE FOOT. Compensation shall include payment for all labor, equipment, materials, including all stainless steel fasteners, survey, supervision and all incidentals necessary to complete the work under this section to the satisfaction of the Specification, the Contract Drawings and to the Department.
- C. PURPLEHEART LUMBER WOOD CURB will be paid for at the Contract Unit Price per LINEAR FOOT. Compensation shall include payment for all labor, equipment, materials, including all stainless steel fasteners, survey, supervision and all incidentals necessary to complete the work under this section to the satisfaction of the Specification, the Contract Drawings and to the Department.
- D. PURPLEHEART LUMBER RAIL will be paid for at the Contract Unit Price per LINEAR FOOT. Compensation shall include payment for all labor, equipment, materials, including all stainless steel fasteners, survey, supervision and all incidentals necessary to complete the work under this section to the satisfaction of the Specification, the Contract Drawings and to the Department.
- E. PURPLEHEART LUMBER BENCH will be paid for at the Contract Unit Price per LUMP SUM. Compensation shall include payment for all labor, equipment, materials, including all stainless steel fasteners, survey, supervision and all incidentals necessary to complete the work under this section to the satisfaction of the Specification, the Contract Drawings and to the Department.
- F. PURPLEHEART LUMBER BUMPERS will be paid for at the Contract Unit Price per LINEAR FOOT. Compensation shall include payment for all labor, equipment, materials, including all stainless steel fasteners, survey, supervision and all incidentals necessary to complete the work under this section to the satisfaction of the Specification, the Contract Drawings and to the Department.

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4.3 PAYMENT ITEMS

Item	Description	Unit
06101-1	PURPLEHEART LUMBER DECKING - DOCK	SF
06101-2	PURPLEHEART LUMBER DECKING – OVERLOOK (WEST OBSERVATION DECK)	SF
06101-3	PURPLEHEART LUMBER WOOD CURB	LF
06101-4	PURPLEHEART LUMBER RAIL	LF
06101-5	PURPLEHEART LUMBER BENCH	LS
06101-6	PURPLEHEART LUMBER BUMPERS	LF

END OF SECTION