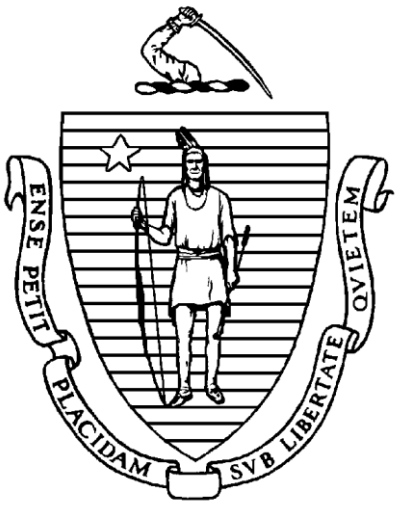


Department of Conservation and Recreation

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. P26-3659-C1A
Title: Damon Pond Dam Repairs and Area Improvements
Location: Willard Brook State Forest, Ashby, Massachusetts

GENERAL BID proposals shall be submitted on a form furnished by the Department and will be received until 12:00 PM on Thursday, July 23, through DCR's E-bid room at www.bidexpress.com/businesses/36765/home.

Individual sets of contract documents will only be available in 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 on site (59 Townsend Road, Ashby MA) on Wednesday, June 17, 2026, at 10:00 am. Questions must be received no later than 12:00p on Wednesday July 1, 2026. Responses to questions / addendums will be issued prior to 5:00 pm on Monday, July 13, 2026.

The project consists of work to bring Damon Pond Dam into compliance with the Massachusetts Dam Safety Regulations (302 CMR 10.00) and making state park site improvements. Proposed work includes concrete and masonry repairs to the dam, spillway, and training walls, removal of unsuitable vegetation on and within 20 feet of the dam, site drainage improvements, overtopping protection to the dam embankment and structural repairs to the bridge deck and railings. The project also includes construction of recreational features including two ADA- compliant parking spaces and an ADA/MAAB-compliant stabilized aggregate path from Hosmer Road to the boundary of the southern beach.

The estimated project cost is $2,130,971.00

The work is to be accomplished within 365 calendar days of a notice to proceed. Liquidated damages in the amount of $750 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 Dam Construction 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.

Bidders shall also have a minimum of 10 years of experience and shall have successfully completed at least five dam rehabilitation or repair construction projects within the last 10 years including at least two projects in excess of one million dollars. Submit a summary of experience and representative projects with references to show compliance with the requirements listed above.

The Proposed contract includes a requirement of 6% for MBE (Minority Business Enterprise) 10% for WBE (Women Business Enterprise) and 3% VOBE 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.

Nicole LaChapelle, 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.: P26-3659-C1A
Title: Damon Pond Dam Rehabilitation
Project Scope: Damon Pond Dam into compliance with the Massachusetts Dam Safety Regulations (302 CMR 10.00) and making state park site improvements. Proposed work includes concrete and masonry repairs to the dam, spillway, and training walls, removal of unsuitable vegetation on and within 20 feet of the dam, site drainage improvements, overtopping protection to the dam embankment and structural repairs to the bridge deck and railings. The project also includes construction of recreational features including two ADA- compliant parking spaces and an ADA/MAAB-compliant stabilized aggregate path from Hosmer Road to the boundary of the southern beach.

Deadline for filing general bids is 12:00 P.M. on Thursday July 23, 2026.

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 be completed 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 decisions, prospective bidders shall comply with Section 3 herein.

SECTION 2 - GENERAL BIDDERS - QUALIFICATION

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

A summary of experience and representative projects with references to show compliance with experience requirements.

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

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

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: Christopher DeTurk, Project Manager
Department of Conservation and Recreation
180 Beaman Street
West Boylston, MA 01583

Email: Christopher.DeTurk@mass.gov

Questions must be received no later than 12:00p on Wednesday July 1, 2026. Responses to questions / addendums will be issued prior to 5:00 pm on Monday, July 13, 2026.

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, 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:

"Notwithstanding any policy terms or endorsements: P26-3659-C1A / Damon Pond Dam Repairs and Area Improvements 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. The 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 contractual liability coverage, and the Contractor's Protective Liability coverage is in force. Certificates shall include specific acknowledgment that the coverage 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 &	500,000.00 each occurrence
Property Damage	1,000,000.00 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 VOBE 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 VOBE 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 & VOBE 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 & VOBE 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 & VOBE availability, (ii) the geographic location of the project to the extent related to MBE,WBE & VOBE availability, (iii) the scope of the work, (iv) the percentage of work available for subcontracting to MBE,WBE & VOBEs and/or (v) other relevant factors, including a **documented** inability by the prospective Bidder to obtain commitments from MBE,WBE & VOBE subcontractors sufficient to meet the MBE,WBE & VOBE 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 & VOBE 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 (if) each solicited, and (ii) each MBE,WBE & VOBE 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 person, including the reason for rejecting any MBE,WBE & VOBE 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 & VOBE 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 & VOBE 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 & VOBE participation.

8.3 Any reduction or waiver of the MBE,WBE & VOBE 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 & VOBE requirements for this Contract, (ii) a completed Letter of Intent in the form provided by the Awarding Authority for each MBE,WBE & VOBE listed in the Schedule for Participation, and (iii) a current SDO certification letter for each MBE,WBE & VOBE listed in the Schedule of MBE,WBE & VOBE Participation

showing that the MBE,WBE & VOBE 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 & VOBE Work”) with enough specificity to permit the Awarding Authority to identify the items of contract work that the MBE,WBE & VOBE 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 & VOBE 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 & VOBE 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 & VOBE and appropriate Letters of Intent and SDO certification letters establishing that the MBE,WBE & VOBE 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 & VOBE 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 paragaraph 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.

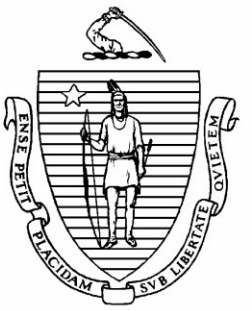
10.2 Please note that no part of the Contractor's work may be subcontracted without the prior written approval of the Awarding Authority. The Contractor must complete a minimum of 51% of the scope of this contract by his own work force. If the Contractor desires to subcontract any part of the Work, the 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 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 ($ 0.00).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 anyagency 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 - VOBE 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: Nicole LaChapelle

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 of _ Dollars and Zero Cents ($ 0.00). 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) _____(Seal)

(Print Name of General Contractor) (Print Name of Surety)

By_____ By_____

(Signature – Title) (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 of _ Dollars and Zero Cents ($ 0.00). 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) _____(Seal)

(Print Name of General Contractor) (Print Name of Surety)

By_____ By_____

(Signature – Title) (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 LLC VOTE

N/A

_____, 2025

I hereby certify, warrant and represent that I am the _____of

the _____(the "LLC") and that
(Name of LLC)

I am fully and unconditionally authorized pursuant to the Operating Agreement of the LLC to execute and deliver on behalf of the LLC a contract and all amendments thereto, and to act as principal and to execute bonds in connection therewith:

Mass. State Project No. _____

Project Title:_____

I further certify under the penalties of perjury that I, _____, am the duly qualified and acting member and principal of the LLC for all purposes.
.

_____
Name

_____
Print Name

_____
Date

SUBSCRIBED AND SWORN TO THIS ____DAY OF _____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:_____

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

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 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.

Women Business Enterprise Participation in the work

Name & address of WBE 10**%**	Dollar Value of Participation	Nature 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 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/legislationeexecorder/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 VOBE Participation and appropriate Letters of Intent establishing that the VOBE 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.

_____ Date:_____
Contractor Authorizing Signature

_____
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 VOBE **3%**	Dollar Value of Participation	Nature Participation
1.		
2.		
3.		
4.		
5.		
6.		

Total VOBE Commitment: _____

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

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

Name of bidder:_____

Date:_____By:_____

Letter of Intent – Veteran-Owned Business Enterprise Participation

(To be completed by VOBE 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 VOBE will be credited toward VOBE 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 VOBE 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.

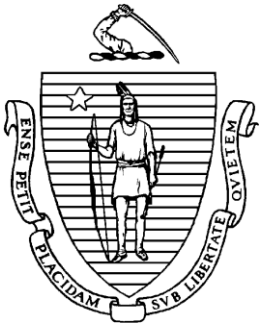
Bidder/Contractor Name: _____

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 of 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 by 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. <u>Failure to Complete Work on Time - Liquidated Damages.</u>

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. <u>Final Acceptance of the Work.</u>

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. <u>One-Year Warranty Repair List and Inspection.</u>
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. <u>Change Orders Generally.</u>
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. <u>False Claims. Statutory Provisions Regarding Changes.</u>

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. <u>Mediation.</u>

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. <u>Schedule of Values.</u>

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. <u>Periodic Payments (M.G. L. c. 30, sec. 39K) for Building Projects.</u>

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 specified in in G.L. c. 29, §29C , 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. <u>Contracts for Public Works Governed by M.G.L. c. 30, sec. 39G:</u>

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 deposit d 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 than 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 or 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. <u>Liens</u>

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. <u>Final Payment; Release of Claims by Contractor.</u>

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 amende3d, 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 aspect 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. <u>Sanctions</u>.

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:

(l) 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 Co0ntractor 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. <u>Suspension of Payment and/or Performance for Noncompliance</u>.

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 al 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 ay provision of this Article.

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF CONSERVATON 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 VOBE 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 VOBE identified as a veteran-owned small business via the VetBiz database shall count towards meeting the Program participation goal.

The Contractor must demonstrate that VOBEs 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 VOBE 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 SDVOBE 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 VOBE 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 VOBE 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 VOBE 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 VOBE 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- VOBE or non- VOBE general Bidder to meet the goals established for this Contract based upon any or all the following:

a) actual VOBE 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 VOBEs; and/or

e) other relevant factors, including a **documented** inability by the prospective Bidder to obtain commitments from VOBE subcontractors sufficient to meet the VOBE 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 VOBEs. 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 VOBEs. The Bidder shall also demonstrate that, where commercially reasonable, subcontracts were divided into units capable of being performed by 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 available VOBEs qualified to perform such work. The Bidder shall identify each VOBE 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 VOBE solicited, including the reason for rejecting and VOBE who submitted a bid or proposal.

- Evidence that the Bidder made reasonable efforts to follow up on the written

notices sent to VOBEs with telephone calls or personal visits to determine with certainty whether the VOBEs were interested in performing the work. Phone logs or other documentation must be submitted.

- Evidence of efforts made to assist VOBE's 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 VOBE goals.

D) The Bidder may also submit any other information supporting its request for a waiver or reduction in the VOBE 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 VOBE 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 VOBE 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 VOBE participation in amounts equal to or exceeding the VOBE 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 VOBE (the "VOBE Work") with enough specificity to permit the Awarding Authority to identify the items of contract work that the VOBE will perform for VOBE participation credit. The Awarding Authority reserves the right to reject any Letter of Intent if the price to be paid for the VOBE 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 VOBE 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 VOBE Participation and appropriate Letters of Intent establishing that the VOBE 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 VOBE 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 VOBE Participation with its Bid. A filed Sub-Bidder may, at its option, submit a Letter of Intent with its Bid if it is a VOBE. If a filed sub-Bidder intends to sub-subcontract work to a VOBE, 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 VOBE 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:

D **Design Contract**
D **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.

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF CONSERVATON AND RECREATION

SPECIAL GOOD FAITH REQUIREMENTS FOR PARTICIPATION BY VETERAN OWNED BUSINESS ENTERPRISES
(Implementing Executive Order No. 638, Promoting the Equitable Participation of Women and Underrepresented Groups in Construction

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.

Pursuant to Executive Order No. 638: Promoting the Equitable Participation of Women and Underrepresented Groups in Construction ("EO No. 638"), bidders shall include in their bid submission a Plan of the how they plan to:

1. encourage the use of registered apprentices for the performance of the Work.
2. develop strong workforce equity practices.
3. partner with worker-serving organizations with a track record of reaching women and underrepresented groups; and
4. provide support services, including childcare, to facilitate the participation of women and underrepresented groups on the Work to be performed under the contract.

In addition, bidders are hereby notified that the contract shall include, and it shall be a requirement that any subcontract shall include, the following data collection and reporting obligations, at appropriate intervals, required by EO No. 638:

1. workforce needs, which may include the expected number of jobs, job hours, and job hours by occupation.
2. workforce demographics, consistent with but not limited to the requirements of M.G.L. c. 7C, §6 and M.G.L. c. 149, §44A, which may include race, gender, zip code, and other workforce characteristics.
3. benefits and supportive services provided to workers.
4. Hours worked by all employees, including women and people of color, by trade and position; and
5. Apprenticeship participation and pre-apprenticeship program completion statistics.

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.

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 MASSSCHUSETTS
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) Total Hours	(B) Hourly Base Wage	Employer Contributions			(F) [B+C+D+E] Hourly Total Wage (prev.	(G) [A*F] Weekly Total Amount
		S	M	T	W	T	F	S			(C) Health & Welfare	(D) Pension	(E) Supp. unemployed		

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)
☐ MBE ☐ WBE ☐ VOBE			$	$	$	$
☐ MBE ☐ WBE ☐ VOBE			$	$	$	$
☐ MBE ☐ WBE ☐ VOBE			$	$	$	$
☐ MBE ☐ WBE ☐ VOBE			$	$	$	$
☐ MBE ☐ WBE ☐ VOBE			$	$	$	$
☐ MBE ☐ WBE ☐ VOBE			$	$	$	$
☐ MBE ☐ WBE ☐ 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 VOBE 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

_____
Authorized Signature

_____
Print Name

FOR MBE/WBE/VOBE FIRM

_____
Authorized Signature

_____
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.

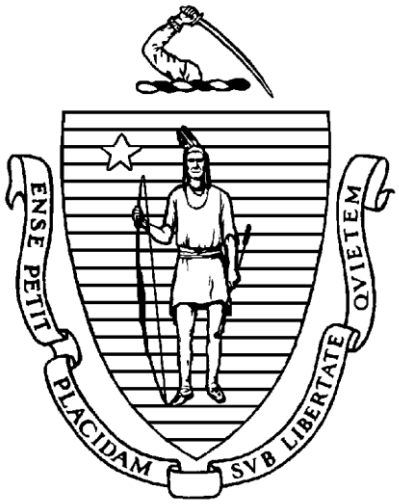
Request No.	Date:	Amount:
Request No.	Date:	Amount:
Request No.	Date:	Amount:

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 OF THE CONTRACT

Attachments to Special Conditions
Ashby, Massachusetts

Damon Pond Dam Repairs and Area Improvements Project

Massachusetts Department of Conservation and Recreation

May 2026

Massachusetts Wetlands Protection Act Order of Conditions

Massachusetts Department of Environmental Protection 401 Water Quality Certification

United States Army Corps of Engineers Pre-Construction Notification Authorization

Massachusetts Department of Conservation and Recreation Office of Dam Safety Chapter 253 Dam Safety Permit

Massachusetts Department of Environmental Protection Chapter 91 Permit

Massachusetts Department of Transportation State Highway Access Permit

Geotechnical Data

Tighe & Bond

Massachusetts Wetlands Protection Act Order of Conditions

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 - Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File #:093-0445
eDEP Transaction #:1841479
City/Town:ASHBY

E. Signatures

This Order is valid for three years from the date of issuance, unless otherwise specified pursuant to General Condition #4. If this is an Amended Order of Conditions, the Amended Order expires on the same date as the original Order of Conditions.

12/6/2024
1. Date of Original Order

Please indicate the number of members who will sign this form. This Order must be signed by a majority of the Conservation Commission.

3
2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

Signatures:

Robert Leary

Cathy Kristofferson

George A. Bauman

Roberta Flashman

☐ by hand delivery on

Date

☒ by certified mail, return receipt requested, on

Date 12/6/24

9589 0710 5270 0902 9457 89

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.

G. Recording Information

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.

ASHBY
Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

ASHBY
Conservation Commission

Please be advised that the Order of Conditions for the Project at:

HOSMER ROAD — Project Location
093-0445 — MassDEP File Number

Has been recorded at the Registry of Deeds of:

County | Book | Page

for:

Property Owner

and has been noted in the chain of title of the affected property in:

Book | Page

In accordance with the Order of Conditions issued on:

Date

If recorded land, the instrument number identifying this transaction is:

Instrument Number

If registered land, the document number identifying this transaction is:

Document Number

Signature of Applicant

Rev. 4/1/2010

Special Conditions:

SC#1. This order shall apply to any successors and assigns in interest or control and any other person engaging in activity on the property identified in the Notice of Intent.

SC#2. A copy of this Order and of all construction and planting plans must be kept on the Site and generally available at all times for contractors to review and comply with upon commencement of any work and during any site work including planting, grading and construction. The original Order of Conditions must be transferred to the owner of the property with every transfer of title of the property until such time as a Certificate of Compliance has been issued by the Ashby Conservation Commission.

SC#3. This document shall be included in all construction contracts, subcontracts, and specifications dealing with the work proposed and shall supersede any conflicting contract requirements. It is the responsibility of the Applicant, Owners and/or successor(s) to ensure that the project engineer and all contractors working on this site are provided with a copy of this Order of Conditions before commencement of construction and those personnel performing the permitted work are fully aware of the permit's terms and conditions. Thereafter, the contractor shall be held jointly liable for any violation of this Order resulting from the failure to comply with its conditions.

SC#4. Work shall halt on the site if a Commission member, Commission representative or DEP representative determines that any of the work is not in compliance with this Order of Conditions. Work shall not resume until the Commission is satisfied that the work will comply, and has so notified the applicant in writing.

SC#5. Any damage caused as a result of this project to any wetland resource area(s) shall be the responsibility of the applicant to repair, restore and/or replace. Sedimentation or erosion into these areas shall be considered fill of that wetland area and thus damage to wetland resource areas. If sediment reaches these areas, the Ashby Conservation Commission and the DEP shall be contacted immediately by the applicant. A plan for abatement of the problem and restoration shall be submitted to the Ashby Conservation Commission and/or DEP for approval. All activities contributing to sedimentation or erosion into resource areas shall cease until an abatement & restoration plan is approved. When possible, debris, sediment and other materials that fall into or otherwise enter any wetlands shall be immediately removed by hand.

SC#6. The Commission reserves the right to impose additional conditions to protect resource areas and interests as defined by MGL Chapter 131 Section 40 (310 CMR 10) if any activity in conjunction with this project results in an alteration of wetland resource area(s) or degradation of surface water quality discharging from the site.

SC#7. At least 72 hours prior to commencement of any excavation or construction, a Pre-Activity conference shall be held on the site with the Applicant, the Project Engineer, the contractor(s) conducting the work, and member(s) of the Conservation Commission in attendance. The purpose of the meeting is to ensure that the requirements of this Order are understood by all parties. It is the

responsibility of the Applicant to arrange this conference to fit the schedule of at least 1 Commission member, and to deliver written notice thereof to all parties at least 48 hours in advance of the conference. This notice shall also advise the Commission of the name(s) and telephone number(s) of the person(s) responsible on site for compliance with this Order. Failure to hold the Pre-Activity conference will result in an immediate cease & desist Enforcement Order put in place until such time as the prescribed conference is held. Proof of filing these Orders of Conditions on the property deed should be brought to the Pre-Activity meeting. Meeting request should be sent to conscom@ashbyma.gov. The Pre-Activity meeting is a prerequisite for Conservation Commission sign-off on project Building Permit application

SC#8. If the Project Engineer changes at any time during execution of the project a Mid-Activity conference shall be held on site prior to the restart of activities with the Applicant, the new Project Engineer, the contractor(s) conducting the work, and members of the Conservation Commission in attendance. The purpose of the meeting is to ensure that the requirements of this Order are understood by all parties. It is the responsibility of the Applicant to arrange this conference to fit the schedule of at least 1 Commission member, and to deliver written notice thereof to all parties at least 48 hours in advance of the conference. This notice shall also advise the Commission of the name(s) and telephone number(s) of the new person(s) responsible on site for compliance with this Order. Failure to hold the Mid-Activity conference will result in an immediate cease & desist Enforcement Order put in place until such time as the prescribed conference is held.

SC#9. The applicant shall designate an Environmental Monitor (EM) to oversee all work within the 100-foot buffer zone on the project site. The EM's responsibilities shall include, but not be limited to, supervision of the maintenance and replacement of all erosion controls and temporary stormwater structures and for ensuring that the project remain in compliance with this Order during construction. The applicant shall provide the Commission with the names(s), address(es) and telephone number(s) of the EM and his or her alternate at the Pre-Activity conference to ensure that the EM can be contacted during an emergency. Prior to any change in EM assignment, updated information shall be provided to the Commission.

SC#10. The Environmental Monitor shall inspect erosion controls on a weekly basis and after any storm events and shall have the authority to modify existing controls or require additional controls if s/he deems it necessary. The EM shall have the authority to require that any erosion problems are addressed immediately and shall immediately notify the Commission if any discharges to a wetland resource area occur.

SC#11. The Environmental Monitor shall report, in writing, to the Commission once every month while the project is underway within the 100-foot buffer zone or any wetland resource area to confirm that all activities are in compliance with the conditions of this Order. The construction phase is the physical process of building and all other associated activities such as landscaping, refurbishing, site clearance, restoration and demolition. **Failure to file a monthly Environmental Monitor report will result in an immediate cease & desist Enforcement Order until the report is received.** The status report shall include photo documentation and written reporting including, at a minimum,

1) a description of any erosion control problems,
2) progress in construction with photos,
3) grading changes,
4) changes in construction schedule or sequence,
5) actions taken to address problems and
6) any other recommendations for site management.

SC#12. No clearing of trees or disturbance of soils shall occur prior to the Pre-Activity conference, except for the minimal disturbance of shrubs and herbaceous plants necessary for installation of erosion or sedimentation control devices where required.

SC#13. Prior to the Pre-Activity conference and commencement of any work on the project site, erosion and sedimentation control measures shall be installed as shown on the referenced plans. The erosion control specifications provided in the Notice of Intent and in the Order of Conditions are the minimum standards for this project. The erosion controls shall be the limit of disturbance between the project and the protected resource areas. No hay bales shall be used within the 100-foot Wetland Buffer Zone. Erosion control methods such as staked wattles or filter mitts that require less disturbance than dug-in silt fencing is preferred, though if silt fencing is used it must be dug in up to the 6" line provided on the fencing. Any bales used to back-up erosion controls must be seed-free straw. All erosion controls, except for siltation fencing, must be free of non-biodegradable materials, covering and netting: no plastic or nylon. All temporary measures will remain in-place and be maintained until permanent vegetation has been established on all adjacent disturbed soil surfaces. The Conservation Commission may require additional or modified erosion control measures at any time before, during and after construction.

SC#14. 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 MassDEP have been completed.

SC#15. Members and agents of the Conservation Commission shall have the right to enter and inspect the premises to evaluate and ensure compliance with the Conditions and performance standards stated in this Order, the Act and 310 CMR 10.00 as well as Mass DEP's Policies. The Commission may acquire any information, measurements, photographs, observations and/or materials or may require the submission of any data or information deemed necessary for that evaluation.

SC#16. Any proposed activity above and beyond that as described in the Plans of Record within jurisdictional resource areas and their Buffer Zones (as defined at 310 CMR 10.04) must be preceded by a negative Determination of Applicability, Order of Resource Area Delineation or an Order of Conditions from the Conservation Commission, unless said activity is a 'minor exempt activity' as defined at 310 CMR 10.58(6)(b) and 310 CMR 10.02(2)(b). Failure to abide by this Special Condition will result in potential enforcement action on the part of the Commission.

SC#17. The referenced plans do not include the installation of an underground storage tank(s) (UST), such as for propane gas, the installation of UST is not permitted under this Order of Conditions. A Notice of Intent must be submitted for the installation of any UST and a Final Order of Conditions

recorded prior to the installation and use of any UST or underground fuel distribution lines within the jurisdiction of the Wetlands Protection Act.

SC#18. Excavated materials not used for backfill shall be removed from the area and disposed of legally. Records shall be kept documenting that excess material has been properly disposed of at a legal site and copies of receipts shall be forwarded to the Conservation Commission.

SC#19. All waste products, refuse, debris, grubbed stumps, slash, excavate, construction materials, etc. shall be disposed of in a legal manner and shall not be incorporated in any manner into the project site with the exception of the reduction of stumps and slash to mulch. No mulch shall be placed in wetlands resource areas.

SC#20. At no time during or after construction shall fill or other materials be placed, slide into or fall beyond the limit of grading as shown on the plan. The applicant shall be responsible for inspecting and maintaining all slopes and shall immediately notify the Conservation Commission if erosion or encroachment occurs.

SC#21. Refueling, servicing, and repair of motorized construction vehicles shall be done outside of the 100-foot Wetland Buffer Zone. Mobile equipment shall be refueled outside of the 100-foot Buffer Zone in the parking area along Route 119 / Townsend Road. Stationary equipment (e.g., pumps, generators) may be refueled in place if necessary. Equipment operators shall be prepared to immediately respond to accidental releases of fuel, motor oil, and other liquids through containment.

SC#22. Mobile equipment with petroleum products or hydraulic fluids shall not be stored overnight within the buffer zone. Under no circumstances shall the project contractor store, stage or locate unconsolidated material or construction equipment not directly associated with the project and subject site within resource areas or the buffer zone.

SC#23. The applicant shall have absorbent materials for use in containing accidental spills available on site at all times. If any release of fuel, motor oil, lubricating oils, etc. occurs, the applicant or designee shall immediately notify the Commission Chair (conscom@ashbyma.gov). A response action or cleanup shall be conducted pursuant to GLc. 21E (Massachusetts Oil and Hazardous Material Release Prevention and Response Act) and the Massachusetts Contingency Plan (MCP).

SC#24. All erosion and sedimentation controls 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 area.

SC#25. An adequate reserve of erosion control materials shall be on site at all times for emergency or routine replacement.

SC#26. Stockpiles of soils, aggregate, or any other unconsolidated construction materials permitted by this Order within 100-foot Buffer Zones shall be covered with tarpaulins or mulch when not in active use. Stockpiles in place for greater than twenty-four (24) hours shall be ringed with an entrenched siltation barrier or staked wattle and covered at the close of each workday. This includes all soils stripped on site. The areas of construction shall remain in a stable condition at the close of each construction day. Erosion controls shall be inspected daily, and maintained or reinforced if necessary. After any storm event, all accumulated silt adjacent to the barriers shall be removed.

SC#27. Temporary stabilization shall include, but not be limited to: hydroseeding, straw mats, jute netting, sod, mulch or other means approved by the Commission prior to its use. Where a slope is steeper than 3:1, temporary stabilization shall be staked or otherwise affixed to the slope. The required inspection reports shall specify the time of installation and type of erosion control measure used. Temporary stabilization shall be biodegradable with no nylon or plastic. Photodegradable material shall not be allowed as substitution for biodegradable temporary stabilization measures.

SC#28. Plans of Record shall be the version May 2024 signed & stamped 11/25/2024, with Sheet C-102 and Sheet G-002 updated Revision 10/03/2024 as defined in Section A.8. Final Approved Plans and Other Documents of this Order of Conditions.

SC#29. Erosion controls shall be **compost filled tubes** free of plastic or other non-biodegradable netting. Photodegradable netting shall not be allowed.

SC#30. Time of year restrictions as prescribed by MassWildlife shall apply for this Project to mitigate the potential for impacts to native brook trout downstream. Specifically, no in-water work shall occur from October to April. The Time of Year work window may be extended if approved by MassWildlife. The Conservation Commission shall be informed if the Time of Year work window is extended.

SC#31 - Construction sequence shall consist generally of the following elements:

1. Mobilize to the site.
2. Reduce impoundment elevation.
3. Install erosion and sediment controls as shown on the Project Drawings.
4. Hold pre-construction site visit with Ashby Conservation Commission. See SC#11.
5. Cut trees and other woody vegetation.
6. Remove stumps and roots and strip topsoil.
   Install cofferdam and turbidity curtain
7. Construct sediment dewatering area.
8. Excavate sediment and deposit in dewatering area.
9. Perform concrete and masonry repairs and subsurface grouting
10. Add cobbles in eroded channel downstream from outfall at southeastern project limit.
11. Remove cofferdam
12. Construct groundwater collection swale and new piping while removing old piping
13. Place geocells and accessible pathway
14. Repave Hosmer Road and accessible parking spaces

15. Spread topsoil and seed.
16. Replace stoplogs.
17. Demobilize from site.
18. Remove erosion controls and turbidity curtain once vegetation is established.

SC#32. A vehicle tire cleaning station to prevent materials from migrating off the site shall be installed in the parking area along Route 119 / Townsend Road.

SC#33. Matting within the limits of Bordering Land Subject to Flooding (BLSF), including the recreational beach area, shall be anchored in place with spikes through eyelets in the matting.

SC#34. No further clearing or impact to the 100' Wetland Buffer or 200' Riverfront Area shall be allowed without additional permitting by the Ashby Conservation Commission. **This shall be noted in the Certificate of Compliance and shall be an ongoing in perpetuity condition.**

SC#35. Fertilizers utilized for landscaping shall be slow release, low-nitrogen types. Pesticides, herbicides, fungicides, and fertilizers shall not be used within the 100-foot Wetland Buffer Zone. **This shall be noted in the Certificate of Compliance and shall be an ongoing in perpetuity condition.**

SC#36. All stabilized slopes shall be maintained as designed and constructed by the property owner and any successors or assigns. This condition shall survive the expiration of this Order, and shall be included as a continuing condition in perpetuity on the Certificate of Compliance. **This shall be noted in the Certificate of Compliance and shall be an ongoing in perpetuity condition.**

SC#37. De-icing chemicals (e.g., sodium, potassium, and calcium chloride) are prohibited on roadways within the 100-foot Wetland Buffer Zone. This condition shall survive the expiration of this Order, and shall be included as a continuing condition in perpetuity on the Certificate of Compliance. **This shall be noted in the Certificate of Compliance and shall be an ongoing in perpetuity condition.**

SC#38. Upon completion of all work regulated by this Order, the Applicant shall submit DEP Form 8A, the request for a Certificate of Compliance, which must include detailed as-built plans depicting post construction conditions on the work site as well as a written description of the post construction site status. Both must be signed and stamped by a professional engineer or land surveyor certifying that the site has been developed in accordance with the conditions of this Order and the site plans referenced within. All disturbed areas must be permanently stabilized, and all temporary stabilization measures along with all erosion controls must be removed before a Certificate of Compliance will be issued.

Massachusetts Department of Environmental Protection 401 Water Quality Certification

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection
100 Cambridge Street 9th Floor Boston, MA 02114 • 617-292-5500

Maura T. Healey
Governor

Kimberley Driscoll
Lieutenant Governor

Rebecca L. Tepper
Secretary

Bonnie Heiple
Commissioner

June 13, 2025

Dan Mortell
180 Beaman St
West Boylston, MA 01583

DEP WQC APPLICATION # 25-WW26-0010-APP
DEP FILE # 093-0445
EEA # 16688
NHESP File # 2024-0139086
NAE # TBD
Complete Application Date: April 14, 2025

RE: COMBINED 401 WATER QUALITY
CERTIFICATION FOR DREDGING & FILL/EXCAVATION
Application for: COMBINED PERMIT – BRP WW 26

AT: Damon Pond – 0 Hosmer Rd, Ashby MA
Damon Pond, Willard Brook State Forest

Dear Mr. Mortell:

The Department of Environmental Protection ("MassDEP") has reviewed your application for a Combined Chapter 91 Permit/401 Water Quality Certification for Dredging and Fill/Excavation ("Combined Permit"), as referenced above and is basing its certification upon an evaluation of the information contained in the application which is relevant to water quality considerations. In accordance with the provisions of Section 401 of the Federal Clean Water Act (33 U.S.C. § 1251 *et seq*.), M.G.L. c. 21, §§ 26-53, and 314 CMR 9.00, MassDEP has determined there is reasonable assurance the project or activity, as conditioned herein, will be conducted in a manner which will not violate applicable water quality standards (314 CMR 4.00) and other appropriate requirements of state law.

The waters of this portion of the Project Drainage Area are designated in the Massachusetts Surface Water Quality Standards as Class B. Such waters are intended "as habitat for fish, other aquatic life and wildlife, and for primary and secondary contact recreation." Antidegradation provisions of these Standards require that "existing uses and the level of water quality necessary to protect the existing uses shall be maintained and protected." These waters are also classified as Outstanding Resource Water ("ORW") as

they are located within the Squannacook and Nissitissit Rivers Sanctuary Area of Critical Environmental Concern ("ACEC"). Accordingly, they are designated for protection under 314 CMR 4.04(3). The discharge of dredged or fill material and/or dredging in an ORW is not permitted, except as otherwise provided in 314 CMR 9.06(3)(a) through (k) and 314 CMR 9.07(1)(k)1. through 5. Pursuant to 314 CMR 9.06(3)(b) and 314 CMR 9.07(1)(k)2.

The above referenced project involves the repair and improvement of the Damon Pond dam in Willard Brook State Forest. This project aims to correct dam safety concerns and improve accessibility to public recreational areas. Concerns about the dam's safety were discovered during a 2019 inspection and repair to the dam includes "masonry, training walls, and concrete dam walls include removal of vegetation, organic matter, loose mortar, and efflorescence." To comply with Mass DEP's policy on Trees in Dams, vegetation including tree and brush will be removed within 20 feet of the dam including any intrusion into masonry walls, spillways and embankments. On Hosmer Road, the bridge and roadway are scheduled for repair and construction of ADA compliant parking and pathways from the road to the southern beach are proposed. Maintenance and infrastructure repair and improvement is slated for public recreation sites at Damon Pond in the Willard Brooks State Forest which will ensure future public access of this site as overseen by DCR.

Sediment Chemistry Results: On 11/19/2020, three samples were collected. One along the upper reach of Damon Pond and two in the impounded sediment closer to the dam. The analytical results were compared to MassDEP's Interim Policy for Sampling, Analysis, Handling and Tracking Requirements for Dredged Sediment Reuse and Disposal (COMM-94-007) and to Reportable Concentration ("RC") S-1 of the Massachusetts Contingency Plan ("MCP"). All results were either non-detect or below the RCS-1 and COMM-94-007 criteria.

Public Notice: The Combined Permit Application public notice was published in The Fitchburg Sentinel Newspaper on April 23, 2025. No comments were received by MassDEP during the 21-day public comment period pursuant to 314 CMR 9.05(3)(e), which ended on May 7, 2025.

Section 61 Findings: Pursuant to M.G.L. Chapter 30, Sections 61 to 62H inclusive [the Massachusetts Environmental Policy Act ("MEPA")], the project, as referenced in the Combined Permit Application, DEP Application # 25-WW26-0010-APP, was required to file an Expanded Environmental Notification Form ("EENF"). The Massachusetts Department of Recreation and Conservation (the "Proponent") filed the EENF for the construction of the project under EEA # 16688 and noticed the EENF in the Environmental Monitor (the "Monitor") on April 10, 2023. In the Certificate issued on May 10, 2023, the Secretary of Energy and Environmental Affairs (the "Secretary") determined that "the potential impacts of this project do not warrant further MEPA review" and granted "a waiver from the categorical requirement to prepare an EIR." MassDEP has reviewed the findings in both the EENF Certificate and the FROD and confirms that based on the avoidance, minimization, and mitigation measures undertaken by the Proponent, in

conjunction with the requirements set forth in this Combined 401 WQC, all outstanding issues have been addressed satisfactorily.

Pursuant to 314 CMR 4.00, 314 CMR 9.05(1), 314 CMR 9.06(1), 314 CMR 9.06(2), 314 CMR 9.07(1), 314 CMR 9.07(2), 314 CMR 9.07(3), 314 CMR 9.07(7), 314 CMR 9.09(1), and 314 CMR 9.09(2), the following Special Conditions are necessary to ensure that sediment dredging and disposal practices are implemented in such a manner as to prevent water quality degradation and to maintain the chemical, physical, and biological integrity of the Waters of the United States within the Commonwealth. These conditions ensure that practicable steps are taken to avoid and minimize water quality impacts from turbidity and sedimentation associated with sediment dredging, disposal, and/or transportation.

Therefore, based on information currently in the record, MassDEP grants a Combined 401 WQC for this project subject to the following conditions to maintain or attain water quality, to minimize any damage to the environment that may result from the project, and to ensure compliance with appropriate provisions of state law. MassDEP certifies that there is reasonable assurance the project or activity, as conditioned herein, will be conducted in a manner which will not violate applicable water quality standards (314 CMR 4.00) and other appropriate requirements of state law.

1. The contractor shall take all steps necessary to assure that the proposed activities will be conducted in a manner that will avoid violations of the anti-degradation provisions of the Massachusetts Surface Water Quality Standards, 314 CMR 4.00, that protect all waters, including wetlands.

2. Prior to the start of work, or for any portion of the work thereafter, MassDEP shall be notified of any change(s) in the proposed project or plans that may affect waters or wetlands. MassDEP will determine whether the change(s) requires a revision to this Certification.

3. Dredging in accordance with this Combined 401 WQC may begin following the 21-day appeal period and once all other permits have been received.

4. All work shall be performed in accordance with the following documents and plans:

    * Application for Combined Permit, Application # 24-WW26-0010-APP, dated April 4, 2025.

    * Plan entitled “Damon Pond Dam Atch 11 Project Plan Set” consisting of 15 sheets, various scales, dated May 2024.

    * Project Narrative titled: “Damon Pond Atch 10 Project Narrative” consisting of 21 pages describing the project dated April 1, 2025.

5. MassDEP shall be notified, attention David Wong, 617-874-7155, david.w.wong@mass.gov, one week prior to the start of in-water work so that MassDEP staff may inspect the work for compliance with the terms and conditions of this Combined 401 WQC.

6. The term of the 401 WQC of the Combined Permit remains in effect for the same duration as the federal permit that requires it.

7. During the project period, there shall be no discharge or spillage of fuel, oil, or other pollutants, including sediments, onto any part of the site. The applicant shall take all reasonable precautions to prevent the release of pollutants by ignorance, accident, or vandalism.

8. No later than four weeks after issuance of this Combined 401 WQC, the applicant shall submit a notification procedure outlining the reporting process to MassDEP for incidents relating to dredging activities that impact surrounding resource areas and habitats including, but not limited to, observed dead or distressed fish or other aquatic organisms, observed oily sheen on the surface of the water, a sediment spill, a turbidity plume beyond the deployed Best Management Practices ("BMPs"), and a barge or equipment accident/spill. If at any time during implementation of the project such an incident occurs, the applicant shall immediately notify MassDEP and all site related activities impacting the water shall cease until the source of the problem is identified and adequate mitigating measures are deployed to the satisfaction of MassDEP.

9. Future maintenance dredging is not authorized under this Combined 401 WQC.

10. Flow to the downstream channel Willard Brook shall be maintained throughout construction of the project.

11. If dewatering is required at any point during construction, heated or sediment laden water shall not be allowed to re-enter the brook directly. Sediment control will be of the utmost importance (See Condition #16).

12. The applicant, or its contractor, shall make every feasible effort to complete the project within the Combined 401 WQC timeframe. Should the applicant, or their contractor, fail to complete the project and wish to request an amendment to the Combined 401 WQC for incursion into the no-dredge period, the written request shall be received by MassDEP by January 1st. The following information shall be included in the request:

    a. project location and 401 WQC Application number,
    b. the date on which dredging started,
    c. the number of days and hours per day the dredge operated,
    d. expected daily average production rate and the actual daily average production rate,

e. an explanation of why the project failed to remain on schedule,
f. an account of efforts made to get the project back on schedule,
g. a plan depicting the areas that remain to be dredged,
h. the number of cubic yards that remain to be dredged,
i. an accurate estimate of the number of days required to complete the project,
j. an evaluation of the impact of continued dredging on the species of concern,
k. a description of any efforts that will be made to minimize the impact of the project on
l. the species of concern, and a realistic assessment of any societal/financial effects of a denial of permission to continue dredging.

MassDEP will share the information with other resource agencies and a decision to grant or deny the amendment shall be made by January 15th. Requests for amendment received after January 1st will be considered at MassDEP's discretion.

13. All equipment/machinery shall be stored above the High Water Mark ("HWM") and outside any wetland resource areas when not in use.

14. All sediment management activities authorized under this Combined 401 WQC shall be conducted under the supervision of a Licensed Site Professional ("LSP").

15. BMPs such as a silt curtain shall be deployed surrounding the dredge area to minimize turbidity. At a minimum, the silt curtain shall be bottom weighted to minimize the degree of lifting/failing and shall be of suitable material/grade based on the velocity of the current at the site. Intermediate vertical floats shall be placed on the silt curtain to lift the bottom of the silt curtain at low tide so that the bottom edges of the curtain remain close to the mudline at low tide but do not rake the sediment in areas subject to tidal influence.

16. No later than 21 days prior to commencement of dredging activity, a dredged material dewatering plan shall be submitted to MassDEP for review and written approval. At a minimum, the dewatering plan shall include, but not be limited to, the location of the dewatering area, the type of containment, method of dewatering (i.e. mechanical or by gravity), method of collecting the dewatered effluent, and method of disposal.

17. Within 30 days of the completion of dredging, photographs of the affected areas depicting post-dredge conditions shall be taken and submitted to David Wong david.w.wong@mass.gov at MassDEP.

18. The applicant shall submit a turbidity, total suspended solids and dissolved oxygen monitoring plan to MassDEP for review and acceptance within eight weeks of the effective date of this Certification or four weeks prior to the commencement of the dredging operation whichever comes first.

19. BMPs shall be deployed to minimize turbidity during temporary cofferdam construction. At a minimum, silt curtains shall be used to control turbidity at the surrounding areas. Water quality nearby the construction areas such as turbidity (NTU) should be monitored during before, during, and after cofferdam construction to ensure that water quality standards are met. Turbidity monitoring data should be kept on site and available for MassDEP review upon request.

Failure to comply with this Combined 401 WQC is grounds for enforcement, including civil and criminal penalties, under M.G.L. c. 21, § 42, 314 CMR 9.00, M.G.L. c. 21A, § 16, 310 CMR 5.00, or other possible actions/penalties as authorized by the General Laws of the Commonwealth.

This Combined 401 WQC does not relieve the applicant of the obligation to comply with other appropriate state or federal statutes or regulations. Any changes made to the project as described in the previously submitted Combined Permit Application or supplemental documents will require further notification to and, if an amendment is required, approval by MassDEP.

NOTICE OF APPEAL RIGHTS

Certain persons shall have a right to request an adjudicatory hearing concerning 401 WQCs by MassDEP when an application is required:

a. the applicant or property owner;
b. any person aggrieved by the decision who has submitted written comments during the public comment period;
c. any ten persons of the Commonwealth pursuant to M.G.L. c. 30A where a group member has submitted written comments during the public comment period; or
d. any governmental body or private organization with a mandate to protect the environment, which has submitted written comments during the public comment period.

Any person aggrieved, any ten persons of the Commonwealth, or a governmental body or private organization with a mandate to protect the environment may appeal without having submitted written comments during the public comment period only when the claim is based on new substantive issues arising from material changes to the scope or impact of the activity and not apparent at the time of public notice. To request an adjudicatory hearing pursuant to M.G.L. c. 30A, § 10, a Notice of Claim must be made in writing, provided that the request is made by certified mail or hand delivery to MassDEP, with the appropriate filing fee specified within 310 CMR 4.10 along with a DEP Fee Transmittal Form within 21 days from the date of issuance of this Certificate.

Department of Environmental Protection
Case Administrator
Office of Appeals and Dispute Resolution

100 Cambridge Street, Suite 900
Boston, MA 02114

A copy of the request shall at the same time be sent by certified mail or hand delivery to the issuing office of the Wetlands Program at:

Department of Environmental Protection
Wetlands Program
100 Cambridge Street, Suite 900
Boston, MA 02114

A Notice of Claim for Adjudicatory Hearing shall comply with MassDEP's Rules for Adjudicatory Proceedings, 310 CMR 1.01(6), and shall contain the following information pursuant to 314 CMR 9.10(3):

a. the Combined Permit Application Number;
b. the complete name of the applicant and address of the project;
c. the complete name, address, and fax and telephone numbers of the party filing the request, and, if represented by counsel or other representative, the name, fax and telephone numbers, and address of the attorney;
d. if claiming to be a party aggrieved, the specific facts that demonstrate that the party satisfies the definition of "aggrieved person" found at 314 CMR 9.02;
e. a clear and concise statement that an adjudicatory hearing is being requested;
f. a clear and concise statement of (1) the facts which are grounds for the proceedings, (2) the objections to this Certificate, including specifically the manner in which it is alleged to be inconsistent with the MassDEP's Water Quality Regulations, 314 CMR 9.00, and (3) the relief sought through the adjudicatory hearing, including specifically the changes desired in the final written 401 WQC; and
g. a statement that a copy of the request has been sent by certified mail or hand delivery to the applicant, the owner (if different from the applicant), the conservation commission of the city or town where the activity will occur, the Department of Conservation and Recreation (when the certificate concerns projects in Areas of Critical Environmental Concern), the public or private water supplier where the project is located (when the certificate concerns projects in Outstanding Resource Waters), and any other entity with responsibility for the resource where the project is located.

The hearing request along with a DEP Fee Transmittal Form and a valid check or money order payable to the Commonwealth of Massachusetts in the amount of one hundred dollars ($100) must be mailed to:

Commonwealth of Massachusetts
Department of Environmental Protection
Commonwealth Master Lockbox
PO Box 4062

Boston, MA 02211

The request will be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver. The filing fee is not required if the appellant is a city or town (or municipal agency), county, or district of the Commonwealth of Massachusetts, or a municipal housing authority. MassDEP may waive the adjudicatory hearing filing fee pursuant to 310 CMR 4.06(2) for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file an affidavit setting forth the facts believed to support the claim of undue financial hardship together with the hearing request as provided above.

Should you have any questions relative to this Combined 401 WQC, please contact David Wong, david.w.wong@mass.gov.

Sincerely,



Lisa Rhodes
Wetlands Program Chief

enclosure: Communication For Non-English Speaking Parties - 310 CMR 1.03(5)(a)
Project Plan Set

ecc: Tim Bauman, Ashby Conservation Commission, 960 Massachusetts Ave, Lunenburg MA 01462
Lucas Acaba, Tighe & Bond, 90 James St, Greenfield MA 01301
Judith Schmitz, MassDEP CERO, 8 New Bond St Worcester MA, 01606
Edward Reiner, EPA, 5 Post Office Square, Suite 100, Boston, MA 02109
Maninder Singh, Regulatory/Enforcement Division, U.S. Army Corps of Engineers, 696 Virginia Road, Concord, MA 01742-2751



Communication for Non-English-Speaking Parties

This document is important and should be translated immediately.

If you need this document translated, please contact MassDEP's Director of Environmental Justice at the telephone number listed below.

Español Spanish

Este documento es importante y debe ser traducido inmediatamente. Si necesita traducir este documento, póngase en contacto con el Director de Justicia Ambiental de MassDEP (*MassDEP's Director of Environmental Justice*) en el número de teléfono que figura más abajo.

Português Portuguese

Este documento é importante e deve ser traduzido imediatamente. Se você precisar traduzir este documento, entre em contato com o Diretor de Justiça Ambiental do MassDEP no número de telefone listado abaixo.

繁體中文 Chinese Traditional

本文檔很重要，需要即刻進行翻譯。
如需對本文檔進行翻譯，請透過如下列示電話號碼與 MassDEP 的環境司法總監聯絡。

简体中文 Chinese Simplified

这份文件非常重要，需要立即翻译。
如果您需要翻译这份文件，请通过下方电话与 MassDEP 环境司法主任联系。

Ayisyen Kreyòl Haitian Creole

Dokiman sa a enpòtan epi yo ta dwe tradui l imedyatman. Si w bezwen tradui dokiman sa a, tanpri kontakte Direktè. Jistis Anviwònmantal MassDEP a nan nimewo telefòn ki endike anba a.

Việt Vietnamese

Tài liệu này và quan trọng và phải được dịch ngay. Nếu quý vị cần bản dịch của tài liệu này, vui lòng liên hệ với Giám Đốc Phòng Công Lý Môi Trường của MassDEP theo số điện thoại được liệt kê bên dưới.

ប្រទេសកម្ពុជា Khmer/Cambodian

ឯកសារនេះមានសារៈសំខាន់
ហើយគប្បីត្រូវបានបកប្រែភ្លាមៗ។
ប្រសិនបើអ្នកត្រូវការអោយឯកសារនេះបកប្រែ
សូមទាក់ទងនាយកផ្នែកយុត្តិធម៌បរិស្ថានរបស់
MassDEPតាមរយៈលេខទូរស័ព្ទដែលបានរាយក្នុងខាងក្រោម។

Kriolu Kabuverdianu Cape Verdean

Es dokumentu sta important i tenki ser tradusidu immediatamenti. Se nho ta presisa ke es dokumentu sta tradisidu, por favor kontata O Diretor di Justisia di Environman di DEP ku es numero di telifoni menxionadu di baixo.

Contact Deneen Simpson 857-406-0738
Massachusetts Department of Environmental Protection
100 Cambridge Street 9th Floor Boston, MA 02114
TTY# MassRelay Service 1-800-439-2370 • https://www.mass.gov/environmental-justice
(Version revised 8.2.2023) 310 CMR 1.03(5)(a)

Русский Russian

Это чрезвычайно важный документ, и он должен быть немедленно переведен. Если вам нужен перевод этого документа, обратитесь к директору Департамента экологического правосудия MassDEP (MassDEP's Director of Environmental Justice) по телефону, указанному ниже.

العربية Arabic

هذه الوثيقة مهمة وتجب ترجمتها على الفور.

إذا كنت بحاجة إلى ترجمة هذه الوثيقة، فيرجى الاتصال بمدير العدالة البيئية في MassDEP على رقم الهاتف المذكور أدناه.

한국어 Korean

이 문서는 중대하므로 즉시 번역되어야 합니다.
본 문서 번역이 필요하신 경우, 매사추세츠 환경보호부의 "환경정의" 담당자 분께 문의하십시오. 전화번호는 아래와 같습니다.

հայերեն Armenian

Այս փաստաթուղթը կարևոր է, և պետք է անհապաղ թարգմանել այն:
Եթե Ձեզ անհրաժեշտ է թարգմանել այս փաստաթուղթը, դիմեք Մասաչուսեթսի շրջակա միջավայրի պահպանության նախարարության (MassDEP) Բնապահպանական հարցերով արդարադատության ղեկավարին (Director of Environmental Justice)՝ ստորև նշված հեռախոսահամարով

فارسی Farsi Persian

این دوشتار بسیار مهمی است و باید فوراً ترجمه شود.
اگر نیاز به ترجمه این دوشتار دارید لطفاً با مدیر عدالت محیط زیستی MassDEP در شماره تلفن ذکر شده زیر تماس بگیرید.

Français French

Ce document est important et doit être traduit immédiatement. Si vous avez besoin d'une traduction de ce document, veuillez contacter le directeur de la justice environnementale du MassDEP au numéro de téléphone indiqué ci-dessous.

Deutsch German

Dieses Dokument ist wichtig und muss sofort übersetzt werden. Wenn Sie eine Übersetzung dieses Dokuments benötigen, wenden Sie sich bitte an MassDEP's Director of Environmental Justice *(Direktor für Umweltgerechtigkeit in Massachusetts)* unter der unten angegebenen Telefonnummer.

Ελληνική Greek

Το έγγραφο αυτό είναι πολύ σημαντικό και πρέπει να μεταφραστεί αμέσως. Αν χρειάζεστε μετάφραση του εγγράφου αυτού, παρακαλώ επικοινωνήστε με τον Διευθυντή του Τμήματος Περιβαλλοντικής Δικαιοσύνης της Μασαχουσέτης στον αριθμό τηλεφώνου που αναγράφεται παρακάτω

Italiano Italian

Questo documento è importante e deve essere tradotto immediatamente. Se hai bisogno di tradurre questo documento, contatta il Direttore della Giustizia Ambientale di MassDEP al numero di telefono sotto indicato.

Język Polski Polish

Ten dokument jest ważny i powinien zostać niezwłocznie przetłumaczony. Jeśli potrzebne jest tłumaczenie tego dokumentu, należy skontaktować się z dyrektorem ds. sprawiedliwości środowiskowej MassDEP pod numerem telefonu podanym poniżej.

हिन्दी Hindi

यह दस्तावेज महत्वपूर्ण है और इसका अनुवाद तुरंत किया जाना चाहिए। यदि आपको इस दस्तावेज का अनुवाद कराने की जरूरत है, तो कृपया नीचे दिए गए टेलीफोन नंबर पर MassDEP के पर्यावरणीय न्याय निदेशक से संपर्क करें।

Contact Deneen Simpson 857-406-0738
Massachusetts Department of Environmental Protection
100 Cambridge Street 9th Floor Boston, MA 02114
TTY# MassRelay Service 1-800-439-2370 • https://www.mass.gov/environmental-justice
(Version revised 8.2.2023) 310 CMR 1.03(5)(a)

Tighe & Bond

United States Army Corps of Engineers Pre-Construction Notification Authorization

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

June 24, 2025

Regulatory Division
File Number: NAE-2025-01208

Christopher DeTurk
Massachusetts Department of Conservation and Recreation

180 Beaman Street
West Boylston, Massachusetts 01583
Sent by email: Christopher.DeTurk@state.ma.us

Dear Mr. DeTurk:

The U.S. Army Corps of Engineers (USACE) has reviewed your application to repair an existing dam's masonry and concrete walls, excavation of sediment at the upstream end of the dam, removal of vegetation to address safety deficiencies, and structural repairs to the Hosmer Road. The impacts associated with this project are shown below:

Area (sf)	Length (lf)	Volume (cy)	Duration	Purpose
8,500	147	1,000	9 months	Cofferdam, excavation and access.
1,800			9 months	Downstream water control.
180	85		9 months	Reconstruction of falling wall.
10	10		9 months	AC pipe removal.

This project is located in Damon Pond at Hosmer Road, Ashby, Massachusetts. The work is shown on the enclosed plans titled "Department of Conservation and Recreation Damon Pond Dam Repairs And Area Improvements Ashby, Massachusetts," on fifteen sheets, and dated "August 2022."

Based on the information that you have provided, we verify that the activity is authorized under General Permit # 02 and # 24 of the June 2, 2023, federal permit known as the Massachusetts General Permits (GPs). The GPs are available at https://www.nae.usace.army.mil/Missions/Regulatory/State-General-Permits/Massachusetts-General-Permit.

Please review the 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:

You must complete and return the enclosed Work Start Notification Form to this office at least two weeks before the anticipated start date. You must complete and return the enclosed Compliance Certification Form within one month following the completion of the authorized work.

This authorization presumes that the work as described above and as shown on your plans noted above is in waters of the U.S.

This authorization expires on 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 Crystal Gardner of my staff at crystal.i.gardner@usace.army.mil or (978) 318-8332 or if you have any questions.

Sincerely,

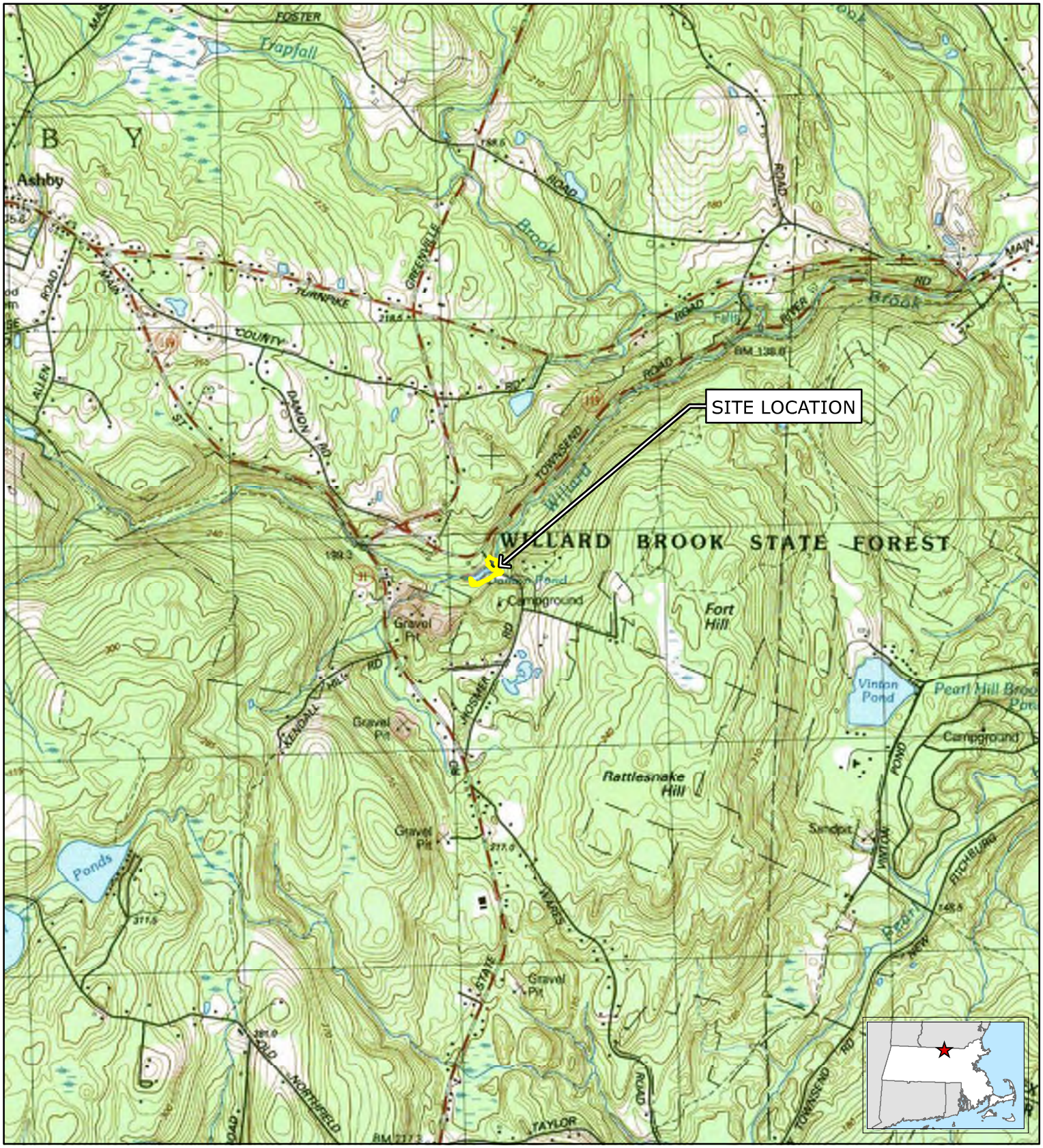
Kara Hellige

Kara A. Hellige
Chief, Massachusetts Branch
Regulatory Division

Enclosures

cc:

Melissa P. Coady, Tighe & Bond Inc., MPCoady@tighebond.com
Nathan Margason, U.S. EPA, Region 1, Boston, MA margason.nathan@epa.gov
Rachel Croy, U.S. EPA, Region 1, Boston, MA, croy.rachel@epa.gov
Sean Duffey, Coastal Zone Management, Boston, MA, sean.duffey@mass.gov
Patrice Bordonaro, Coastal Zone Management, Boston, MA,
patrice.bordonaro@mass.gov
David Wong, MassDEP, david.w.wong@mass.gov



LEGEND

Approximate Limit of Site Work

Tighe&Bond

Based on USGS Topographic Map for Ashby, MA Revised 1988.
Contour Interval Equals 3 meters.

1:24,000

0 1,000 2,000

Feet

N

FIGURE 1
SITE LOCATION

Damon Pond Dam Repairs
and Area Improvements
Willard Brook State Forest
Ashby, Massachusetts

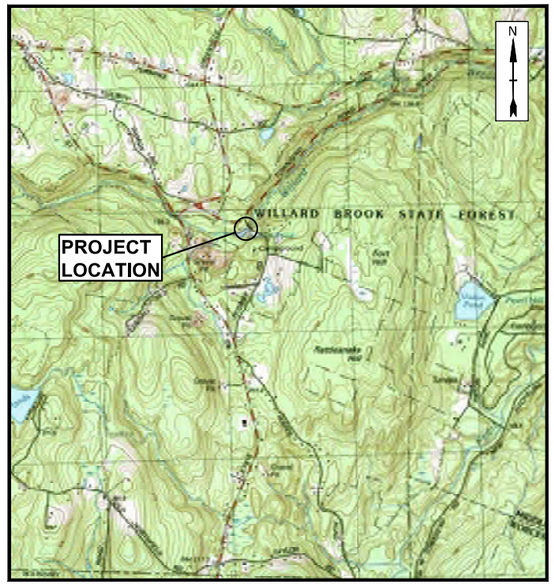
April 2021

V:\Projects\M\M0736\DamonPond\Figures\DamonPond_AshbyMA_Topo.mxd [Exported By: kjw, 4/20/2021, 12:22:32 PM]

M0736

MASSACHUSETTS DEPARTMENT OF CONSERVATION AND RECREATION
DAMON POND DAM REPAIRS AND AREA IMPROVEMENTS
WILLARD BROOK STATE FOREST
ASHBY, MASSACHUSETTS
AUGUST 2022

LIST OF DRAWINGS		
SHEET NO.	DRAWING NO.	DRAWING TITLE
GENERAL		
1	G-001	COVER SHEET
2	G-002	GENERAL NOTES, LEGEND, AND ABBREVIATIONS
CIVIL		
3	C-101	EXISTING CONDITIONS PLAN
4	C-102	PROPOSED SITE PLAN
5	C-103	DETAILS - 1
6	C-104	EROSION AND SEDIMENT CONTROL DETAILS
7	C-105	SEDIMENT HAUL ROUTE AND DISPOSAL LOCATION SITE PLAN
STRUCTURAL		
8	S-001	STRUCTURAL NOTES
9	S-101	REPAIR AND PHOTO LOCATION PLAN
10	S-501	DEMOLITION DETAILS
11	S-502	DEMOLITION DETAILS
12	S-503	REPAIR DETAILS
13	S-504	REPAIR DETAILS
14	S-505	REPAIR DETAILS
15	S-506	TRASH RACK DETAILS



LOCATION MAP
1:24000

PREPARED BY:

Tighe&Bond

PREPARED FOR:

MASSACHUSETTS DEPARTMENT OF
CONSERVATION AND RECREATION
OFFICE OF DAM SAFETY
251 CAUSEWAY STREET, SUITE 600
BOSTON, MA 02114

COMPLETE SET 15 SHEETS

Last Saved: 8/26/2022
Plotted: Aug 26, 2022 - 1:58pm By: LPT
Tighe & Bond: J:\M\M0736 MA DCR Engineering Services MSA\82 - Damon Pond Dam\82A - Design Permitting and Construction\Drawings-Figures\AutoCad\Sheets\M736-Task82A-Cover.dwg

EROSION AND SEDIMENTATION CONTROL NOTES:

E1. TEMPORARY SEDIMENT AND EROSION CONTROL BY THE CONTRACTOR SHALL BE PERFORMED IN ACCORDANCE WITH THE SPECIFICATIONS LISTED BELOW.

E2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING ALL TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES NECESSARY TO EXECUTE AND COMPLETE THE WORK OF THE CONTRACT, IN COMPLIANCE WITH THE TERMS AND CONDITIONS CONTAINED IN THE CONTRACT AND PROJECT PERMITS. CONTROLS SHOWN ON THE CONTRACT DRAWINGS AND MENTIONED IN THE TECHNICAL SPECIFICATIONS SHALL BE CONSIDERED MINIMUM REQUIREMENTS. THE CONTRACTOR SHALL EMPLOY WHATEVER SUPPLEMENTARY MEASURES NECESSARY TO PROTECT WETLANDS, WATERS, AND ADJACENT AREAS FROM DISTURBANCE OR DISCHARGE OF SEDIMENTS.

E3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING SEDIMENT AND EROSION CONTROLS TO MEET THE CONDITIONS OF ALL APPLICABLE PERMITS AND REGULATIONS. SUCH CONTROLS SHALL BE INSTALLED WHEREVER THE POTENTIAL EXISTS FOR THE DISTURBANCE OF LAND OR THE TRANSPORT OF SEDIMENT.

E4. EROSION AND SEDIMENTATION CONTROLS SHALL CONSIST OF COMPOST WATTLES INSTALLED PER DETAILS PROVIDED ON SHEET 5.

E5. COMPOST WATTLES SHALL BE INSTALLED PRIOR TO COMMENCEMENT OF CLEARING AND GRUBBING ACTIVITIES. LOCATION OF COMPOST WATTLES TO BE ADJUSTED UPON COMPLETION OF CLEARING AND GRUBBING BUT PRIOR TO COMMENCEMENT OF GRADING ACTIVITIES.

E6. ALL EROSION AND SEDIMENTATION CONTROLS SHALL BE MAINTAINED IN GOOD CONDITION AND PROPER WORKING ORDER. NECESSARY REPAIRS SHALL BE MADE IMMEDIATELY.

E7. ALL EROSION AND SEDIMENTATION CONTROLS SHALL BE PROPERLY DISPOSED OFF-SITE UPON COMPLETION OF WORK, SITE STABILIZATION AND/OR AUTHORIZATION FROM THE OWNER.

E8. COFFERDAMS SHALL BE INSTALLED IN PHASES AS INDICATED ON THE CONTRACT DRAWINGS. ALL COFFERDAMS SHALL CONSIST OF NON-ERODIBLE MATERIAL.

BEST MANAGEMENT PRACTICES

INSPECTION AND MAINTENANCE
- SEDIMENT AND EROSION CONTROLS AND BMPS SHALL BE INSTALLED PRIOR TO COMMENCING CONSTRUCTION AT THE SITE. NO WORK WHICH SHALL DISTURB THE SITE OR CREATE THE POTENTIAL FOR SEDIMENT RELEASE SHALL COMMENCE UNTIL THE SEDIMENT AND EROSION CONTROLS HAVE BEEN INSPECTED AND APPROVED BY THE OWNER, ENGINEER, AND REGULATORY AGENCIES. ALL CONTROLS AND BMPS SHALL BE SUBJECT TO INSPECTION BY THE OWNER, HIS REPRESENTATIVE, AND REGULATORY AGENCIES AT ANYTIME THEREAFTER.
- PERIODIC INSPECTION, MAINTENANCE, AND CLEANING OF TEMPORARY EROSION OF SEDIMENT CONTROL MEASURES AND BEST MANAGEMENT PRACTICES (BMPS) SHALL BE REQUIRED. ALL CONTROLS AND BMPS SHALL BE INSPECTED EVERY 7 DAYS AND WITHIN 24 HOURS OF RAINFALL EVENTS OF 0.5 INCHES OR GREATER. ROUTINE INSPECTION AND MAINTENANCE WILL REDUCE THE CHANCE OF POLLUTING STORMWATER BY FINDING AND CORRECTING PROBLEMS BEFORE THE NEXT RAIN EVENT. THE FOCUS OF THE INSPECTION WILL BE TO DETERMINE:
  1) WHETHER OR NOT THE MEASURE WAS INSTALLED / PERFORMED CORRECTLY;
  2) WHETHER OR NOT THERE HAS BEEN ANY DAMAGE TO THE MEASURE SINCE IT WAS INSTALLED OR PERFORMED; AND
  3) WHAT SHOULD BE DONE TO CORRECT ANY PROBLEMS WITH THE MEASURE. EACH MEASURE IS TO BE OBSERVED TO DETERMINE IF IT IS STILL EFFECTIVE.

  IN SOME CASES, SPECIFIC MEASUREMENTS MAY BE TAKEN TO DETERMINE IF MAINTENANCE OF THE MEASURES IS REQUIRED.

SITE MANAGER
- PRIOR TO CONSTRUCTION, A SITE MANAGER WILL BE DESIGNATED BY THE CONTRACTOR TO BE RESPONSIBLE FOR INSTALLATION, MONITORING, INSPECTION, AND CORRECTION OF EROSION AND SEDIMENT CONTROL MEASURES.

CONSTRUCTION SITE ENTRANCE
- TO REDUCE THE TRACKING OF SEDIMENT FROM THE CONSTRUCTION SITE ONTO OTHER AREAS OF THE PROPERTY AND/OR PUBLIC ROADS, AS WELL AS THE PRODUCTION OF AIRBORNE DUST, A STABILIZED CONSTRUCTION ENTRANCE IS TO BE ESTABLISHED AND AT ANY ADDITIONAL AUTHORIZED PERMANENT CONSTRUCTION STAGING AREA.
- THE ENTRANCE IS TO CONSIST OF A 6-INCH THICK PAD OF CRUSHED STONE UNDERLAIN WITH FILTER FABRIC OR A BITUMINOUS CONCRETE APRON. IT IS TO BE REMOVED AND THE AREA RESTORED FOLLOWING CONSTRUCTION.

SITE CLEARING
- DURING SITE CLEARING, EXISTING VEGETATION WITHIN THE OVERALL LIMITS OF CLEARING AND GRUBBING SHALL BE CLEARED AND REMOVED, EXCEPT AS OTHERWISE DIRECTED. THIS INCLUDES ALL VEGETATION ON THE DAM EMBANKMENT AND WITHIN 20 FEET OF THE DAM EMBANKMENT.
- PRIOR TO ANY SITE CLEARING ACTIVITIES, SEDIMENT CONTROL BARRIERS SHALL BE PLACED ALONG THE OUTER LIMIT OF DISTURBANCE.
- CLEARING IS TO BE LIMITED TO THOSE AREAS OF PROPOSED WORK. DISTURBED AREAS ARE TO BE KEPT TO A MINIMUM. NO TREE WITH A BREAST HEIGHT DIAMETER OF GREATER THAN 6 INCHES SHALL BE CLEARED FROM AREAS OUTSIDE THE LIMITS OF CLEARING AND GRUBBING WITHOUT PRIOR APPROVAL FROM THE OWNER.

EROSION CONTROL BARRIERS
- COMPOST WATTLE BARRIERS ARE TO BE PLACED TO TRAP SEDIMENT TRANSPORTED BY RUNOFF BEFORE IT REACHES THE DRAINAGE FEATURES, WATERBODIES, OR WETLANDS, IN ADDITION TO AREAS WHERE HIGH RUNOFF VELOCITIES OR HIGH SEDIMENT LOADS ARE EXPECTED.THE COMPOST WATTLES ARE TO BE REPLACED AS DETERMINED BY PERIODIC FIELD INSPECTIONS.

DUST CONTROL
- STANDARD DUST CONTROL MEASURES, INCLUDING SPRAYING AND MISTING SHALL BE USED AS NECESSARY. CALCIUM CHLORIDE SHALL NOT BE ALLOWED ON THIS PROJECT.

STAGING AREAS
- THE CONTRACTOR SHALL COORDINATE LAYDOWN STAGING AREAS IN WHICH TO STORE EQUIPMENT AND MATERIALS WITH THE OWNER.
- STAGING AREAS SHALL BE SURROUNDED WITH COMPOST WATTLE EROSION BARRIERS ON THE DOWN HILL SIDE.
- DURING AND AFTER CONSTRUCTION, ALL PAVED ROAD AND DRIVEWAY SURFACES ARE TO BE SCRAPED AND BROOMED FREE OF EXCAVATED MATERIALS ON A DAILY BASIS, UNLESS APPROVED BY THE OWNER.

STOCKPILED MATERIALS
- STOCKPILES OF SOIL CREATED DURING CONSTRUCTION ACTIVITIES ARE TO BE SURROUNDED WITH EROSION CONTROL BARRIER AROUND THE PERIMETER OF THE STOCKPILE. STOCKPILES OF ERODIBLE MATERIAL ARE TO BE COVERED PRIOR TO INCLEMENT WEATHER WITH A MINIMUM OF 20 MIL POLYETHYLENE SHEETING. STOCKPILES LEFT UNDISTURBED LONGER THAN 14 DAYS SHALL BE SEEDED OR COVERED.

EQUIPMENT FUELING
- EQUIPMENT FUELING AND OTHER ACTIVITIES INVOLVING PETROLEUM, OIL, OR OTHER POTENTIALLY HAZARDOUS SUBSTANCES ARE TO BE PERFORMED AT PRE-APPROVED, DESIGNATED AREAS WITH APPROPRIATE SPILL PREVENTION AND CONTROL MEASURES. PORTABLE SECONDARY CONTAINMENT IS TO BE USED, AND SORBENT MATERIALS ARE TO BE PLACED AROUND THE PERIMETER OF THE FUELING AREA.

CONSTRUCTION DEWATERING
- CONSTRUCTION DEWATERING SHALL BE REQUIRED DURING PORTIONS OF CONSTRUCTION WHICH REQUIRE EXCAVATION OR OTHER ACTIVITIES WHERE GROUNDWATER MAY INTERFERE WITH THE WORK. CONSTRUCTION DEWATERING DISCHARGE TO A SURFACE WATER BODY SHALL BE PRE-TREATED FOR SEDIMENT REMOVAL BY PASSING THROUGH AN APPROPRIATELY SIZED FILTER SOCK, SILT BAG, FRACTIONATION / SEDIMENTATION TANK, OR SEDIMENT TRAP PRIOR TO DISCHARGE, AS NECESSARY.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING DEWATERING TECHNIQUES AND MAINTAINING DEWATERING PROCEDURES THROUGHOUT THE DURATION OF THE PROJECT.

OUTLET PROTECTION
- APPROPRIATE OUTLET PROTECTION, CONSISTING OF RIPRAP CHANNEL LINING, A LEVEL SPREADER, OR OTHER SUCH MEASURE SHALL BE PROVIDED AT THE OUTLET OF ANY DEWATERING CONDUIT OR STORMWATER CULVERT OR CHANNEL OUTFALL TO REDUCE VELOCITIES AND ENHANCE SEDIMENTATION PRIOR TO DISCHARGE.

SURFACE WATER CONTROL
- MAINTAIN FLOW THROUGH A PORTION OF SPILLWAY AND THE OUTLET STRUCTURE AT ALL TIMES. THE IMPOUNDMENT MAY BE DRAWN DOWN TO ACCOMMODATE THE WORK. THE CONTRACTOR SHALL SUBMIT A WATER CONTROL PLAN THAT WILL ADDRESS EMERGENCY MEASURES TO IMPLEMENT IN THE EVENT A STORM OCCURS DURING CONSTRUCTION.

TURBIDITY MONITORING AND CONTROL
- TURBIDITY SHALL BE MONITORED AND CONTROLLED BY THE CONTRACTOR. A TURBIDITY CURTAIN SHALL BE INSTALLED SURROUNDING AREAS OF EXCAVATION AT AND BELOW THE IMPOUNDMENT WATER LINE.
- IF TURBIDITY LEVELS ARE UNACCEPTABLE AS JUDGED BY THE OWNER, ENGINEER, OR REGULATORY AGENCY, ADDITIONAL MEASURES SHALL BE IMPLEMENTED AT NO EXPENSE TO THE OWNER.

LIMITS OF WORK
- THE CONTRACTOR SHALL LINE THE UPGRADIENT BOUNDARY OF WORK AREAS WITH ORANGE SAFETY FENCING BEFORE THE START OF SITE CLEARING ACTIVITIES.

TEMPORARY STABILIZATION
- WHEN NECESSARY, TEMPORARY SLOPE PROTECTION SHALL BE PROVIDED BY INSTALLING SEDIMENT TRAP BARRIERS AT THE TOE OF FILLS OR CUT SLOPES. IF ADDITIONAL STABILIZATION IS NEEDED, THEN THE CONTRACTOR SHALL INSTALL MULCH LOGS, MATTING, SUCH AS STRAW, JUTE, WOOD FIBER, OR BIODEGRADABLE MESH. A TACKIFIER SHALL BE USED ON LOOSE MATERIALS USED FOR TEMPORARY EROSION CONTROL.
- IN THE EVENT THAT DISTURBED AREAS AT THE SITE ARE TO BE LEFT UN-WORKED FOR MORE THAN TWO WEEKS, THE AREAS SHALL BE MULCHED WITH STRAW AT A RATE OF 100 LBS. PER 1,000 S.F. TO HELP CONTROL EROSION. 100% BIODEGRADABLE EROSION CONTROL BLANKETS OR TWO INCHES OF WOOD CHIP MULCH MAY ALSO BE USED AS TEMPORARY COVER.
- IN THE EVENT THAT DISTURBED AREAS AT THE SITE ARE TO BE LEFT UN-WORKED FOR MORE THAN ONE MONTH, THE AREAS SHALL BE TOPSOILED AND SEEDED AS PER THE SPECIFICATIONS AND AT NO ADDITIONAL COST TO THE OWNER.
- LEAVE THE SURFACE OF ALL EXCAVATIONS AND FILLS IN A FIRM AND STABLE CONDITION AT THE END OF EACH DAY. ROLL OR OTHERWISE TREAT THE SURFACE AS NEEDED.

SITE RESTORATION
- STABILIZATION OF DISTURBED AREAS OR NEW SOIL FILLS SHALL BE IMPLEMENTED WITHIN 14 DAYS AFTER GRADING OR CONSTRUCTION ACTIVITIES HAVE PERMANENTLY CEASED. APPROPRIATE VEGETATIVE SOIL STABILIZATION IS TO BE USED TO MINIMIZE EROSION. TEMPORARY AND PERMANENT VEGETATIVE COVER IS TO BE ESTABLISHED IN ACCORDANCE WITH THE PROJECT PLANS AND SPECIFICATIONS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORATION OF PREVIOUSLY VEGETATED UPLAND AREAS DISTURBED BY CONSTRUCTION ACTIVITIES. RESTORATION OF UPLAND AREAS CONSIST OF REPLACEMENT OF TOPSOIL AND APPROPRIATELY SEEDED AND STABILIZED.
- DISTURBED UPLAND AREAS SHALL THEN BE HYDROSEEDED WITH AN APPROVED SEED MIX AT THE RATE RECOMMENDED BY THE MANUFACTURER. SEEDING RATE SHALL BE DOUBLED FOR DORMANT SEEDING. SEED MIX SHALL BE AS FOLLOWS OR AS APPROVED BY THE ENGINEER:

THE NEW ENGLAND EROSION CONTROL/RESTORATION MIX FOR DRY SITES:

COMMON NAME	BOTANICAL NAME
CREEPING RED FESCUE	*Festuca rubra*
CANADA WILD RYE	*Elymus canadensis*
ANNUAL RYEGRASS	*Lolium multiflorum*
PERENNIAL RYEGRASS	*Lolium perenne*
BLUE GRAMA	*Bouteloua gracilis*
LITTLE BLUESTEM	*Schizachyrium scoparium*
INDIAN GRASS	*Sorghastrum nutans*
ROUGH BENTGRASS/TICKLEGRASS	*Agrostis scabia*
UPLAND BENTGRASS	*Agrostis perennans*

THE NEW ENGLAND EROSION CONTROL/RESTORATION MIX FOR MOIST SITES:

COMMON NAME	BOTANICAL NAME
RIVERBANK WILD RYE	*Elymus riparius*
RED FESCUE	*Festuca rubra*
LITTLE BLUESTEM	*Schizachyrium scoparium*
SWITCH GRASS	*Panicum*
BIG BLUESTEM	*Andropogon gerardii*
BLUE VERVAIN	*Verbena hastata*
UPLAND BENTGRASS	*Agrostis perennas*
NODDING BUR MARIGOLD	*Bidens cernua*
HOLLOW-STEM JOE PYE WEED	*Eupatorium fistulosum*
BONESET	*Eupatorium perfoliatum*
NEW ENGLAND ASTER	*Aster novae-angliae*
WOOL GRASS	*Scirpus cyperinus*
SOFT RUSH	*Juncus effusus*

- 100% BIODEGRADABLE EROSION CONTROL BLANKETS MAY BE USED IN LIEU OF HYDROSEEDING AT THE CONTRACTOR'S DISCRETION TO PROVIDE ADDITIONAL EROSION PROTECTION AND MUST BE USED FOR STABILIZATION OF SLOPES IN EXCESS OF 3H:1V.
- FINAL STABILIZATION SHALL BE CONSIDERED COMPLETE WHEN ALL SOIL-DISTURBING ACTIVITIES HAVE BEEN COMPLETED AND A UNIFORM, PERENNIAL VEGETATIVE COVER WITH A DENSITY OF EIGHTY PERCENT HAS BEEN ESTABLISHED OR EQUIVALENT STABILIZATION MEASURES (SUCH AS THE USE OF MULCHES OR EROSION CONTROL MATTING) HAVE BEEN EMPLOYED ON ALL UNPAVED AREAS AND AREAS NOT COVERED BY PERMANENT STRUCTURES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF ALL VEGETATED SURFACES, INCLUDING WATERING, FERTILIZING, REPAIRING EROSION, AND RE-SEEDING UNTIL ESTABLISHMENT CONDITIONS ARE MET AND UNTIL THE END OF THE CONTRACTUAL MAINTENANCE PERIOD.

GENERAL NOTES:

1. THE EXISTING CONDITIONS PLAN WAS PREPARED BY WSP FROM A FIELD SURVEY PERFORMED IN JANUARY 2019 AND IN OCTOBER 20, 2020. NO SUBSURFACE UTILITY RESEARCH WAS CONDUCTED FOR THIS SURVEY.
2. THE HORIZONTAL DATUM SHOWN HEREON IS THE MASSACHUSETTS STATE COORDINATE GRID, NORTH AMERICAN DATUM OF 1983 (NAD-83), BASED UPON VRS-GPS OBSERVATIONS FROM STATION "CMTS" MAINTAINED BY MAINE TECHNICAL SOURCE.
3. THE VERTICAL DATUM SHOWN HEREON REFERENCES THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD-88), BASED UPON VRS-GPS OBSERVATIONS FROM STATION "CMTS" MAINTAINED BY MAINE TECHNICAL SOURCE.
4. WETLAND RESOURCE AREAS WERE DELINEATED BY TIGHE & BOND, INC. AND LOCATED BY WSP USA IN JANUARY 2019.
5. THE 100-YEAR FLOODING LIMIT WAS ESTABLISHED BASED ON MODELING BY TIGHE & BOND USING SCS TR-55 AND HEC RAS METHODS AS OUTLINED IN 310 CMR 10.57 (2)(a)(3).
6. EDGE OF WATER DEPICTED ON SURVEY WAS LOCATED IN JANUARY 2019 WHEN DAMON POND WAS IN WINTER DRAWDOWN.

ABBREVIATIONS

BLSF	BORDERING LAND SUBJECT TO FLOODING
BTM	BOTTOM
B/FTG	BOTTOM OF FOOTING
CONC	CONCRETE
CRW	CONCRETE RETAINING WALL
DIA	DIAMETER
EF	EACH FACE
EJ	EXPANSION JOINT
ELEV,EL	ELEVATION
EOP	EDGE OF PAVEMENT
EOW	EDGE OF WATER
EW	EACH WAY
HMA	HOT MIX ASPHALT
HORIZ	HORIZONTAL
IPF	IRON PIN FOUND
MIN	MINIMUM
MAX	MAXIMUM
OC	ON CENTER
PSI	POUNDS PER SQUARE INC
PVC	POLYVINYLCHLORIDE PIPE
R&D	REMOVE AND DISPOSE
RET	RETAINING
SCH	SCHEDULE
SHT	SHEET
SPK	SPIKE
SRW	STONE RETAINING WALL
SS	STAINLESS STEEL
T	TOP
TBM	TEMPORARY BENCHMARK
T/WALL	TOP OF WALL
TYP	TYPICAL
VERT	VERTICAL
WGR	WOODEN GUARD RAIL

LEGEND

CATCH BASIN
CUVLERT END
GUY WIRE
UTILITY POLE
DECIDUOUS TREE
CONIFER TREE
SHRUB
SIGN (SINGLE POSTED)
POST
APPROXIMATE BORING LOCATION
APPROXIMATE SEDIMENT LOCATION
26.3 SPOT ELEVATION
EDGE OF WATER
OE OVERHEAD WIRES
EXISTING TREE LINE
45 INTERMEDIATE CONTOUR
40 INDEX CONTOUR
40 TOP OF SEDIMENT
WF 1E-30 BORDERING VEGETATED WETLAND LINE WITH WETLAND FLAG AND NUMBER
100-FOOT BUFFER ZONE
LAND SUBJECT TO FLOODING (BLSF)
EROSION CONTROL BARRIER
PROPOSED COFFERDAM
TURBIDITY CURTAIN
LIMIT OF WORK
MEAN ANNUAL HIGH WATER (MAHW)
INLAND BANK

Tighe&Bond

Permit Set

Department of Conservation and Recreation

Damon Pond Dam Repairs And Area Improvements

Ashby, Massachusetts

August 2022

MARK	DATE	DESCRIPTION

PROJECT NO:	M736/82A
DATE:	8/2022
FILE:	M736-Task82A-LendNotes.dwg
DRAWN BY:	LPT
CHECKED:	DRB
APPROVED:	CDH

GENERAL NOTES, LEGEND AND ABBREVIATIONS

SCALE: NO SCALE

G-002
SHEET 2 OF 15

Last Saved: 8/2/2022
Plotted: Aug 02, 2022 - 2:30pm By: LPT
Tighe & Bond J:\M\M736 MA DCR Engineering Services MSA\82 - Damon Pond Dam\82A - Design Permitting and Construction\Drawings+Figures\AutoCad\Sheets\M736-Task82A-LendNotes.dwg

Tighe&Bond

Permit Set

Department of Conservation and Recreation

Damon Pond Dam Repairs And Area Improvements

Ashby, Massachusetts

August 2022

MARK	DATE	DESCRIPTION

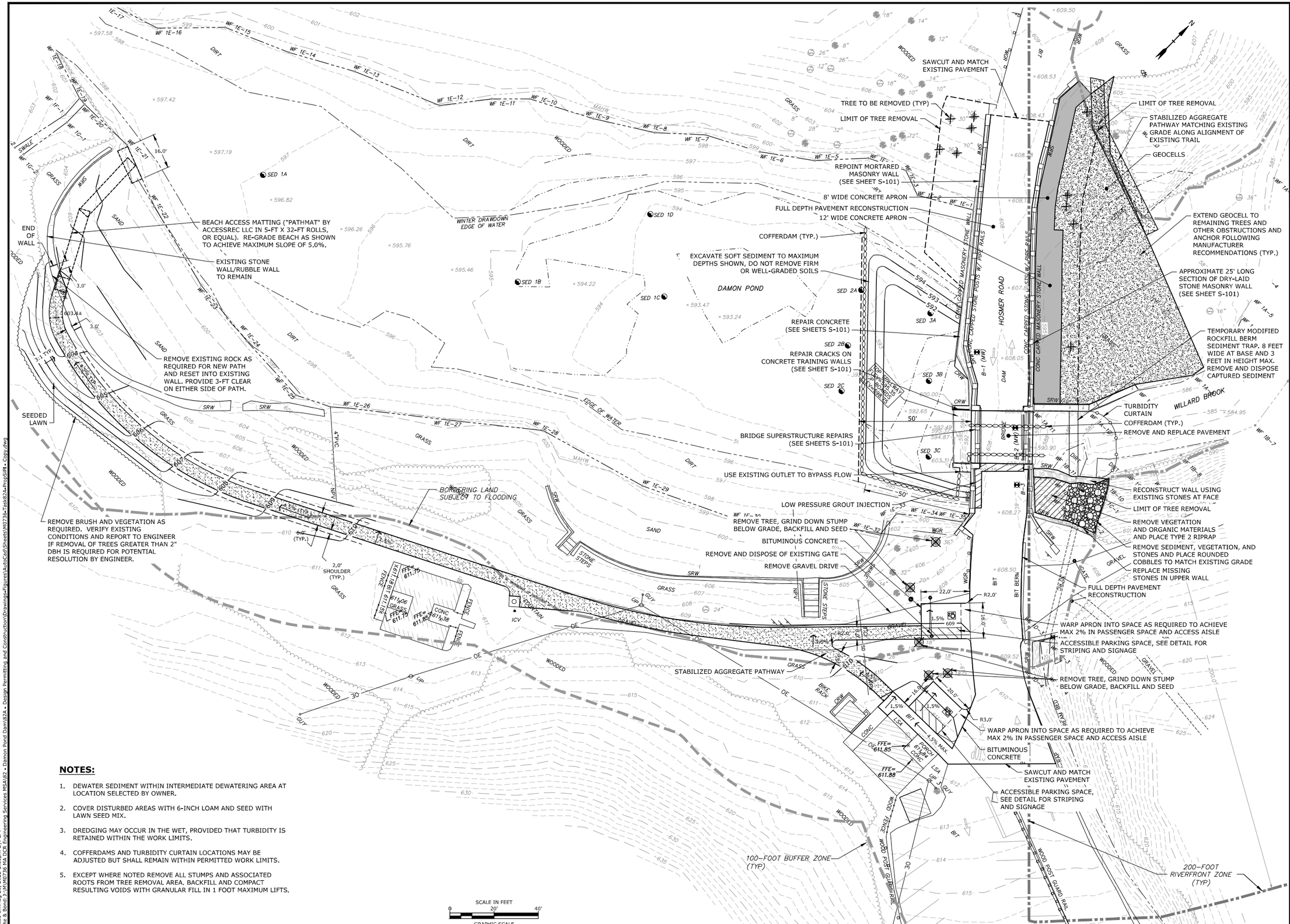
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DATE:	8/2022
FILE:	M0736-Task82A-ExistSiPlan.dwg
DRAWN BY:	LPT,BL
CHECKED:	CDH,DRB
APPROVED:	CDH

EXISTING CONDITIONS PLAN

SCALE: 1"=20'

C-101
SHEET 3 OF 15

Last Saved: 8/22/2022
Plotted: Aug 26, 2022–2:31pm By: LPT
Tighe & Bond J:\M\M0736 MA DCR Engineering Services MSA\82 - Damon Pond Dam\82A - Design Permitting and Construction\Drawings+Figures\AutoCad\Sheets\M0736-Task82A-ExistSiPlan.dwg



NOTES:

1. DEWATER SEDIMENT WITHIN INTERMEDIATE DEWATERING AREA AT LOCATION SELECTED BY OWNER.
2. COVER DISTURBED AREAS WITH 6-INCH LOAM AND SEED WITH LAWN SEED MIX.
3. DREDGING MAY OCCUR IN THE WET, PROVIDED THAT TURBIDITY IS RETAINED WITHIN THE WORK LIMITS.
4. COFFERDAMS AND TURBIDITY CURTAIN LOCATIONS MAY BE ADJUSTED BUT SHALL REMAIN WITHIN PERMITTED WORK LIMITS.
5. EXCEPT WHERE NOTED REMOVE ALL STUMPS AND ASSOCIATED ROOTS FROM TREE REMOVAL AREA, BACKFILL AND COMPACT RESULTING VOIDS WITH GRANULAR FILL IN 1 FOOT MAXIMUM LIFTS.

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Department of Conservation and Recreation

Damon Pond Dam Repairs And Area Improvements

Ashby, Massachusetts

August 2022

MARK	DATE	DESCRIPTION

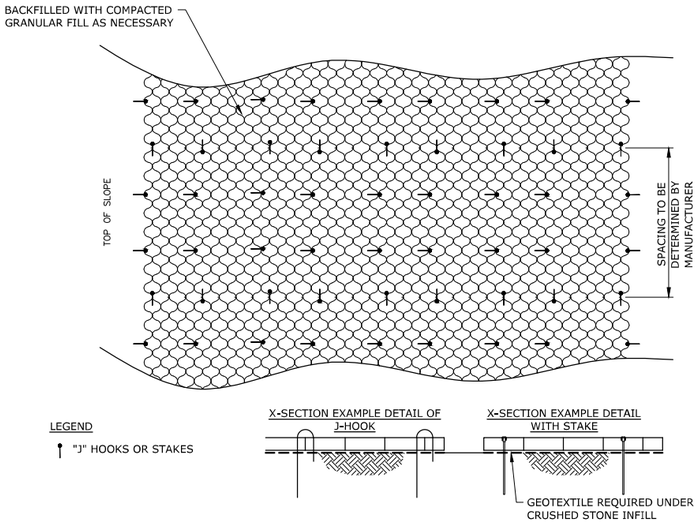
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DATE:	8/2022
FILE:	M0736-Task82A-PropSiPl - Copy.dwg
DRAWN BY:	LPT,BL
CHECKED:	CDH,DRB,PP
APPROVED:	CDH

PROPOSED SITE PLAN

SCALE: 1"=20'

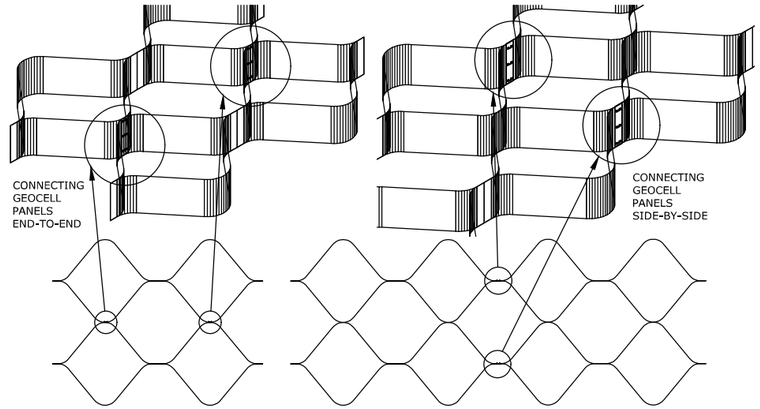
C-102
SHEET 4 OF 15

Last Saved: 8/22/2022
Last Saved By: LPT
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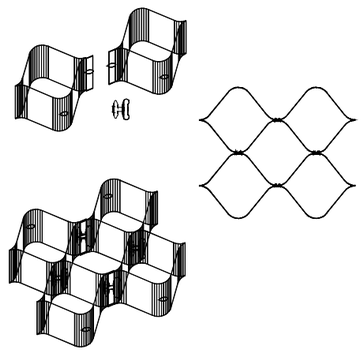


NOTES:
1. APPROXIMATE STAKING PATTERN SHOWN. FINAL STAKING PATTERN SHALL BE AS RECOMMENDED BY THE MANUFACTURER
2. J-HOOK OR STAKE SIZE AND EMBEDMENT SHALL BE AS RECOMMENDED BY THE MANUFACTURER.
3. PROVIDE 4-INCH GEOCELL DESIGNED FOR 1' OF OVERTOPPING.

GEOCELL STAKE PATTERN
NO SCALE

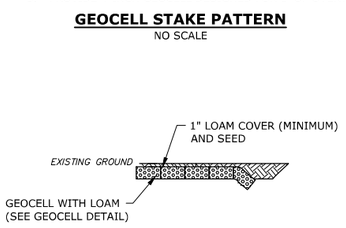


TYPICAL GEOCELL PANEL STAPLING DETAILS
NO SCALE

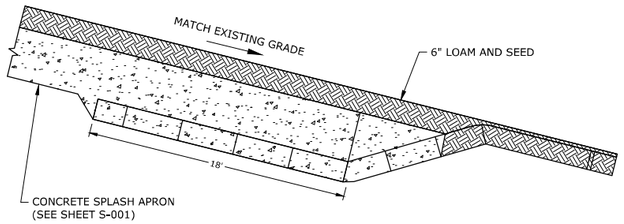


TYPICAL GEOCELL KEY DETAILS
NO SCALE

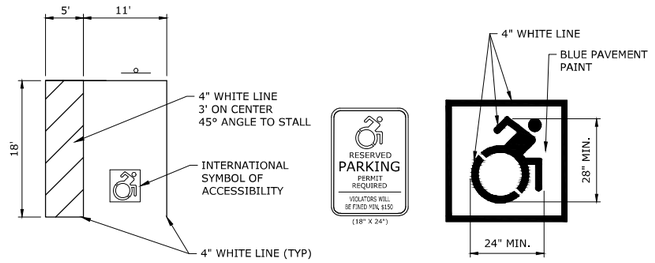
NOTES:
1. APPROXIMATE CONNECTION DETAILS SHOWN. FINAL CONNECTION DETAILS SHALL BE AS RECOMMENDED BY THE MANUFACTURER.
2. MANUFACTURER CONNECTIONS ARE TYPICALLY COMPOSED OF EITHER STAPLES OR KEYS, NOT BOTH.



TYPICAL GEOCELL WITH LOAM DETAIL
NO SCALE



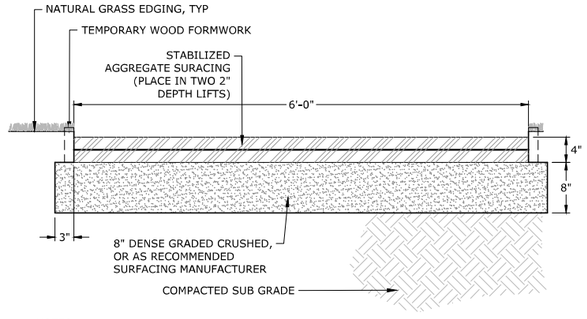
CONCRETE - GEOCELL INTERFACE
NO SCALE



VAN ACCESSIBLE SIGN INTERNATIONAL SYMBOL OF ACCESSIBILITY

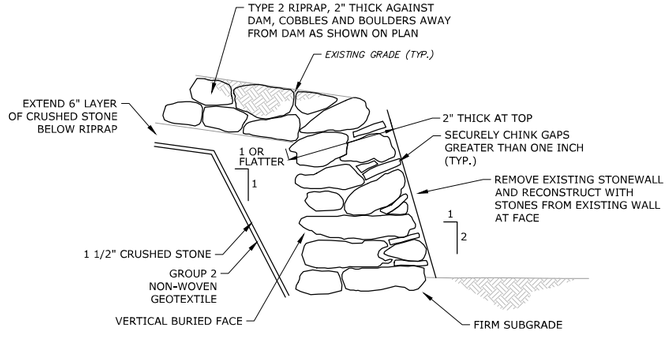
NOTES:
1. SIGN LOCATED AT ALL HANDICAPPED PARKING SPACES.
2. SIGN BACKGROUND - BLUE REFLECTIVE
3. LETTERS, GRAPHICS & BORDER - WHITE REFLECTIVE

ACCESSIBLE PARKING STRIPING DETAILS
NO SCALE



NOTES:
1. ORGANIC-LOCK PATHWAY AGGREGATE MUST ALWAYS BE PRE-WET FOR INSTALLATION IN HIGH SLOPE AREAS.
2. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
3. ALL DIMENSIONS ARE CONSIDERED TRUE AND REFLECT MANUFACTURER'S SPECIFICATIONS.
4. DO NOT SCALE DRAWINGS.
5. THIS DETAIL IS FOR INFORMATION PURPOSES ONLY. ALL INFORMATION CONTAINED HEREIN WAS CURRENT AT THE TIME OF DEVELOPMENT, BUT MUST BE REVIEWED AND APPROVED BY THE PRODUCT MANUFACTURER TO BE CONSIDERED ACCURATE.
6. CONTRACTOR'S NOTE: FOR PRODUCT AND COMPANY INFORMATION VISIT: www.CADdetails.com/info REFERENCE NUMBER 2643-001A
7. WHERE STABILIZED AGGREGATE PATHWAY IS INSTALLED THROUGH GEOCELL, PROVIDE 1" TOPPING LAYER TO COMPLETELY COVER GEOCELL.

ORGANIC LOCK PAVING
STABILIZED AGGREGATE SURFACING
NO SCALE



NOTE:
1. SUPPLEMENT STONES WITH OFF-SITE MATERIAL IF NEEDED. SUPPLEMENTAL STONES SHALL BE OF SIMILAR COLOR AND PARENT MATERIAL TO EXISTING WALL.
2. AT LEAST 75% OF STONES USED SHALL BE LARGER THAN 24 INCHES IN THEIR LARGEST DIMENSION.

MASONRY WALL RECONSTRUCTION
NO SCALE

Tighe&Bond

Permit Set

Department of Conservation and Recreation

Damon Pond Dam Repairs And Area Improvements

Ashby, Massachusetts

August 2022

MARK	DATE	DESCRIPTION

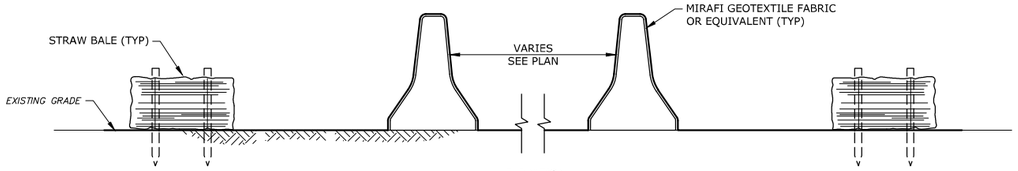
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DATE:	8/2022
FILE:	M736-Task82A-Details.dwg
DRAWN BY:	LPT,BL
CHECKED:	DRB
APPROVED:	CDH

DETAILS - 1

SCALE: AS SHOWN

C-103
SHEET 5 OF 15

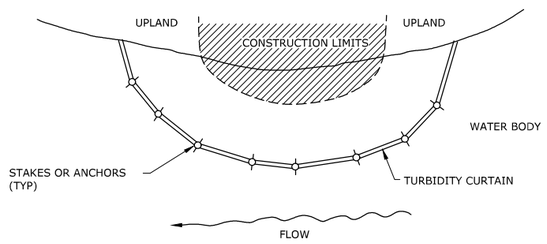
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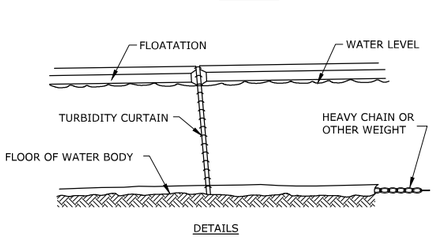
ELEVATION

NOTES:
1. A MINIMUM OF TWO WOOD STAKES ARE REQUIRED PER HAY BALE.
2. STEEL DOWELS MAY BE USED WHERE WOOD STAKES CANNOT BE DRIVEN INTO THE GROUND.
3. FACILITY IS TO BE WITHIN THE PARK AT A LOCATION ESTABLISHED BY OWNER.
4. ONCE SEDIMENT CONTAINS NO FREE DRAINING LIQUID AS DETERMINED BY PAINT FILTER TEST, REMOVE BARRIERS, GEOTEXTILE, STRAW BALES, AND OTHER TEMPORARY MEASURES AND RELOCATE SEDIMENT TO AN ADJACENT STOCKPILE LOCATION DETERMINED BY THE OWNER.

INTERMEDIATE SEDIMENT DEWATERING FACILITY
NO SCALE

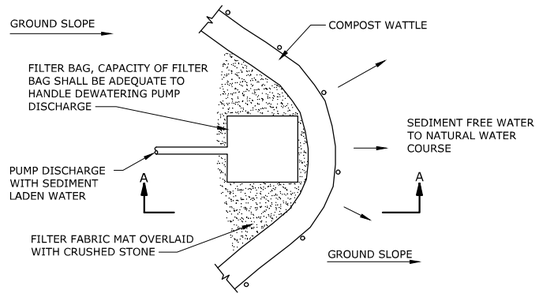


PLAN VIEW

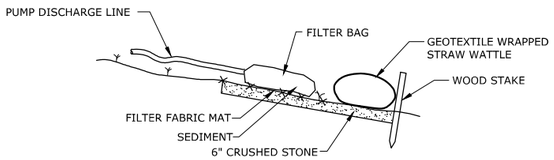


DETAILS

TEMPORARY TURBIDITY CURTAIN DETAIL
NO SCALE

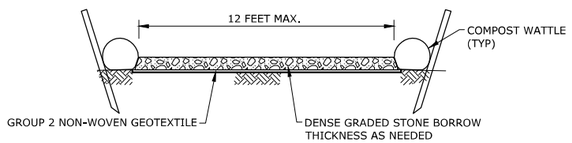


PLAN



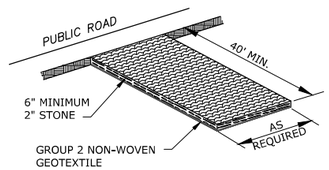
SECTION A-A

SEDIMENT TRAP
NO SCALE



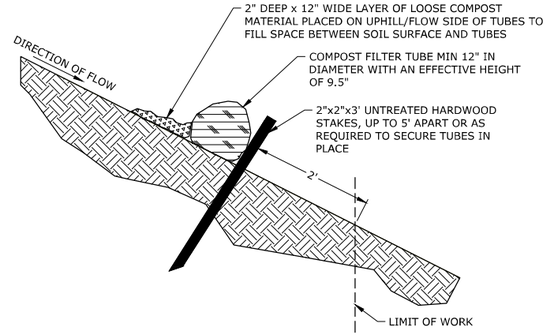
NOTES:
1. USE ABOVE DETAIL IN WET OR SOFT UPLAND AREAS TO PREVENT SINKING OF EQUIPMENT AT NO ADDITIONAL COST TO THE OWNER.
2. UPON COMPLETION OF THE PROJECT, REMOVE ALL MATERIAL, LOOSEN THE TOPSOIL, RESTORE PRE-PROJECT GRADES, LOAM AND SEED.
3. TOPSOIL MAY BE STRIPPED, STOCKPILED, AND REPLACED FOLLOWING CONSTRUCTION AT THE DESCRETION OF THE CONTRACTOR.
4. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES MAY BE REQUIRED.

TYPICAL CROSS-SECTION TEMPORARY ACCESS ROAD
NO SCALE



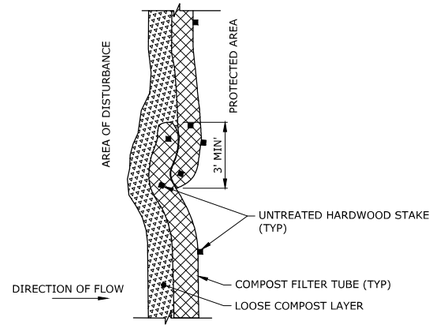
NOTE:
1. REMOVE FOLLOWING CONSTRUCTION.

TEMPORARY CONSTRUCTION ENTRY PAD
NO SCALE



SECTION VIEW

NOTES:
1. TUBES FOR COMPOST FILTERS SHALL BE JUTE MESH OR APPROVED BIODEGRADABLE MATERIAL. ADDITIONAL TUBES SHALL BE USED AT THE DIRECTION OF THE ENGINEER.
2. TAMP TUBES IN PLACE TO ENSURE GOOD CONTACT WITH SOIL SURFACE. IT IS NOT NECESSARY TO TRENCH TUBES INTO EXISTING GRADE.
3. WHEN STAKING IS NOT POSSIBLE, SUCH AS WHEN TUBES MUST BE PLACED ON PAVEMENT, HEAVY CONCRETE OR CINDER BLOCKS CAN BE USED BEHIND TUBES UP TO 5' APART OR AS REQUIRED TO SECURE TUBES IN PLACE.



PLAN VIEW - JOIN DETAIL

EROSION CONTROL BARRIER COMPOST FILTER TUBE
NO SCALE

NOTES:
1. PROVIDE 3' MINIMUM OVERLAP AT ENDS OF TUBES TO JOIN IN A CONTINUOUS BARRIER AND MINIMIZE UNIMPEDED FLOW.
2. STAKE JOINING TUBES SNUGLY AGAINST EACH OTHER TO PREVENT UNFILTERED FLOW BETWEEN THEM.
3. SECURE ENDS OF TUBES WITH STAKES SPACED 18" APART THROUGH TOPS OF TUBES.

GENERAL COMPOST FILTER TUBE NOTES:
1. PROVIDE A MINIMUM TUBE DIAMETER OF 12" FOR SLOPES UP TO 50' IN LENGTH WITH A SLOPE RATIO OF 3H:1V OR STEEPER. LONGER SLOPES OF 3H:1V MAY REQUIRE LARGER TUBE DIAMETER OR ADDITIONAL COURSING OF FILTER TUBES TO CREATE A FILTER BERM. REFER TO MANUFACTURER'S RECOMMENDATIONS FOR SITUATIONS WITH LONGER SLOPES OR STEEPER SLOPES.
2. INSTALL TUBES ALONG CONTOURS AND PERPENDICULAR TO SHEET OR CONCENTRATED FLOW.
3. DO NOT INSTALL IN PERENNIAL, EPHEMERAL OR INTERMITTENT STREAMS.
4. CONFIGURE TUBES AROUND EXISTING SITE FEATURES TO MINIMIZE SITE DISTURBANCE AND MAXIMIZE CAPTURE AREA OF STORMWATER RUN-OFF.
5. TUBES CAN BE PLACED DIRECTLY ON EXISTING PAVEMENT WHEN NECESSARY.
6. PLACING TUBES AGAINST THE UPHILL SIDE OF WELL-ANCHORED, STATIONARY FEATURES SUCH AS EXISTING TREES, CAN PROVIDE ADDITIONAL BRACING.
7. CURVE ENDS UPHILL TO PREVENT DIVERSION OF UNFILTERED RUN-OFF.
8. STRAW WATTLES WITH A 100% BIODEGRADABLE MESH MAY BE SUBSTITUTED IN AREAS INACCESSIBLE FOR FILTER TUBE INSTALLATION EQUIPMENT.

Tighe&Bond

Permit Set

Department of Conservation and Recreation

Damon Pond Dam Repairs And Area Improvements

Ashby, Massachusetts

August 2022

MARK	DATE	DESCRIPTION

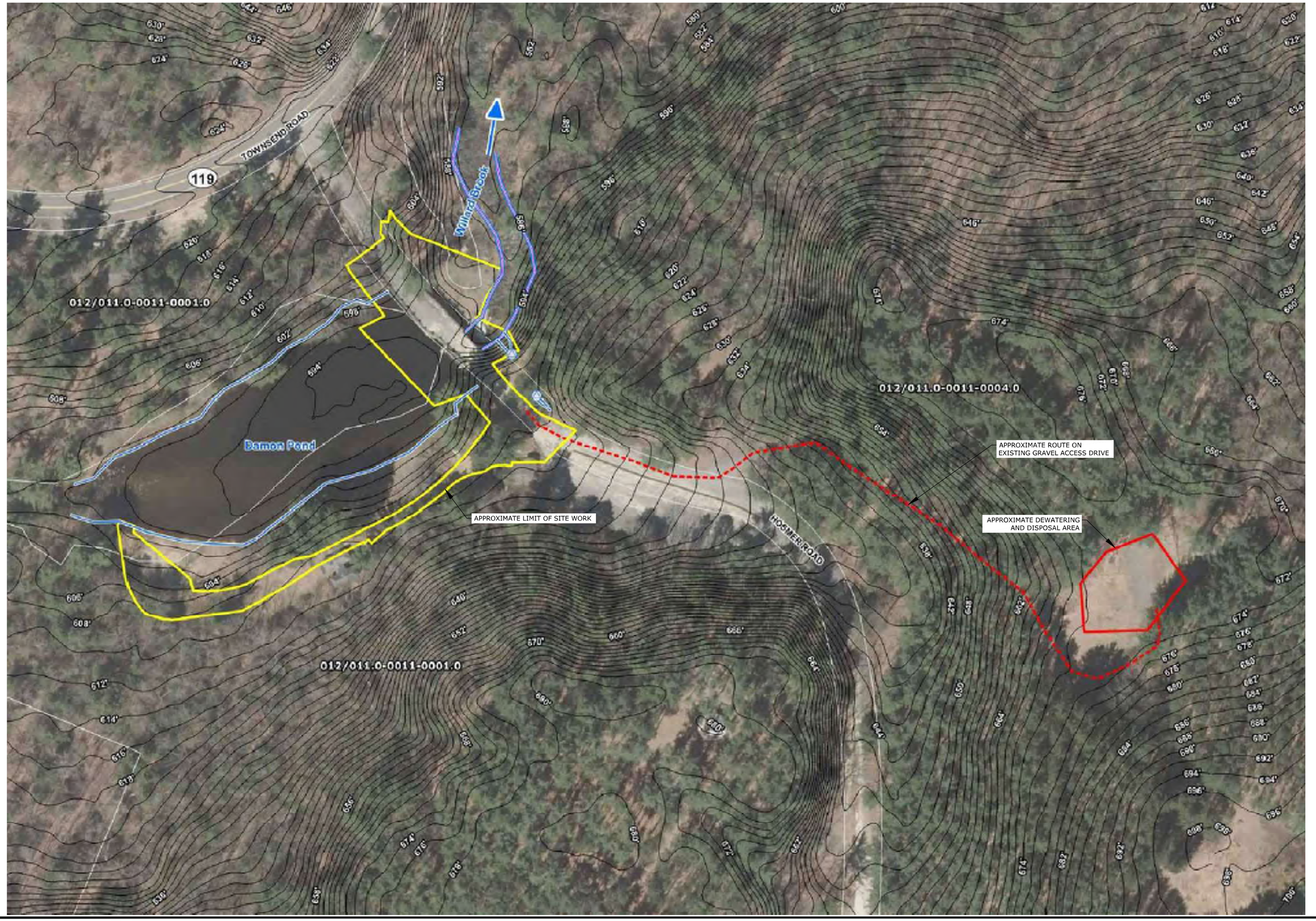
PROJECT NO:	M736/82A
DATE:	8/2022
FILE:	M736-Task82A-DetailsEC.dwg
DRAWN BY:	LPT
CHECKED:	DRB
APPROVED:	CDH

EROSION AND SEDIMENT CONTROL DETAILS

SCALE: AS SHOWN

C-104
SHEET 6 OF 15

Last Saved: 8/26/2022
Plotted: Aug 26, 2022 - 2:21:18pm By: LPT
Tighe & Bond J:\M\M736 MA DCR Engineering Services MSA\82 - Damon Pond Dam\82A - Design Permitting and Construction\Drawings-Figures\AutoCad\Sheets\M736-Task82A-DetailsEC.dwg



Tighe&Bond

Permit Set

Department of Conservation and Recreation

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Ashby, Massachusetts

August 2022

MARK	DATE	DESCRIPTION

PROJECT NO:	M736/82A
DATE:	8/2022
FILE:	M736-Task82A-SitePl-GIS.dwg
DRAWN BY:	LPT,GIS
CHECKED:	DRB
APPROVED:	CDH

SEDIMENT HAUL ROUTE AND DISPOSAL LOCATION SITE PLAN

SCALE: NO SCALE

C-105
SHEET 7 OF 15

Last Saved: 8/26/2022
Plot Date: 8/26/2022 - 10:06am By: LPT
Tighe & Bond: J:\M\M736 HA DCR Engineering Services MSA\82 - Damon Pond Dam\82A - Design Permitting and Construction\Drawings-Figures\AutoCad\Sheets\M736-Task82A-SitePl-GIS.dwg

GENERAL NOTES:

1. ALL EXISTING BRONZE DISCS REPRESENTING STATE BENCHMARKS OR SURVEY TRIANGULATION POINTS MUST NOT BE DISTURBED. WHEN THE WORK CALLED FOR INVOLVES DISTURBING A BRONZE DISC THE CONTRACTOR SHALL NOTIFY THE ENGINEER SUFFICIENTLY IN ADVANCE OF THE WORK TO PERMIT THE STATE TO TEMPORARILY RELOCATE THE AFFECTED MARKER.
2. ALL WORK SHALL COMPLY WITH OSHA'S LATEST STANDARDS. ALL REQUIREMENTS OF OSHA'S EXCAVATION STANDARDS SHALL BE PROVIDED BY THE CONTRACTOR INCLUDING, BUT NOT LIMITED TO, THE PROVISION FOR A COMPETENT PERSON ON SITE AND ANY REQUIRED DOCUMENTATION THAT MAY REQUIRE CERTIFICATION BY A PROFESSIONAL ENGINEER.
3. THE VERTICAL DATUM SHOWN HEREON REFERENCES THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
4. THE OWNER AND ENGINEER ASSUME NO RESPONSIBILITY FOR THE LOCATION OF EXISTING UTILITIES. THE ENGINEER AND OWNER MAKE NO GUARANTEE AS TO THE UNDERGROUND CONDITIONS THAT MAY BE ENCOUNTERED.
5. PER MASSACHUSETTS LAW, CONTRACTOR SHALL CALL 1-888-DIG-SAFE, (1-888-344-7233) AND THE TOWN OF {FILL IN} PRIOR TO ANY UNDERGROUND EXCAVATION ON SITE. THE DIG-SAFE SERVICE WILL FIELD LOCATE AND MARK UNDERGROUND UTILITIES IN THE FIELD. THE DIG-SAFE VERIFICATION NUMBER SHALL BE SUBMITTED TO THE TOWN OF {FILL IN} PRIOR TO ANY DEMOLITION AND REMOVAL OR CONSTRUCTION WORK.
6. ALL EXISTING CONDITIONS SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. IF FIELD CONDITIONS ARE OBSERVED THAT VARY SIGNIFICANTLY FROM THOSE SHOWN ON THESE PLANS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING FOR RESOLUTION OF THE CONFLICTING INFORMATION.
7. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN ALL UTILITIES FUNCTIONING PROPERLY IN THE AREAS UNDER CONSTRUCTION PRIOR TO COMPLETION OF THE PROJECT. ALL PIPES AND STRUCTURES WITHIN THE LIMITS OF THIS CONTRACT SHALL BE LEFT IN A CLEAN AND OPERABLE CONDITION AT THE COMPLETION OF THE WORK. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT SAND AND SILT FROM DISTURBED AREAS FROM ENTERING THE SYSTEM. CONTRACTOR IS RESPONSIBLE FOR DAMAGE SUSTAINED TO ANY EXISTING UTILITIES AND IT IS HIS RESPONSIBILITY TO MAKE REPAIRS TO THE REQUIREMENTS OF THE TOWN OR RESPECTIVE UTILITY COMPANY.
8. COORDINATE RELOCATION OR SUPPORTING OF UTILITY POLES WITH THE RESPECTIVE UTILITIES. NO UTILITY POLE RELOCATIONS ARE ANTICIPATED.
9. ANY AND ALL DEMOLISHED BUILDING MATERIALS, STRUCTURES, PIPES, PAVEMENT, CURBING, SURPLUS MATERIAL, AND SITE RUBBLE SHALL BE DISPOSED OF BY THE CONTRACTOR OFF-SITE AT HIS EXPENSE AND IN ACCORDANCE WITH ALL APPLICABLE STATE AND FEDERAL ENVIRONMENTAL REGULATIONS.
10. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO ENSURE THAT DEBRIS DOES NOT FALL ON ANY ROADWAY, RAILROAD, OR WATERWAY BELOW THE EXISTING STRUCTURE. ALL COSTS INCLUDING ERECTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURES OR OTHER SUCH APPROVED METHODS, SHALL BE SUBSIDIARY TO THE APPROPRIATE ITEMS OF WORK BEING PERFORMED.
11. ALL MATERIALS AND METHODS ARE TO COMPLY WITH THE MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, DATED 1988, AND ITS LATEST REVISIONS.
12. ALL DISTURBED AREAS SHALL BE LOAMED & SEEDED UNLESS OTHERWISE SPECIFIED. OVER EXCAVATE LOAM & SEED AREAS AS REQUIRED TO MEET GRADE.
13. IF LOCATIONS, SIZES, ETC. CHANGE FROM THESE PLANS, THE NEW CHANGES SHALL BE SUBMITTED TO THE OWNER/ENGINEER FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
14. ALL DIMENSIONS ARE HORIZONTAL AND VERTICAL, AND ARE GIVEN AT 68 DEGREES FAHRENHEIT.
15. ALL WORK PERFORMED BY THE CONTRACTOR SHALL COMPLY WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS AND REQUIREMENTS.
16. THE CONTRACTOR SHALL REVIEW AND UNDERSTAND ALL APPLICABLE ENVIRONMENTAL PERMITS AND ENSURE THAT ALL CONSTRUCTION CONDITIONS ARE MET.
17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTION SAFETY, AND MEANS AND METHODS TO PERFORM AND COMPLETE THE WORK.
18. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY DAMAGE TO PRIVATE OR PUBLIC PROPERTY OUTSIDE THE LIMITS OF CONSTRUCTION SHOWN ON THE PLANS CAUSED BY THE CONTRACTOR, AT THE SOLE COST TO THE CONTRACTOR.
19. THE CONTRACTOR SHALL SUBMIT LITERATURE (MANUFACTURER'S LITERATURE, CUT SHEETS, APPLICATION PROCEDURES, ETC.) FOR ALL PRODUCTS PROPOSED FOR USE ON THE PROJECT, FOR APPROVAL BY THE ENGINEER. APPROVAL OF MATERIALS SHALL BE IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF MASSDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, LATEST EDITION AS AMENDED, SUBSECTION 5.03 AND SECTION 6.00, CONTROL OF MATERIALS.
20. DETAIL OR SHOP DRAWINGS SHALL BE SUBMITTED AND APPROVED IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF MASSDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, LATEST EDITION AS AMENDED, SUBSECTION 5.02, PLANS AND DETAIL DRAWINGS.
21. TAKE ALL NECESSARY MEASURES AND PROVIDE ALL NECESSARY CONTINUOUS BARRIERS OF SUFFICIENT TYPE, SIZE AND STRENGTH TO PREVENT ACCESS TO ALL OPEN EXCAVATIONS AT THE COMPLETION OF EACH DAY'S WORK.
22. STORE FUEL, OIL, PAINT, OR OTHER HAZARDOUS MATERIALS IN A SECONDARY CONTAINER AND REMOVE FROM THE SITE TO A LOCKED INDOOR AREA WITH AN IMPERVIOUS FLOOR DURING NON-WORK HOURS.
23. IMMEDIATELY REPORT SPILLS OF OIL AND/OR HAZARDOUS MATERIALS (OHM) TO THE MASSDEP.
24. PROVIDE A SUFFICIENT SUPPLY OF ABSORBENT SPILL RESPONSE MATERIALS, SUCH AS BOOMS OR BLANKETS, AT THE CONSTRUCTION SITES AT ALL TIMES TO CLEAN UP POTENTIAL SPILLS OF HAZARDOUS MATERIALS.
25. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 3/4", UNLESS OTHERWISE NOTED.
26. SHEAR KEYS SHALL BE 3" HIGH BY ONE-THIRD THE WIDTH OF THE CONCRETE ELEMENT, CENTERED.
27. PEEL AND STICK BARRIER MEMBRANE SHALL BE 2' WIDE WITH PROTECTION BOARD (SUBSIDIARY) AND PLACED CENTERED OVER ALL HORIZONTAL AND VERTICAL EXPANSION AND CONSTRUCTION JOINTS.
28. APPLY PAVEMENT JOINT ADHESIVE ALONG ALL LONGITUDINAL JOINTS BETWEEN PAVEMENT PASSES AND ALONG BRIDGE CURB LINES AND EXPANSION JOINT ARMORING PRIOR TO PLACING ALL PAVEMENT COURSES.
29. STRUCTURAL WORK SHALL CONFORM TO MASSACHUSETTS STATE BUILDING CODE, LATEST EDITION, INCLUDING MOST RECENT ADDENDA, AND CONTRACT DOCUMENTS. IN CASE OF CONFLICT, MOST STRINGENT REQUIREMENT SHALL GOVERN.
30. CONTRACTOR SHALL EXAMINE DRAWINGS FOR ALL TRADES FOR THE VERIFICATION OF LOCATION AND DIMENSIONS OF ALL CHASES, INSERTS, OPENINGS, SLEEVES AND OTHER PROJECT REQUIREMENTS NOT SHOWN ON THE STRUCTURAL DRAWINGS.

SPECIFICATIONS:

SPECIFICATIONS:	AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION
	MASSACHUSETTS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES,2021
1. REINFORCING STEEL:	AASTHO M31 (ASTM A 615) GRADE 60
	EPOXY COATED BARS: DECK & CURBS
2. CONCRETE:	DECK & CURBS:
	4500 PSI (AT 28 DAYS)

REINFORCEMENT:

1. DETAILING, FABRICATION, AND ERECTION OF REINFORCEMENT, UNLESS OTHERWISE NOTED, SHALL CONFORM TO AASHTO DESIGN SPECIFICATIONS, ACI "BUIDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318)" AND ACI "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES (ACI 315)", LATEST EDITION.
2. STEEL REINFORCEMENT UNLESS OTHERWISE SHOWN SHALL CONFORM TO ASTM A615 GRADE 60 MINIMUM (YEILD STRENGTH - 60,000 PSI).
3. WHERE CONTINUOUS BARS ARE CALLED FOR THEY SHALL BE RUN CONTINUOUSLY AROUND CORNERS AND LAPPED AT NECESSARY SPLICES OR HOOKED AT DISCONTINUOUS ENDS.
4. WHERE REINFORCEMENT IS CALLED FOR IN SECTION, REINFORCEMENT IS CONSIDERED TYPICAL WHEREVER THE SECTION APPLIES.
5. REINFORCEMENT SHALL BE CONTINUOUS THROUGH ALL CONSTRUCTION JOINTS UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
6. REINFORCEMENT COUPLER SPLICES SHALL BE MECHANICAL DEVICES CAPABLE OF TRANSMITTING THE ULTIMATE TENSILE AND COMPRESSIVE STRENGTH OF THE BAR.
7. REINFORCEMENT SHALL BE SET BEFORE PLACING CONCRETE OR MORTAR. SETTING ANY REINFORCEMENT INTO WET CONCRETE OR MORTAR IS PROHIBITED.

CONCRETE

1. CONCRETE WORK SHALL CONFORM TO THE LATEST EDITIONS OF THE AASHTO DESIGN SPECIFICATIONS, THE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318), AND SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDING (ACI 301).
2. CONCRETE SHALL BE CONTROLLED CONCRETE, PROPORTIONED, MIXED, AND PLACED UNDER THE SUPERVISION OF AN APPROVED CONCRETE TESTING AGENCY OR THE ENGINEER.
3. CONCRETE SHALL BE NORMAL WEIGHT CONCRETE AND SHALL HAVE A COMPRESSIVE STRENGTH OF 4500 PSI AT 28 DAYS, UNLESS OTHERWISE NOTED AND SHALL BE AIR ENTRAINED (SEE SPECS).
4. THE USE OF CONSTRUCTION JOINTS WHERE SHOWN ON THE DRAWINGS IS MANDATORY. OMISSIONS, ADDITIONS OR CHANGES SHALL NOT BE MADE EXCEPT WITH THE SUBMISSION OF A WRITTEN REQUEST TOGETHER WITH DRAWINGS OF THE PROPOSED JOINT LOCATIONS FOR APPROVAL OF THE STRUCTURAL ENGINEER.
5. WHERE CONSTRUCTION JOINTS ARE NOT SHOWN, DRAWINGS SHOWING LOCATION OF CONSTRUCTION JOINTS AND CONCRETE PLACING SEQUENCE SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO PREPARATION OF THE REINFORCEMENT SHOP DRAWINGS.
6. CONCRETE SLABS SHALL BE CAST SO THAT THE SLAB THICKNESS IS AT NO POINT LESS THAN THAT INDICATED ON THE DRAWINGS.
7. CONCRETE SLABS AND WALLS SHALL BE CAST ALTERNATELY OR IN A CHECKERBOARD FASHION SO THAT ADJACENT SECTIONS ARE PLACED NO SOONER THAN THREE DAYS APART. AT LEAST TWO DAYS MUST ELAPSE AFTER PLACING CONCRETE IN WALLS BEFORE PLACING FLOOR SYSTEM SUPPORTED THEREON.
8. CONCRETE SHALL BE PLACED WITHOUT HORIZONTAL CONSTRUCTION JOINTS EXCEPT WHERE SHOWN OR NOTED.
9. EXPOSED EDGES OF CONCRETE ELEMENTS SHALL HAVE CHAMFERED CORNERS
10. ONLY CRITICAL CONSTRUCTION JOINTS ARE SHOWN. SEE SPECIFICATIONS FOR REQUIRED MAXIMUM SPACING OF CONSTRUCTION JOINTS.

CONCRETE REPAIR NOTES:

11. CONCRETE REPAIRS ARE TO BE IN CONFORMANCE WITH THE APPLICABLE REQUIREMENTS OF SPECIFICATION SECTIONS 03100, 03200, 03300 AND 03930.

BRIDGE SUPERSTRUCTURE REHABILITATION NOTES:

1. AFTER REMOVAL OF EXISTING PAVEMENT AND MEMBRANE, CONTRACTOR TO PROVIDE ENGINEER WITH 48 HOUR NOTICE TO SOUND EXISTING CONCRETE DECK AND TO DETERMINE AREAS REQUIRING PARTIAL AND FULL DEPTH DECK REPAIRS.
2. DETERIORATED AREAS OF DECK SHALL BE PATCHED IN ACCORDANCE WITH THE DETAILS PROVIDED IN THE DRAWINGS HEREIN. PRIOR TO PLACING NEW CONCRETE, THE PATCHED AREAS SHALL BE PREPARED TO A SATURATED, SURFACE-DRY CONDITION.
3. REFER TO CONCRETE REPAIR NOTES ABOVE FOR FURTHER REPAIR REQUIREMENTS.

DAM WALL CONCRETE REPAIR NOTES:

1. ASSUMED REPAIR QUANTITIES ARE BASED ON LIMITED ACCESS TO DAM WALL DURING ENGINEER'S OBSERVATIONS. CONTRACTOR SHALL PERFORM THEIR OWN "SOUNDING" OF THE DAM WALL, IDENTIFYING HOLLOW SOUNDING AND SPALLED AREAS THAT NEED REPAIR ALONG THE ENTIRE LENGTH OF THE DAM WALL. FINDINGS ARE TO BE REPORTED TO ENGINEER PRIOR TO PERFORMING ANY REPAIRS.
2. REFER TO CONCRETE REPAIR NOTES ABOVE FOR FURTHER REPAIR REQUIREMENTS.

MINIMUM RE-BAR SPLICE LENGTHS SCHEDULE

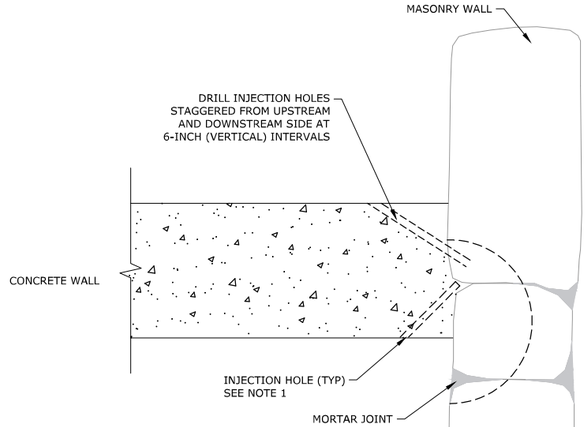
BAR SIZE	SPLICE LENGTH
#3	16
#4	19
#5	24
#6	28

IF THE CLEAR SPACING BETWEEN THE REBARS IS LESS THAN THREE BAR DIAMETERS OR IF THE COVER IS LESS THAN TWO BAR DIAMETERS, INCREASE THE SPLICE LENGTH BY AN ADDITIONAL 50%.

THE MINIMUM REBAR SPLICE LENGTH SCHEDULE IS BASED ON
F'c= 4,500 PSI AND Fy=60,000 PSI.

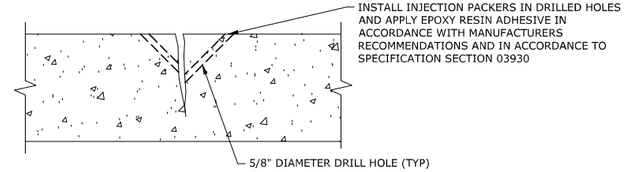
FOR HORIZONTAL REINFORCEMENT SO PLACED THAT MORE THAN 12 INCHES OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW, INCREASE THE DEVELOPMENT LENGTH BY AN ADDITIONAL 30%.

WHEN BARS OF DIFFERENT SIZE ARE LAP SPLICED, THE SPLICE LENGTH SHALL BE THE LARGER OF EITHER THE DEVELOPMENT LENGTH OF THE LARGER BAR OR THE SPLICE LENGTH OF THE SMALLER BAR.



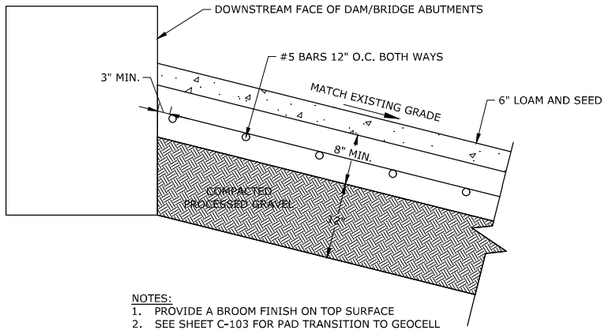
NOTES:
1. INSTALLED INJECTION PACKERS IN DRILLED HOLES AND APPLIED LIQUID CHEMICAL GROUT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. PROVIDED WATERTIGHT REPAIR. FOLLOWING INJECTION, REMOVED EXCESS GROUT UNTIL FLUSH WITH EXISTING SURFACE. RUBBED SMOOTH. SEE 03930 FOR FURTHER REQUIREMENTS.
2. LOCATION SHOWN ON S-101.
3. THE CONTRACTOR EXERCISED AN ABUNDANCE OF CAUTION TO PREVENT EXCESS LIQUID CHEMICAL GROUT FROM DROPPING INTO POND OR THE SPILLWAY CHANNEL.

CONCRETE-MASONRY INTERFACE LEAK REPAIR
NO SCALE



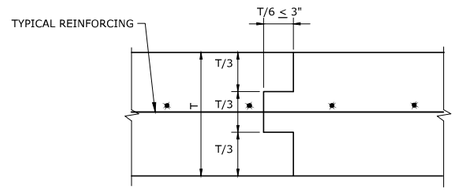
NOTES:
1. REMOVE ALL ORGANIC MATTER FROM CRACK PRIOR TO INJECTION.
2. CLEAN EXCESS EPOXY OFF CONCRETE SURFACE AND REMOVE PINS AFTER REPAIR IS COMPLETE.
3. LEAVE REPAIR SURFACES FLUSH WITH EXISTING CONCRETE.

CRACK REPAIR DETAIL
NO SCALE



NOTES:
1. PROVIDE A BROOM FINISH ON TOP SURFACE
2. SEE SHEET C-103 FOR PAD TRANSITION TO GEOCELL

SPLASH APRON DETAIL
NO SCALE



TYPICAL CONSTRUCTION JOINT
NO SCALE

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Permit Set

Department of Conservation and Recreation

Damon Pond Dam Repairs And Area Improvements

Ashby, Massachusetts

August 2022

MARK	DATE	DESCRIPTION

PROJECT NO:	M736/82A
DATE:	8/2022
FILE:	M0736-Task82A-S-Notes.dwg
DRAWN BY:	JAK
CHECKED:	CDH,DRB
APPROVED:	CDH

STRUCTURAL NOTES

SCALE: NO SCALE

S-001
SHEET 8 OF 15

Last Saved: 8/24/2022
Plotted: Aug 25, 2022 - 7:42am By: UT
Tighe & Bond: J:\M\M0736 MA DCR Engineering Services MSA\82 - Damon Pond Dam\82A - Design Permitting and Construction\Drawings-Figures\AutoCad\Sheets\M0736-Task82A-S-Notes.dwg

CONCRETE APRON AND GEOCELLS, SEE SHEET C-103 AND DETAIL ON S-001

RAILINGS TO BE REPAINTED OR REPLACED AND PAINTED (TYP), SEE PHOTOS 2 AND 4 ON S-501 AND DETAIL ON SHEET S-504

6 S-504

REPAIR VISIBLE SPALLED CONCRETE AND DELAMINATED AREAS, APPROXIMATELY 50 SQ FT. SEE DAM WALL CONCRETE REPAIR NOTES ON S-001

ALL EFFLORESCENCE AND STAINING DUE TO WATER SEEPAGE IS TO BE REMOVED; INCLUDES BOTH UPSTREAM AND DOWNSTREAM WALLS AND BRIDGE CONCRETE AND MASONRY SURFACES, INCLUDING BRIDGE ABUTMENTS AND PILASTERS AT ROADWAY

REPOINT ALL MORTARED MASONRY WALL JOINTS; COLLECT AND DISPOSE OF DEBRIS; INCLUDES BOTH UPSTREAM AND DOWNSTREAM MASONRY FACES OF THE DAM AND BRIDGE AND BRIDGE ABUTMENTS (UNLESS OTHERWISE NOTED). ALL ORGANIC MATTER AND VEGETATION TO BE REMOVED FROM WALL SURFACES

1 S-504

REMOVE EXISTING MORTAR ON TOP OF PILASTERS IN ACCORDANCE WITH 02225 AND REPLACE IN ACCORDANCE WITH 04920 (TYP)

LIMIT OF SEDIMENT EXCAVATION

30'±
AREA OF STONE WALL IS ABSENT OF MORTAR; RECHINK GAPS GREATER THAN 1 INCH WITH STONES OF THE SAME PARENT MATERIAL, DO NOT USE MORTAR IN THIS AREA OF THE WALL, SEE REPAIR DETAIL ON C-103

CRACK INJECTION REPAIR ON CONCRETE TRAINING WALL, APPROXIMATELY 15 LF, SEE CRACK REPAIR DETAIL ON SHEET S-001

BRIDGE BEAM REPAIRS, SEE PHOTOS 5-8 ON S-501 AND DETAILS 2 S-504 2 S-504

7&8 (UNDER BRIDGE)

5&6 (UNDER BRIDGE)

NEW TRASH RACK AT INLET TO LOW-LEVEL OUTLET, SEE SHEET S-506 FOR DETAILS AND REQUIREMENTS

CRACK INJECTION REPAIR ON CONCRETE TRAINING WALL AND BETWEEN CONCRETE TRAINING WALL AND STONE ABUTMENT TO REPAIR LEAK, APPROXIMATELY 40 LF SEE CRACK REPAIR DETAIL ON SHEET S-001

INVERT
INV 30 RC
ELEV: 600.38'

INVERT
INV 24 RC
ELEV: 591.02'

INVERT
INV 24 RC
ELEV: 591.12'

PHOTO LOCATION SYMBOL = #

N

SCALE IN FEET
0 10' 20'
GRAPHIC SCALE

Tighe&Bond

Permit Set

Department of Conservation and Recreation

Damon Pond Dam Repairs And Area Improvements

Ashby, Massachusetts

August 2022

MARK	DATE	DESCRIPTION

PROJECT NO:	M736/82A
DATE:	8/2022
FILE:	M0736-Task82A-Structural.dwg
DRAWN BY:	JAK
CHECKED:	CDH,DRB
APPROVED:	CDH

REPAIR AND PHOTO LOCATION PLAN

SCALE: 1"=10'

S-101
SHEET 9 OF 15

Last Saved: 8/24/2022
Last Saved By: JKaplan 8/25/2022 2:47pm By: LPT
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PHOTO 1
DAM AND BRIDGE LOOKING NORTHWEST ALONG HOSMER ROAD
NO SCALE



PHOTO 2:
TYPICAL RAILING & PILASTER 1
NO SCALE



PHOTO 3:
TYPICAL RAILINGS & PILASTER 2
NO SCALE

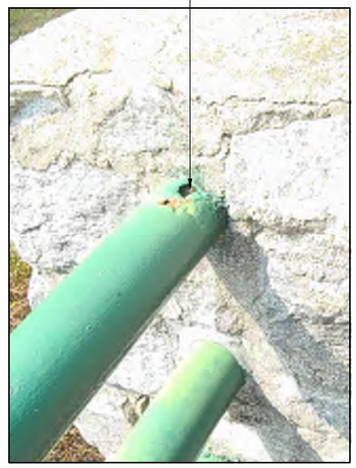


PHOTO 4:
TYPICAL CORRODED RAILINGS
NO SCALE



PHOTO 5:
NORTHWEST BUTTRESS AND SOUTHERN SPANDREL BEAM
NO SCALE

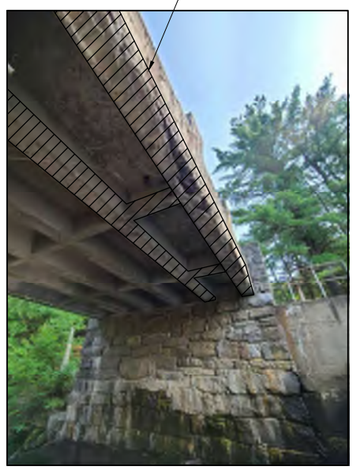


PHOTO 6:
LOOKING SOUTHEAST: CONCRETE DETERIORATION ON SOUTHERN SPANDREL BEAM
NO SCALE

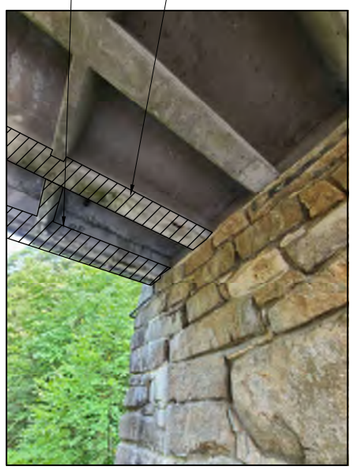


PHOTO 7:
NORTHERN SPANDREL & INTERIOR BEAMS AT SOUTHEASTERN BUTRESS
NO SCALE



PHOTO 8:
CLOSE UP: NORTHERN SPANDREL & INTERIOR BEAMS AT SOUTHEASTERN BUTRESS
NO SCALE

NOTE:
1. SEE GENERAL NOTES ON SHEET S-001 AND SPECIFICATION SECTION 03930 FOR CONCRETE REPAIR REQUIREMENTS.
2. SEE SPECIFICATION SECTION 04920 FOR MASONRY AND CAP MOCKUP AND MATERIAL REQUIREMENTS.
3. ONE PILASTER SHALL BE IDENTIFIED AND USED AS A MOCKUP FOR PILASTER REPOINTING AND CAP WORK. MOCKUP TO BE APPROVED BY DCR PRIOR TO BEGINNING REPOINTING WORK. SEE SPECIFICATION SECTION 04920 FOR MOCKUP REQUIREMENTS.

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Permit Set

Department of Conservation and Recreation

Damon Pond Dam Repairs And Area Improvements

Ashby, Massachusetts

August 2022

MARK	DATE	DESCRIPTION

PROJECT NO:	M736/82A
DATE:	8/2022
FILE:	M0736-Task82A-Structural.dwg
DRAWN BY:	JAK
CHECKED:	CDH,DRB
APPROVED:	CDH

DEMOLITION DETAILS

SCALE: NO SCALE

S-501
SHEET 10 OF 15

Last Saved: 8/24/2022
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PHOTO 9
VEGETATION AND EFFLORESCENCE ALONG UPSTREAM DAM WALL
NO SCALE



PHOTO 10
VISIBLE SPALL AND EFFLORESCE ALONG UPSTREAM DAM WALL
NO SCALE



PHOTO 11
TYPICAL STONE MASONRY SECTION TO BE REPOINTED
NO SCALE



PHOTO 12
DOWNSTREAM FACE OF DAM WALL TO BE LEFT DRY STACKED
NO SCALE



PHOTO 13
STAINING ON BRIDGE ABUTMENTS TO BE CLEANED
NO SCALE

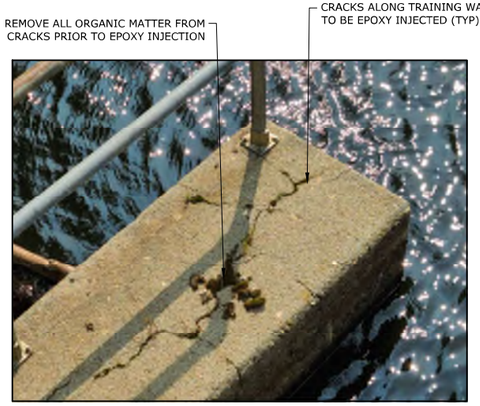


PHOTO 14
CRACKS IN TRAINING WALL
NO SCALE

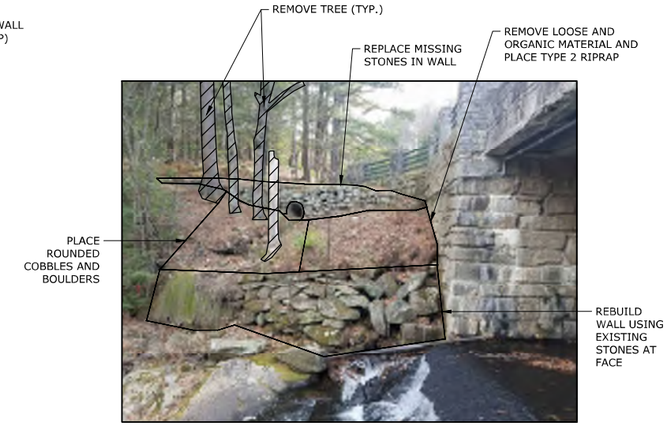


PHOTO 15
IMPROVEMENTS TO WALL DOWNSTREAM OF DAM
NO SCALE

NOTE:
1. A 6FT X 6FT SECTION OF WALL SHALL BE IDENTIFIED AND USED AS A MOCKUP FOR REPOINTING WORK. MOCKUP TO BE APPROVED BY DCR PRIOR TO BEGINNING REPOINTING WORK. SEE SPECIFICATION SECTION 04920 FOR MOCKUP REQUIREMENTS.

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Permit Set

Department of Conservation and Recreation

Damon Pond Dam Repairs And Area Improvements

Ashby, Massachusetts

August 2022

MARK	DATE	DESCRIPTION

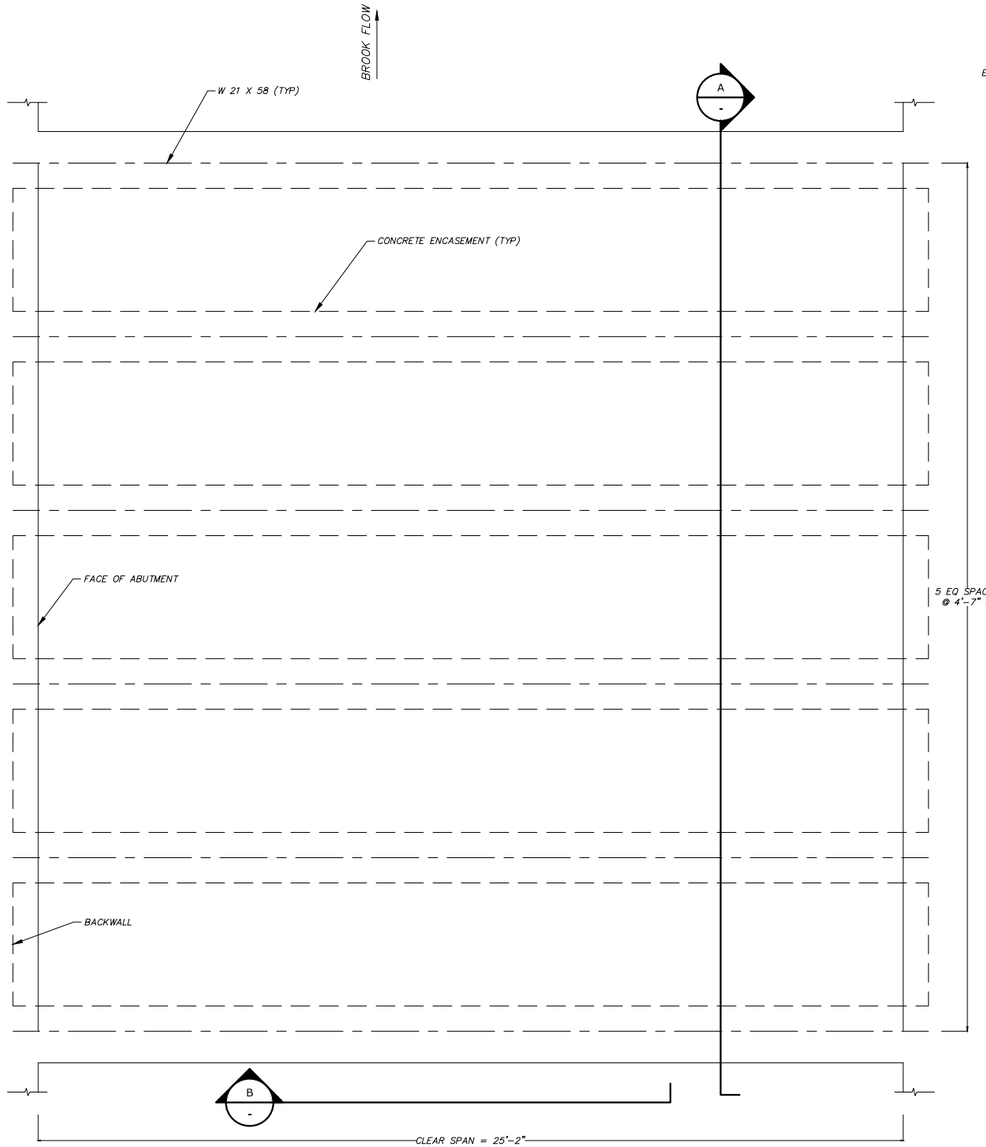
PROJECT NO:	M736/82A
DATE:	8/2022
FILE:	M0736-Task82A-Structural.dwg
DRAWN BY:	JAK
CHECKED:	CDH,DRB
APPROVED:	CDH

DEMOLITION DETAILS

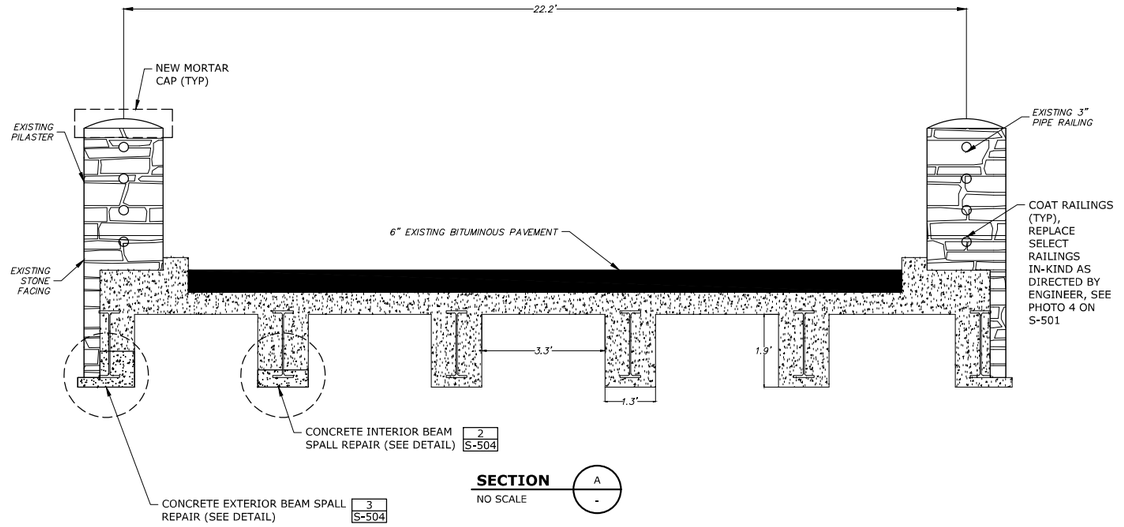
SCALE: NO SCALE

S-502
SHEET 11 OF 15

Last Saved: 8/24/2022
Plotted: Aug 25, 2022 - 2:50pm By: LPT
Tighe & Bond J:\M\M0736 MA DCR Engineering Services MSA\82 - Damon Pond Dam\82A - Design Permitting and Construction\Drawings+Figures\AutoCad\Sheets\M0736-Task82A-Structural.dwg

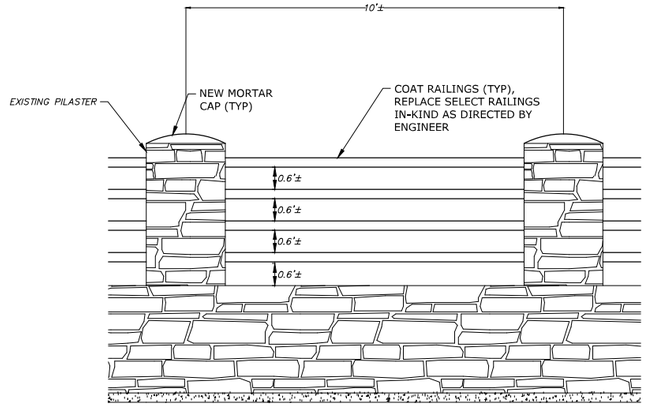


HOSMER ROAD BRIDGE FRAMING PLAN
1" = 2'



SECTION A -
NO SCALE

NOTES:
1. FRAMING PLAN AND EXISTING SECTION BASED ON BRIDGE NO. A-12-10 WILLARD BROOK SECTION DATED JUNE 27TH, 2001 AND ARE APPROXIMATE, CONTRACTOR TO FIELD VERIFY PRIOR TO FABRICATION
2. FIELD OBSERVATIONS RECORDED JANUARY 16TH, 2019.
3. ALL CONCRETE REPAIR TO BE IN CONFORMANCE WITH SPECIFICATION SECTION 03300 & 03930.
4. RAILING MATERIALS SHALL BE IN CONFORMANCE WITH SPECIFICATION SECTION 05500.
5. SEE GENERAL NOTES FOR ADDITIONAL REQUIREMENTS.
6. MAINTAIN EXISTING DECK SCUPPERS.



SECTION B -
NO SCALE

Tighe&Bond

Permit Set

Department of Conservation and Recreation

Damon Pond Dam Repairs And Area Improvements

Ashby, Massachusetts

August 2022

MARK	DATE	DESCRIPTION

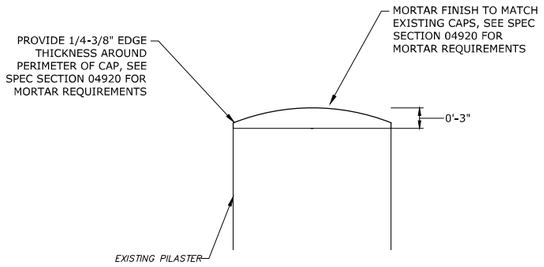
PROJECT NO:	M736/82A
DATE:	8/2022
FILE:	M0736-Task82A-Structural.dwg
DRAWN BY:	JAK
CHECKED:	CDH,DRB
APPROVED:	CDH

REPAIR DETAILS

SCALE: AS SHOWN

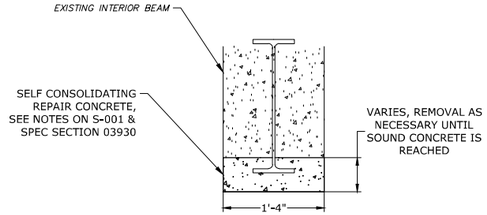
S-503
SHEET 12 OF 15

Last Saved: 8/24/2022
Plotted: Aug 26, 2022 - 2:55pm By: LPT
Tighe & Bond J:\M\M0736 MA DCR Engineering Services MSA\82 - Damon Pond Dam\82A - Design Permitting and Construction\Drawings+Figures\AutoCad\Sheets\M0736-Task82A-Structural.dwg



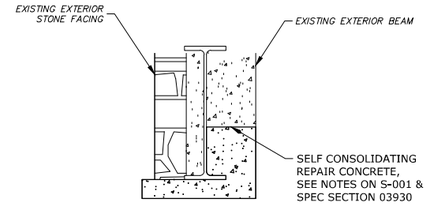
MORTAR CAP

DETAIL	1
1"=1'	-



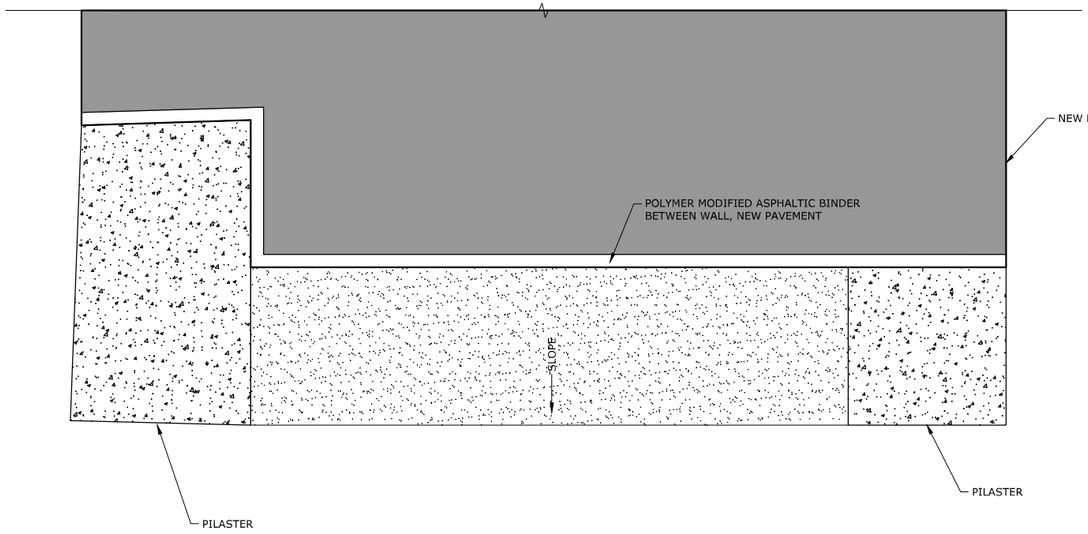
INTERIOR BEAM SPALL REPAIR DETAIL

DETAIL	2
1"=1'	-

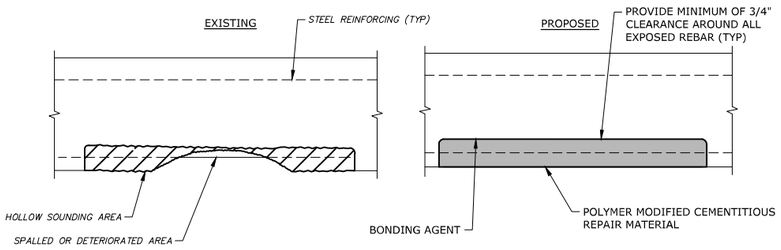


EXTERIOR BEAM SPALL REPAIR DETAIL

DETAIL	3
1"=1'	-



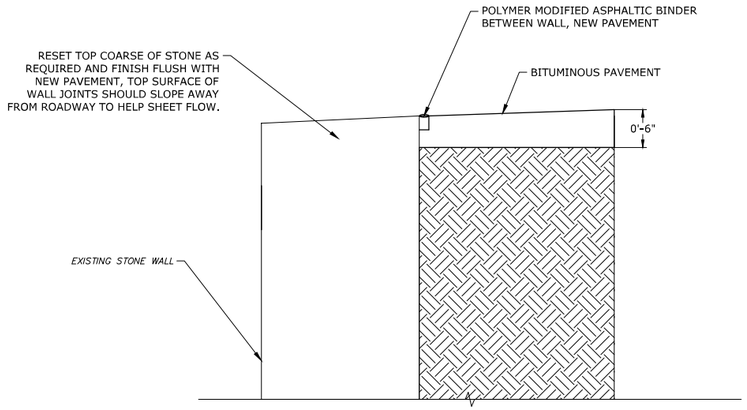
DETAIL	4
1"=1'	-



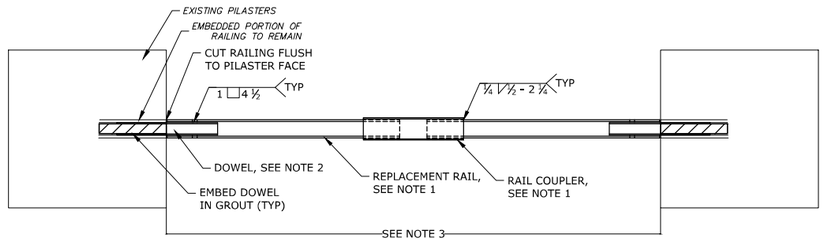
SPALLED OR HOLLOW AREA CONCRETE REPAIR AT DAM WALL

DETAIL	6
NO SCALE	--

NOTE:
SEE NOTES ON S-001 AND SPEC SECTION 03930



DETAIL	5
1"=1'	-



RAILING REPLACEMENT

DETAIL	7
NO SCALE	-

NOTE:
1. REPLACEMENT RAIL AND COUPLING TO BE A53 GRADE B PIPE, EXTRA STRONG (SCH 80). RAILING OD TO MATCH EXISTING, COUPLER ID TO SNUG FIT RAILING OD.
2. DOWEL TO BE A53 GRADE B PIPE, EXTRA STRONG (SCH 80), GROUT DOWEL INTO EXISTING RAILING/ PILASTER OPENING, OD TO SNUG FIT ID OF REPLACEMENT RAIL, 8" EMBED EACH WAY.
3. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS AND RAILING CONNECTION TO PILASTER AND REVIEW FINDINGS WITH ENGINEER PRIOR TO THE ORDERING AND FABRICATION OF RAIL REPLACEMENT ELEMENTS.

Tighe&Bond

Permit Set

Department of Conservation and Recreation

Damon Pond Dam Repairs And Area Improvements

Ashby, Massachusetts

August 2022

MARK	DATE	DESCRIPTION

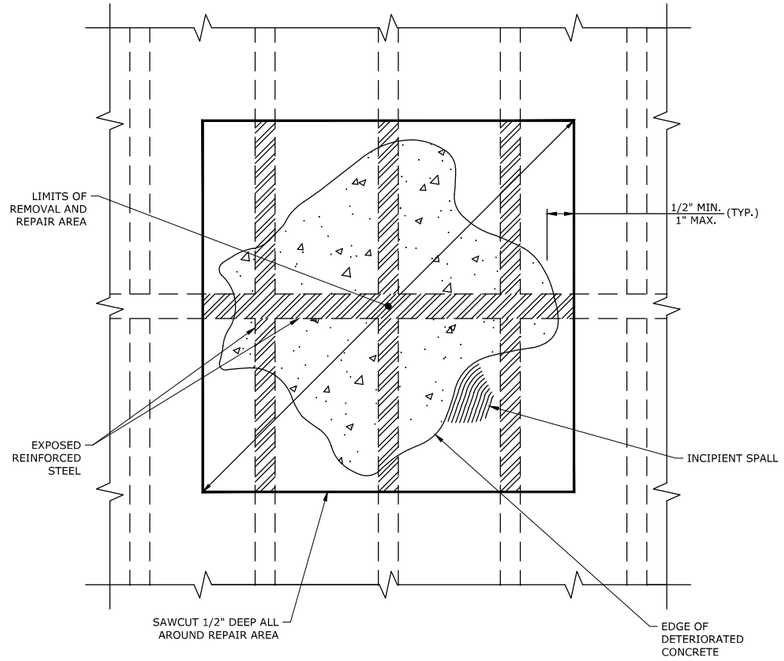
PROJECT NO:	M736/82A
DATE:	8/2022
FILE:	M0736-Task82A-Structural.dwg
DRAWN BY:	JAK
CHECKED:	CDH,DRB
APPROVED:	CDH

REPAIR DETAILS

SCALE: AS SHOWN

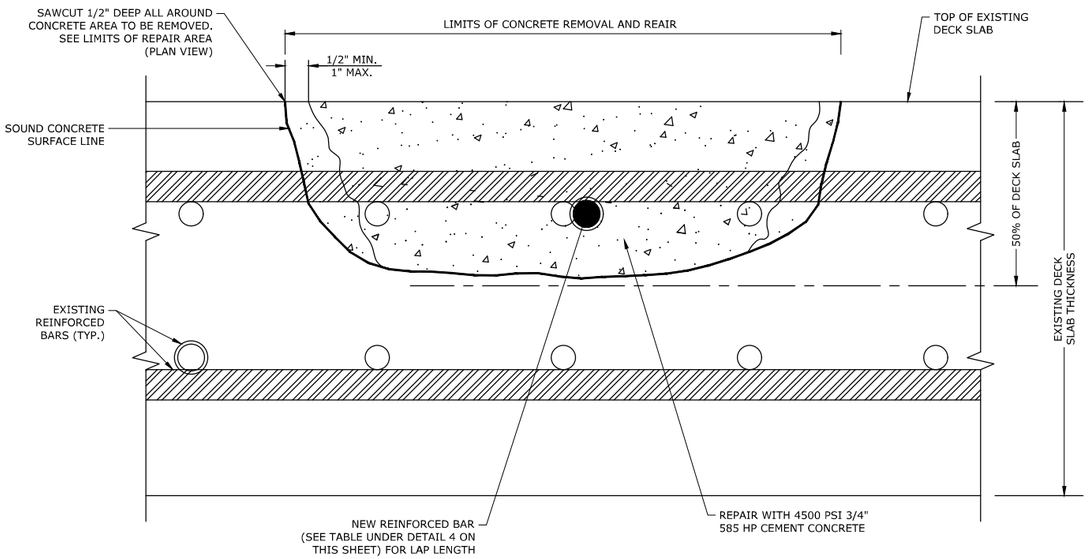
S-504
SHEET 13 OF 15

Last Saved: 8/24/2022
Plotted: Aug 26, 2022 - 2:53pm By: LPT
Tighe & Bond J:\M\M0736 MA DCR Engineering Services MSA\82 - Damon Pond Dam\82A - Design Permitting and Construction\Drawings\Figures\AutoCad\Sheets\M0736-Task82A-Structural.dwg



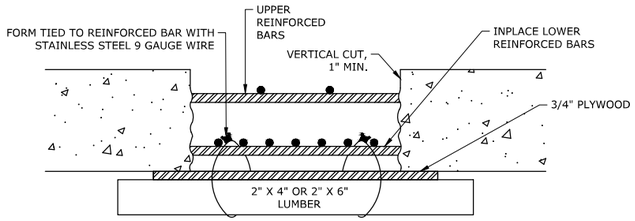
PLAN VIEW: TYPICAL LIMITS OF BRIDGE DECK REPAIR AREA

DETAIL	1
NO SCALE	--



PARTIAL DEPTH BRIDGE DECK REPAIR

DETAIL	2
NO SCALE	--



NOTE:

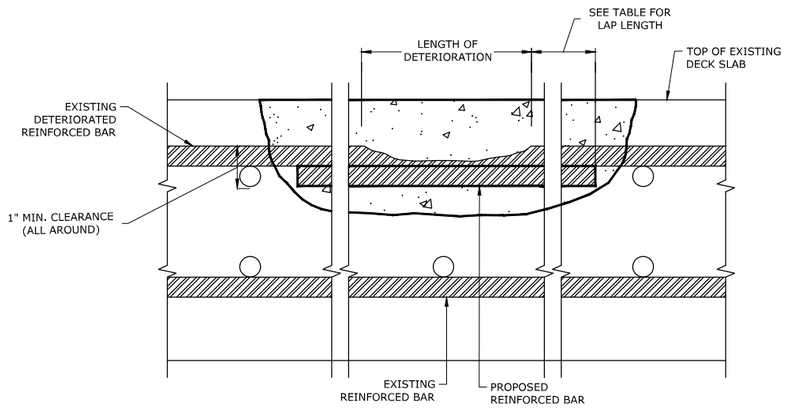
1. 2X LUMBER AND PLYWOOD TO BE REMOVED AFTER REPAIR COMPLETED

FORMWORK SUPPORT FOR FULL DEPTH BRIDGE DECK REPAIR

DETAIL	3
NO SCALE	--

NOTE:

1. REFER TO BRIDGE SUPERSTRUCTURE REHABILITATION NOTES ON S-001 FOR CONCRETE DECK REPAIR REQUIREMENTS.



STEEL REINFORCEMENT LAP LENGTH				
MODIFICATION	#4 BARS	#5 BARS	#6 BARS	#7 BARS
COATED, CENTER TO CENTER SPACING < 6" COVER < 3DB	31"	39"	46"	53"
COATED, CENTER TO CENTER SPACING < 6" COVER ≥ 3DB	18"	22"	27"	49"
COATED, CENTER TO CENTER SPACING ≥ 6" COVER < 3DB	22"	28"	33"	49"
COATED, CENTER TO CENTER SPACING ≥ 6" COVER ≥ 3DB	18"	22"	27"	39"

TYPICAL DETERIORATED REINFORCING BAR REPAIR DETAIL FOR BRIDGE DECK REPAIRS

DETAIL	4
NO SCALE	--

Tighe&Bond

Permit Set

Department of Conservation and Recreation

Damon Pond Dam Repairs And Area Improvements

Ashby, Massachusetts

August 2022

MARK	DATE	DESCRIPTION

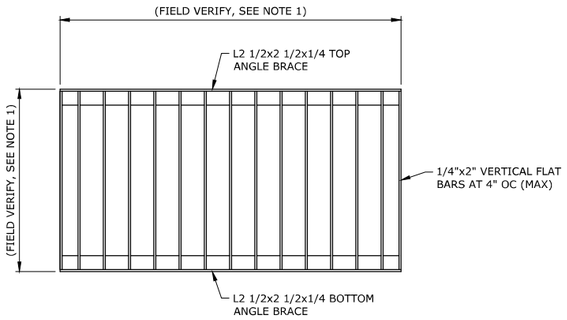
PROJECT NO:	M736/82A
DATE:	8/2022
FILE:	M0736-Task82A-Structural.dwg
DRAWN BY:	JAK
CHECKED:	CDH,DRB
APPROVED:	CDH

REPAIR DETAILS

SCALE: NO SCALE

S-505
SHEET 14 OF 15

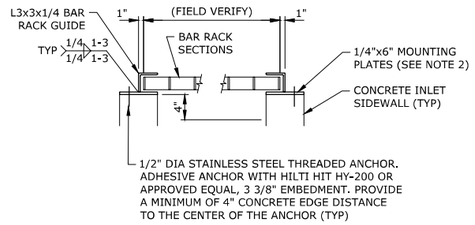
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Plotted: Aug 25, 2022 - 2:57pm By: LPT
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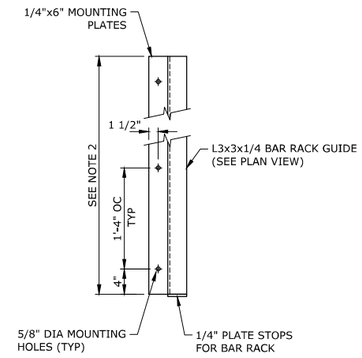
NOTES:

1. CONTRACTOR TO FIELD VERIFY INLET STRUCTURE MEASUREMENTS. APPROXIMATE DIMENSIONS ARE 3'-0" X 3'-0". RACK WIDTH TO FIT BETWEEN GUIDE FRAMES WITH 1" CLEAR ON EACH END AS DETAILED. RACK HEIGHT TO BE FROM INLET BASE TO TOP OF CONCRETE CURB.
2. COORDINATE LENGTH OF GUIDE FRAMES TO EQUAL PROVIDED RACK HEIGHT.

BAR RACK - ELEVATION VIEW
1" = 1'-0"



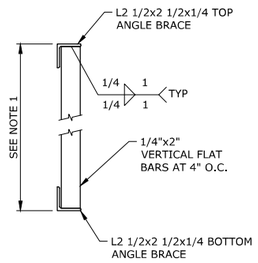
BAR RACK GUIDE FRAMES - PLAN VIEW
1" = 1'-0"



NOTE:

1. ONE REQUIRED AS SHOWN AND ONE REQUIRED OPPOSITE HAND.

BAR RACK GUIDE FRAME - ELEVATION VIEW
1" = 1'-0"



BAR RACK - SECTION VIEW
1 1/2" = 1'-0"

Tighe&Bond

Permit Set

Department of Conservation and Recreation

Damon Pond Dam Repairs And Area Improvements

Ashby, Massachusetts

August 2022

MARK	DATE	DESCRIPTION

PROJECT NO:	M736/82A
DATE:	8/2022
FILE:	M0736-Task82A-Structural.dwg
DRAWN BY:	JAK
CHECKED:	CDH,DRB
APPROVED:	CDH

TRASH RACK DETAILS

SCALE: AS SHOWN

S-506
SHEET 15 OF 15

Last Saved: 8/24/2022
Plotted: Aug 26, 2022 - 2:58pm By: LPT
Tighe & Bond J:\M\M0736 MA DCR Engineering Services MSA\82 - Damon Pond Dam\82A - Design Permitting and Construction\Drawings+Figures\AutoCad\Sheets\M0736-Task82A-Structural.dwg

US Army Corps
of Engineers ®
New England District

WORK-START NOTIFICATION FORM

(Minimum Notice: Two weeks before work begins)

EMAIL TO: **crysyal.i.gardner**@usace.army.mil and cenae-r-ma@usace.army.mil; or

MAIL TO: **Crystal Gardner**
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 or mail it to: Massachusetts Office of Coastal Zone Management, Project Review Coordinator, Suite 900, 100 Cambridge Street, Boston, MA 02114.

A verification from the U.S. Army Corps of Engineers, file # **NAE-2025-01208** was issued to the MADCR (Ashby, MA). This work in is located in Damon Pond off Hosmer Road in Ashby, Massachusetts and authorized the repairs to the Damon Pond Dam's masonry and concrete walls, excavation of sediment at the upstream end of the dam, and removal of vegetation to address safety deficiencies. Structural repairs to the Hosmer Road bridge as well as installation of American Disabilities Act (ADA)-compliant parking spaces and aggregate path from Hosmer Road to the southern beach are proposed.

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: Gardner _____ **Submittals Required:** _____

Inspection Recommendation: _____

Massachusetts Department of Conservation and Recreation Office of Dam Safety Chapter 253 Dam Safety Permit

The Commonwealth of Massachusetts
Department of Conservation and Recreation
State Transportation Building | 10 Park Plaza | Suite 6620 | Boston, MA 02116
www.Mass.gov/DCR | **Tel:** (617) 626-1250

Maura T. Healey, ***Governor*** | Kimberley Driscoll, ***Lieutenant Governor*** | Rebecca L. Tepper, ***Secretary*** | Nicole LaChapelle, ***Commissioner***

Certified Mail No. 7019 1120 0000 5149 3582
Return Receipt Requested

M.G.L. Chapter 253

Dam Safety Permit

Permit No. 14 - 2026 - 466

Applicant

Chris Haker, PE
Tighe & Bond, Inc.
53 Southampton Rd
Westfield, MA 01085

On behalf of:
Massachusetts Department of Conservation and Recreation
c/o Christopher DeTurk, Dam Rehabilitation and Maintenance Manager, ODS
180 Beaman Street
West Boylston, MA 01583

Re: Damon Pond Dam Repairs and Area Improvements Project
National Dam ID: MA02518
Registry Location: Middlesex, Deed Book 5456, Page 485
Owner: Massachusetts Department of Conservation and Recreation
Dam Location: Ashby

Date: February 19, 2026

Dear Mr. Haker:

Reference is made to the permit application dated October 31, 2025 provided by Tighe & Bond, Inc. (T&B). These were submitted for Department of Conservation and Recreation (DCR) Office of Dam Safety (ODS) regulatory review of the above-referenced dam repair project.

Permission is hereby granted under M.G.L. Chapter 253, as amended, to perform work indicated on the drawings titled "**Massachusetts Department of Conservation and Recreation, Damon Pond Dam Repairs and Area Improvements – Willard Brook State Forest, Ashby, MA**" dated May 2024 and as described in supporting documentation provided by T&B.

Permission is granted subject to the following conditions:

a) At least 21 days before the start of construction, the dam owner shall provide the DCR/ODS - Permits Section a completed **DAM SAFETY IMPROVEMENTS – NOTICE OF CONSTRUCTION** (form attached) with a construction schedule and proof of recording of the Ch. 253 Permit at the Registry of Deeds in the county where the dam lies. If the Notice of Construction provided to ODS lacks a construction schedule, proof of recording of the permit, or an explanation of why permit recording is not possible, ODS will return the Notice of Construction to the dam owner indicating the Notice of Construction is incomplete and informing the owner that construction shall not commence until ODS has received a complete Notice of Construction with the required attachments.

b) For all features of the project, the Dam Engineer (T&B) shall notify ODS of any design change from the original design submitted with the permit application due to regulatory requirements, changes in field conditions or any other unanticipated occurrence. This notification shall be a formal submittal to ODS which includes all relevant revised plans, computations and data (survey, geotechnical, etc.) supporting the design change(s). This submittal shall be forwarded to ODS by registered mail, return receipt requested, and will require an amendment to the permit. Review time may vary based upon the complexity of the design change(s), however, ODS will generally issue the permit amendment within five (5) business days of receipt of a complete design revision submittal.

c) The Dam Engineer must report to ODS any unforeseen incidents that occur at the work site during project work. Unforeseen incidents include, but are not limited to, significant uncontrolled seepage into the work area, significant earth support failures or slope failures. The report must explain in detail what occurred, corrective measures taken to mitigate the occurrence and any impacts the occurrence may have had on the project. If the incident results in a design change, ODS must be provided revised design documents (refer to Condition (b), above).

d) During construction, a copy of the dam's Emergency Action Plan (EAP) shall be maintained on-site by the resident engineer.

e) The following shall be prepared by the contractor, approved by the Dam Engineer, and submitted to ODS prior to construction:

- Cofferdam designs. The cofferdams shall be carefully designed to resist anticipated forces without failing and to ensure that seepage around, under, or through the cofferdams is manageable;
- A water control and diversion plan describing methods to be employed to allow work to be performed "in the dry" and to manage both the water level in Damon Pond and outflow from Willard Brook while construction is in progress; and
- A flood response plan. While construction is underway, weather forecasts, stream flows and water levels shall be monitored to allow adequate time to respond to rising water levels at the construction site. If high water levels are expected, equipment and materials shall be removed from the work area and personnel evacuated. Sufficient materials and equipment required for flood response shall be maintained in a safe location at, or near, the construction site.

f) A sufficient level of construction oversight shall be provided by the Dam Engineer to ensure the work conforms to: the project plans and specifications; the Ch. 253 Permit conditions; and generally-accepted dam construction practices as determined by the U.S. Army Corps of Engineers, the U.S. Bureau of Reclamation and/or the U.S. Natural Resources Conservation Service.

Guidance, procedures, checklists, worksheets and references to aid in construction quality assurance are available in the United States Department of Agriculture Natural Resources Conservation Service National Engineering Handbook Part 645-Construction Inspection.

For access to a .pdf copy of NEH Part 645, please email ODS at dam.safety@mass.gov .

g) The Dam Engineer shall invite ODS to the preconstruction meeting, another project meeting at 50% completion and the final inspection meeting. ODS reserves the right to make site visits and inspections at any time during the permit period. ODS requests the following items be addressed at the pre-construction meeting:

- Identification of the
  - resident engineer (Owner's representative overseeing the project);

- contractor's qualified site superintendent; and
- Dam Engineer's representative overseeing the project.

- Provide emergency contact information for the contractor and resident engineer;
- Presentation of the resident engineer's weekly work schedule and discussion of the level of construction oversight to be provided by the resident engineer;
- Level of Dam Engineer construction oversight including: identification of any critical construction items to be overseen by the Dam Engineer; procedures for the Dam Engineer's review and approval of shop drawings and other submittals; documentation of Dam Engineer's approval of any design modifications; procedures for coordinating and scheduling the Dam Engineer's inspection of critical construction elements;
- Anticipated schedule of construction meetings and required attendees. It is expected that while construction is ongoing, weekly construction meetings will be held and attended by the Dam Engineer, the resident engineer, the contractor's superintendent and other appropriate participants; and
- Presentation of the initial construction schedule with identification and discussion of major items.

ODS shall be provided a copy of the preconstruction meeting minutes.

h) The Dam Engineer shall provide ODS written documentation that he/she has reviewed and approved all pertinent submittals or samples concerning critical project dam features. This documentation may be in the form of a submittal log which may be submitted as part of the "as-built" report, described below.

i) Upon completion of work the Applicant shall submit to ODS a **DAM SAFETY CERTIFICATE OF COMPLETION** (form attached). With this certificate of completion submit one bound as-built report with 11"x17" record drawings signed and stamped by a registered professional civil engineer with contractor's signature attesting that all work was performed according to the plans and specifications. The as-built report shall include documentation of submittals reviewed and approved by the Dam Engineer, copies of any materials or construction testing reports and color photos of construction phases and appurtenant installations. Photograph numbers, location and direction in which each photo was taken must be identified. An electronic copy (as a .pdf) of the as-built report and record drawings shall be provided to ODS via email, .ftp site or on a USB flash drive.

j) Once the project has been completed and the reservoir has returned to its normal elevation, the Dam Engineer shall perform a Phase I Inspection to document the condition of the dam. ODS receipt of the Phase I inspection report is required prior to issuance of the Certificate of Compliance.

k) The Certificate of Completion, as-built report and Phase I Inspection report shall be provided to ODS within 90 days of substantial completion of work unless ODS agrees to

later submission of these documents. Submission of these documents is required prior to ODS issuing a Certificate of Compliance.

Any permit issued by DCR shall be subject to revocation by order of the Commissioner if the permittee fails to conform to 302 CMR 10.00, Dam Safety Rules and Regulations, provisions of this permit, or any other applicable laws and regulations.

This permit does not release the applicant from the requirements of any other regulatory authority. Such authorizations and/or notifications include, but are not limited to:

Local Conservation Commission;
Massachusetts Department of Environmental Protection (DEP);
Massachusetts Department of Fish and Game (DFG);
Massachusetts Executive Office of Environmental Affairs (EOEA), MEPA Unit; and
U.S. Army Corps of Engineers.

This extended permit must be recorded by the applicant at the Registry of Deeds in the county where the dam lies. Recording must be done prior to the commencement of construction and a copy of the recorded permit filed with the Office of Dam Safety.

This extended permit remains valid for two (2) years from the original date of permit issuance: **February 19, 2026.**

Permit expiration date: **February 19, 2028**.

William Salomaa, Director
DCR, Office of Dam Safety

Bryan Carignan, Permit Engineer
DCR, Office of Dam Safety

Attachments: Dam Safety Improvements – Notice of Construction form
Dam Safety Certificate of Completion form

Informational (NOT TO BE RECORDED AT REGISTRY OF DEEDS)

Excerpts from Dam Safety Rules Regulations:

302 CMR 10.09(5): Recording a Chapter 253 Permit.

A permit to construct, drawdown, repair, alter, breach or remove a dam shall be recorded at the Registry of Deeds in the county where the dam lies. Recording must be done prior to the commencement of construction and a copy of the recorded permit filed with the Commissioner.

To: DCR, Office of Dam Safety – Permits Section
180 Beaman Street
West Boylston, MA 01583

DAM SAFETY IMPROVEMENTS - NOTICE OF CONSTRUCTION

Dam Owner/Applicant
Name:
Representative:
Address:
Phone:
Fax:
Email Address:

Project
Project location Town/City:
Dam name:
National Dam ID Number:
State Dam ID Number:
Nature of Dam Safety Improvements:
Chapter 253 Permit date of issue:
Chapter 253 Permit expiration date:
Permit Recorded at_____ Registry of Deeds
Dam Parcel Registry of Deeds Book Number:
Dam Parcel Registry of Deeds Page Number:
Recorded Permit Registry of Deeds Book Number:
Recorded Permit Registry of Deeds Page Number:
Copy of the recorded permit attached Yes ( )
Construction start date:
Construction schedule attached Yes ( )

Engineer
Company Name:
Representative:
Address:
Phone:
Fax:
Email Address:

Contractor
Company Name:
Representative:
Address:
Phone:
Fax:
Email Address :

Brief description of project, note location and dates of construction:

_____
_____
_____

By Contractor

Print name and title:_____

Signature and date:_____

By Engineer

Print name, title:_____

Signature and date:_____

By Dam Owner/Applicant

Print name and title:_____

Signature and date:_____

To: DCR, Office of Dam Safety – Permits Section
180 Beaman Street
West Boylston, MA 01583

DAM SAFETY CERTIFICATE OF COMPLETION

Dam Owner/Applicant
Name:
Representative:
Address:
Phone:
Fax:
Email Address:

Project
Project location Town/City:
Dam name:
National Dam ID Number:
State Dam ID Number:
Nature of Dam Safety Improvements:
Chapter 253 Permit date of issue:
Chapter 253 Permit expiration date:
Permit Recorded at_____ Registry of Deeds
Dam Parcel Registry of Deeds Book Number:
Dam Parcel Registry of Deeds Page Number:
Recorded Permit Registry of Deeds Book Number:
Recorded Permit Registry of Deeds Page Number:
Project completion date:

Engineer
Company Name:
Representative:
Address:
Phone:
Fax:
Email Address:

Contractor
Company Name:
Representative:
Address:
Phone:
Fax:
Email Address :

Brief description of project and dates of construction:

_____
_____
_____

Statement of project completion in accordance with plans, specifications, dam safety permit conditions and standard construction practices:

_____
_____
_____

By Contractor

Print name and title:_____

Signature and date:_____

By Engineer

Print name, title and PE stamp here:_____

Signature and date:_____

By Dam Owner/Applicant

Print name and title:_____

Signature and date:_____

Massachusetts Department of Environmental Protection Chapter 91 Permit

Department of Environmental Protection

Address: 100 Cambridge Street, Suite 900, Boston MA 02114 | **Phone**: 617-292-5500

Maura T. Healey	Kim Driscoll	Rebecca Tepper	Bonnie Heiple
Governor	Lieutenant Governor	Secretary	Commissioner

February 13, 2026

Massachusetts Department of Conservation & Recreation
Priscilla Geigis, Deputy Commissioner
c/o Lucas Acaba, Tighe & Bond
177 Corporate Drive
Portsmouth, NH 03801

Re: Draft Permit – Chapter 91 Application No. WW01-0000763; Improvement Dredging; 0 Route 119 (Parcel ID: 012/011.0-0011-0001.0); within Squannassit Area of Critical Environmental Concern; Waters of Damon Pond (Impoundment of Willard Brook); Ashby, Middlesex County

Deputy Commissioner Geigis:

Subject to the appeal rights identified in the regulations at 310 CMR 9.17, the Department of Environmental Protection Waterways Regulation Program has tentatively approved the enclosed, above-referenced Chapter 91 Permit Application. Pursuant to 310 CMR 9.14, a copy of the Permit is enclosed. **This Permit is not final until the administrative appeal period for this Permit has elapsed, or if such an appeal has been filed, until all proceedings before the Department have been completed.**

Pursuant to 310 CMR 9.17, this decision may be appealed within twenty-one (21) days of the date of issuance of this Permit. The work authorized by this Permit shall not commence if the Department receives a request for an adjudicatory hearing in accordance with 310 CMR 9.17(2). Upon successful completion of the appeal period, this Permit may be recorded at the applicable Registry of Deeds within the chain of title for the affected property.

Please contact Susan You of the Waterways Regulation Program at susan.you@mass.gov if there are any questions.

Sincerely,

Daniel J. Padien
Program Chief
Waterways Regulation Program

cc: Town of Ashby Selectboard
Town of Ashby Planning Board
Town of Ashby Conservation Commission (DEP File #093-0445)
Priscilla Geigis, Deputy Commissioner, MA Department of Conservation & Recreation
Christopher DeTurk, MA Department of Conservation & Recreation

Encl: Chapter 91 Permit
MassDEP Communication for Non-English-Speaking Parties
Notice of Appeal Rights

NOTICE OF APPEAL RIGHTS

Who has the right to appeal?
The following persons shall have the right to an adjudicatory hearing concerning this decision by the Department to grant or deny a license or permit, in accordance with 310 CMR 9.17(1)**:** (a) an Applicant who has demonstrated property rights in the lands in question, or which is a public agency; (b) any person aggrieved by the decision of the Department to grant a license or permit who has submitted written comments within the public comment period; (c) ten (10) residents of the Commonwealth who, pursuant to M.G.L. Chapter 30A, § 10A, have submitted comments within the public comment period with at least 5 of the 10 residents residing in the municipality(s) in which the license or permitted activity is located. The appeal shall clearly and specifically state the facts and grounds for the appeal and the relief sought, and each appealing resident shall file an affidavit stating the intent to be part of the group and to be represented by its authorized representative; (d) the municipal official in the affected municipality who has submitted written comments within the public comment period; and (e) CZM, for any project identified in 310 CMR 9.13(2) (a) for CZM participation or, in an Ocean Sanctuary, if it has filed a notice of participation within the public comment period.

How can I request an adjudicatory hearing?
A person requesting an adjudicatory hearing must submit a "Notice of Claim" to the Department, with a copy of the MassDEP Adjudicatory Hearing Fee Transmittal Form and include the details specified, within twenty-one (21) days of the date of issuance of this decision. The MassDEP Adjudicatory Hearing Fee Transmittal Form is available at the following website**:** https://www.mass.gov/doc/adjudicatory-hearing-fee-transmittal-form/download. The Notice of Claim must be made in writing and sent by certified mail or hand delivery to:

MassDEP
Case Administrator
100 Cambridge Street, Suite 900
Boston, MA 02114

A copy of the complete Notice of Claim must be sent at the same time by certified mail or hand delivery to: (1) the Applicant, (2) the municipal official of the city or town where the project is located, and (3) the issuing office of the MassDEP, which in this case is located at:

MassDEP
Waterways Regulation Program
100 Cambridge Street, Suite 900
Boston, MA 02114

The MassDEP Adjudicatory Hearing Fee Transmittal Form and a valid check payable to "The Commonwealth of Massachusetts" in the amount of one hundred dollars ($100) must be mailed to:

MassDEP
Commonwealth Master Lockbox
P.O. Box 4062
Boston, MA 02211

What information must be included in the hearing request?
Pursuant to 310 CMR 9.17(3), any Notice of Claim requesting an adjudicatory hearing must include the following information:

(a) the MassDEP Waterways Application File Number;
(b) the complete name, address, fax number and telephone number of the Applicant;
(c) the address of the project;
(d) the complete name, address, fax number, and telephone number of the party filing the request and, if represented by counsel, the name, address, fax number, and phone number of the attorney;
(e) if claiming to be a person aggrieved, the specific facts that demonstrate that the party satisfies the definition of "aggrieved person" found in 310 CMR 9.02;
(f) a clear statement that a formal adjudicatory hearing is being requested;
(g) a clear statement of the facts which are the grounds for the proceedings, the specific objections to the MassDEP's written decision, and the relief sought through the adjudicatory hearing, including specifically the changes desired in the final written decision; and
(h) a statement that a copy of the request has been sent to: the Applicant and the municipal official of the city or town where the project is located.

Dismissal of request
The request for appeal will be dismissed if the filing fee is not paid, unless the appellant is exempt or is granted a waiver.

Exemptions
The filing fee is not required if the appellant is a city or town (or municipal agency), county, or district of the Commonwealth of Massachusetts, or a municipal housing authority.

Waiver
The Department may waive the adjudicatory hearing filing fee pursuant to 310 CMR 4.06(2) for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file an affidavit setting forth the facts believed to support the claim of undue financial hardship together with the hearing request as provided above.

Department of Environmental Protection

Address: 100 Cambridge Street, Suite 900, Boston MA 02114 | **Phone**: 617-292-5500

Maura T. Healey	**Kim Driscoll**	**Rebecca Tepper**	**Bonnie Heiple**
Governor	Lieutenant Governor	Secretary	Commissioner

PERMIT NUMBER: WW01-0000763

NAME AND ADDRESS OF PERMITTEE:
Massachusetts Department of Conservation & Recreation
Priscilla Geigis, Deputy Commissioner
10 Park Plaza, Suite 6620
Boston, MA 02116

ISSUED: February 13, 2026
EFFECTIVE: March 10, 2026
EXPIRATION: March 10, 2031

Permission is hereby given by the Department of Environmental Protection Waterways Regulation Program (the "Department") for Massachusetts Department of Conservation & Recreation (the "Permittee") to perform improvement dredging within waters of Damon Pond, as further detailed below.

The project site is located within Damon Pond (impoundment of Willard Brook) within the Squannassit Area of Critical Environmental Concern in the Town of Ashby at 0 Route 119 (Parcel ID: 012/011.0-0011-0001.0). The proposed activities include dredging within a 5,500-square foot area (approximately 1,000 cubic yards of sediment) to a depth of 3 feet below the High Water Mark including over-dredging (an elevation of 592 feet) and implementing temporary water control measures to facilitate work. The work will occur approximately 50 feet upstream of an existing dam, and the dredged sediment will be disposed of outside of Chapter 91 jurisdiction.

All work authorized herein shall be performed in the locations shown and to the dimensions indicated in the Permit plans entitled: "*PLAN ACCOMPANYING PETITION OF MASSACHUSETTS DEPARTMENT OF CONSERVATION AND RECREATION TO DREDGE AND MAINTAIN DAMON POND DAM WITHIN DAMON POND AT HOSMER ROAD, ASHBY, MIDDLESEX COUNTY, MASSACHUSETTS*" Sheets 1-4, signed and sealed by Daniel R. Buttrick, Massachusetts Professional Engineer No. 48155, on February 12, 2026.

CHAPTER 91 PERMIT NUMBER: WW01-0000763
0 Route 119, Damon Pond (Willard Brook), Squannassit ACEC, Ashby, Middlesex County

SPECIAL CHAPTER 91 PERMIT CONDITIONS

1. The Permittee shall provide notification to the Department a minimum of three (3) days prior to commencement of any authorized dredging activities.

2. The Permittee shall remove all temporary structures upon completion of the project and within the 5-year term of this Permit.

3. Within sixty (60) days of completion of the dredging authorized herein, the Permittee shall furnish, to the Department, a bathymetric survey signed and sealed by a Professional Land Surveyor that depicts the post-dredge depths within the dredge area.

STANDARD CHAPTER 91 PERMIT CONDITIONS

1. Acceptance of this authorization shall constitute an agreement by the Licensee/Permittee to conform to all terms and conditions stated herein.

2. Any modification from that explicitly authorized herein and contained on the Plans shall require prior review of the Department to determine whether additional authorization is required pursuant to M.G.L. Chapter 91, the Public Waterfront Act, and the Waterways Regulations at 310 CMR 9.00.

3. The Licensee/Permittee shall inform the Department in writing at least three (3) days before commencing any authorized dredging or dredge material disposal.

4. This authorization is issued upon the express condition that any and all other applicable authorizations necessitated due to the provisions hereof shall be secured by the Licensee/Permittee prior to the commencement of any activity hereby authorized.

5. This authorization shall be revocable by the Department for noncompliance with the terms and conditions set forth herein. This authorization may be revoked after the Department has given written notice of the alleged noncompliance to the Licensee/Permittee, or his agent, and those persons who have filed a written request, with the Department, for such notice and have afforded the Licensee/Permittee a reasonable opportunity to correct said noncompliance. Failure to correct noncompliance after the issuance of a written notice by the Department shall render this authorization void.

6. This authorization is issued subject to all applicable federal, state, county, and municipal laws, ordinances, bylaws, and regulations, including but not limited to, a valid Order of Conditions issued pursuant to the Wetlands Protection Act, M.G.L. Chapter 131, §40 and a valid Water Quality Certification issued pursuant 314 CMR 9.00.

7. This authorization is issued upon the express condition that dredging, transportation, and disposal of dredge material shall be in strict conformance with all applicable requirements and authorizations of the Department. Any subsequent maintenance dredging and transportation and disposal of dredge material during the term of this authorization shall be in strict conformance with all applicable requirements and authorizations of the Department.

8. Unless otherwise authorized in accordance with a Special Condition of this authorization, no maintenance dredging beyond the time authorized herein is permitted.

9. The dredging under this authorization shall be conducted as to cause no unnecessary obstruction of the free passage of vessels.

10. In conducting the dredging authorized, care shall be taken to cause no shoaling. If, however, any shoaling is caused, the Licensee/Permittee shall, at his expense, remove the shoal areas. The Licensee/Permittee shall pay all costs of supervision, and if at any time the Department deems necessary a survey or surveys of the area dredged, the Licensee/Permittee shall pay all costs associated with such work.

11. Nothing in this authorization shall be construed as to impair the legal rights of any persons or authorize dredging on land not owned by the Licensee/Permittee without consent of the owner(s) of such property.

12. The Licensee/Permittee shall assume and pay all claims and demands arising in any manner from the work authorized herein and shall save harmless and indemnify the Commonwealth of Massachusetts, its officers, employees, and agents from all claims, audits, damages, costs and expenses incurred by reason thereof.

13. Whosoever violates any provisions of this authorization shall be subject to a fine of twenty-five thousand dollars and zero cents ($25,000.00) per day for each day such violation occurs or continues, or by imprisonment for not more than one year, or both such fine and imprisonment; or shall be subject to civil penalty not to exceed twenty-five thousand dollars and zero cents ($25,000.00) for each day such violation occurs or continues.

14. In the event of any conflict between the Special Conditions and the Standard Conditions, the Special Conditions shall prevail.

All notifications and submittals shall include the Chapter 91 Permit Number and shall be submitted electronically to: dep.waterways@mass.gov (preferred) or to: Waterways Program Coordinator, 100 Cambridge Street, Suite 900, Boston, MA 02114 (or to the Program's current mailing address).

DEPARTMENT OF ENVIRONMENTAL PROTECTION



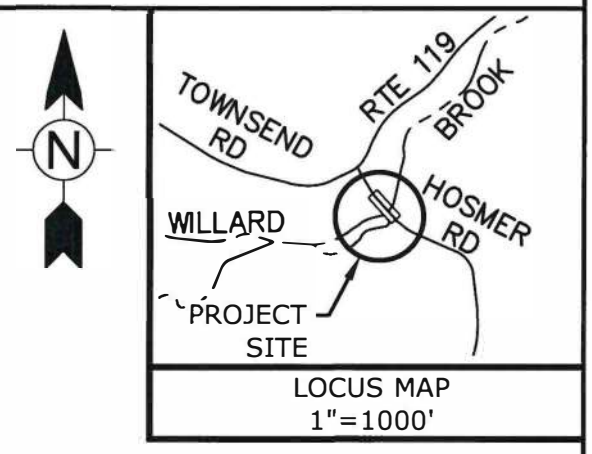
Daniel J. Padien
Program Chief
Waterways Regulation Program

I CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE AND BELIEF, THIS PLAN ADHERES TO THE FORMATING RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

NAME

2/12/2026
DATE

LIST OF DRAWINGS	
SHEET NO.	SHEET TITLE
1	COVER SHEET
2	EXISTING CONDITIONS PLAN
3	DREDGE AREA SITE PLAN
4	DREDGE AREA PROFILES



LOCUS MAP
1"=1000'

PROPERTY LINE/TOWN LINE
EXISTING EASEMENT LINE
EXISTING CONTOUR LINE
PROPOSED CONTOUR LINE
EXISTING TOP OF SEDIMENT LINE
ORDINARY HIGH WATER
FEMA FLOOD ZONE BOUNDARY
TEMPORARY COFFERDAM
WINTER DRAWDOWN LINE

REFERENCE PLANS:

1. TOPOGRAPHIC INFORMATION SHOWN WAS DERIVED FROM A GROUND FIELD SURVEY CONDUCTED BY WSP IN JANUARY 2019 AND ON OCTOBER 20, 2020. NO SUBSURFACE UTILITY RESEARCH WAS CONDUCTED FOR THIS SURVEY.

NOTES:

1. HORIZONTAL DATUM IS NAD83 AND VERTICAL DATUM IS NAVD88.
2. CHAPTER 91 PERMITTED SCOPE OF WORK INCLUDES TEMPORARY COFFER DAMS, DREDGING. ALL OTHER FILL/STRUCTURE/ACTIVITIES EXEMPT OR OTHERWISE NOT A PART OF THE CHAPTER 91 APPLICATION/AUTHORIZATION.
3. THE PROJECT SITE IS LOCATED WITHIN FEMA ZONE A, NO FLOOD ELEVATION DETERMINED. FEMA FLOOD INSURANCE RATE MAP IS 25017B, REV. 7/8/2025.

COMMONWEALTH OF MASSACHUSETTS
DANIEL R. BUTTRICK
CIVIL
No. 48156
REGISTERED PROFESSIONAL ENGINEER
2/12/2026

COVER
SHEET 1 OF 4
AUGUST 29, 2025

Tighe&Bond

PLAN ACCOMPANYING PETITION OF MASSACHUSETTS DEPARTMENT OF CONSERVATION AND RECREATION TO DREDGE DAMON POND DAM WITHIN DAMON POND AT HOSMER ROAD, ASHBY, MIDDLESEX COUNTY, MASSACHUSETTS.

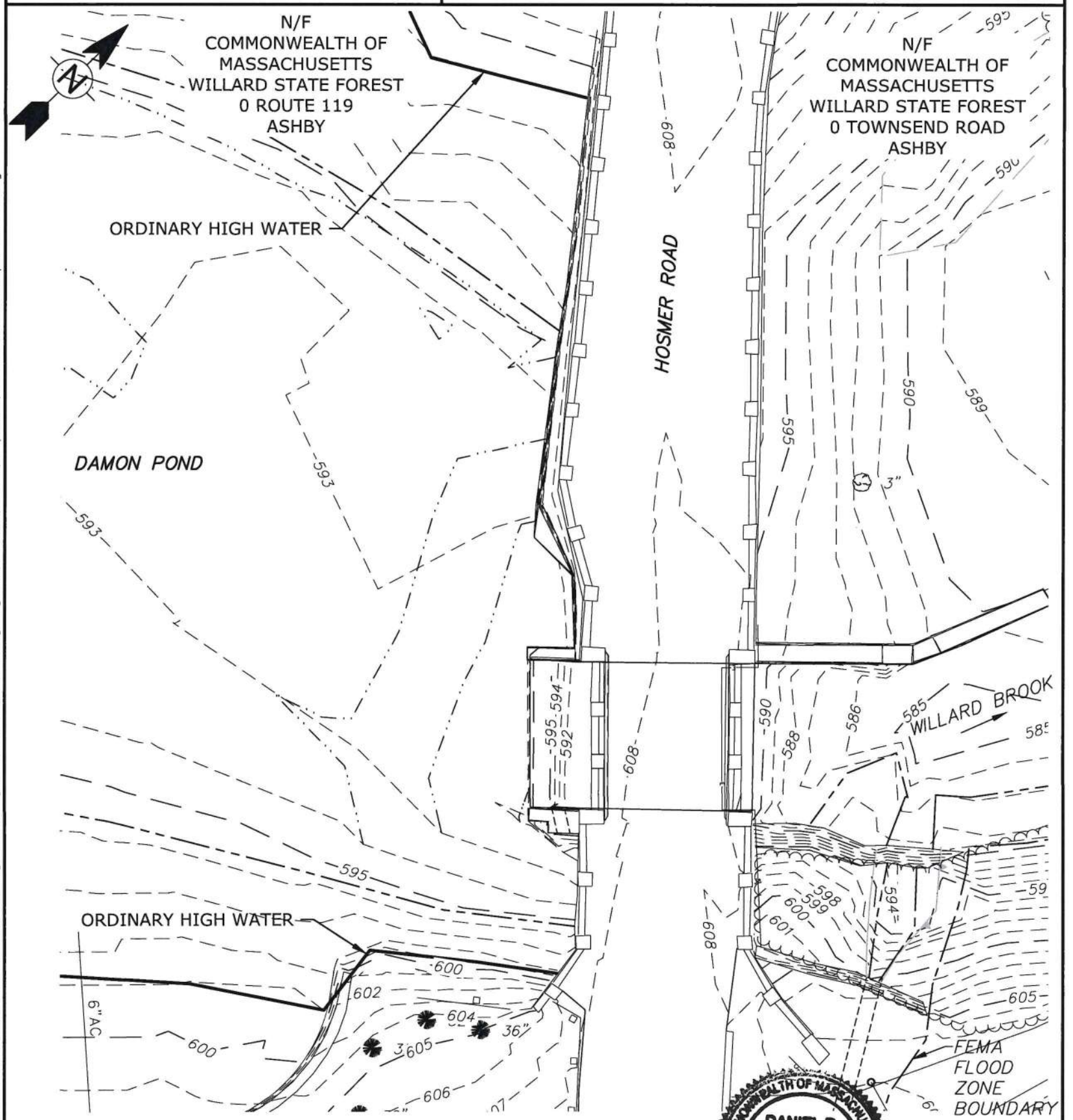
CHAPTER 91 PERMIT NO. W01-0000763

Plotted On:Oct 27, 2025-11:12am By: LPT
J:\M\M0736 MA DCR Engineering Services MSA\82 - Damon Pond Dam\82A - Design Permitting and Construction\Drawings-Figures\AutoCad\Sheets\Chapter91\M736-Task82A-Ch91-Cover1.dwg

I CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE AND BELIEF, THIS PLAN ADHERES TO THE FORMATING RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

Daniel R Buttrick 2/12/2026

NAME DATE



COMMONWEALTH OF MASSACHUSETTS
DANIEL R. BUTTRICK
CIVIL
No. 48158
REGISTERED PROFESSIONAL ENGINEER
2/12/2026

0 20' 40'
SCALE IN FEET
SCALE: 1"= 20

EXISTING CONDITIONS PLAN
SHEET 2 OF 4
AUGUST 29, 2025

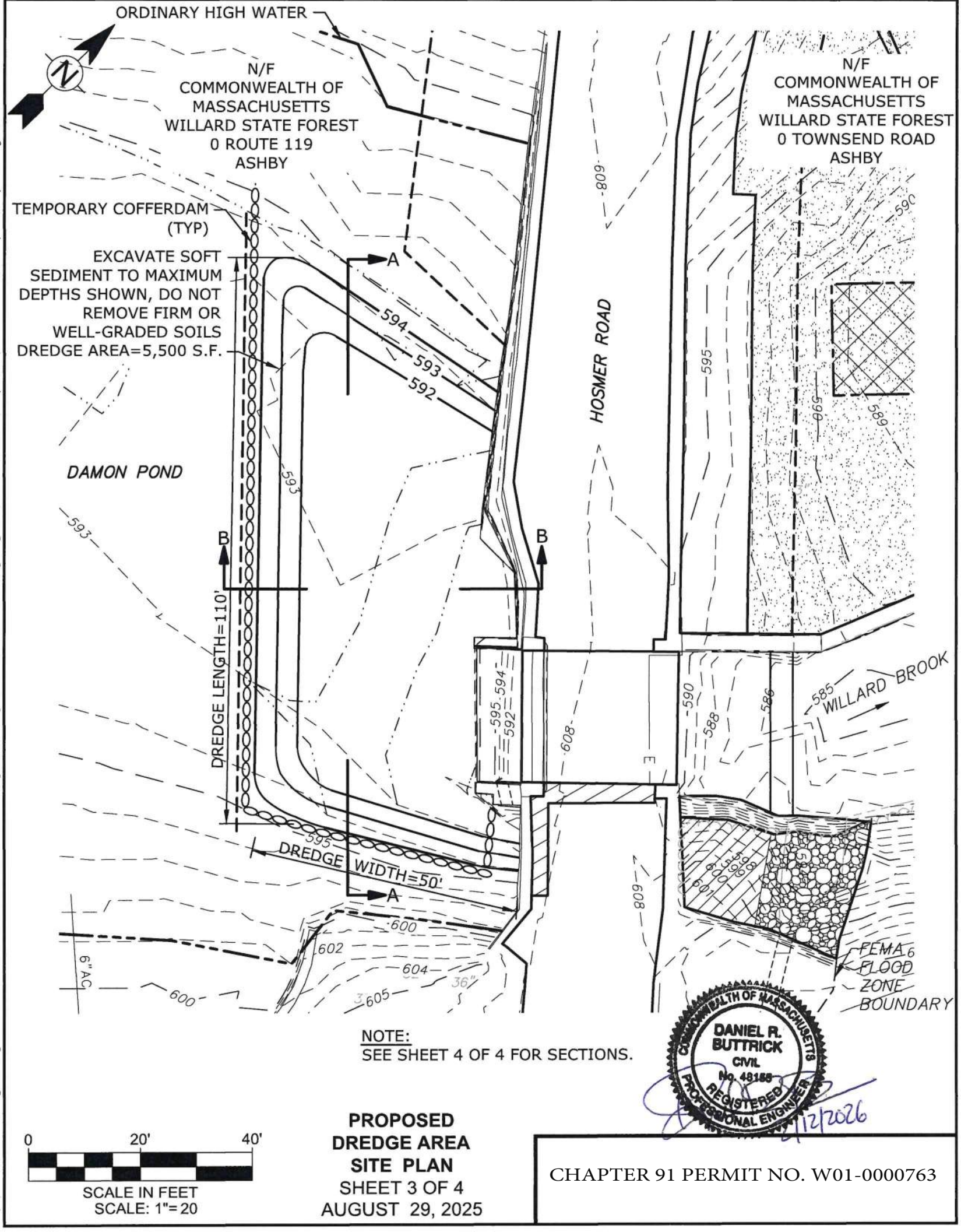
CHAPTER 91 PERMIT NO. W01-0000763

Plotted On:Aug 28, 2025-1:50pm By: LPT
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I CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE AND BELIEF, THIS PLAN ADHERES TO THE FORMATING RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

NAME

2/12/2026
DATE



NOTE:
SEE SHEET 4 OF 4 FOR SECTIONS.

COMMONWEALTH OF MASSACHUSETTS
DANIEL R. BUTTRICK
CIVIL
No. 48185
REGISTERED PROFESSIONAL ENGINEER

2/12/2026

0 20' 40'
SCALE IN FEET
SCALE: 1"= 20

PROPOSED DREDGE AREA SITE PLAN
SHEET 3 OF 4
AUGUST 29, 2025

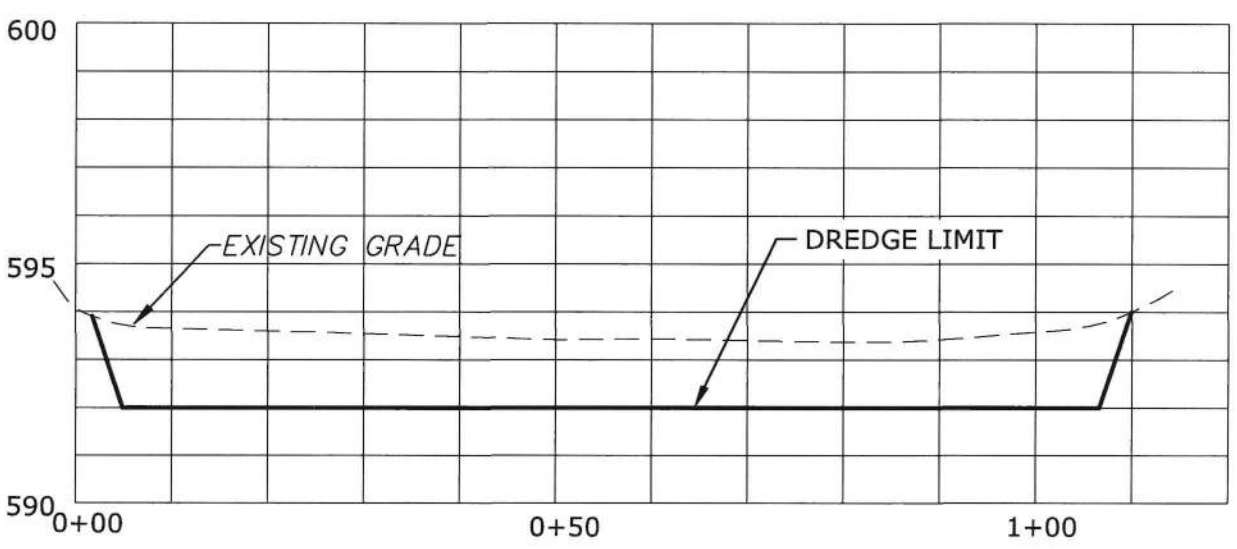
CHAPTER 91 PERMIT NO. W01-0000763

Plotted On:Oct 23, 2025-11:35am By: LPT
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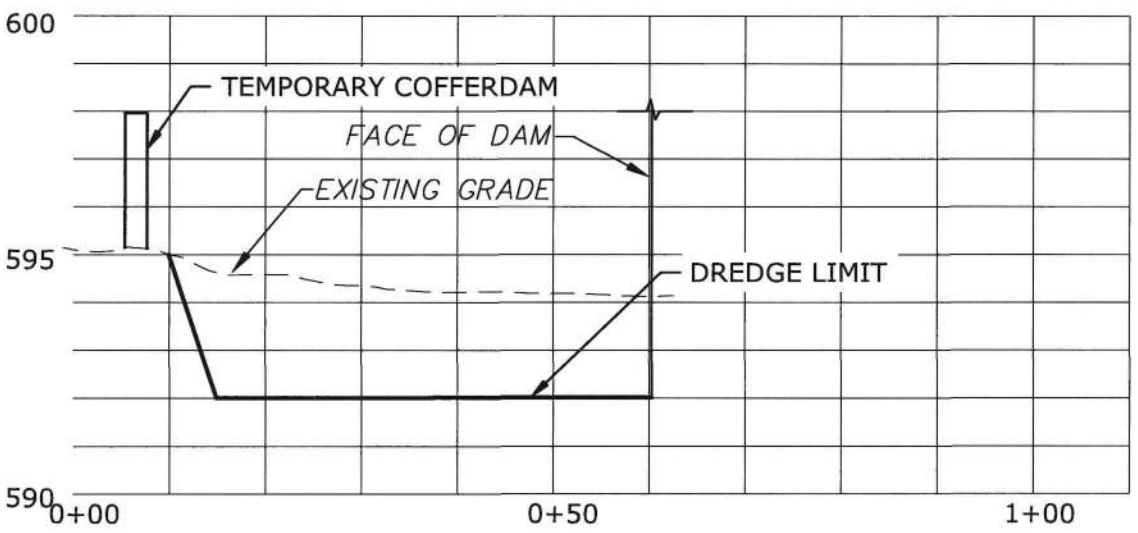
I CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE AND BELIEF, THIS PLAN ADHERES TO THE FORMATING RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

NAME

2/12/2026
DATE



NORTH WEST - SOUTH WEST CROSS SECTION A-A



SOUTH WEST - NORTH EAST CROSS SECTION B-B

COMMONWEALTH OF MASSACHUSETTS
DANIEL R. BUTTRICK
CIVIL
No. 40155
REGISTERED PROFESSIONAL ENGINEER

2/12/2026

0 20' 40'
SCALE IN FEET
SCALE: 1"= 20' (HORIZ)

PROPOSED DREDGE AREA PROFILES
SHEET 4 OF 4
AUGUST 29, 2025

CHAPTER 91 PERMIT NO. W01-0000763

Plotted On:Aug 28, 2025-1:54pm By: LPT
J:\M\M0736 MA DCR Engineering Services MSA\82 - Damon Pond Dam\82A - Design Permitting and Construction\Drawings-Figures\AutoCad\Sheets\Chapter91\M0736-Task82A-Chapt91-PropSiPl.dwg

重要 महत्वपूर्ण σημαντικός
Important
կարեւոր quan trọng مهم

Communication for Non-English-Speaking Parties

This document is important and should be translated immediately.

If you need this document translated, please contact MassDEP's Director of EJ at the telephone number listed below.

Español Spanish

Este documento es importante y debe ser traducido de inmediato. Si necesita este documento traducido, comuníquese con la Directora de Diversidad de MassDEP al número de teléfono que aparece más abajo.

Português Portuguese

Este é um documento importante e deve ser traduzido imediatamente. Se precisar de uma tradução deste documento, entre em contato com o Diretor de Diversidade da MassDEP nos números de telefone listados abaixo.

繁體中文 Chinese Traditional

本文件非常重要，應立即翻譯。如果您需要翻譯這份文件，請用下面列出的電話號碼聯絡 MassDEP 多元化負責人。

简体中文 Chinese Simplified

本文件非常重要，应立即翻译。如果您需要翻译这份文件，请用下面列出的电话号码与 MassDEP 的多元化主任联系。

Ayisyen Kreyòl Haitian Creole

Dokiman sa-a se yon bagay enpòtan epi yo ta dwe tradwi I imedyatman. Si ou bezwen dokimar sa a tradwi, tanpri kontakte Direktè Divèsite MassDEP la nan nimewo telefòn endike anba.

Việt Vietnamese

Tài liệu này rất quan trọng và cần được dịch ngay lập tức. Nếu quý vị cần dịch tài liệu này, xin liên lạc với Giám đốc Đa dạng của MassDEP theo các số điện thoại ghi dưới đây.

ប្រទេសកម្ពុជា Khmer/Cambodian

ឯកសារនេះគឺសំខាន់ហើយគួរត្រូវបានបកប្រែភ្លាមៗ។ ប្រសិនបើអ្នកត្រូវការឱ្យគេបកប្រែឯកសារនេះ
សូមទាក់ទងមកនាយកផ្នែកពិពិធកម្មរបស់ MassDEP តាមលេខទូរស័ព្ទខាងក្រោម។

Kriolu Kabuverdianu Cape Verdean

Kel dukumentu li é inpurtánti y debe ser traduzidu imidiatamenti. Se bu meste di kel dukumentu traduzidu, pur favor kontakta Diretor di Diversidádi di MassDEP na numeru abaxu indikadu.

Contact Deneen Simpson 857-406-0738
Massachusetts Department of Environmental Protection
100 Cambridge Street 9th Floor Boston, MA 02114
TTY# MassRelay Service 1-800-439-2370 • https://www.mass.gov/environmental-justice

(Version revised 4.21.2023) 310 CMR 1.03(5)(a)

Русский Russian

Это важный документ, и он должен быть безотлагательно переведен. Если вам нужен перевод данного документа, пожалуйста, свяжитесь с директором по вопросам многообразия (Diversity Director) компании MassDEP по указанному ниже телефону.

العربية Arabic

هذه الوثيقة مهمة ويجب ترجمتها على الفور. اذا كنت بحاجة الى هذه الوثيقة مترجمة، يرجى الاتصال بمدير التنوع PMassDE على أرقام الهواتف المدرجة أدناه.

한국어 Korean

이 문서는 중요하고 즉시 번역해야 합니다. 이 문서의 번역이 필요하시다면, 아래의 전화 번호로 MassDEP 의 다양성 담당 이사에 문의하시기 바랍니다.

հայերեն Armenian

Այս փաստաթուղթը կարևոր է և պետք է անմիջապես թարգմանվի:
Եթե Ձեզ անհրաժեշտ է այս փաստաթուղթը թարգմանել, դիմեք MassDEP-ի բազմազանության տնօրենին ստորև նշված հեռախոսահամարով:

فارسی Farsi Persian

این سند مهم است و باید فورا ترجمه شود.
اگر به ترجمه این سند نیاز دارید، لطفا با مدیر بخش تنوع نژادی MassDEP به شماره تلفن ذکر شده در زیر تماس بگیرید.

Français French

Ce document est important et devrait être traduit immédiatement. Si vous avez besoin de ce document traduit, veuillez communiquer avec le directeur de la diversité MassDEP aux numéros de téléphone indiqués ci-dessous.

Deutsch German

Dieses Dokument ist wichtig und sollte sofort übersetzt werden. Sofern Sie eine Übersetzung dieses Dokuments benötigen, wenden Sie sich bitte an den Diversity Director MassDEP unter der unten aufgeführten Telefonnummer.

Ελληνική Greek

Το παρόν έγγραφο είναι σημαντικό και θα πρέπει να μεταφραστεί αμέσως. Αν χρειάζεστε μετάφραση του παρόντος εγγράφου, παρακαλούμε επικοινωνήστε με τον Διευθυντή Διαφορετικότητας του MassDEP στους αριθμούς τηλεφώνου που αναγράφονται παρακάτω.

Italiano Italian

Comunicazione per parti che non parlano inglese. Questo documento è importante e dovrebbe essere tradotto immediatamente. Se avete bisogno di questo documento tradotto, potete contattare il Direttore di Diversità di MassDEP al numero di telefono elencato di seguito.

Język Polski Polish

Dokument ten jest ważny i powinien zostać natychmiast przetłumaczony. Jeśli potrzebujesz przetłumaczonej wersji dokumentu, prosimy o kontakt z dyrektorem ds. różnorodności MassDEP pod jednym z numerów telefonu wymienionych poniżej.

हिन्दी Hindi

यह दस्तावेज महत्वपूर्ण है और इसका तुरंत अनुवाद किया जाना चाहिए. यदि आपको इस दस्तावेज़ का अनुवाद करने की आवश्यकता है, तो कृपया नीचे सूचीबद्ध टेलीफोन नंबरों पर मासडेप्स डाइवर्सिटी के निदेशक से संपर्क करें.

Contact Deneen Simpson 857-406-0738
Massachusetts Department of Environmental Protection
100 Cambridge Street 9th Floor Boston, MA 02114
TTY# MassRelay Service 1-800-439-2370 • https://www.mass.gov/environmental-justice
(Version revised 4.21.2023) 310 CMR 1.03(5)(a)

Tighe & Bond

Massachusetts Department of Transportation State Highway Access Permit

3-2024-0709

Bridge/Culvert - Repair or Modify

ASHBY

Subject to all of the terms, conditions and restrictions printed or written below, permission is hereby granted to **DEPARTMENT OF CONSERVATION & RECREATION** to enter upon the State Layout **TOWN OF ASHBY**, on the road known as **Hosmer Road over Damon Pond,** for the purpose **Railing repair. Concrete repair on beams. Vegetation and Efflorescence on dam/bridge structure removal. Dam wall repair and improvement. Training wall repair. All for Bridge A-12-010 (25F),** as shown on the plans on file in the MassDOT Highway Division, District Three Permits Office.

Prior to ANY work being done within the State Highway Layout, the Grantee must receive approval from the District in the form of an approved Work Request through the State Highway Access Permit System, SHAPS. The Work Request shall be submitted no later than 12:00 PM on the Thursday PRIOR to the week the work will begin. Work Requests shall be submitted weekly, for the duration of the project, for review/approval. The Grantee must submit their proposed **"Work Schedule"** by logging into their SHAPS account and submitting a **"Work Request Form**". This form can be found by selecting the *Forms and Sample Submission Documents* link located in the left-hand column of the SHAPS dashboard. Once completed the form shall be uploaded under the "Work" tab (shovel icon) of the permit. Once submitted we will review and approve/deny for the following week(s) schedule. A work schedule must be approved by MassDOT Permits Section/Operations before any work takes place within the State Right of Way. Any unscheduled, unapproved, or unpermitted work shall be in violation. For more information please call (857)-368-3001.

It is the responsibility of the Grantee to obtain any additional approvals necessary prior to performing this work.

THE 2026 FIFA WORLD CUP WILL BE HELD AT GILLETTE STADIUM IN FOXBOROUGH, RELATED EVENTS, AND SIGNIFICANT TOURIST EVENTS SUCH AS SAIL BOSTON AND THE 250TH ANNIVERSARY OF THE UNITED STATES WILL BE HELD THROUGHOUT THE REGION. MATCHES AND FAN FEST AND OTHER POSSIBLE 250TH CELEBRATION ACTIVITIES ARE SCHEDULED THROUGH JUNE, JULY, AND AUGUST 2026.THE DISTRICT WILL BE IMPOSING WORK AND/OR TRAFFIC RESTRICTIONS AS NECESSARY TO MINIMIZE IMPACTS DURING THESE PERIODS WHEN, AS DETERMINED BY MASSDOT, THE GRANTEE'S OPERATIONS COULD IMPACT VEHICULAR TRAFFIC, PARTICULARLY ON INTERSTATE HIGHWAYS AND MAJOR ARTERIALS THROUGHOUT THE REGION AND LOCAL ROADS NEAR THE EVENT SITES. THE GRANTEE SHALL PLAN ACCORDINGLY. ANY NECESSARY OR EMERGENCY WORK REQUIRED DURING THIS TIME WILL REQUIRE DISTRICT APPROVAL.

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SPECIAL CONDITIONS

- *Due to the nature of this project, the District will allow the Certificate of Liability Insurance for this project to be provided post issuance of this permit. Please be advised that no Work Requests will be approved for the work within the SHLO until these documents have been provided, reviewed, and approved of. Please submit these ancillary documents at least 2 weeks prior to when the Grantee intends to begin work within the SHLO to allow adequate time for review/approval.*
    - *Once available, the Certificate of Liability Insurance must be in accordance with MassDOT Insurance Requirements.*
- *Once a deck shielding design and details are available and have been thoroughly reviewed and approved by the Designer (Engineer of Record), these shall be provided to the District for the opportunity to review and comment.*

WORK HOURS

- **All Lane Closures** shall only take place between the hours of **9:00pm – 5:00am Sunday through Thursday**.

- No equipment, trucks, etc. shall occupy any part of the traveled way outside of those hours.

- **If No Lane closure is required,** then work shall be permitted between **9:00am-3:30pm Monday through Friday**.

- No work shall be allowed on holidays, the Friday after a Thursday holiday, or at any times between and including the day before or the day after a long weekend which involves a holiday without the permission of the District Operations Engineer.

In no case will operations commence prior to the specified hours of this Permit. This includes traffic set-ups that restrict the flow of traffic upstream of and through the construction zone.

If the Grantee would like to request a change in the approved work hours they must make a formal request through SHAPS. This can be done by logging into their SHAPS account and uploading a letter that clearly outlines the requested change and provides justification showing that the roadway will be able to function adequately during the times requested while the approved traffic management plan (TMP) is implemented. **The Grantee shall also leave a note in the permit under the "Discuss/Notes" tab at the time of this request to ensure the District is notified.**

MassDOT reserves the right to change or alter permitted work hours as deemed necessary.

GENERAL TRAFFIC MANAGEMENT AND SAFETY REQUIREMENTS

If applicable, any and all portable changeable message board (PCMSs) utilized as part of the approved traffic management plan (TMP) under this permit must be properly secured with regards to hacking and unauthorized tampering prevention. The Grantee(s) shall adhere to all appropriate security specifications and take all necessary precautions to mitigate the risk of the boards being hacked. All PCMSs shall be stored in a secured area and shall have a lockable, weatherproof enclosure for the operator interface, removable local keyboards which shall be removed whenever possible, and a password protected controller with local administrative passwords changed on a regular basis. The message(s) shall be approved by MassDOT prior to use.

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The Grantee(s) must contact the "Dig Safe" Center at 811 to obtain a "Dig Safe" number prior to starting any emergency excavation for the purpose of identifying the location of underground utilities.

No work, other than of an emergency nature, shall be authorized during inclement weather.

WORK IN PROGRESS: In the event of inclement weather (snow, ice, dense fog, etc.), which lessens the visibility of advanced warning signs, vehicles and workers, the Grantee(s) will suspend all operations (except in emergencies) so as to not interfere with the safety of the motoring public and the operations of work. In the event of snow or icing conditions, all vehicles and equipment must be removed from the roadway and/or shoulder area (at least thirty (30') feet away from the roadway) to avoid interfering with Snow and Ice Operations. If steel plates are being utilized, every effort shall be made to properly backfill all openings and remove said plates, located within the roadway, to avoid a hazardous condition during plowing operations. If emergency work is being done during snow and ice operations which impede snow removal, the grantee will be responsible to remove said snow and deicing after emergency work is completed.

When any portion of the roadway will be blocked with equipment to facilitate the proposed work, the Grantee(s) will be required to submit a TMP to MassDOT, Highway Division, to be reviewed and approved by the District Permits Engineer
prior to working within or impacting the roadway. The plan must include information relating to proper signing, traffic control device placement and police details. A Truck Mounted Attenuator (TMA) may be required as part of the setup.
At any time during construction operations when a traffic delay of over twelve (12) minutes occurs and the situation is worsening, the Grantee or the Department shall begin to suspend operations. Continuously increasing delays of over twelve (12) minutes shall not be permitted. When it appears that delays are developing, one or more of the parties mentioned above shall drive the queue to determine the actual time of delay. Monitoring of traffic delays will be a continuous process until the job activity is complete and off the traveled way or until the determination is made to suspend operations.

No detours are allowed under the terms of this Permit except during extreme emergencies.

If traffic must be "stopped", the duration shall not be more than five (5) minutes.

A uniformed police officer and their vehicle are required for traffic management to protect the safety of the motorist, pedestrians and workers as determined by MassDOT, Highway Division.

Necessary signs, lights and barriers shall be installed by the Grantee in accordance with the latest Edition of the "Manual on Uniform Traffic Control Devices", as amended with the latest revisions.

All required signs and traffic warning devices shall be furnished by the Grantee. Cones or non-reflectorized warning devices shall not be left in operating position on the highway when the daytime operations have ceased.

If it becomes necessary for MassDOT, Highway Division to remove any construction warning devices or their appurtenances from any project due to negligence by the Grantee/Contractor, all expenses will be billed to the Grantee and they shall be responsible for reimbursement to MassDOT, Highway Division.

All working personnel and those who are to be found within the travelled way, breakdown lanes or within the State Highway Layout are required to wear approved safety vests and hard hats.

All vehicles that have an obstructed view to the rear (i.e. dump trucks, box trucks, flatbed trucks, graders, bulldozers, loaders, tractors, etc.) are required to have backup alarms, in full working order, and all vehicles, except passenger cars, which are assigned to the permitted project and which operate on the site at speeds of 25 M.P.H. or less shall have an

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official SLOW MOVING VEHICLE emblem displayed, subject to Chapter 90 Section 7 of the Massachusetts General Laws to operate on any MassDOT, Highway Division roadways, under contract or permit.

All operations shall be conducted to minimize the interference of motorist or pedestrian traffic, and under no circumstances shall the operations create a hazardous environment for the general public.

The Grantee is responsible for maintaining access and egress to all impacted properties.

TRENCH

The Grantee(s) must adhere to 520 CMR 14.00; EXCAVATION AND TRENCH SAFETY, as promulgated by the Department of Public Safety in conjunction with the Division of Occupational Safety pursuant to authority granted by M.G.L. c. 82A § 1. If not already approved, a Trench Permit Rider must be completed and submitted to MassDOT, Highway Division before any trench work is performed under this Permit.

BACKFILL METHOD FOR WORK WITHIN THE HARDENED SURFACE OF THE ROADWAY SHALL BE AS FOLLOWS

All permanent trench restorations shall be performed in accordance with MassDOT's "Utility Trench Permanent Pavement Repair" detail. This detail has been provided at the end of this permit for reference and is described in detail below.

The roadway must be sawcut in neat, true lines along the length of the trench. The trench shall then be excavated, the utility repaired, and controlled low-strength materials (CLSM) Type Mechanical Excavatable placed to one (1') foot and seven and one half (7.5") inches below the finish grade of the roadway surface. From the bottom of the excavation to a minimum of twelve (12") inches above the top of the utility, utility specific backfill material shall be allowed. The trench shall then be plated securely and ramped with bituminous concrete overnight to allow the controlled low-strength materials to cure. The plates may need to be recessed to the finished grade of the roadway as directed by the Engineer. Unless circumstances are beyond your control due to an emergency, NO STEEL PLATES MAY BE LEFT WITHIN THE STATE HIGHWAY LAYOUT OVER THE WEEKEND WITHOUT PRIOR APPROVAL BY MASSDOT'S PERMIT SECTION/OPERATIONS. No trench shall be left open overnight.

Once the CLSM has cured a minimum of twelve (12") inches of gravel sub-base shall be placed on top of it. Then the perimeter of the trench must be sawcut a minimum of one (1') foot beyond the existing edge of the trench and this material removed to a depth of seven and one half (7.5") inches.

The Grantee must then place the first layer of the permanent bituminous concrete patch which shall consist of three and one half (3.5") inches of Superpave Base Course 37.5 (SBC – 37.5). Once installed an additional sawcut shall be made a minimum of one (1') foot around the perimeter of the trench and this material removed to a depth of four (4") inches.

The final two layers of the permanent bituminous concrete patch shall then be installed consisting of two and one quarter (2.25") inches of Superpave Intermediate Course 19.0 (SIC – 19.0), AND one and three quarter (1.75") inches of Superpave Surface Course 12.5 (SSC – 12.5). Superpave Intermediate Course 19.0 (SIC – 19.0) may be substituted for Superpave Base Course 37.5 (SBC – 37.5). If this is done, the intermediate course shall be placed in two (2) lifts.

If a temporary patch is to be used, the CLSM shall be placed to the elevation of the adjoining subgrade, then gravel shall be placed and compacted to within three and one half (3.5") inches of the finished grade. The last three and one half (3.5") inches shall be hot mix asphalt placed in two layers: one and one half (1.5") surface course over two (2") intermediate course. The temporary patches and the underlying material shall then be excavated to a depth of seven and

one half (7.5") inches below the existing surface to install the permanent patch constructed in the manner described above.

The exposed edges of all longitudinal and transverse saw cut joints shall be treated with hot poured rubberized asphalt joint sealant meeting MassDOT specifications.

Yellow metal foil marking tape shall be placed eighteen (18") inches over the conduit. Metal marking tape/wire should be used for non-metallic conduit.

For roads with an existing cement concrete base, a reinforced, high early strength air entrained, Class "F" cement concrete slab shall be cast in place to meet the existing pavement. Specific joint details with the existing pavement shall be approved dependent on the existing site conditions.

All trench dimensions shall be in accordance with sub-section 140.80 of the MassDOT Standards and Specifications for Highways and Bridges.

**Controlled Low-Strength Materials (CLSM), Type Mechanical Excavatable, must be batched at a concrete plant and shall meet the specifications outlined in the LATEST Edition of the "Commonwealth of Massachusetts Department of Transportation Standard Specifications for Highways and Bridges", as amended, and LATEST Supplemental Specifications at the time of permit issuance and/or as directed in this permit.*

The infra-red method may be performed in conjunction with the permanent patch, if required, to create a smooth driving surface consistent with the existing roadway. The District Office must be notified two (2) business days prior to starting this work, so that an inspector may be assigned. This mix must be machine laid.

All disturbed traffic safety lines and markings, and/or utility structures and covers must be replaced in-kind according to the LATEST Edition of the *"Commonwealth of Massachusetts Department of Transportation Standard Specifications For Highways and Bridges*", as amended .

No trench shall be left open overnight. If it becomes necessary for said trench to be left overnight, then it shall be covered securely with steel plates and ramped with bituminous concrete. The plates may need to be recessed to the finished grade of the roadway as directed by the Engineer. Unless circumstances are beyond your control, NO STEEL PLATES MAY BE LEFT OVER THE WEEKEND.

Attention is called to the clauses in this permit relating to the laying of pipes, conduit, etc.

All excavated material, including bituminous concrete, cement concrete, stone, gravel, etc., shall be removed from the State Highway Layout. No stockpiling will be allowed within the State Highway Layout.

The Grantee shall assume full responsibility for the structural integrity of any trench constructed under this Permit. The Grantee shall maintain this section of roadway at all times from inception of this project until the resurfacing of this particular roadway by the Massachusetts Highway Department.

BACKFILL METHOD FOR WORK WITHIN THE SOFT SHOULDER AREA SHALL BE AS FOLLOWS

Backfill for conduit or pipe shall be selected from excavation free from large lumps, clods or rock. If the excavated material is deemed unacceptable Gravel Borrow Type C (M1.03.0 Type C) shall be used as a backfill. The material shall be placed between the pipe and the walls of the trench in layers not exceeding six (6") inches in depth and

thoroughly compacted. Each layer, if dry, shall be moistened and then compacted by rolling or by tamping with mechanical rammers. Special care should be taken to thoroughly compact the fill under the haunches of the pipe or conduit. This method of filling and compacting shall be continued until the material is level with the top of the pipe or conduit. The remainder of the filling shall consist of suitable material placed in successive layers not more than six (6") inches in depth. Each layer shall be thoroughly compacted as specified above. The top four (4") inches shall be restored with compacted loam and seeded in accordance with MassDOT Standard Specifications.

If the work and excavation are performed within the soft shoulder along the immediate area of the road, or if the excavation directly abuts or tapers under the hardened surface of the roadway, the opening must be backfilled with Controlled Low-Strength Materials (CLSM) to prevent undermining and preserve the integrity of the roadway.

The Grantee(s) shall be responsible for the shoulder and roadway areas affected by the proposed work, to be performed as described herein, and shall routinely inspect said areas for deficiencies such as settling, heaving, cracks etc. This responsibility shall remain in effect until work is performed at the subject location by MassDOT, Highway Division.

SIDEWALK RECONSTRUCTION

When HMA sidewalks are impacted, the sidewalk shall be reconstructed with eight (8") inches of gravel borrow topped with three (3") inches of Superpave. The HMA shall be laid in TWO courses with a compacted lift thickness of one and three quarter (1.75") inches of intermediate course AND one and one quarter (1.25") inches of surface course. When concrete sidewalks are impacted, the HMA layers shall be replaced with four (4") inches of cement concrete (4,000 psi, 3/4-inch 610). Cement concrete sidewalks shall be replaced in full panel widths. If the sidewalk is at a driveway and cement concrete is used, the sidewalk shall be six (6") inches deep.

The new sidewalk must be compacted in accordance with the LATEST Edition of the "*Commonwealth of Massachusetts Department of Transportation Standard Specifications For Highways and Bridges*", as amended, and LATEST Supplemental Specifications and graded in such a manner that no ponding of water occurs within the Highway Layout. If such ponding occurs, the Grantee(s) will be responsible for its correction.

The Grantee(s) will install concrete wheelchair ramps in conformance with the Architectural Access Board Regulations within all sidewalk areas located at drives or roadway intersections that may be included in this project.

The Grantee(s) shall be responsible for the maintenance and repair of the portion of the repaired sidewalk located within the State Highway Layout and shall routinely inspect the sidewalk for deficiencies such as settling, heaving, cracks, etc. This responsibility shall remain in effect until MassDOT, Highway Division or the Town reconstructs the sidewalk.

DRIVEWAY RECONSTRUCTION

When HMA driveways are impacted, the driveway shall be reconstructed with eight (8") inches of gravel borrow topped with four (4") inches of Superpave. The HMA shall be laid in TWO courses with a compacted lift thickness of two and one half (2.50") inches of intermediate course AND one and one half (1.50") inches of surface course. When cement concrete driveways are impacted, the HMA layers shall be replaced with six (6") inches of cement concrete (4,000 psi, 3/4-inch 610). Cement concrete driveways shall be replaced in full panel widths.

The Grantee(s) will install concrete wheelchair ramps in conformance with the Architectural Access Board Regulations within all sidewalk areas located at drives or roadway intersections that may be included in this project.

The Grantee(s) shall be responsible for the maintenance and repair of the portion of the repaired driveway located within the State Highway Layout and shall routinely inspect the driveway for deficiencies such as settling, heaving, cracks, etc. This responsibility shall remain in effect until MassDOT, Highway Division, the Town or applicable property owner reconstructs the driveway.

WINTERTIME WORK CONDITIONS

Work to be performed between November 1st and April 1st may be allowed WEATHER PERMITTING, with prior written approval from the District Highway Director or an authorized representative, and must be in conformance with the LATEST Edition of the "Commonwealth of Massachusetts Department of Transportation Standard Specifications For Highways and Bridges", as amended, and LATEST Supplemental Specifications at the time of permit issuance and/or as directed in this permit. All construction shall conform to the LATEST Massachusetts Department of Transportation, Highway Division's "Construction Standard Details".

When the air temperature falls below 50° F, extra precautions shall be taken in drying the aggregates, controlling the temperatures of the material and placing and compacting the mixtures.

No bituminous concrete mixture shall be placed unless the breakdown and intermediate rolling can be completed by the time the material has cooled to 170° F, and provided that the density of the completed pavement attains at least 95% of the laboratory compacted density.

No materials are to be staged within the Right of Way to exceed one day's work limits. Due to possible inclement weather (Snow & Ice) which could occur at any time, you may not exceed placing materials beyond the next day's limit.

Particular care must be taken to prepare the roadway/shoulder areas for public safety at the end of each workday. Excavation activities may be cancelled with the prediction of snow or freezing temperatures.

Resulting from "emergency" excavations, no trench shall be covered with a steel plate without the permission of the District Operations Engineer during the wintertime. Should the Grantee be unable to obtain permission to use a steel plate, then these instructions shall be followed: The trench shall be backfilled with gravel borrow Type C (M1.03.0 Type C) throughout with special care taken to thoroughly compact the fill under the haunches of the pipe or conduit. The remainder of the backfill must be compacted every six (6") inches by rolling or by tamping with mechanical rammers up to a depth of three and one half (3.5") inches below the existing surface. The last three and one half (3.5") inches shall be a temporary patch consisting of hot mix asphalt placed in two layers: one and one half (1.5") inches Superpave Surface Course 12.5 (SSC – 12.5) over two (2") inches Superpave Intermediate Course 19.0 (SIC – 19.0). The temporary patches and the underlying material shall then be excavated to a depth of seven and one half (7.5") inches below the existing surface to install the permanent patch constructed in the manner described above. Permanent patching will not begin for ninety (90) days or until, in the Engineer's judgment, final compaction and settlement of the trench area has occurred.

All trench restoration and work involving hot mix asphalt completed during the wintertime is considered temporary unless otherwise approved by MassDOT's Permit Section/Operations. All trenches and work involving hot mix asphalt will need to receive permanent restoration after the winter season.

The Grantee(s) are responsible for assuring that all work associated with this Permit involving pressure washing, pumping, or any other activity causing water to accumulate in the roadway, is closely monitored to avoid icing conditions during the winter season. If necessary, the Grantee(s) will be required to address the issue by spreading salt or other de-icing materials at their expense. If MassDOT is required to respond to an icing condition as a result of the work performed, the Grantee(s) will be billed for all costs incurred by MassDOT, Highway Division to correct this safety issue.

The Grantee(s) will be responsible for the clearing of ice and snow on the State Road(s) where work is performed within the project limits. The roadways shall be reasonably maintained (plowed and chemically treated), to ensure safe travel and avoid any conflict with MassDOT Snow and Ice Operations.

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Special attention shall be given when performing work that will impact MassDOT, Highway Division, snow and ice operations.

TRAFFIC SIGNALS

The Grantee(s) will be responsible to repair/replace any damaged items tied to the exiting traffic signal including but not limited to conduit and detectors. The Grantee will be billed for any cost incurred to restore normal operation to MassDOT, Highway Division signal equipment, to the satisfaction of the Engineer.

IN THE EVENT of DAMAGE to loop detector wires, lead-in cables, power cables, conduit or any traffic signal related asset during operations, it would be the Grantee's responsibility and expense to have the asset replaced and repaired by a MassDOT Approved Traffic Signal Contractor as soon as weather permits.

If damage to a signal asset should occur, please contact **Jeff Gomes – Assistant District Traffic Engineer (O&M) at (774)-270-4960 before** starting the repair work. Also, an assigned MassDOT electrician must check all underground conduit/asset repairs BEFORE the trench is backfilled. The District Three Permit Office shall also be contacted at (857)-368-3043.

If any roadway travel lanes must be closed or if normal signal operation will be affected during the work, police for traffic control must be provided at the Grantee's expense.

GENERAL

All work done under this contract shall be in conformance with the LATEST Edition of the "Commonwealth of Massachusetts Department of Transportation Standard Specifications For Highways and Bridges", as amended, and LATEST Supplemental Specifications at the time of permit issuance and/or as directed in this permit. All construction shall conform to the LATEST Massachusetts Department of Transportation, Highway Division's "Construction Standard Details"; the 2015 Overhead Signal Structure and Foundation Standard Drawings; the latest Manual on Uniform Traffic Control Devices with Massachusetts Amendments; the latest edition to the following: the 1996 Construction and Traffic Standard Details (as related to Traffic Standard details only); the 1990 Standard Drawings for Traffic Signs and Supports; the 1968 Standard Drawings for Traffic Signals and Highway Lighting; the latest edition of American Standard for Nursery Stock; the Plans and these Special Provisions.

All street approaches and driveways where disturbed shall be replaced conforming to original alignment, grade, and materials.

The shoulder area shall be restored to a condition as good as existed prior to the work.

All grassed areas where disturbed shall be restored to as good condition as found by loaming and seeding.

Accommodation shall be made for the safety of pedestrian traffic during the work period.

Care shall be exercised to protect existing underground structures.

The bounds marked MHB shall not be disturbed or buried.

No metal drums are allowed within the State Highway Layout.

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UNIFORMED POLICE OFFICERS SHALL BE IN ATTENDANCE TO DIRECT TRAFFIC.

All required signs and traffic warning devices, **including the use of arrowboard(s),** shall be furnished by the Grantee. All signs and devices shall be in accordance with the current edition of the FHWA Manual on Uniform Traffic Control Devices. The number and location of all signs and devices shall be as deemed necessary by the Engineer for the safe and efficient performance of the work and the safety of the traveling public.

All warning devices shall be subject to removal, replacement and/or repositioning by the Grantee as often as deemed necessary by the Engineer.

Cones or non-reflectorized warning devices shall not be left in operational position on the highway when the daytime operations have closed. If it becomes necessary for the MassDOT Highway Division to remove any warning devices or appurtenances from the project due to negligence by the Grantee, all costs for this work will be charged to the Grantee.

All vehicles excepting passenger cars which are assigned to the permitted project, and which operate on the site at speeds of 25 mph or less shall have an official SLOW MOVING VEHICLE emblem displayed.

Only a minimal amount of men and equipment shall occupy the State Highway Layout.

Only equipment to be used in the actual construction work shall be allowed within the State Highway Layout.

ALL PERSONNEL WHO ARE WORKING IN THE STATE HIGHWAY LAYOUT SHALL WEAR SAFETY VESTS AND HARDHATS.

The Grantee shall exercise this permit subject to all the rules and regulations made from time to time by the said MassDOT Highway Division and the Department of Public Utilities and nothing in the permit shall be construed as authorizing any installation or maintenance thereof except in strict conformity with all Federal, State and Municipal laws, ordinances, and regulations.

The Grantee shall indemnify and save harmless the Commonwealth and MassDOT Highway Division against all suits, claims or liability of every name and nature arising at any time out of or in consequence of the Acts of the Grantee in the performance of the work covered by this permit and/or failure to comply with the terms and conditions of this permit whether by itself or its employees or subcontractors.

A copy of this permit will be made available at the project site at all times during the progress of work for inspection by Department Personnel. Should the Grantee or contractor not have a copy at the site, the work will be stopped until such permit is made available.

This office will be notified prior to the start of work under the provisions of this permit.

ALL OF SAID WORK SHALL BE DONE AS DIRECTED AND TO THE SATISFACTION OF THE ENGINEER FROM THIS DEPARTMENT.

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No work shall be done under this permit until the Grantee shall have communicated with and received instructions from the District Highway Director or an authorized representative.

"FOLLOWING CONDITIONS APPLY TO PERMITS"

Definitions

Whenever the word "MassDOT" is used herein it shall mean the Massachusetts Department of Transportation of the Commonwealth of Massachusetts. Whenever the word "Director" is used herein it shall mean the District Highway Director or other authorized representative of MassDOT. Whenever the word "Grantee" is used herein it shall mean the person or persons, corporation, or municipality to whom this permit is granted, or their legal representatives.

Conditions:

Conditions Relating Particularly to Permits for the Laying of Pipes, Conduits, etc.

After any pipes, conduits, drains or other underground structures are laid, or any excavation is made in the roadway, the trenches or openings shall be properly backfilled with suitable material, the backfilling shall be thoroughly tamped, and the surface of the road over said structures shall be left even with the adjoining ground. If the work is done in cold weather no frozen material shall be used for back-filling.

Wherever the hardened surface of the roadway, gutters, or any part of the surface of the highway is disturbed it shall be replaced in as good condition as before it was disturbed, and if new materials are required, they shall correspond with those already in place on the road. Where service pipes are to cross the highway, the connections shall be made without disturbing the hardened surface of the roadway, by driving the pipes under the roadway, or the service pipes shall be carried under and across the road in a larger pipe, unless otherwise ordered by the Director.

The Grantee shall maintain the surface of the roadway over said structures as long as MassDOT may deem necessary, until all signs of the trenches shall have been eliminated.

GENERAL AND ADDITIONAL CONDITIONS

During the progress of the work all structures underground and above ground shall be properly protected from damage or injury; such barriers shall be erected and maintained as may be necessary for the protection of the traveling public; the same shall be properly lighted at night; and the Grantee shall be responsible for the damages to persons or property due to or resulting from any work done under this permit. Except as herein authorized, no excavation shall be made, or obstacle placed within the limits of the State highways in such a manner as to interfere unnecessarily with the travel over said road. If any grading of sidewalk work done under this permit interferes with the drainage of the State highway in any way, such catch basins and outlets shall be constructed as may be necessary, in the opinion of the Director, to take proper care of such drainage.

Wherever the hardened surface of the roadway is disturbed, and the Director may consider it necessary or advisable to do so, said surface will be restored by the employees of MassDOT, at such time as MassDOT may direct, and the expense thereof shall be borne by the Grantee, who shall purchase and deliver on the road the materials necessary for said work if and when directed by the Director. All payments to the supplier and laborers, inspectors, etc., employed by MassDOT for or on account of the work herein contemplated shall be made by said Grantee forthwith on receipt of written orders, pay rolls, or vouchers approved by MassDOT.

IF THE GRANTEE DOES ANY WORK CONTRARY TO THE ORDERS OF THE DIRECTOR, AND, AFTER DUE NOTICE, FAILS TO CORRECT SUCH WORK OR TO REMOVE STRUCTURES OR MATERIALS ORDERED TO BE REMOVED, OR FAILS TO COMPLETE WITHIN THE SPECIFIED TIME THE WORK AUTHORIZED BY THIS PERMIT, MASSDOT MAY, WITH OR WITHOUT NOTICE, CORRECT OR COMPLETE SUCH WORK IN WHOLE

OR IN PART, OR REMOVE SUCH STRUCTURES OR MATERIALS, AND THE GRANTEE SHALL REIMBURSE MASSDOT FOR ANY EXPENSE INCURRED IN CORRECTING AND/OR COMPLETING THE WORK OR REMOVING THE STRUCTURES OR MATERIALS.

ALL OF THE WORK HEREIN CONTEMPLATED SHALL BE DONE UNDER THE SUPERVISION AND TO THE SATISFACTION OF THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION, AND THE ENTIRE EXPENSE THEREOF SHALL BE BORNE BY THE GRANTEE.

On the completion of the work herein contemplated all rubbish and debris shall be removed and the roadway and roadsides shall be left neat and presentable and satisfactory to the Director. MassDOT hereby reserves the right to order the change of location or the removal of any structure or' structures authorized by this permit at any time, said change or removal to be made by and at the expense of the Grantee or its I their successors or assigns. This permit may be modified or revoked at any time by MassDOT without rendering said MassDOT or the Commonwealth of Massachusetts liable in any way.

The Grantee shall pay the salary, subsistence and travel expenses of any inspector appointed by MassDOT to supervise the work herein contemplated.

All of the above conditions shall be applicable to the work herein authorized, unless the same are inconsistent with the conditions on the face of the permit, in which case the conditions written or printed on the face of the permit shall apply.

The acceptance of this permit or the doing of any work thereunder shall constitute an agreement by the Grantee to comply with all of the conditions and restrictions printed or written herein.

REQUESTING PERMIT "SIGN OFF"

Upon completion of ALL work within the State Highway Layout the Grantee shall request a final inspection. This can be done by submitting a **"Sign Off Request"** through SHAPS. After logging into their SHAPS account the Grantee will navigate to the "Action" option. This is located on the SHAPS main dashboard, in the rightmost column titled *Action* of the respective row for the permit application. When the option is selected, choose "Request Sign-Off" from the drop-down menu and follow the on-screen prompts to upload a Completion of Work Form. This form can also be found by selecting the *Forms and Sample Submission Documents* link located in the left-hand column of the SHAPS dashboard. **Once finished, leave a message in the "Discuss/Notes" tab so the District is notified.** Once received, the MassDOT Permits Section/Operations will complete a field inspection to verify all work was found to be in compliance with the terms and conditions as outlined in this permit and is acceptable to MassDOT. The field inspection will take a minimum of two weeks to be performed from the time the signoff request is received. The Grantee will be notified through SHAPS if the work has been accepted or will receive a Punchlist providing the findings that will need to be addressed.

If a Punchlist is provided, once the remediation work is complete the Grantee shall follow the above-mentioned steps to request another final inspection.

Maura Healey, Governor
Kimberley Driscoll, Lieutenant Governor
Phillip Eng, Interim Secretary & CEO
Jonathan L. Gulliver, Undersecretary & Highway Administrator

3-2024-0709

Approved Signature

Barry Lorion by E.N.
District Highway Director

Date of Issue: May 13, 2026

Permit Expiration: Thursday, May 13, 2027

District 3, 499 Plantation Parkway Worcester, MA 01605
Tel: (857) 368-3000, FAX: (857) 368-0310
www.mass.gov/orgs/highway-division

Insurance Requirements: The Grantee shall purchase and maintain throughout the term of the Permit adequate insurance coverage, to include but not be limited to the following types and amounts of coverage:

a) The following minimum insurance coverage is required.
   i) Workers' Compensation Insurance in compliance with applicable federal and state laws, including U.S. Longshoreman's and Jones Act coverage, and Employers Liability Insurance with limits of at least One Million Dollars ($1,000,000) per occurrence. The policy must be endorsed to provide that the insurer waives all rights of subrogation against MassDOT.
   ii) Automobile Liability Insurance covering owned, non-owned and hired vehicles.
   iii) Commercial General Liability Insurance including contractual liability specifically covering this Permit and personal injury coverage, written on an occurrence form.
   iv) Umbrella Liability Insurance (an excess liability policy is not acceptable). The combination of the policy limits of the underlying automobile liability and general liability policies and the umbrella liability policy shall provide overall limits of **not less than $6,000,000** (six million dollars) per occurrence.
b) **The policies listed in subsections ii, iii and iv above must be endorsed to name "MassDOT, 10 Park Plaza, Boston, MA 02116" as additional insured**.
c) All insurance maintained by the Grantee pursuant to this Permit shall be written by insurance companies licensed to do business in the Commonwealth. If the Grantee determines that any such insurance needs to be placed with surplus lines carriers not licensed by the Commonwealth, written permission from MassDOT is required. All insurance companies to be used by the Grantee must have a Best's Rating of not less than A- and be reasonably acceptable to MassDOT.
d) If requested by MassDOT in writing, the Grantee will furnish certified copies of the aforementioned policies to MassDOT's designated representative.
e) All insurance maintained by the Grantee shall provide that insurance for the benefit of MassDOT shall be primary and MassDOT's own insurance shall be non-contributing.
f) The Grantee shall provide MassDOT with certificates of insurance evidencing the above referenced insurance policies prior the execution of this Permit. The certificates shall contain an unequivocal provision that MassDOT shall be given thirty (30) days prior written notice of cancellation, material change or non-renewal of the coverage.

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 4/29/2020

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

	CONTACT NAME:
	PHONE (A/C, No, Ext): / FAX (A/C, No):
	E-MAIL ADDRESS:
LEEKENN-01	INSURER(S) AFFORDING COVERAGE / NAIC #
	INSURER A :
	INSURER B :
	INSURER C :
	INSURER D :
	INSURER E :
	INSURER F :

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X **COMMERCIAL GENERAL LIABILITY** CLAIMS-MADE / X OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: POLICY / X PRO-JECT / X LOC OTHER:	Y			4/1/2020	4/1/2021	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ 1,000,000 $ 300,000 $ 10,000 $ 1,000,000 $ 2,000,000 $ 2,000,000
E	**AUTOMOBILE LIABILITY** X ANY AUTO OWNED AUTOS ONLY / SCHEDULED AUTOS HIRED AUTOS ONLY / NON-OWNED AUTOS ONLY	Y			4/1/2020	4/1/2021	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$ 1,000,000 $ $ $
D	X **UMBRELLA LIAB** / X OCCUR **EXCESS LIAB** / CLAIMS-MADE DED / RETENTION $	Y			4/1/2020	4/1/2021	EACH OCCURRENCE AGGREGATE	$ 10,000,000 $ 10,000,000
E	**WORKERS COMPENSATION AND EMPLOYERS' LIABILITY** ANYPROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y / N: N **(Mandatory in NH)** If yes, describe under DESCRIPTION OF OPERATIONS below	N / A	Y		4/1/2020	4/1/2021	X PER STATUTE / X OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	 $ 1,000,000 $ 1,000,000 $ 1,000,000
C B	2nd Layer Excess Liab 3rd Layer Excess Liab			1000585045201 AEC 0195464-04	4/1/2020 4/1/2020	4/1/2021 4/1/2021	Each Occ./Aggregate Each Occ./Aggregate	$15,000,000 $25,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

MassDOT is included as Additional Insured as required by written contract and executed prior to a loss, but limited to the operations of the Insured under said contract, with respect to the Automobile, General Liability and Umbrella/Excess Liability policies. Automobile, General Liability and Umbrella/Excess Liability evidenced herein are primary and noncontributory to other insurance available to an additional insured, but only to the extent required by written contract with the insured and executed prior to a loss. A Waiver of Subrogation applies in favor of above mentioned additional insureds with respect to insured operations where required by written contract but limited to the operations of the Insured under said Contract and executed prior to a loss, with respect to the Workers Compensation policy.

CERTIFICATE HOLDER

MassDOT
10 Park Plaza
Boston MA 02116

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

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Tighe & Bond

Geotechnical Data

SECTION 00300

GEOTECHNICAL DATA

PART 1 GENERAL

1.1 SUMMARY

A. For the preparation of Bidding Documents, Engineer has relied upon the following reports and tests of subsurface and latent physical conditions of the site. The location of all bore holes is shown on the Drawings.

1. Soil boring data (attached)

a. The subsurface data are not guaranteed as to accuracy or completeness, nor are they a part of the Contract Documents.

b. Bidders are cautioned that the subsurface data have been utilized for general design purposes only. No explicit or implicit representation is made as to the nature of the materials which may be encountered below the surface of the ground.

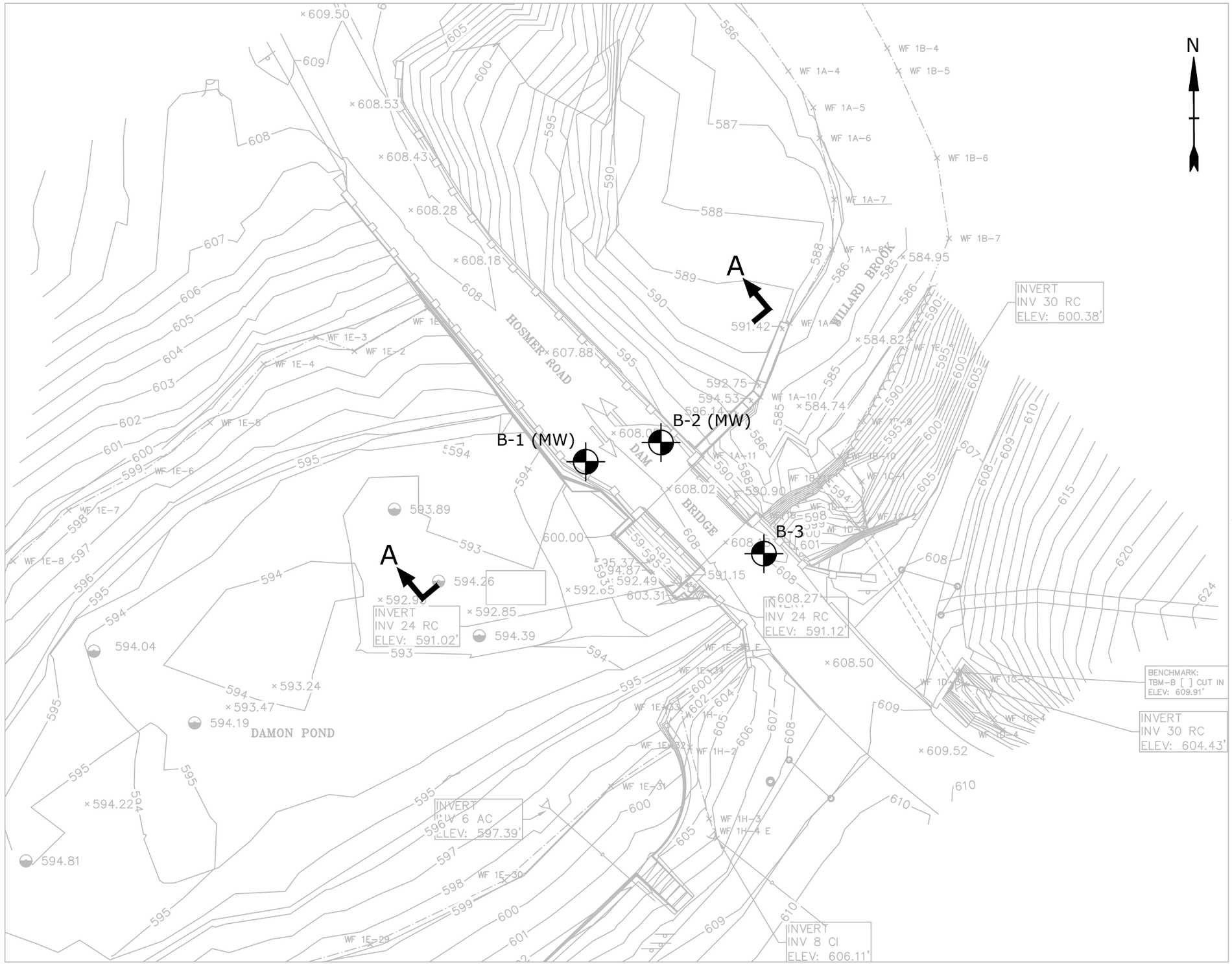
c. The making available of this subsurface data to Bidders is not intended to relieve them from their responsibility to familiarize themselves with the subsurface and other site conditions.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

J:\M\M0736 MA DCR Engineering Services MSA\82 - Damon Pond Dam\82A - Design Permitting and Construction\Design\Specifications\Div 0 Attachments\00300 Geotechnical Data.docx



GENERAL NOTES:

1. BASE PLAN TAKEN FROM "TOPOGRAPHIC SURVEY", PREPARED BY WSP USA, INC., DATED JANUARY 15, 2019.
2. ELEVATIONS SHOWN HEREIN REFERENCE THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
3. BORING LOCATIONS LOCATED BY A TIGHE & BOND REPRESENTATIVE BY MEASURING FROM EXISTING SITE FEATURES. LOCATIONS SHOULD BE CONSIDERED APPROXIMATE.
4. BORINGS DRILLED BY GEOSEARCH, INC. OF STERLING, MA ON FEBRUARY 18 AND 19, 2019. BORINGS WERE ADVANCED USING FLUSH-JOINT CASING USING DRIVE AND WASH METHODS.
5. DISTURBED SOIL SAMPLES WERE OBTAINED USING A STANDARD SPLIT-SPOON SAMPLER ADVANCED BY A 140-POUND HAMMER FREE FALLING FROM A HEIGHT OF 30 INCHES.
6. REFER TO BORING LOGS FOR DETAILED INFORMATION.

LEGEND:

B-# APPROXIMATE BORING LOCATION

(MW) DENOTES MONITORING WELL

0 15' 30' 60'

GRAPHIC SCALE

DAMON POND DAM
ASHBY, MA

SUBSURFACE EXPLORATION PLAN

DATE: 03/22/2019
SCALE: 1" = 30'
FIGURE 1

Tighe&Bond
Engineers | Environmental Specialists

Apr 10, 2019-11:15am Plotted By: dgnatek
Tighe & Bond, Inc. \\tighebond.com\data\Data\Projects\MM0736 MA DCR Engineering Services MSA\82 - Damon Pond Dam\Drawings_Figures\AutoCAD\Geotechnical\M-0736-082-B-BLP.dwg

Tighe&Bond
Engineers | Environmental Specialists

Project: Damon Pond Dam Phase II Evaluation
Location: Hosmer Road, Ashby, MA
Client: Massachusetts DCR

Boring No. **B-1 (MW)**
Page 1 of 1
File No. M-0736-082
Checked by: D. Gnatek

Drilling Co. Geosearch, Inc.
Foreman: Chris
T&B Rep.: N. Guidi
Date Start: 02/18/19 End: 02/18/19
Location See Exploration Location Plan
GS. Elev. 608± Datum: NAVD88

	Casing	Sampler
Type	FJ	Split Spoon
I.D./O.D.	4"/4-1/2"	1-3/8"/2"
Hammer Wt.	140#	140#
Hammer Fall	30"	30"
Rig Make/Model	CME 85 w/ auto hammer	

Groundwater Readings

Date	Time	Depth	Casing	Sta. Time
18-Feb	11:00	17.1		0 hrs
3-Apr	10:00	14.5		6.5 wks

Depth (ft.)	Casing Blows Per Ft.	Sample No. / Rec.(in)	Sample Depth (ft.)	Blows Per 6"	PID Reading (ppm)	Sample Description	General Stratigraphy	Notes	Well Construction
		S-1 / 20	0-2	58-83		Very dense, light brown, fine to coarse SAND, some Gravel, trace Silt	0.3' **ASPHALT**		Concrete 0.5'
				43-41					0.5' Sand
		S-2 / 14	2-4	12-12		Medium dense, light brown, fine to coarse SAND and GRAVEL, trace Silt			3' Bentonite
				5-5					4'
5		S-3 / 16	4-6	2-2		Very loose, light brown, fine to coarse SAND, little Silt, trace Gravel			Washed Silica Sand
				1-1					
		S-4 / 11	6-8	2-2		Very loose, light brown, fine to coarse SAND, little Silt, trace Gravel			
				1-1					
		S-5 / 15	8-10	2-2		6" Loose, light brown, fine to coarse SAND, trace Silt, trace Gravel, over loose, brown, fine to coarse SAND, little Gravel, trace Silt	**EMBANKMENT FILL**		
				3-3					
10		S-6 / 13	10-12	3-11		Medium dense, brown, fine to coarse SAND, some Gravel, trace Silt			10' Bentonite Chips
				7-12					
		S-7 / 16	12-14	12-11		Dense, brown, fine to medium SAND and GRAVEL, trace Silt			12.5' 12.5'
				28-18					13.3'
		S-8 / 8	14-16	16-21		Dense, brown, fine to coarse SAND and GRAVEL, trace Silt			
15				14-9					
		S-9 / 3	16-18	6-7		Medium dense, brown, fine to coarse SAND, some Gravel, trace Silt			Silica Sand
				13-24					
		S-10 / 0	18-18.3	100/4		No Recovery	18.3'		0.010" Slotted PVC Screen
		C-1 / 22	19-24			Hard to very hard, slight to moderately weathered, moderately fractured, medium to coarse-grained, grey/white/pink GRANITE, close to very close, shallow dipping fractures (fine to medium-grained, dark grey SCHIST intrusion from 19.3' to 20.5') REC = 22"/60" = 36.7% RQD = 8.5"/60" = 14.2%	**BEDROCK**		
20									
						End of boring at 24'			23.3'
25									
30									

Notes:

Proportions Used

TRACE (TR.)	0 - <10%
LITTLE (LI.)	10 - <20%
SOME (SO.)	20 - <35%
AND	35 - <50%

Density/Consistency

VERY LOOSE	0-4	VERY SOFT	<2
LOOSE	4-10	SOFT	2-4
MEDIUM DENSE	10-30	MEDIUM	4-8
DENSE	30-50	STIFF	8-15
VERY DENSE	>50	VERY STIFF	15-30
		HARD	>30

Tighe&Bond
Engineers | Environmental Specialists

Boring No. **B-2 (MW)**
Page 1 of 1
File No. M-0736-082
Checked by: D. Gnatek

Project: Damon Pond Dam Phase II Evaluation
Location: Hosmer Road, Ashby, MA
Client: Massachusetts DCR

Drilling Co. Geosearch, Inc.
Foreman: Chris
T&B Rep.: N. Guidi
Date Start: 02/19/19 End: 02/19/19
Location See Exploration Location Plan
GS. Elev. 608± Datum: NAVD88

	Casing	Sampler
Type	FJ	Split Spoon
I.D./O.D.	4"/4-1/2"	1-3/8"/2"
Hammer Wt.	140#	140#
Hammer Fall	30"	30"
Rig Make/Model	CME 85 w/ auto hammer	

Groundwater Readings

Date	Time	Depth	Casing	Sta. Time
19-Feb	11:30	19.0		0 hrs
3-Apr	10:00	18.3		6.5 wks

Depth (ft.)	Casing Blows Per Ft.	Sample No. / Rec.(in)	Sample Depth (ft.)	Blows Per 6"	PID Reading (ppm)	Sample Description	General Stratigraphy	Notes	Well Construction
		S-1 / 24	0-2	41-61		Very dense, light brown, fine to coarse SAND, some Gravel, trace Silt	0.4' **ASPHALT**		Concrete; 0.5' Sand
				31-15					
		S-2 / 15	2-4	5-6		Medium dense, light brown, fine to medium SAND, trace Gravel, trace Silt			3' Bentonite
				6-8					4'
5		S-3 / 9	4-6	5-9		3" Medium dense, dark brown, fine to coarse SAND, little Silt, trace Gravel, trace Organic Matter, over medium dense, light brown, fine to coarse SAND, little Silt, trace Gravel			Washed Silica Sand
				4-6					
		S-4 / 12	6-8	8-3		Loose, light brown, fine to coarse SAND, little Silt, trace Gravel			
				4-3					7.5' Bentonite Chips
		S-5 / 0	8-10	5-5		No Recovery			
				4-5					9.5'
10		S-6 / 4	10-12	4-2		Very loose, light brown, fine to coarse SAND, little Silt, trace Gravel	**EMBANKMENT FILL**		10.5'
				1-1					
		S-7 / 10	12-14	9-4		Loose, brown, fine to coarse SAND and GRAVEL, trace Silt			
				4-6					
		S-8 / 5	14-16	7-23		Dense, grey, fine to coarse SAND and GRAVEL, trace Silt			Silica Sand; 0.010" Slotted PVC Screen
15				8-5					
		S-9 / 6	16-18	3-9		Medium dense, brown, fine to coarse SAND, some Gravel, little Concrete, trace Silt			
				19-48					
		S-10 / 6	18-20	7-17		Medium dense, brown, fine to coarse SAND and GRAVEL, little Silt			
				11-26					
20		S-11 / 2	20-20.7	10-100/2		Medium dense, brown, fine to coarse SAND and GRAVEL, trace Silt	20.7'		20.5'
						End of boring at 20.7' due to casing refusal			
25									
30									

Notes:

Proportions Used

TRACE (TR.)	0 - <10%
LITTLE (LI.)	10 - <20%
SOME (SO.)	20 - <35%
AND	35 - <50%

Density/Consistency

VERY LOOSE	0-4	VERY SOFT	<2
LOOSE	4-10	SOFT	2-4
MEDIUM DENSE	10-30	MEDIUM	4-8
DENSE	30-50	STIFF	8-15
VERY DENSE	>50	VERY STIFF	15-30
		HARD	>30

Tighe&Bond
Engineers | Environmental Specialists

Boring No. **B-3**
Page 1 of 1
File No. M-0736-082
Checked by: D. Gnatek

Project: Damon Pond Dam Phase II Evaluation
Location: Hosmer Road, Ashby, MA
Client: Massachusetts DCR

Drilling Co. Geosearch, Inc.
Foreman: Chris
T&B Rep.: N. Guidi
Date Start: 02/19/19 End: 02/19/19
Location See Exploration Location Plan
GS. Elev. 608± Datum: NAVD88

	Casing	Sampler
Type	FJ	Split Spoon
I.D./O.D.	4"/4-1/2"	1-3/8"/2"
Hammer Wt.	140#	140#
Hammer Fall	30"	30"
Rig Make/Model	CME 85 w/ auto hammer	

Groundwater Readings

Date	Time	Depth	Casing	Sta. Time
Not Encountered				

Depth (ft.)	Casing Blows Per Ft.	Sample No. / Rec.(in)	Sample Depth (ft.)	Blows Per 6"	PID Reading (ppm)	Sample Description	General Stratigraphy	Notes	Well Construction
		S-1 / 21	0-2	71-74		Very dense, grey/brown, fine to coarse SAND and GRAVEL, trace Silt	0.3' **ASPHALT**	1	No Well Installed
				52-40			**EMBANKMENT FILL**		
		S-2 / 15	2-4	58-19		Dense, light brown, fine to medium SAND, some Gravel, trace Silt			
				18-27					
5		S-3 / 13	4-6	18-49		Very dense, grey/brown, fine to coarse SAND and GRAVEL, trace Silt			
				22-31					
		S-4 / 9	6-8	5-3		Loose, light brown, fine to coarse SAND, little Silt, trace Gravel			
				3-3					
		S-5 / 8	8-10	6-5		Medium dense, light brown, fine to medium SAND and GRAVEL, little Silt			
				5-3					
10		S-6 / 10	10-11.7	6-3		Loose, grey/brown, fine to coarse SAND, little Gravel, trace Silt			
				5-100/2		End of boring at 11.7'			
15									
20									
25									
30									

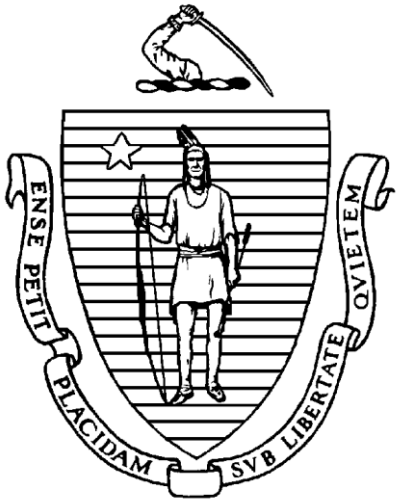
Notes:

Proportions Used

TRACE (TR.)	0 - <10%
LITTLE (LI.)	10 - <20%
SOME (SO.)	20 - <35%
AND	35 - <50%

Density/Consistency

VERY LOOSE	0-4	VERY SOFT	<2
LOOSE	4-10	SOFT	2-4
MEDIUM DENSE	10-30	MEDIUM	4-8
DENSE	30-50	STIFF	8-15
VERY DENSE	>50	VERY STIFF	15-30
		HARD	>30



BID PACKAGE

PART V

TECHNICAL SPECIFICATIONS

Project Manual
Volume 1 of 1

Damon Pond Dam Repairs and Area Improvements

Massachusetts Department of Conservation and Recreation

April 2026

Tighe & Bond
53 Southampton Road
Westfield, MA 01085



05/05/2026



05/07/2026

Damon Pond Dam Repairs and Area Improvements
Massachusetts Department of Conservation and Recreation
Townsend Road/ Route 119 Ashby, MA
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	Cover
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01320	Construction Photographs
01325	Scheduling of Construction
01330	Submittal Procedures
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01420	References
01450	Quality Control
01451	Independent Testing Services
01510	Temporary Utilities
01520	Construction Facilities
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01570	Temporary Controls
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Damon Pond Dam Repairs and Area Improvements
Massachusetts Department of Conservation and Recreation
Townsend Road/ Route 119 Ashby, MA
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03300	Cast in Place Concrete
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J:\M\M0736 MA DCR ENGINEERING SERVICES MSA\82 - DAMON POND DAM\82A - DESIGN PERMITTING AND CONSTRUCTION\DESIGN\SPECIFICATIONS_TABLE OF CONTENTS.DOCX

END OF SECTION

SECTION 01110

SUMMARY OF WORK

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

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

Massachusetts Department of Conservation and Recreation
Damon Pond Dam Repairs and Area Improvements
Willard Brook State Forest
Ashby, Massachusetts
April 2026

Tighe & Bond, Inc.
Consulting Engineers
Westfield, Massachusetts

2. The Work includes the following major items:

a. clearing of brush and vegetation.

b. removal of trees.

c. implementation of water control for bridge and dam repairs.

d. excavation and stockpiling of sediment from Damon Pond.

e. bridge superstructure repairs.

f. installation of approximately 450 linear feet of Americans with Disabilities Action / Architectural Access Board-compliant stabilized aggregate pathway.

g. installation of two ADA parking spaces.

h. installation of geocell overtopping protection.

i. installation of a concrete apron adjacent to north stone masonry wall.

j. stone masonry & concrete wall repairs.

k. grading and drainage improvements.

l. full depth pavement reconstruction of Hosmer Road.

m. site restoration.

B. Related Requirements

1. Part IV - Special Conditions of the Contract

1.2 SUBMITTALS

A. Informational Submittals

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

1.3 PROJECT/SITE CONDITIONS

A. Permits

1. Obtain the permits and approvals listed below:

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

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

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

2. Comply with the permits and approvals listed below:

a. Town of Ashby Conservation Commission Order of Conditions. A copy of the Order of Conditions is included in Section 00800.

b. MADEP Section 401 Water Quality Certification. A copy of the Water Quality Certification is included in Section 00800.

c. Army Corps of Engineers Section 404 PCN. A copy of the Individual Permit is included in Section 00800.

d. Department of Conservation and Recreation Chapter 253 - Dam Safety Permit

e. Department of Environmental Protection Chapter 91 Dredge Permit

3. Coordinate with MassDOT to obtain the final State Highway Access Permit and comply with that permit once obtained.

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

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

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

B. Existing Conditions

1. Use of Premises and Off-site Work

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

b. Land owned by the Owner is available for staging.

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

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

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

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

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

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

PART 2 PRODUCTS

2.1 MATERIALS FURNISHED BY OWNER

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

PART 3 EXECUTION – NOT USED

END OF SECTION

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SECTION 01140

WORK RESTRICTIONS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

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

B. Related Requirements

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

1.2 SUBMITTALS

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

B. Action Submittals

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

1.3 WORK SCHEDULE

A. Conduct the Work during daylight hours on Monday through Friday, and within the time between 7:00 a.m. and 5:00 p.m. No work is to be done on Owner's holidays, Saturdays, Sundays or outside of the work hours described above.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 CONSTRUCTION CONSTRAINTS

A. The following are constraints for the Work. Incorporate these constraints into the schedule required to be submitted under Section 01325.

1. All components of the existing facility must remain in operation throughout construction of the new facility unless otherwise specified herein or in Section 01310.
2. Time of Year restrictions must be adhered to, including:

a. Public vehicular access to and within Willard Brook State Park via Hosmer Road must be maintained except between September 8, 2026 and 6:00 AM on May 17, 2027. Between September 8 and May 17 access may be closed. Incidental closures outside this period may be permitted at the discretion of the Owner with prior notice.

b. Safe public pedestrian access from Townsend Road to the park across the dam may be maintained to the extent practicable but may be ended when determined necessary by the Contractor in conjunction with the Owner.

c. Public access to the park contact station must be maintained prior to September 9 2026 and following May 17, 2027.

d. Tree clearing is not permitted prior to November 1 2026 and after April 15, 2027 without prior approval of Owner.

e. No in-water activity that may potentially generate turbidity is permitted between October 1 2026 and April 20, 2026. Outside of this period, turbidity must still be controlled.

3.2 AVAILABLE WORK AREA

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

3.3 SITE USAGE PLAN

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

3.4 SNOW REMOVAL

A. Willard Brook State Park and Hosmer Road are not maintained in the winter. Contractor is responsible for performing snow removal to facilitate construction if winter work is performed.

END OF SECTION

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SECTION 01270

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 DIVISION 0 WORK INCIDENTAL TO THE CONTRACT PRICE

A. No separate measurement or payment will be made for Work called for in Division 0 or of the Specifications, unless specifically covered under the Bid items listed below. All costs associated with this Work will be considered incidental to the Contract Bid price.

B. Division 1 through Division 13 Work will be measured and paid for at the Contractor's unit Bid price or lump sum item cost as indicated on the Bid form. Those payable Work items, and related prices as Bid, will be the basis for all compensation to the Contractor for Work performed under this Contract. Work not specifically included as a Bid item, but which is required to properly and satisfactorily complete the Work is considered ancillary and incidental to the Bid item Work, and payment for such Work is considered to be included in the values as Bid for payable items. Compensation for all unit Bid price Work will be made based on the measured quantity of Work under the appropriate Bid items.

1.2 SITE PREPARATION (ITEM 1)

A. Measurement

1. There will be no measurement for Site Preparation as this Work will be on a lump sum basis.

B. Payment

1. Payment of the Bid price for Site Preparation will be full compensation for all labor, equipment and materials required for clearing, grubbing, stripping topsoil, and implementing and maintaining erosion and sediment control measures.

2. Payments will be made on a monthly basis as a percentage of the lump sum Bid and the amount of Work for that particular month.

1.3 TEST PITS (ITEM 1A)

A. Measurement

1. Measurement for test pits will be on a cubic yard basis as approved and measured in the field by the Owner or their representative.

B. Payment

1. Payment of the Bid price for test pits will be full compensation for all cutting of surfaces, excavation, backfill, compaction, dewatering, sheeting and bracing, required measurements, and all labor, equipment and materials required for incidental to the Work.

1.4 CONTROL OF WATER (ITEM 2)

A. Measurement

1. There will be no measurement for Control of Water as this Work will be on a lump sum basis.

B. Payment

1. Payment of the lump sum Bid price will be full compensation for all labor, equipment and materials required for or incidental to the control of water to facilitate the Work including preparation of control of water plans, flood contingency plans, plan revisions, implementation and operation of cofferdams, diversions, bypassing, pumping, turbidity curtains; and related work needed to maintain a work area sufficiently free of flowing and standing water.

2. Payments will be made on a monthly basis as a percentage of the lump sum Bid and the amount of Work for that particular month.

1.5 TRAFFIC CONTROL (ITEM 3)

A. Measurement

1. There will be no measurement for traffic control as this Work will be on a lump sum basis.

B. Payment

1. Payment of the lump sum Bid price will be full compensation for all labor, equipment and materials required for or incidental to the traffic control Work.

2. Payments will be made on a monthly basis as a percentage of the lump sum Bid and the amount of Work for that particular month.

3. No uniformed traffic control or roadway flaggers are required for the project. The Contractor may use uniformed traffic control or roadway flaggers for their convenience at no additional cost to the owner.

1.6 DREDGING (ITEM 4)

A. Measurement

1. There will be no measurement for dredging as this Work will be on a lump sum basis.

B. Payment

1. Payment of the lump sum Bid price will be full compensation for all labor, equipment and materials required for or incidental to dredging work, including sediment excavation, dewatering, hauling, construction of temporary dewatering facility, management of sediment, removal of temporary dewatering facility, relocating sediment to the final placement location, and related work.

2. Payments will be made on a monthly basis as a percentage of the lump sum Bid and the amount of Work for that particular month.

1.7 DRAINAGE IMPROVEMENTS (ITEM 5)

A. Measurement

1. There will be no measurement for drainage improvements as this Work will be on a lump sum basis.

B. Payment

1. Payment of the lump sum Bid price will be full compensation for all labor, equipment and materials required for or incidental to drainage improvements included in the Project, including construction of rockfill lined and grassed swale with underdrain, catch basins, manhole, piping, excavation, backfill and compaction, except for asbestos pipe removal.

2. Payments will be made on a monthly basis as a percentage of the lump sum Bid and the amount of Work for that particular month.

1.8 ASBESTOS PIPE REMOVAL AND DISPOSAL (ITEM 5A)

A. Measurement

1. Measurement for asbestos cement pipe removal and disposal will be on a linear foot basis for the removal and disposal of existing asbestos cement drainage piping as shown on the drawings or at other locations as approved by the Owner or their representative.

B. Payment

1. Payment of the Bid price will be full compensation for the removal and lawful disposal of asbestos cement pipe to the extents approved by the Owner or their representative and obtaining certificates of disposal for the pipe, including all labor, equipment and materials required for or incidental to the Work.

1.9 PATHWAYS (ITEM 6)

A. Measurement

1. There will be no measurement for pathways as this Work will be on a lump sum basis.

B. Payment

1. Payment of the lump sum Bid price will be full compensation for all labor, equipment and materials required for or incidental to pathway construction at the site as shown on the Drawings, including excavation, subgrade preparation, placing and compacting base materials, placing stabilized aggregate pathway materials in accordance with manufacturer requirements, grading, site restoration, and related work.

2. Payments will be made on a monthly basis as a percentage of the lump sum Bid and the amount of Work for that particular month.

1.10 OVERTOPPING PROTECTION (ITEM 7)

A. Measurement

1. There will be no measurement for overtopping protection as this Work will be on a lump sum basis.

B. Payment

1. Payment of the lump sum Bid price will be full compensation for all labor, equipment and materials required for or incidental to overtopping protection construction at the site as shown on the Drawings, including excavation, subgrade preparation, placing and compacting base materials, formwork, reinforcing, jointing, concrete placement, geocell installation, regrading, site restoration, and related work.

2. Payments will be made on a monthly basis as a percentage of the lump sum Bid and the amount of Work for that particular month.

1.11 ROADWAY REPAIRS AND PAVING (ITEM 8)

A. Measurement

1. There will be no measurement for roadway repairs and paving as this Work will be on a lump sum basis.

B. Payment

1. Payment of the lump sum Bid price will be full compensation for all labor, equipment and materials required for or incidental to roadway repairs and ADA parking spaces at the site as shown on the Drawings, including sawcutting, removal and disposal of asphalt and base materials, excavation, placing and compacting base materials, paving, sealing, jointing, painting, signage, and related work.

2. Payments will be made on a monthly basis as a percentage of the lump sum Bid and the amount of Work for that particular month.

1.12 CONCRETE AND MORTARED MASONRY REPAIRS (ITEM 9)

A. Measurement

1. There will be no measurement for concrete and mortared masonry repairs as this Work will be on a lump sum basis.

B. Payment

1. Payment of the lump sum Bid price will be full compensation for all labor, equipment and materials required for or incidental to concrete and mortared masonry repairs at the site as shown on the Drawings, including staging, netting, provisions to catch debris, removal of loose materials, preparation of services, removal and disposal of debris, and placing stones, repointing, mortar, grout, concrete, sealant, filler, moist curing, and related work except as described in Items 9A, 9B, 9C, 9D, and 10.

2. Payments will be made on a monthly basis as a percentage of the lump sum Bid and the amount of Work for that particular month.

1.13 HORIZONTAL AND VERTICAL SPALL REPAIR ON DAM FACE (ITEM 9A)

A. Measurement

1. Measurement for Horizontal and Vertical Dam Concrete Spall Repairs shall be on a square foot basis as measured in the field by the Owner or their representative for horizontal and vertical spalls in concrete surfaces along the dam.

B. Payment

1. Payment of the Bid unit price for Dam Concrete Spall Repairs shall be full compensation for all labor, equipment and materials required for or incidental to the Work.

1.14 OVERHEAD SPALL REPAIRS ON BRIDGE DECK (ITEM 9B)

A. Measurement

1. Measurement for Bridge Deck Overhead Concrete Spall Repairs shall be on a square foot basis as measured in the field by the Owner or their representative for overhead concrete spalls on the underside of the bridge deck.

B. Payment

1. Payment of the Bid unit price for Bridge Deck Overhead Concrete Spall Repairs shall be full compensation for all labor, equipment and materials required for or incidental to the Work.

1.15 PARTIAL DEPTH DECK REPAIRS (ITEM 9C)

A. Measurement

1. Measurement for Bridge Deck Partial Depth Repairs shall be on a square foot basis as measured in the field by the Owner or their representative for horizontal partial depth deck repairs along the topside of the bridge deck.

B. Payment

1. Payment of the Bid unit price for Bridge Deck Partial Depth Repairs shall be full compensation for all labor, equipment and materials required for or incidental to the Work.

1.16 FULL DEPTH DECK REPAIRS (ITEM 9D)

A. Measurement

1. Measurement for Bridge Deck Full Depth Repairs shall be on a square foot basis as measured in the field by the Owner or their representative for horizontal full depth deck repairs along the bridge deck.

B. Payment

1. Payment of the Bid unit price for Bridge Deck Full Depth Repairs shall be full compensation for all labor, equipment and materials required for or incidental to the Work.

1.17 RAILING REPAIRS (ITEM 10)

A. Measurement

1. There will be no measurement for railing repairs as this Work will be on a lump sum basis.

B. Payment

1. Payment of the lump sum Bid price will be full compensation for all labor, equipment and materials required for or incidental to railing repairs at the site as shown on the Drawings, including full repointing of masonry pilasters, new pilaster caps, temporary safety fencing, cleaning and repainting railing tubes not to be replaced, and related work.

2. Replacing railings with full depth corrosion is included as Item 10A

3. Payments will be made on a monthly basis as a percentage of the lump sum Bid and the amount of Work for that particular month.

1.18 RAILING REPLACEMENT (ITEM 10A)

A. Measurement

1. Measurement for Railing Replacement shall be on the basis of each individual railing tube replaced for railings that exhibit perforations from corrosion.

B. Payment

1. Payment of the lump sum Bid price will be full compensation for all labor, equipment and materials required for or incidental to railing tube replacement including removal and disposal of existing railings which may be coated in lead and PCB containing paint, installation of new railings, preparing for coating, coating, temporary safety fencing, mortar repair, and related work.

1.19 DRY LAID MASONRY REPAIRS (ITEM 11)

A. Measurement

1. There will be no measurement for dry laid masonry repairs as this Work will be on a lump sum basis.

B. Payment

1. Payment of the lump sum Bid price will be full compensation for all labor, equipment and materials required for or incidental to dry laid masonry repairs at the site as shown on the Drawings, including demolition, excavation, subgrade preparation, crushed stone, providing and placing recovered and new stones, chinking, placing adjacent riprap and stream bed materials, and surface restoration.

2. Payments will be made on a monthly basis as a percentage of the lump sum Bid and the amount of Work for that particular month.

1.20 GROUTING PLAN PREPARATION (ITEM 12)

A. Measurement

1. There will be no measurement for grouting plan preparation as this Work will be on a lump sum basis.

B. Payment

1. Payment of the lump sum Bid price will be full compensation for all labor, equipment and materials required for or incidental to preparation, submission, and revision of a plan describing the proposed grouting procedure, equipment, materials, and methods to be used, including meeting with Engineer and Owner and providing additional information when requested.

2. Payments will be made on a monthly basis as a percentage of the lump sum Bid and the amount of Work for that particular month.

1.21 MOBILIZATION OF GROUT PLANT (ITEM 12A)

A. Measurement

1. Measurement for mobilization of the grout plant, including all fixed costs associated with implementing grouting, with the exception of preparation of the grouting plan, will be on a lump sum basis for each time the grout plant and related facilities are mobilized.

B. Payment

1. The lump sum payment shall be full compensation for furnishing all labor, materials, tools, equipment, and services necessary for the fixed costs associated with implementing grouting, with the exception of preparation of the grouting plan.

2. Payment of drilling and testing the holes for grouting and grout injection are to be paid separately as unit price items.

1.22 DRILLING FOR GROUT INJECTION (ITEM 12B)

A. Measurement

1. Measurement for grout hole drilling for spillway grouting will be on a linear foot basis of grout hole drilled as measured in the field by the Owner or their representative.

B. Payment

1. Payment of the bid price for each foot of drilling and preparation shall be full compensation for drilling, preparing, and testing the grout holes as required, including all labor, equipment, and materials for, or incidental to, the work specified.

2. Mobilization/demobilization of drilling and grouting equipment and other fixed costs associated with the grouting program shall be paid under Item 12A.

1.23 GROUT INJECTION (ITEM 12C)

A. Measurement

1. Measurement for grouting shall be on each 94 lbs. of cement used based on a count of bags of cement.

2. Measurement for bags of different weights will be adjusted on a unit weight basis (e.g., a 50 lb bag will be equivalent to 0.532 bags of 94 lb. weight).

3. Measurement for premixed grout, if used, shall be adjusted based on the average weight of cement in each bag as reported by the manufacturer (e.g., A dry premixed grout with a cement content of 22 to 24 lbs. per 50 lb bag as reported by the manufacturer will be assumed to contain 23 lbs. of cement and measured to be equivalent to 0.245 cement bags of 94 lb. weight).

B. Payment

1. Payment of the bid price for grouting shall be full compensation for furnishing and applying the grout, including all labor, equipment, and materials for or incidental to the work specified.

2. There shall be no additional payment for water, sand, bentonite, or other admixtures used.

3. Mobilization/demobilization of drilling and grouting equipment and other fixed costs associated with the grouting program shall be paid under Items 12A and 12B. Grout hole drilling and testing shall be paid under Item 12C.

1.24 BAR RACK (ITEM 13)

A. Measurement

1. There will be no measurement for the bar rack as this Work will be on a lump sum basis.

B. Payment

1. Payment of the lump sum Bid price will be full compensation for all labor, equipment and materials required for or incidental to providing a bar rack as indicated on the Drawings.

1.25 SITE RESTORATION (ITEM 14)

A. Measurement

1. There will be no measurement for Site Restoration as this Work will be on a lump sum basis.

B. Payment

1. Payment of the lump sum Bid price will be full compensation for all labor, equipment and materials required for or incidental to site restoration at the site as shown on the Drawings, including removal of debris, litter, trash, grading, spreading loam, seeding, planting, maintaining vegetation and removal of invasive plants during the maintenance and warranty periods.

2. Payments will be made on a monthly basis as a percentage of the lump sum Bid and the amount of Work for that particular month.

1.26 TREE PLANTINGS (ITEM 14A)

A. Measurement

1. Measurement for Tree Plantings shall be on a per tree basis as counted in the field by the Owner or their representative.

B. Payment

1. Payment of the Bid unit price will be full compensation for all labor, equipment and materials required for or incidental to planting trees within the state park at a location indicated by the Owner.

1.27 SITE FURNISHINGS (ITEM 15)

A. Measurement

1. There will be no measurement for site furnishings as this Work will be on a lump sum basis.

B. Payment

1. Payment of the lump sum Bid price will be full compensation for all labor, equipment and materials required for or incidental to providing ADA-accessible beach access matting and a swim area float rope as indicated on the Drawings.

2. Payments will be made on a monthly basis as a percentage of the lump sum Bid and the amount of Work for that particular month.

1.28 MISCELLANEOUS SIGNS (ITEM 15A)

A. Measurement

1. Measurement for Miscellaneous Signs shall be on a per sign basis as counted in the field by the Owner or their representative.

B. Payment

1. Payment of the Bid unit price will be full compensation for all labor, equipment and materials required for or incidental to providing informational signs not specifically indicated on the Drawings.

1.29 GENERAL CONDITIONS (ITEM 16)

A. Measurement

1. There will be no measurement for general conditions as this Work will be on a lump sum basis.

B. Payment

1. Payment of the lump sum Bid price will be full compensation for all labor, equipment and materials required for or incidental to work described in Division 1 including work plans, schedules, meetings, temporary construction facilities, office trailers, temporary controls except control of water, submittals, permit compliance, field engineering, documentation, record drawings, and any other general conditions.

2. Payments will be made on a monthly basis as a percentage of the lump sum Bid and the amount of Work for that particular month.

1.30 MOBILIZATION AND DEMOBILIZATION (ITEM 17)

A. Measurement

1. There will be no measurement for the mobilization and demobilization to the Site as this Work will be on a lump sum basis.

B. Payment

1. Payment of the lump sum Bid price will be paid in two equal installments. The first installment will occur at the time the first payment requisition is submitted after the Contractor has initiated full-time construction activity. Payment for the second installment will be included in the first payment request after Substantial Completion has been reached and all equipment has been removed from the Site. In no case will the total of both installments exceed 5 percent of the base Bid price.

1.31 MONTHLY PRICE ADJUSTMENT FOR HOT MIX ASPHALT (HMA) MIXTURES (ITEM 101)

A. Measurement

1. This Contract contains a price adjustment for bituminous concrete (hot mix asphalt) mixtures. The value provided in the Bid Form is an allowance for budgeting purposes only. The value is neither a limit nor a guarantee of payment. Payment to the Contractor for increases in the price of liquid asphalt, or credits due to the Owner for decreases in the price of liquid asphalt, will be determined in accordance with the following procedure.

a. The Base Price for liquid asphalt for this Project will be as determined by MassDOT for May 2026.

b. The price adjustment shall be based on the variance in price for the liquid asphalt component only of hot mix asphalt from the Base Price to the Period Price. It shall not include transportation or other charges. The price adjustment shall occur on a monthly basis.

c. The Period Price shall be as published by the Massachusetts Department of Transportation for the calendar month in which the Work was completed.

d. The Contract price adjustment will be paid only for the liquid asphalt contained in the hot mix asphalt paid under the following Items: Roadway Repairs and Paving.

e. For the aforementioned items subject to the Contract price adjustment, the liquid asphalt content of hot mix asphalt mixtures shall be calculated based on 5.5% (0.055) by weight regardless of percentages established in individual job mix formulas.

f. The price adjustment will be determined by multiplying the number of tons of hot mix asphalt paid during each one-month period by the liquid asphalt content times the variance in price between Base Price and Period Price of liquid asphalt.

g. The price adjustment will be paid only if the variance of the Period Price from the Base Price is 5 percent or more for a given month. The adjustment will be paid with no deduction of the 5 percent from either upward or downward adjustments.

2. No price adjustments will be made for Work completed beyond the date of Final Completion.

1.32 MONTHLY PRICE ADJUSTMENT FOR DIESEL FUEL (ITEM 102)

A. Measurement

1. This Contract contains a price adjustment for diesel fuel. The value provided in the Bid Form is an allowance for budgeting purposes only. The value is neither a limit nor a guarantee of payment. Payment to the Contractor for increases in the price of diesel fuel, or credits due to the Owner for decreases in the price of diesel fuel, will be determined in accordance with the following procedure.

a. The Base Price for diesel fuel for this Project will be as determined by MassDOT for May 2026.

b. The price adjustment shall be based on the variance in price for diesel fuel from the Base Price to the Period Price and shall occur on a monthly basis.

c. The Period Price shall be as published by the Massachusetts Department of Transportation for the calendar month in which the Work was completed.

d. The price adjustment will be determined by multiplying the number of cubic yards of excavation and borrow (as defined in the next paragraph) paid during each one-month period by 0.29 gallons per cubic yard, and adding that to the tons of hot mix asphalt (as defined in the next paragraph) paid during each one-month period by 2.90 gallons per ton. The total number of gallons calculated shall then be multiplied by the variance in price between Base Price and Period Price of diesel fuel.

e. Excavation and borrow paid under the following Items shall be used to calculate the amount of diesel fuel as described in the above paragraph: Pathways, Dredging, Roadway Repairs and Paving, Overtopping Protection. Hot mix asphalt paid under the following Items shall be used to calculate the amount of diesel fuel as described in the above paragraph: Roadway Repairs and Paving.

f. The price adjustment will be paid only if the variance of the Period Price from the Base Price is 5 percent or more for a given month. The adjustment will be paid with no deduction of the 5 percent from either upward or downward adjustments.

2. No price adjustments will be made for Work completed beyond the date of Final Completion.

1.33 MONTHLY PRICE ADJUSTMENT FOR GASOLINE (ITEM 103)

A. Measurement

1. This Contract contains a price adjustment for gasoline. The value provided in the Bid Form is an allowance for budgeting purposes only. The value is neither a limit nor a guarantee of payment. Payment to the Contractor for increases in the price of gasoline, or credits due to the Owner for decreases in the price of gasoline, will be determined in accordance with the following procedure.

    a. The Base Price for gasoline for this Project will be as determined by MassDOT for May 2026.

    b. The price adjustment shall be based on the variance in price for gasoline from the Base Price to the Period Price and shall occur on a monthly basis.

    c. The Period Price shall be as published by the Massachusetts Department of Transportation for the calendar month in which the Work was completed.

    d. The price adjustment will be determined by multiplying the number of cubic yards of excavation and borrow (as defined in the next paragraph) paid during each one-month period by 0.15 gallons per cubic yard, multiplied by the variance in price between Base Price and Period Price of gasoline.

    e. Excavation and borrow paid under the following Items shall be used to calculate the amount of gasoline as described in the above paragraph: Pathways, Dredging, Roadway Repairs and Paving, Overtopping Protection. Hot mix asphalt paid under the following Items shall be used to calculate the amount of diesel fuel as described in the above paragraph: Roadway Repairs and Paving

    f. The price adjustment will be paid only if the variance of the Period Price from the Base Price is 5 percent or more for a given month. The adjustment will be paid with no deduction of the 5 percent from either upward or downward adjustments.

2. No price adjustments will be made for Work completed beyond the date of Final Completion.

1.34 MONTHLY PRICE ADJUSTMENT FOR STRUCTURAL STEEL AND REINFORCING STEEL (ITEM 104)

A. Measurement

1. This Contract contains a price adjustment for structural steel and reinforcing steel. The value provided in the Bid Form is an allowance for budgeting purposes only. The value is neither a limit nor a guarantee of payment. Payment to the Contractor for increases in the price of structural steel and reinforcing steel, or credits due to the Owner for decreases in the price of structural steel and reinforcing steel, will be determined in accordance with the following procedure.

    a. Price adjustments will be handled as described below and shall only apply to unfabricated structural steel material, consisting of rolled shapes, plate steel, sheet piling, pipe piles, steel castings and steel forgings, and unfabricated reinforcing steel bars.

b. The Base Price Date is the month and year in which bids are opened for the project. This date is used to select the Base Price Index.

c. Period Prices of unfabricated structural steel and unfabricated reinforcing steel on a project are variable prices calculated based on the purchase date of the steel (Period Price Date) using an index of steel prices to adjust the Base Price.

d. The Period Price Date is the date the steel was delivered to the fabricator as evidenced by an official bill of lading submitted to the Department containing a description of the shipped materials, weights of the shipped materials and the date of shipment. This date is used to select the Period Price Index.

e. The index used for the calculation of Period Prices is the U.S. Bureau of Labor Statistics (BLS) Producer Price Index (PPI) Series ID WPU101702 (Not Seasonally Adjusted, Group: Metals and Metal Products, Item: Semi-finished Steel Mill Products.) As this index is subject to revision for a period of up to four months after its original publication, no price adjustments will be made until the index for the period is finalized, i.e., the index is no longer suffixed with a "(P)".

f. Period Prices are determined as follows:

g. Period Price = Base Price x Index Factor

h. Index Factor = Period Price Index / Base Price Index

i. The price adjustment will be paid only if the variance of the Period Price from the Base Price is 5 percent or more for a given month. The adjustment will be paid with no deduction of the 5 percent from either upward or downward adjustments.

j. Price adjustments will be calculated by multiplying the number of pounds of unfabricated structural steel material or unfabricated reinforcing steel bars subject to a price adjustment by the index factor calculated as shown above.

k. Price adjustments will not include the costs of shop drawing preparation, handling, fabrication, coatings, transportation, storage, installation, profit, overhead, fuel costs, fuel surcharges, or other such charges not related to the cost of the unfabricated structural steel and unfabricated reinforcing steel.

l. The weight of steel subject to a price adjustment shall not exceed the final shipping weight of the fabricated part by more than 10%.

B. No price adjustments will be made for Work completed beyond the date of Final Completion.

1.35 MONTHLY PRICE ADJUSTMENT FOR PORTLAND CEMENT IN CONCRETE (ITEM 105)

A. Measurement

1. This Contract contains a price adjustment for Portland cement contained in cast-in-place concrete. The value provided in the Bid Form is an allowance for budgeting purposes only. The value is neither a limit nor a guarantee of payment. Payment to the Contractor for increases in the price of Portland cement, or credits due to the Owner for decreases in the price of Portland cement, will be determined in accordance with the following procedure.

    a. The Base Price for Portland cement for this Project will be as determined by MassDOT for May 2026.

    b. The price adjustment shall be based on the variance in price for the Portland cement component only of cast-in-place concrete from the Base Price to the Period Price. It shall not include transportation or other charges. The price adjustment shall occur on a monthly basis.

    c. The Period Price shall be as published by the Massachusetts Department of Transportation for the calendar month in which the Work was completed.

    d. The Contract price adjustment will be paid only for the Portland cement component of cast-in-place concrete paid under the following Item: Overtopping Protection.

    e. For the aforementioned items subject to the Contract price adjustment, the Portland cement content of cast-in-place concrete mixtures shall be calculated based on 0.305 tons of Portland cement per cubic yard of cast-in-place concrete, regardless of actual Portland cement content of individual concrete mix designs.

    f. The price adjustment will be determined by multiplying the number of cubic yards of cast-in-place concrete paid during each one-month period by the Portland cement content, times the variance in price between Base Price and Period Price of Portland cement.

    g. The price adjustment will be paid only if the variance of the Period Price from the Base Price is 5 percent or more for a given month. The adjustment will be paid with no deduction of the 5 percent from either upward or downward adjustments.

B. No price adjustments will be made for Work completed beyond the date of Final Completion.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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SECTION 01310

COORDINATION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Project Management

2. Coordination

3. Project Meetings

B. Related Requirements

1. Section 01140 - Work Restrictions

2. Section 01325 - Scheduling of Construction

C. Related Work Not Included

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

1.2 SUBMITTALS

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

B. Informational Submittals

1. At the pre-construction conference, supply to the Owner the cell phone number of a responsible person who may be contacted during off-hours for emergencies 24 hours a day, seven days a week.

2. Prepare a contact list of phone numbers, including cell phone numbers, and emails for all Project personnel and submit to the Engineer at the pre-construction conference. Include Contractor, Owner, Engineer, Park staff, and Town personnel including police, fire, and ambulance.

1.3 PROJECT MANAGEMENT

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

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

1.4 COORDINATION

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

1.5 PROJECT MEETINGS

A. Pre-Construction Conference

1. The Contractor shall be prepared to discuss the following subjects at the Pre-Construction Conference. Documentation for these items is required to be submitted within the time frames included in individual specification sections.

a. Project scheduling

b. Sequencing of critical path Work items

c. Shop Drawing procedures

d. Project changes and clarification procedures

e. Use of sites, access to Work areas, office and storage areas, security and temporary facilities

f. Contractor safety plan and representative

g. Progress payments and procedures

h. Required documentation

i. Project personnel contact list

B. Progress Meetings

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

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

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

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

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

C. Attend weekly meetings with local agencies, including the Conservation Commission to discuss the progress of the Work and address any local concerns.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 GENERAL

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

3.2 COORDINATION WITH THE OWNER'S OPERATIONS

A. Notify the Owner and Engineer, in writing, a minimum of 1 week in advance of commencing Work on site. Work on site shall not occur until all permits are obtained.

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

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

D. Coordinate the following operations with the Owner and the Engineer:

1. Roadway closures outside of the designated closure period.

2. Installation of water control.

3. Bridge superstructure repairs and required road closures and detours

4. On-site stockpiling of sediment

3.3 SEQUENCE OF CONSTRUCTION

A. Provide a detailed construction schedule as required in Section 01325.

END OF SECTION

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SECTION 01320

CONSTRUCTION PHOTOGRAPHS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

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

1.2 SUBMITTALS

A. Informational Submittals

1. Submit electronic files of each photograph on a CD or USB flash drive.

PART 2 PRODUCTS

2.1 CONSTRUCTION PHOTOGRAPHS

A. Electronic files shall be in .jpg format.

PART 3 EXECUTION

3.1 PRE-CONSTRUCTION PHOTOGRAPHY

A. Prior to the commencement of any Work under this Contract, take photographs at each location at 100 foot intervals along the entire length of the limits of work. The photographs will serve as a record of the original conditions where construction activities will occur.

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

C. Provide a minimum of thirty (30) preconstruction photographs, or more as required to document the preconstruction condition of the Site and adjacent properties.

3.2 PROGRESS PHOTOGRAPHY

A. Take construction photographs of active work areas at least weekly throughout the life of the Contract. The photographs shall be indicative of the work that is currently in progress. A minimum of ten (10) photographs shall be taken at each scheduled interval at each location where Work is in progress.

B. Take post construction photographs at locations in sufficient quantity to document final conditions of the dam. Provide a minimum of thirty (30) post construction photographs taken at the same locations as the preconstruction photograph.

END OF SECTION

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SECTION 01325

SCHEDULING OF CONSTRUCTION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Progress Schedule

B. Related Requirements

1. Section 01140 - Work Restrictions

2. Section 01310 - Coordination

1.2 REFERENCES

A. The Use of CPM in Construction - A Manual for General Contractors and the Construction Industry, an Associated General Contractors (AGC) of America publication.

1.3 PROGRESS SCHEDULE

A. Network Analysis

1. Prepare an electronic network analysis using the critical path method under concepts and methods outlined in the current edition of AGC's "The Use of CPM in Construction - A Manual for General Contractors and the Construction Industry."

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

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

D. Include, at a minimum, the following activities on the Progress Schedule:

1. Project mobilization

2. Submittal and approval of Shop Drawings

3. Procurement of equipment and critical materials

4. Installation of equipment and critical materials

5. Fabrication of special equipment and material, and its installation and testing

6. Final inspecting and testing

7. Punchlist

8. Final cleanup

9. Other activities that may be critical to the Progress Schedule

10. All activities of the Owner and the Engineer which affect progress and/or affect required dates for completion of the Work

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

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

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

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

I. The Progress Schedule should show description of each activity, and activity duration in calendar days.

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

1.4 SUBMITTALS

A. Informational Submittals

1. Submit four prints of the preliminary Progress Schedule prepared in accordance with Article 2.05 of Section 00700 and the requirements of this section. Progress schedule must be submitted within 10 days after the Effective Date of the Agreement. Progress Schedule must be approved by the Owner and Engineer before the first progress payment will be made.

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

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

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

1.5 PERIODIC REPORTS

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

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

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

3. Activities or portions of activities completed during the reporting period, and their total value as basis for Contractor's periodic request for payment.

Payment made will be based on the total value of such activities completed or partially completed after verification by the Engineer.

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

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

6. Include a narrative which includes:

   a. A description of problem areas, anticipated and current

   b. Delaying factors and their impact

   c. An explanation of corrective actions taken or proposed

7. Show the date of latest revision.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

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SECTION 01330

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Action Submittals

2. Informational Submittals

1.2 DEFINITIONS

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

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

1.3 ACTION SUBMITTALS

A. Shop Drawings

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

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

a. 24 inches by 36 inches

b. 22 inches by 34 inches

c. 11 inches by 17 inches

d. 8.5 inches by 11 inches

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

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

5. Check all Shop Drawings regarding measurements, size of members, materials, and details to determine if they conform to the Contract Documents. Shop Drawings found to be inaccurate, not in compliance, or otherwise in error shall

be returned to the Subcontractors or Suppliers for correction before submission to the Engineer. Drawings that are current shall be marked with the date, name, and approval stamp of the Contractor.

6. All details on Shop Drawings submitted for approval shall show clearly the relation of the various parts to the main members and lines of the structure, and where correct fabrication of the work depends upon field measurements, such measurements shall be made and noted on the Shop Drawings before being submitted for approval.

7. Installation drawings shall be drawn to scale and fully dimensioned.

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

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

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

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

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

D. Product Substitutions: In accordance with Section 01630.

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

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

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

1.4 INFORMATIONAL SUBMITTALS

A. Schedule of Submittals

1. Submit a preliminary Schedule of Submittals within 10 days of the Effective Date of the Agreement in accordance with Article 2.05 of Section 00700.

B. Schedule of Manufacturers and Suppliers

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

C. Schedule of Major Products

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

D. Product Listing and Manufacturers Qualifications

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

E. Certificates of Compliance

1. General:

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

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

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

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

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

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

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

F. Application for Payment

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

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

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

I. Contractor Design Data

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

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

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

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

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

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

N. Test and Inspection Reports

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

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

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

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

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

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

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

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

1.5 PROCEDURES

A. Coordination

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

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

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

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

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

1. Field measurements

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

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

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

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

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

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

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

H. Partial and Incomplete Submittals

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

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

   a. Missing or incomplete Submittal Certification Form

   b. Insufficient number of copies

   c. Missing content

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

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

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

J. Resubmission

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

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

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

K. Distribution

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

1.6 ENGINEER'S REVIEW

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

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

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

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

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

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

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

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

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

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

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

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

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

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SUBMITTAL CERTIFICATION FORM

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

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

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

☐ NO DEVIATIONS

☐ A COMPLETE LIST OF DEVIATIONS AS FOLLOWS:

_____
_____
_____
_____
_____
_____

SUBMITTED BY:_____ DATE:_____

GENERAL CONTRACTOR'S STAMP

PE CERTIFICATION FORM

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

_____ to design
(Name of Contractor)

_____
(Insert PE Responsibilities)

In accordance with Specification section _____for the

_____
(Name of Project)

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

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

_____
(Insert Name of Owner)

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

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

SECTION 01350

HEALTH AND SAFETY PLAN

PART 1 GENERAL

1.1 SUMMARY

A. The Contractor shall:

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

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

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

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

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

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

B. Related Sections

1. 02225– Selective Demolition

2. 13286– PCB Contaminated Building Materials Abatement

1.2 SITE-SPECIFIC PROJECT CONDITIONS

A. The Contractor shall review and understand all existing information as it relates to potential exposure to subsurface site contaminants, environmental data and reports.

B. The Contractor shall review and understand all existing information as it relates to potential exposure to hazardous structure/building materials (i.e., asbestos, polychlorinated biphenyls (PCBs), lead paint, and oil/hazardous materials containers). Site-specific information with respect to potential exposures to hazardous structure/building materials are included in applicable technical specifications contained herein. See Sections 02220, 02225, 13286, for applicable environmental data.

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

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

2. The Contractor shall be responsible for determining if a higher level of personnel protection is required based on the criteria outlined in the Contractor's HASP. In the event that the Contractor determines that a level of protection higher than Level D is required, the Contractor's personnel shall take the necessary steps outlined in the Contractor's HASP.

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

1.3 REFERENCES

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

B. OSHA 29 CFR Part 1926 (Construction Standards)

C. Applicable state regulations

D. OSHA Regulation 29 CFR §1926.62 (Lead)

1.4 DEFINITIONS

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

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

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

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

1.5 CONTRACTOR'S RESPONSIBILITIES

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

B. Provide a designated SSHO for the project.

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

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

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

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

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

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

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

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

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

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

G. Work under this Contract is being performed on a "Regulated clean-up site", as defined in 29 CFR §1910.120, 29 CFR §1926.65, and Article 1.4.F, above.

H. The site-specific HASP must include all elements required by OSHA's HAZWOPER standard, as contained in 29 CFR §1910.120(b) and 29 CFR §1926.65(b) and the elements in this specification.

I. Train all workers assigned to areas where contaminated media are likely to be encountered in accordance with 29 CFR §1910.120(e) and 29 CFR §1926.65(e).

J. Develop and implement a medical surveillance program per 29 CFR §1910.120(f) and 29 CFR §1926.65(f) for applicable employees.

K. Provide a lead exposure control plan in accordance with 29 CFR §1926.62(e)(2).

1.6 HEALTH & SAFETY PLAN (HASP) REQUIREMENTS

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

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

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

1) equipment operation;

2) confined space entry;

3) slips, trips, and falls;

4) building collapse;

5) falling debris;

6) encountering unmarked utilities;

7) cold and heat stress;

8) hot work (cutting and welding);

9) drum and container handling;

10) trench and/or excavation entry.

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

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

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

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

a. including, but not limited to the following:

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

2) procedures for emergency medical treatment and first aid;

3) site evacuation routes and procedures;

4) emergency alerting and response procedures.

PART 2 PRODUCTS

2.1 PERSONAL PROTECTIVE EQUIPMENT (PPE)

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

1. Level D Protection:

a. Coveralls or Tyvek

b. Gloves

c. Safety boots/shoes

d. Safety glasses

e. Hearing protection (for high noise operations)

f. Hard hat with optional face shield

2. Level C Protection:

a. Air-purifying respirator

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

c. Gloves, inner (disposable, surgical type)

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

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

f. Booties, chemical protective (disposable PVC)

g. Hard hat

h. Face shield (if necessary)

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

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

PART 3 EXECUTION

3.1 HEALTH AND SAFETY PLANNING AND IMPLEMENTATION

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

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

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

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

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

3.2 PERSONNEL AND EQUIPMENT DECONTAMINATION

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

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

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

3.3 INCIDENT REPORTING

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

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

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

END OF SECTION

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SECTION 01420

REFERENCES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Standards referenced in the Contract Documents.

1.2 GENERAL

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

1.3 ABBREVIATIONS

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

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

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

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

83. NSWMA – National Solid Waste Management Association
84. NWMA – National Woodwork Manufacturers Association
85. O&M – Operation and Maintenance
86. OSHA – Occupational Safety and Health Administration
87. PCA – Portland Cement Association
88. PCI – Precast/Prestressed Concrete Institute
89. PDOP – Positional Dilution of Precision
90. PLC – Programmable Logic Controller
91. PS – Product Standard
92. PVC – Polyvinyl Chloride
93. QA/QC – Quality Assurance/Quality Control
94. RCP – Reinforced Concrete Pipe
95. RCSHSB – Red Cedar Shingle and Handsplit Shake Bureau
96. RIS – Redwood Inspection Service
97. RTU – Remote Telemetry Unit
98. SCADA – Supervisory Control and Data Acquisition
99. SDI – Steel Deck Institute
100. SSPC – The Society for Protective Coatings

OR

101. SSPC – Steel Structures Painting Council
102. TCA – Tile Council of America
103. UL – Underwriter's Laboratories
104. UPS – Uninterruptable Power Supply
105. USCS – Unified Soil Classification System
106. USDA – United States Department of Agriculture
107. WCLIB – West Coast Lumber Inspection Bureau
108. WOG – Water, Oil, Gas
109. WWPA – Western Wood Products Association

END OF SECTION

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SECTION 01450

QUALITY CONTROL

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

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

B. Related Requirements

1. Section 01451 - Independent Testing Services
2. Testing requirements are described in various Sections of the Project Manual.

1.2 SUBMITTALS

A. Informational Submittals

1. Product test reports

1.3 QUALITY ASSURANCE

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

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

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

1.4 TESTING SERVICES FURNISHED BY CONTRACTOR

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

1. Concrete materials and mix designs
2. Concrete in place
3. Modified proctor analyses for all borrow materials used on the Project
4. Modified proctor analysis of all subgrade material to be compacted during surface preparation and fine grading and compaction work
5. Sieve analyses for all borrow materials used on the Project
6. Soil structure and nutrient analyses for all loam and topsoil used on the Project

7. Compaction tests performed during trench backfilling and compaction, rough grading and site preparation, fine grading and compaction of roadway and sidewalk subgrades, and placement of roadway and sidewalk subbase materials

8. Design of asphalt mixtures

9. Asphalt in place

10. Field welded joints

11. All other tests and engineering data as required in the Contract Documents.

B. Testing agencies must meet the requirements of Section 01451.

C. An independent commercial testing laboratory, with current Massachusetts certification, shall perform all tests that require the services of a laboratory to determine compliance with the Contract Documents. Independent testing laboratory requirements are defined under Section 01451.

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

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

F. Schedule necessary testing laboratory services.

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

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

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

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

1.5 TESTING SERVICES FURNISHED BY THE OWNER

A. In addition to the testing performed by the Contractor, the Owner may elect to perform its own independent testing for quality control in the field or laboratory on materials and equipment during and after their incorporation in the Work, including soils, concrete, masonry, and steel testing. Testing by the Owner will not offset testing required to be performed by the Contractor.

B. Cooperate with the Owner to obtain and furnish samples of materials, design, mix, equipment, tools, storage, and assistance as requested.

C. Coordinate with the Owner to schedule necessary testing laboratory services.

D. Notify the Engineer 48 hours prior to operations requiring inspections and laboratory testing services so the Owner can schedule the testing and the Engineer witness such.

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

1.6 CODE COMPLIANCE TESTING

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

1.7 PRODUCT TEST REPORTS

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

1.8 SUPPLIERS' FIELD SERVICE

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

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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SECTION 01451

INDEPENDENT TESTING SERVICES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Independent testing services including geotechnical, concrete, grout and mortar, and testing

2. Testing laboratory services

B. Related Requirements

1. Section 01450 - Quality Control

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

3. Section 02320 - Borrow Material

4. Section 03300 - Cast-in-Place Concrete

5. Section 04920 – Stone Masonry Joint Restoration

6. Section 09900 - Painting

1.2 REFERENCES

A. General

1. ASTM E329 – Standard Specifications for Agencies Engaged in the Testing and/or Inspection of Materials used in Construction

B. Soil Testing

1. American Association of State Highway and Transportation Officials (AASHTO)

C. Concrete Testing

1. Cement and Concrete Reference Laboratory (CCRL)

D. Coating Inspection

1. National Association of Corrosion Engineers (NACE)

2. SSPC – The Society for Protective Coatings

E. Masonry Inspection

1. ACI 530-02/ASCE 5-02 TMS 402-02 – Building Code Requirements for Masonry Structures

2. ACI 530.1-02/ASCE 6-02 TMS 602 – Specifications for Masonry Structures

3. ASTM C780 – Standard Test Methods for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Masonry

4. ASTM C1019 – Standard Test Methods for Sampling and Testing Grout

1.3 SUBMITTALS

A. Informational Submittals

1. Qualifications, experience, and certifications of each proposed testing service

2. Certificate of calibration for testing equipment

3. Inspection and test reports

1.4 QUALITY ASSURANCE

A. General

1. Comply with the requirements of Section 01450, Quality Control, for testing and inspection requirements.

2. Testing services shall have the following general qualifications:

a. Minimum five years as a firm with the type of testing specified.

b. Ability to provide timely field testing services to minimize the impact of the testing requirements on construction progress.

c. Certification to perform the specified services in the state in which the Work is to be performed.

3. Testing services proposed by the Contractor shall be subject to review by the Owner and Engineer. Any testing firm not acceptable to the Owner or Engineer will be rejected.

B. All testing agencies and laboratories must meet the requirements of ASTM E329.

C. Testing company shall have been in business for a minimum of the last 5 years providing applicable testing services.

D. Testing equipment shall be calibrated at maximum 12 month intervals by devices of accuracy traceable to National Bureau of Standards. Submit copy of certificate of calibration made by accredited calibration agency.

E. Testing shall be in accordance with applicable codes and regulations referenced in individual Specification Sections, and with selected standards of the American Society for Testing and Materials.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 TESTING SERVICES – GENERAL

A. Provide testing services meeting the following:

1. Provide qualified personnel promptly on notice.

2. Perform inspections required by the Contract Documents. Sample and test materials and observe methods of construction to determine compliance with applicable standards and with the requirements of the Contract Documents.

3. Take specimens and samples for testing, as required in individual Specification Sections. Provide all sampling equipment and deliver all specimens and Samples.

4. Promptly notify the Owner and the Engineer of irregularities or deficiencies in the Work which are observed during performance of services.

5. Promptly submit 2 copies of reports of inspections and tests to the Owner, and one copy to the Engineer including:

   a. Date issued

   b. Project title and number

   c. Testing laboratory or agency name and address

   d. Name and signature of inspector

   e. Date of inspection or sampling

   f. Record of temperature and weather

   g. Date of test

   h. Identification of product and Specification Section

   i. Location of Project

   j. Type of inspection or test

   k. Results of tests and observations regarding compliance with Contract Documents

B. Perform additional tests and services as required to assure compliance with the Contract Documents.

C. Obtain Owner's approval of testing laboratory before performing testing services.

D. Coordinate with testing laboratory.

E. Pay charges associated with testing.

3.2 GEOTECHNICAL TESTING

A. Provide field testing and laboratory services for geotechnical soil testing required in Section 02320.

3.3 CONCRETE TESTING

A. Provide qualified independent field and laboratory testing service to perform the concrete testing required in Division 3 of the specifications.

B. The concrete testing laboratory shall have been inspected by the CCRL within the past five years.

C. The testing laboratory shall be licensed by the Commonwealth of Massachusetts.

D. Field testing technicians shall have a Grade 1 concrete field technician license as issued by the American Concrete Institute (ACI).

3.4 MASONRY TESTING

A. Provide qualified independent field and laboratory testing service to perform the masonry testing required in Division 4 of the specifications.

B. The testing laboratory shall be licensed by the Commonwealth of Massachusetts.

C. Field testing technicians shall have a Structural Masonry Special Inspectors Certificate (SMSI) as issued by the International Code Council (ICC).

3.5 COATING INSPECTIONS

A. The Owner will provide independent coating inspection services to inspect work described in Division 9 of the specifications.

3.6 COORDINATION WITH TESTING LABORATORY

A. Provide testing laboratory personnel access to site and manufacturer's operations.

B. Provide laboratory with representative samples of materials to be tested in required quantities.

C. Furnish labor and facilities:

1. To provide access to Work to be tested.

2. To facilitate inspections and tests.

3. For laboratory's exclusive use for storage and curing of test samples.

4. to provide forms for preparing concrete test beams and cylinders.

D. Notify laboratory sufficiently in advance of operations to allow for assignment of personnel and scheduling of tests.

E. Arrange with laboratory and pay for additional inspections, samples, and tests required for Contractor's convenience.

END OF SECTION

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SECTION 01510

TEMPORARY UTILITIES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Temporary electricity

2. Temporary water service

3. Temporary fuel oil

1.2 QUALITY ASSURANCE

A. Maintain temporary utilities in proper and safe condition throughout the progress of the Work.

1.3 TEMPORARY ELECTRICITY

A. Provide temporary electrical service capable or portable power supply capable of providing sufficient power throughout the site for both temporary power and temporary lighting for the Work and for all field offices. Temporary electrical service shall include all wiring, breakers, breaker boxes, poles, supports and all other materials necessary for a totally operable system.

B. Pay all charges for temporary electricity.

C. Make all arrangements with the electric service company including all permits, securities and inspections fees to obtain the separately metered temporary services.

D. Furnish and connect the temporary electric service point to the utility and coordinate metering as required.

E. All connection points and distribution systems shall be in conformance with applicable electrical codes, OSHA, and enforcement agencies having jurisdiction.

F. Provide a general power distribution system including all wires, cables, supports, protective devices, transformers, motor starters, etc., as required for a complete electrically protected and safe system to handle construction services.

G. Provide all outlets with circuit breaker protection and comply with ground fault protection requirements of the NEC.

H. Provide a portable power supply capable of providing sufficient power at the site for both temporary power and lighting throughout the project. Due to the potential risks of contamination from fuel spills, the use of all fuel-driven generator sets must be strictly controlled and monitored while on site.

I. Refueling must be accomplished off-site when feasible and if fuel is transported to the site, it must be in approved containers with secondary containment. All gasoline driven pumps or diesel generators shall be underlain by sheets of polyethylene plastic and on-site refueling shall be accomplished by pumping or siphoning. Absorbent pads

shall be available for immediate use in the event of an accidental spill. The Contractor shall be responsible for complete cleanup of any accidental spills.

J. Maintain and service the portable power unit(s) throughout the duration of the project.

K. Provide a general power distribution system including all wires, cables, supports, protective devices, transformers, motor starters, etc., as required for a complete electrically protected and safe system to handle required construction services.

1.4 TEMPORARY WATER SERVICE

A. Temporary Drinking Water

1. Provide adequate potable drinking water, so piped or transported as to keep it safe and fresh, and served from single service containers or satisfactory types of sanitary drinking stands or fountains.

2. Provide all such facilities and services in strict accordance with existing and governing health regulations.

B. Water for Construction Purposes

1. The Contractor shall provide water for construction and testing purposes.

2. Water from the pond or brook may not be used for mixing grout.

1.5 TEMPORARY FUEL OIL

A. Properly contain, label, and store all petroleum products off the ground with suitable secondary containment.

B. Take all necessary precautions to avoid leakage and spillage of all petroleum products, including lubricating oils.

C. In general, perform fueling and refueling of all equipment and vehicles off-site. In the event that on-site refueling is necessary and as approved by the Engineer, provide suitable secondary containment facilities to contain all potential spillage, including that resulting from over-filling.

D. Inspect vehicles for leaks prior to entrance to the Work site. Vehicles with leaks are prohibited from entering the Work site. All vehicles, while on the work site, shall be underlain with polyethylene plastic sheets. Absorbent pads must be available on site for immediate use if needed.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

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SECTION 01520

CONSTRUCTION FACILITIES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Field office

2. Temporary sanitary and first-aid facilities

1.2 QUALITY ASSURANCE

A. Maintain temporary construction facilities in proper and safe condition throughout the progress of the Work.

1.3 FIELD OFFICE

A. Provide and maintain for the duration of the Work at a location approved by the Owner and the Engineer, a separate field office trailer or equivalent, for the exclusive use of the Resident Project Representatives. The plans and construction of the office shall be approved by the Engineer and shall be not less than 150 square feet not including bathroom.

B. Trailer shall be equipped with two exterior doors with screens, and at least 3 screened and lockable windows. The trailer shall be weather tight and insulated in the walls, floor and ceiling. Electrical service shall be provided to the trailer. Doors shall be equipped with cylinder locks and two keys shall be supplied for the Engineer's use.

C. Each office shall be equipped with the following:

1. 2, flat top, 30″ x 60″ desks with a minimum of 3 drawers each

2. 3, standard desk arm chairs on rollers

3. 1, table at least 3 feet wide x 6 feet long with sufficient chairs to seat 6

4. 1, 4′ x 6′ whiteboard and markers

5. Overhead lighting (75 foot candles minimum)

6. 2 interior door mats

7. CO_2 fire extinguisher

8. waste basket, broom, and dustpan

9. A supply of drinking water with one automatic cooler

10. Bathroom with toilet and sink

D. Thermostatically controlled heating units or central system of adequate capacity to maintain 70°F under all cold weather conditions. Thermostatically controlled refrigerant type air conditioners of adequate capacity to maintain a maximum temperature of not more than 68°F under all hot weather conditions.

E. Provide sufficiently regular restroom holding tank pumping.

F. Remove all field offices and temporary facilities from the site after the completion of the Work. The premises shall be restored to a condition equivalent to that which existed prior to installation of the facilities, as determined by the Engineer.A field office is not required

1.4 TEMPORARY SANITARY AND FIRST AID FACILITIES

A. Provide suitably enclosed chemical or self-contained toilets for the use of the labor force employed on the Work. Toilets shall be located near the Work sites and secluded from observation insofar as possible. Toilets shall be serviced weekly, kept clean and supplied throughout the course of the Work.

B. Contractor shall enforce proper use of sanitary facilities.

C. Use of the Owner's sanitary facilities by the Contractor is prohibited.

D. Provide a first aid station at the site.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

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SECTION 01550

TRAFFIC REGULATION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Traffic requirements

2. Traffic officers

1.2 PAYMENT PROCEDURES

1. Refer to Section 01270, Measurement and Payment procedures relating to payment for the Work.

2. Traffic officers are not required for this project. If the Contractor elects to use traffic officers for the Contractor's convenience (i.e., entering/exiting the site, delivery of equipment or materials, etc.), then the Contractor shall schedule, document, and pay for traffic officers throughout the Work.

1.3 REFERENCES

A. Manual of Uniform Traffic Control Devices, U.S. Department of Transportation

1.4 TRAFFIC REQUIREMENTS

A. Adhere to all applicable Ashby Town ordinances that relate to traffic control. Coordinate and meet with Town and Owner authorities to review applicable state park emergency access and route requirements for periods when the Hosmer Road bridge is closed to traffic.

B. Coordinate with the Town, Owner, and MassDOT to implement Hosmer Road closures and determine locations for detour and park road closure signage should be established on Route 31 (Fitchburg State Road) on the south side of Hosmer Road and on Route 119 (Townsend Road) on the north side of Hosmer Road.

C. Arrange construction activity so that all streets except the portion of Hosmer Road in the park shall remain open to at least one-way traffic during periods of actual work, and to unimpeded, two-way traffic during all other periods.

D. Provide a detour plan to Engineer for approval showing traffic control signs, barrels, cones, including detour signs, meeting the approval of Engineer, Owner and local Police Departments in accordance with the Manual of Uniform Traffic Control Devices.

E. Determine the location of each day's work and implement the approved traffic control plan.

F. Hand deliver written notice to individual houses affected by driveway and side road closings or detours a minimum 24 hours in advance. A recommended parking area outside the work limits shall be included in the notice.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

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SECTION 01560

TEMPORARY BARRIERS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Temporary Fencing System

B. Related Requirements

1. Section 01720, Field Engineering

1.2 SUBMITTALS

A. Informational Submittals

1. Submit information regarding the proposed temporary fencing system, including material of construction, plan layout, spacing of components, and anchorage.

1.3 TEMPORARY FENCING SYSTEM

A. Provide temporary fencing system around the limits of active construction throughout the duration of the work. Fencing system shall be installed such that the fence system cannot be moved by hand.

B. The Contractor will retain ownership of the temporary fencing system after the completion of the Work.

1.4 SITE SECURITY

A. Provide 6-foot high chain link temporary fencing system to prevent unauthorized access to hazardous construction areas. The location of the temporary fence is shown on the drawings.

B. Do not move the fence system under any circumstances until the construction activities are complete.

C. Remove the temporary fencing system after the completion of the Work.

PART 2 PRODUCTS

2.1 MATERIALS

A. Temporary fencing shall be orange, 48” high and manufactured from high density polyethylene with 4” x 1” mesh size.

B. Temporary fencing material shall meet the following requirements within +/- 5%:

1. Machine Direction Breaking Load: 1210 lbs/ft

2. Machine Direction Yield Strength: 1350 lbs/ft

3. Machine Direction Breaking Elongation: 33%

4. Machine Direction Yield Point Elongation: 13%

5. Tensile Breaking Load: 340 lbs/ft

6. Tensile Yield Strength: 440 lbs/ft

7. Tensile Breaking Elongation: 21%

8. Tensile Yield Point Elongation 8%

C. Site security fencing shall be a 6 foot high chain link fence supported by steel posts a minimum of 8 feet on center. Fence shall conform to the following requirements:

1. Posts, Rails, and Framework

a. All pipes shall be galvanized cold-formed steel conforming to ASTM Designation A120, Schedule 40 latest requirements, and galvanized in conformance with ASTM A123 latest requirements.

b. Member sizes for 6 foot fence are as follows:

	Nominal Size	O.D.	Weight/ Lin. Ft.
Terminal, corner posts	3 in.	2.875	5.79 lbs.
Line posts	2-1/2 in.	2.375	3.65 lbs.

2. Fence Fabric: The fabric shall be woven aluminum-coated steel chain link conforming to ASTM Designation A491 in its entirety. The fabric shall be 9 gauge, 2 inch square mesh.

PART 3 EXECUTION

3.1 FENCE INSTALLATION

A. Install fence according to manufacturer's instructions at locations specified in Paragraphs 1.3 and 1.4 above.

END OF SECTION

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SECTION 01570

TEMPORARY CONTROLS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

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

B. Related Requirements

1. Section 02922 - Hydroseeding and Mulching
2. Section 02402 – Control of Water

1.2 SUBMITTALS

A. Informational Submittals

1. Materials proposed for use in dust control
2. Compost wattles, haybales, mulch, and sediment trapping devices

PART 2 PRODUCTS

2.1 COMPOST WATTLES

A. Compost wattles shall consist of a biodegradable filter material encased in a 100% biodegradable casing. 'Photodegradable' mesh casings shall not be allowed.

2.2 HAYBALES

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

2.3 FILTER FABRIC SILT FENCING

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

2.4 SEDIMENT TRAPPING DEVICES

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

2.5 MULCH

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

PART 3 EXECUTION

3.1 DUST CONTROL

A. Control dust during the Work. Use a mechanical street sweeper daily.

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

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

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

3.2 DRAINAGE AND EROSION CONTROL

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

B. Provide and maintain sediment trapping systems.

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

3.3 HAYBALES

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

B. Perform work in accordance with Town Ashby Conservation Commission Order of Conditions.

3.4 COMPOST WATTLES

A. Place and maintain compost wattles as shown on the drawings or as required by permit.

B. Install compost wattles as shown on the drawings. Replace deteriorated wattles. Remove and dispose of the wattles following the successful growth of vegetation in the areas disturbed by the construction. Wattles shall not be removed until their removal is approved by the Engineer.

C. Perform work in accordance with Town Ashby Conservation Commission Order of Conditions.

3.5 RESTORATION

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

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

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

2. Installing jute netting.

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

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

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

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

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

G. Seed shall be as specified under Section 02920.

3.6 CLEANING

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

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

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

END OF SECTION

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SECTION 01571

CONTROL OF WATER

PART 1 GENERAL

1.1 SUMMARY

A. Section includes requirements for the control of surface water, including

1. Cofferdams

2. Surface Water Diversion

3. Flood Contingency Plan

B. Related Requirements

1. Section 01570 – Temporary Controls

2. Section 02315 – Excavation, Backfill, Compaction and Dewatering

1.2 SUBMITTALS

A. Informational Submittals

1. The following may be separate documents or combined into one plan and should be signed and stamped by a Professional Engineer registered in the state where the work is performed.

a. Water Control Plan, including description of approach, plans, location, materials, size, methods, phasing, calculations, and specifications for the control of water, removal of water from enclosed areas (unwatering), and removal of groundwater and leakage during construction (dewatering, covered by Section 02315).

b. Cofferdam and pump/siphon designs, including materials, locations, construction methods and details, design criteria, calculations demonstrating the adequacy of the system, and other items required for the construction of the systems.

c. Flood Contingency Plan, which shall:

1) Provide plans for monitoring for potential flooding conditions and responses to be undertaken if flooding is forecast or occurs.

2) Provide methods to be implemented for protection of the Work and preventing potential discharges of sediment to the impoundment or downstream resource areas during flooding conditions.

3) Ensure that structures, materials, and equipment will be anchored or restrained to prevent displacement or flotation or will be removed from the floodplain prior to a flood.

4) Identify the storm events that will adversely affect construction activities.

5) Identify the name, address and telephone number of the person(s) responsible for implementing this plan, and contact information for the Contractor's superintendent, project manager, local emergency services, and other parties that can be reachable 24/7 in the event of an emergency.

1.3 PROJECT CONDITIONS

A. Work Restrictions

1. All work on the bridge shall be performed under impoundment drawdown conditions unless approved by the Engineer.

2. All work performed on the bridge shall be performed under impoundment drawdown conditions or with the use of temporary cofferdams unless approved by the Engineer.

B. Bathymetric Data

1. A bathymetric survey was performed by WSP in January 2019 and is included in the drawings. The Contractor is responsible for verifying water depths and sediment thickness as part of planning and design.

C. Estimated Flood Characteristics

1. The following flood flow and elevation information has been obtained from hydrologic and hydraulic modeling performed by Tighe & Bond. It assumes no stoplogs on the spillway crest.

ESTIMATED FLOOD PERFORMANCE OF DAMON POND DAM

FLOOD EVENT	24-HOUR PRECIP DEPTH (INCHES)	INFLOW (CFS)	PEAK WATER SURFACE LEVEL (FT, NAVD88)
2-year flood	3.1	462	598.8
5-year flood	3.9	789	600.1
10-year flood	4.6	1,100	601.2
25-year flood	5.6	1,830	603.7
50-year flood	6.4	2,270	605.8
100-year flood	7.1	2,730	608.6

These flows were estimated using the U.S. Department of Agriculture's (USDA) Technical Release 55 (TR-55) method within the HydroCAD stormwater modeling program, which is based on the USDA Technical Release 20 (TR-20) software.

Note that the annual median flow estimated by USGS StreamStats is 5.6 CFS. The low-level outlet has an estimated capacity of 12 CFS when flowing full.

The low-level outlet will not have adequate capacity to maintain the pond fully drawn down during higher flow periods of the year.

D. Design Criteria

1. Provide a suitable temporary cofferdam sized adequately to control water during construction. Contractor shall be responsible for selection of the flood event/design elevation for design of the cofferdam and water control system.

2. No additional payment shall be made to the Contractor for any damages to the work caused by a flood event up to a 25-year flood; for off-site damages caused by the Contractor's activities during a flood event up to the 100-year flood (e.g., flooding that would not have occurred if the cofferdam were not in place); or if the cofferdam fails unexpectedly during its design flood or a lesser flood.

PART 2 PRODUCTS

2.1 TEMPORARY COFFERDAM SYSTEM

A. Provide an efficient temporary cofferdam system to allow safe execution of the work under this contract. Cofferdams constructed of uncontained fill material (e.g. earth, rock systems) will not be acceptable. Examples of acceptable systems are as follows:

1. A steel frame with membrane system such as the one produced by Portadam Inc., 107 Drivers Lane, Laurel Springs, NJ 08021, Tel. (609) 784-2208

2. 4′x4′ Supersacks constructed of polypropylene (filled with sand) and with lifting straps, provided an anchored waterproof membrane on the wet side of the system is included

3. Water filled cofferdam, such as the one produced by Water Structures Unlimited (Aquadam ®)

4. Sheeting, appropriately braced

B. The Contractor is solely responsible for the design and stability of cofferdams.

PART 3 EXECUTION

3.1 TEMPORARY COFFERDAM SYSTEM

A. Furnish, install, and remove a safe temporary cofferdam system.

B. Cofferdam locations will be approximately as shown on the Drawings, but may deviate based on actual needs at the site for construction with the Owner's approval. The Contractor shall obtain any permit revisions associated with deviation of the cofferdam location.

C. Installation of rip-rap for slope protection or erosion repair may be performed up to one foot below the water line without a cofferdam, provided no excavation, placement or compaction of soil materials is required, and provided that the area is surrounded by a functioning turbidity curtain.

D. The cofferdam shall be surrounded by a functioning turbidity curtain during placement and removal and at other times if necessary to prevent discharge of turbidity.

3.2 DEWATERING

A. The areas within the cofferdam shall be dewatered and maintained in a dry condition to the extent required to construct the work in accordance with all applicable provisions in other sections of the specifications.

3.3 RESERVOIR DRAWDOWN

A. The Contractor shall provide pumps, siphons, or other means to draw down the impoundment sufficient to conduct the work. The low-level outlet is available for the contractor's use but will not provide sufficient capacity to keep the reservoir drawn down during higher flow periods and storms.

3.4 DIVERSION

A. Maintain flow around the cofferdam in a manner that meets the following requirements:

1. Prevent impacts to upstream and downstream areas (eg, increased water levels or flow velocities) that may result from temporary flow constrictions as a result of cofferdams and diversions.

2. Provide temporary scour protection and erosion controls at diversion inlets, discharges, and along diversion channels so that diversions do not cause scour, erosion, sedimentation, or cause unacceptable levels of turbidity.

3. Inlets, channels, and outlets shall be monitored and maintained free of debris and obstructions.

3.5 MAINTENANCE

A. Continuously monitor the cofferdam for evidence of movement, deterioration, and excessive seepage throughout use. The cofferdam shall be maintained in good working order as necessary for the safety of workers and the protection of the permanent work.

B. Maintain water controls in good condition and inlets and discharges clear and free of debris.

3.6 FLOODING

A. Monitor weather and weather related events to anticipate if flood control activities are anticipated. If flooding is anticipated, suspend construction operations, remove equipment which could be damaged, and take actions to protect the work and prepare the area for flooding.

END OF SECTION

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SECTION 01582

PROJECT IDENTIFICATION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Project Identification Signs

B. Related Requirements

1. Section 01330, Submittal Procedures

2. Section 01550, Traffic Regulation

1.2 SUBMITTALS

A. Action Submittals

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

2. Layout of each sign.

1.3 QUALITY ASSURANCE

A. Employ the services of a professional painter who has successfully performed at least 5 emblems of similar size and character within the last 2 years to perform lettering and Owner's emblem.

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

1.4 MAINTENANCE

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

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Project Identification Sign

1. Do not erect or display advertising signs of any kind on site. At start of Work, furnish, erect, and maintain on site where directed by the Owner one sign, 4 ft. by 8 ft. in size, bearing the following information:

a. Name of Owner and emblem in color. Contact the DCR sign shop to obtain a precut vinyl DCR logo. 617-727-5742

b. Name of Project and Contract number

c. Name of the Project location town

d. Name of Contractor

e. Name and Address of Contractor

f. Contact telephone number

g. Name and Address of Consulting Engineer

h. Name and title of the Massachusetts Governor, Lieutenant Governor, Executive Office of Energy and Environmental Affairs Secretary, and Department of Conservation and Recreation Commissioner

i. The text "on behalf of The Citizens of the Commonwealth of Massachusetts"

B. Traffic Control Signs

1. Traffic control signs shall be as specified in Section 01550 and as indicated on the Drawings.

2.2 MATERIALS

A. Sign Materials

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

a. Sign substrate ¾" MDO plywood or 0.080" aluminum mounted on 4"x6" wood posts or 2"x12" metal U-channels. U-channels, must be galvanized or painted black. A two part post system with an 8' U-channel bolted to a 4' U-channel in the ground may be used. Use stainless steel hex head bolts to attach sign to posts. Install posts a minimum 4' below grade. Bottom of sign 4' above grade.

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

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

3. Wrought Hardware: Galvanized.

4. Paint:

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

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

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

PART 3 EXECUTION

3.1 PREPARATION

A. Project Identification Sign

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

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

a. Sign board color sage PMS 5655U. All text is black. Logo color is dark maroon PMS 504U. All type is Frutiger 55 Roman. Logo is Garamond.

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

3.2 ERECTION

A. Project Identification Sign

1. Erect Project signs at locations approved by the Owner in the vicinity of the Damon Pond Dam.

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

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

END OF SECTION

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SECTION 01600

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Products and Materials

2. Product Delivery Requirements

3. Packaging, Handling and Storage Requirements

4. Inspection of Offsite Work

1.2 QUALITY ASSURANCE

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

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

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

1.3 PRODUCTS AND MATERIALS

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

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

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

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

1.4 PRODUCT DELIVERY REQUIREMENTS

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

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

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

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

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

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

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

1.5 PACKAGING, HANDLING AND STORAGE REQUIREMENTS

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

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

C. Properly store and protect all equipment immediately upon its arrival. All equipment shall be stored in a clean, dry, heated, secured, and insured indoor facility satisfactory to the Engineer. Equip drive motors with thermostatically controlled strip heaters. Outdoor storage with plastic, canvas, plywood or other cover will not be allowed except where specific approval for designated items not containing electrical components or bearings is obtained from the Engineer. This approval does not relieve the Contractor of responsibility for proper protection of materials.

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

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

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

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

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

I. Handle, haul, and distribute all materials and all surplus materials on the different portions of the Work, as necessary or required. Provide suitable and adequate storage room for materials and equipment during the progress of the Work, and be responsible for the protection, loss of, or damage to materials and equipment furnished, until the final completion and acceptance of the Work.

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

K. All materials and equipment to be incorporated in the Work shall be placed so as to not damage any part of the Work or existing facilities and so that free access can be had at all times to all parts of the Work and to all public utility installations in the vicinity of the Work. Keep materials and equipment neatly piled and compactly stored in such locations as will cause a minimum of inconvenience to the Owner.

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

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

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

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

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

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

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

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SECTION 01630

PRODUCT SUBSTITUTION DURING CONSTRUCTION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Product substitution procedures

1.2 CONTRACTOR'S OPTIONS

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

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

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

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

1.3 SUBSTITUTIONS

A. If in the Engineer’s sole discretion a product proposed by the Contractor does not qualify as an “or-equal” item under the provisions of Article 7.04 of Section 00700, it can be considered a proposed substitute item. Submit information required under Article 7.05, Section 00700 for proposed substitutes.

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

C. Submit 5 copies of request for substitutions. Submit a separate request for each proposed substitution. In addition to the submittal requirements outlined in Article 7.05 of Section 00700, include the following in each substitution request:

1. For products or Suppliers:

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

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

c. Samples, if appropriate.

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

2. For construction methods (if specified):

a. Detailed description of proposed method.

b. Drawings illustrating method.

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

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

E. A request constitutes a representation that Contractor:

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

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

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

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

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

F. A proposed substitution will not be accepted if:

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

2. It will delay completion of the Work.

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

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

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

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

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SECTION 01720

FIELD ENGINEERING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Establishment of lines, benchmarks, and elevations required to layout and construct the Work

2. Property line survey and delineation

1.2 SUBMITTALS

A. Informational Submittals

1. Submit the qualifications of the Registered Professional Engineer and/or Registered Land surveyor to be hired to perform various portions of the Work, as applicable.

2. Submit documentation verifying the accuracy of field engineering work.

3. Submit 4 copies of final record drawings of field engineering layouts

4. Submit certificate signed by registered (licensed) engineer or surveyor certifying that elevations and locations of Work are in conformance with Contract Documents. Explain deviations.

1.3 RECORDS

A. Maintain a complete, accurate log of control and survey work as it progresses.

1.4 QUALITY ASSURANCE

A. Employ a qualified engineer, registered with the Commonwealth of Massachusetts as a Professional Engineer or a competent surveyor, registered with the Commonwealth of Massachusetts as a Land Surveyor, as required for the particular characteristics of the work being performed.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 PROCEDURES

A. The Registered Professional Engineer or Land Surveyor provided shall establish and maintain lines, elevations and reference marks needed during the progress of the Work and shall re-establish stakes and marks placed by the Engineer that are lost or destroyed through the course of the Work. Verify such work by instrument or other appropriate means.

B. The Engineer shall be permitted at all times to check the lines, elevations and reference marks, set by the Contractor, who shall correct any errors disclosed by such check. Such a check shall not be construed to be an approval of the Contractor's work and

shall not relieve or diminish the responsibility of the Contractor for the accurate and satisfactory construction and completion of the entire Work.

C. Make, check, and be responsible for measurements and dimensions necessary for the proper construction of and the prevention of misfittings in the Work.

D. Furnish all protective stakes and temporary structures for marking and maintaining points and lines for the building of the Work, and give the Engineer such facilities and materials for verifying said lines and points as he may require.

E. Revisions to the layout and elevations of the Work as defined by the Contract Documents shall be approved by the Engineer.

F. Maintain and prepare final record drawings of field engineering layouts and as-built survey conducted after completion of the Work.

G. Submit the pre-construction letter of certification as outlined in Part 1 above.

H. Set grade stakes on a 50 foot grid over the entire project area. This survey work shall be completed prior to beginning any construction.

I. Use the new survey information to make adjustments, if necessary, to the final grading plan for the landfill. Changes to the final grading plan based on revised survey information shall be reviewed and approved by the Engineer.

J. Furnish and set control staking. Rough stakes may be used to denote top and bottom of slopes, edge of refuse, centerline of ditches, etc.

END OF SECTION

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SECTION 01750

PRESERVATION AND RESTORATION OF PROJECT FEATURES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

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

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

1.2 DEFINITIONS

A. Underground Structures

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

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

B. Surface Structures

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

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 REPAIR/RESTORATION

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

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

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

D. Underground and Surface Structures

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

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

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

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

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

6. When any survey monument or property marker, whether of stone, concrete, wood or metal, is in the line of any trench or other demolition or construction work and may have to be removed, notify the Engineer in advance of removal. Under no circumstances shall any monument or marker be removed or disturbed by the Contractor or by any of his Subcontractors, employees or agents, without the permission of the Engineer. Monuments or markers removed or disturbed shall be reset by a land surveyor licensed in the State where the Work is located at the Contractor's expense. Should any monuments or markers be destroyed through accident, neglect or as a result of the Work under this Contract, the Contractor shall, at his own expense, employ a land surveyor licensed in the State where the Work is located to re-establish the monument or marker.

3.2 PROTECTION

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

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

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

D. Underground and Surface Structures

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

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

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

END OF SECTION

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SECTION 01770A

CLOSEOUT PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

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

2. Final Cleaning

1.2 SUBMITTALS

A. Closeout Submittals

1. As-built drawings

2. Operation and maintenance manuals

3. Evidence of payment and release of liens

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

1.3 SUBSTANTIAL COMPLETION

A. Refer to Article 15.03 in 00700, General Conditions, for procedures relating to obtaining Substantial Completion. Refer to 00520, Agreement, for Contract Times.

1.4 PROJECT CLOSEOUT DOCUMENTS

A. As-Built Drawings - Submit as-built drawings for review, approval, or comment. The as-built drawings shall show the completed work, including all deviations from the original Drawings. As-built drawings shall depict the location of all piping and valves installed under this Contract, as well as field changes. Take swing ties to all underground work from a minimum of two horizontal locations. Vertical dimensions to all below grade work shall also be obtained. All fittings, bends, valves and other appurtenances shall be shown. At a minimum, the following information shall be shown on the as-built drawings.

1. Ground survey prepared by Professional Surveyor

2. Ties to all buried fittings (including tees, crosses, bends, reducers, wyes, offsets, adapters, sleeves, caps, plugs), valves, services and structures from two horizontal measurements to permanent surface reference points, and depth below permanent grade. Permanent surface reference points are manholes, catch basins, power poles, and above-grade structures.

3. Ties to all surface structures (including manholes, catch basins, vaults, valve boxes, hydrants, curb stops, cleanouts, wet wells, outlets, etc.) from two horizontal measurements to permanent surface reference points. Re-station surface structures if stationed on Drawings.

4. Ties to other utility crossings, abandoned pipelines, and sewer service stubs, from two horizontal measurements to permanent surface reference points include depth below permanent grade and spacing between crossing utilities.

5. Invert and rim elevation of all gravity pipelines and structures including manholes, catch basins, below-grade structures, wet wells, septic tanks and distribution boxes as appropriate.

6. Depth of ledge at changes in profile but not more than 25-foot intervals.

7. Changes to pipe size and materials.

B. Operation and Maintenance manuals - Provide four copies of operation and maintenance manuals for each type of equipment provided on the project. Manuals shall include as a minimum:

1. The Operations and Maintenance Manual Certification Form (copy attached at the end of this Section) which shall be attached to every copy of each Operations and Maintenance Manual submitted.

2. Detailed service, maintenance and operation instructions for each item supplied

3. Special maintenance requirements, along with special calibration and test procedures

4. Operating instructions

5. Preventative maintenance instructions

6. Corrective-maintenance instructions

7. Complete parts lists with stock numbers and name, address, and telephone number of the local supplier

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

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

E. As specified in Article 15.06.A of Section 00700, provide evidence that all Work, materials and equipment will pass to Owner free and clear of any Liens or other title defects upon final payment. Such evidence may take the form of receipts or releases from all Subcontractors and Suppliers and an affidavit from Contractor as to the completeness of the receipts and releases as described in Section 00700 Article 15.06.A.3.

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

1.5 FINAL PAYMENT

A. Refer to Article 15.05 and 15.06 in 00700, General Conditions, for procedures relating to final inspection and payment.

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

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

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

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 CLEANING

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

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

END OF SECTION

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O&M MANUAL CERTIFICATION FORM

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

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

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

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

SUBMITTED BY:_____ DATE:_____

GENERAL CONTRACTOR'S STAMP

SECTION 02075

GEOSYNTHETICS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes

1. Non-woven geotextiles
2. Temporary 100% degradable erosion control blankets
3. Cellular confinement system
4. Beach Access Matting

1.2 DEFINITIONS

A. For the purpose of this Contract, the term “geosynthetics” include “cellular confinement systems”.

B. For the purpose of this Contract, the term “cellular confinement system” and “geocell” are interchangeable.

1.3 REFERENCES

A. Data Sheet DS1 - Non-Woven Geotextiles

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

C. ASTM D1388 - Test Methods for Stiffness of Fabrics

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

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

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

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

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

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

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

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

L. ASTM D5321 – Standard Test Method for Determining the Shear Strength of Soil-Geosynthetic and Geosynthetic-Geosynthetic Interfaces by Direct Shear

M. GRI-GG1 - Geogrid Rib Tensile Strength

N. GRI-GC8 – Determination of the Allowable Flow Rate of a Drainage Geocomposite

1.4 SUBMITTALS

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

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

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

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

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

2. Anchoring details for channels and slopes.

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

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

E. Submit qualifications of Geocell Manufacturer's field representative certifying the field representative is experienced in the installation of the specified products.

1.5 QUALITY ASSURANCE

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

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

C. Geocell

1. The cellular confinement system material (including anchors) shall be provided from a single manufacturer for the entire project.

2. Prior to installation of any materials, conduct a pre-installation meeting to discuss the scope of work and review installation requirements. The pre-installation meeting shall be attended by all parties involved in the installation of the cellular confinement system.

3. Manufacturer shall provide a qualified field representative on site at the start of construction to ensure the geocell system is installed in accordance with the Contract. Manufacturer's field representative shall have a minimum of five years and five similar project installation experience with the specified products in the specified application.

1.6 DELIVERY, STORAGE AND PROTECTION

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

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

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

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Group 2 Non-Woven Geotextile

1. "4506" as manufactured by Amoco Fabrics and Fibers
2. "FX-60HS" as manufactured by Carthage Mills
3. "160N" as manufactured by Mirafi Inc.
4. Or equal

B. Temporary 100% Degradable Erosion Control Blankets

1. "LANDLOK ENC2" as manufactured by SI Geosolutions, Inc.,
2. "C125 BN" as manufactured by North American Green,
3. Or equal

C. Geocell (Cellular confinement system)

1. "GW30V6" as manufactured by Presto Geosystems
2. "EGA306P" as manufactured by GeoProducts, LLC
3. "CX30-6" as manufactured by Carthage Mills
4. Approved equal

D. Beach Access Matting

1. PathMat by AccessRec/Marine Rescue Products
2. Mobi-mat as manufactured by Deschamps
3. Approved equal

2.2 MATERIALS

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

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

C. Temporary, degradable erosion control blankets (ECBs) shall be composed of a core of 100% coconut fiber and two external confining meshes of non-degradable material. The minimum manufacturer's suggested design life of the ECB shall be 12 months.

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

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

E. Geocell

1. Density shall be 58.4 to 60.2 pounds/ft^3 in accordance with ASTM D 1505.

2. Environmental Stress Crack Resistance (ESCR) shall be 5,000 hours in accordance with ASTM D 1693.

3. Individual cells shall be uniform in shape and size when expanded.

4. Individual cell dimensions (nominal) shall be plus or minus 10%.

5. Approximate cell dimensions for slopes shall be:

a. Length shall be 11 inches.

b. Width shall be 12.5 inches.

c. Depth shall be 6 inches.

F. Beach Access Mats shall be portable removal matting that is ADA/MAAB compliant when unrolled. It shall be woven from woven UV resistant fibers and a minimum of 5 feet in width. Mats shall flex sufficiently to follow proposed alignment without bunching or have provisions for angled joints without causing noncompliant lip at overlap.

G. Anchors and tendons shall be consistent with the manufacturer's recommendations for the slopes to be stabilized.

PART 3 EXECUTION

3.1 EXAMINATION

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

3.2 INSTALLATION

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

B. Require the geocell manufacturer's representative to be present at the beginning of installation to assure proper installation of geocell.

1. Verify site conditions are as indicated on the drawings. Notify the Engineer if the site conditions are not as anticipated.

2. Install anchors as required by the Drawings.

3. Infill Placement

a. Place specified infill in expanded cells with suitable material handling equipment. Equipment shall not be driven over the geoweb prior to

infilling. Appropriate equipment shall be used to prevent crushing or any other damage during and after geoweb installation. Any damage to the geoweb shall be repaired or replaced as necessary at the Contractor's cost.

b. Limit drop height to a maximum of 3 feet (1 meter) to avoid damage or displacement of the cell walls.

c. Infill material shall not be frozen when placed into the geoweb sections.

d. Evenly spread infill and tamp into place

4. Hydroseed areas to be revegetated as applicable and shown on the drawings.

3.3 QUALITY CONTROL

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

END OF SECTION

(DATA SHEETS FOLLOW)

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Data Sheet DS1 - Non-Woven Geotextile Mechanical Properties					
Property	**Test Method**	**Units**	**Testing Frequency**	**Value**	
				Group 2	
Mass per Unit Area	**ASTM D5261**	**oz/yd^2**	**1/150,000 ft^2**	**6**	
AOS	**ASTM D4751**	**US Sieve**	**1/150,000 ft^2**	**70**	
Permitivity	**ASTM D4491**	**gal/min/ft^2**	**1/150,000 ft^2**	**90**	
Puncture Strength	**ASTM D4833**	**lbs**	**1/150,000 ft^2**	**90**	
Mullen Burst Strength	**ASTM D3786**	**lbs/in^2**	**1/150,000 ft^2**	**350**	
Trapezoidal Tear Strength	**ASTM D4533**	**lbs**	**1/150,000 ft^2**	**65**	
Grab Tensile/Elongation	**ASTM D4632**	**lbs(%)**	**1/150,000 ft^2**	**150 (50)**	

DIVISION 2 - SITE CONSTRUCTION

SECTION 02200

PART 1 GENERAL

1.1 SUMMARY

A. Section includes

1. Clearing and grubbing

2. Grading

3. Stripping and stockpiling of soil and sod

1.2 SUBMITTALS

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

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 CLEARING AND GRUBBING

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

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

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

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

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

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

3.2 DISPOSAL OF MATERIALS

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

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

3.3 GRADING

A. In preparation for placing loam, paved drives and appurtenances, perform grading to the lines, grades and elevations shown on the Drawings, and otherwise directed by the Engineer and perform in such a manner that the requirements for formation of embankments can be followed. All material encountered, regardless of its nature, within the limits indicated, shall be removed and disposed of as directed. During the process of grading, maintain the subgrade in such condition that it will be well drained at all times. Install temporary drains and drainage ditches to intercept or divert surface water that may affect the work when necessary.

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

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

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

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

3.4 DUTCH ELM WOOD

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

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

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

END OF SECTION

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SECTION 02225

Selective Demolition

PART 1 GENERAL

1.1 SUMMARY

A. Selective demolition of:

1. Pilaster mortar caps to be removed without damaging stone pilasters, existing stone pilasters to remain, see Photos 1, 2 & 3 on S-501 for pictorial example of selective demolition limits of pilaster mortar cap work. Note all pilaster mortar caps are to be removed, see

2. Isolated railing units between pilasters exhibiting locations of 100% section loss to be removed, adjacent existing railings and stone pilasters to remain, see Photo 4 on S-501 for example railing to be replaced.

B. Refer to Drawings for selective demolition scope and limits.

C. Removal and lawful disposal of miscellaneous debris and solid waste located within the Limit of Work.

1.2 RELATED SECTIONS

A. Section 01350 – Health & Safety Plan

B. Section 13286 – Management of Assumed PCB Bulk Product Waste

1.3 DEFINITIONS

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

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

C. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.

D. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.

E. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

F. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

1.4 SUBMITTALS

A. Quality Control Submittals prior to commencement of on-site demolition:

1. Methods of materials identified to be removed, included but not limited to mortar caps and railings, and equipment proposed for selective demolition.

This submittal should be sufficient to demonstrate a thorough understanding of the Work to be completed and the means that will be implemented to safely complete the Work within the Contract Time without damage to surrounding structures or resources. The Engineer will review the submittal for completeness, but will not "Approve" the means and methods.

2. Waste Management Plan to indicate the types of wastes to be generated and the proposed disposal or recycling locations.

3. Demolition Materials Containment Plan to indicate how selective demolition debris and waste will be contained and prevented from falling into water or to the ground below.

4. Copies of any authorizations and permits required to perform the work, including disposal/recycling facility permits and building permits.

B. Lead Management Plan- Submit written procedures for the methods to be employed for lead paint impact work including methods to remove painted components scheduled for demolition. If work has potential to create an airborne lead hazard, then provide information pertaining to dust control to a level of no emissions, surface preparation, containment construction (if necessary), ventilation, interface of trades, sequencing of lead related work, respirator usage, protective equipment, etc. as required in OSHA 29 CFR 1926.62 Lead in Construction. Shop drawings shall also be provided to show the containment/ventilation setup, decontamination area and other pertinent information. This plan may include the use of HEPA attachments with various dust generating power tools intended for use.

C. Keep and maintain the following records and disposal documentation throughout the project in chronological order in a 3-ring notebook with appropriate tabbed dividers as follows:

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

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

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

4. Copies of all recycling/disposal receipts

D. Pre-demolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by demolition operations. Comply with Section 01320 "Construction Photographs." Submit before Work begins.

1.5 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.6 REGULATORY REQUIREMENTS

A. Contractor is solely responsible for obtaining permits or approvals which may be required to perform the work of this section, including all costs, fees and taxes required or levied.

B. Notify and obtain such permits or approvals from all agencies having jurisdiction over the Work, but not limited to Health, Building, and Fire Departments of the municipality and local, state and federal agencies.

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

D. Conform to procedures identified in Section 01350 – Health and Safety Plan related to site hazards associated with the project with particular attention towards maintaining compliance with OSHA 1926.62 Lead in Construction regulations when impacting and creating lead dust during impact of any painted surface or component throughout the building.

E. Prepare and submit to MassDEP Form BWP-AQ06 (renovation/demolition notification) for all selective demolition activities and pay associated fees. Form shall be submitted at least 10 days prior to the start of Work. Refer to the following link for additional details:

http://www.mass.gov/eea/agencies/massdep/service/approvals/bwp-aq-06.html

1.7 PRE INSTALLATION MEETINGS

A. Pre-demolition Conference: Conduct conference at Project Site.

1. Inspect and discuss condition of construction to be selectively demolished.

2. Review structural load limitations of existing structure.

3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.

4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.

5. Review areas where existing construction is to remain and requires protection.

1.8 JOB CONDITIONS – SELECTIVE DEMOLITION

A. Painted railing poles scheduled for selective demolition were assumed to contain hazardous constituents of lead and other heavy metals. The painted rails were also assumed to contain PCBs greater than 50 parts per million (ppm), Refer to specification Section 13286 for details regarding paint management of the railing poles.

B. Conduct selective demolition work in a manner that will minimize need for disruption of owner's normal operations. Provide minimum of two (2) weeks advance notice to owner of demolition activities which will impact owner's normal operations.

C. The Owner assumes no responsibility for actual condition of items or structures to be demolished. However, variations within the structure may occur by Owner's removal and salvage operations prior to start of selective demolition work.

D. Provide temporary barricades and other forms of protection as required to protect Owner's personnel and general public from injury due to selective demolition work.

1. Provide protective measures as required to provide free and safe passage of Owner's personnel and general public to and from occupied portions of the facility.

2. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of structure of element to be demolished, and adjacent facilities or work to remain.

3. Protect from damage existing finish work that is to remain in place which will become exposed during demolition operations.

4. Protect floors with suitable coverings when necessary.

5. Remove protections at completion of work.

E. Promptly repair damages caused to adjacent facilities by demolition work at no additional cost to the Owner.

F. Conduct selective demolition operations and debris removal in a manner to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.

G. Do not close, block or otherwise obstruct roadways, walks or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

H. Maintain existing utilities, keep in service, and protect against damage during demolition operations.

I. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.

1.9 FIELD CONDITIONS

A. Conduct selective demolition so Owner’s operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Hazardous constituents of lead and other heavy metals are assumed to be present in areas to be impacted by the project.

1. Contractor shall manage painted railing poles to be removed as if they contain lead paint unless the contractor tests the paint and determines that no lead is present.

2. Contractor shall manage painted railing poles as assumed PCB-containing building components. Contractor shall not sample paint for PCB content. Refer

to Section 13286 for details regarding management of assumed PCB components.

3. If suspected hazardous materials are encountered during construction, do not disturb; immediately notify Engineer and Owner.

PART 2 PRODUCTS

2.1 GENERAL

A. HEPA-Filtered Exhausts – Air inside the work area, if applicable, shall be exhausted through a High Efficiency Particulate Air (HEPA) filter.

B. Commercially manufactured HEPA-filtered exhaust units, with specification plates intact, must be provided for each work area to attain, at a minimum, four air volume changes per hour and an inward flow of clean air into each work area y of at least 100 feet per minute. The HEPA filter shall be preceded by replaceable pre-filters and the unit must be designed so that it cannot be operated unless all filters are in place. The purpose of the containment system is to capture fugitive particulate while performing selective demolition.

C. Warning Signs and Labels - Work areas shall be properly demarcated in accordance with OSHA requirements. The contractor's specific containment approaches may also include the following products:

1. Plastic Sheeting ("Poly") - shall be polyethylene or equivalent with two layers with a thickness of at least 6 mil for all applications.

D. Tape and Glue – Shall be capable of sealing plastic joints and attaching plastic to finished surfaces. The bonding strength and resulting seal integrity shall not be affected by mist or water, wetting or encapsulating agent, or any other materials to be used in the work area

B. All materials or equipment delivered to the site shall be unloaded, temporarily stored, and transferred to the work area in a manner that shall not interfere with operation of others at the facility, or employee's access and safety.

C. Damaged or deteriorated materials shall not be used and shall be promptly removed from the premises.

D. Waste Containers and Transportation shall be suitable for loading, temporary storage, transport, and unloading of contaminated waste without risk of ripping, rupture, or exposure to persons, or emissions to the atmosphere.

2.2 SAFETY SUPPLIES AND EQUIPMENT

A. Contractor shall comply with Section 01350 and is fully responsible for the implementation and monitoring of all health and safety measures.

B. Respirator Types: As applicable, provide workers with a full or half facepiece respirator that is approved by NIOSH/MSHA for protection against airborne dust and other hazards that may be present, and meets the requirements of the OSHA standard.

C. Protective Clothing: As applicable, provide workers and approved visitors with disposable coveralls, head and foot coverings, gloves and eye protection (i.e. safety glasses) and half-face respiratory protection including HEPA cartridges.

PART 3 EXECUTION

3.1 INSPECTION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations. Perform lock-out/tag-out procedures as necessary.

B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.

1. Unknown Site Conditions - The information provided on the Drawings and in the Specifications is believed accurate. Field verify all information. Bear full responsibility for obtaining all locations of underground structures, utilities and their connections. Maintain services to buildings outside the limits of work, at no additional cost to the Owner.

2. Investigate to assure the condition of the work to be demolished and take all precautions necessary to ensure safety of people and property.

C. Retain a professional engineer to perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.

1. Perform engineering surveys as the Work progresses to detect hazards resulting from selective demolition activities.

D. Verify that hazardous materials have been remediated before proceeding with selected demolition operations.

E. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs or video.

1. Comply with requirements specified in Section 01320 "Construction Photographs."

2. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.

3.2 SITE PREPARATION

A. Remove and/or stabilize all potential hazards, prior to commencing work. Where hazards cannot be stabilized, mark and control areas around hazards to prohibit access near the hazards. Similarly, all holes shall either be covered or clearly marked to prohibit entry. If necessary, floor coverings shall be capable of supporting heavy equipment use. Likewise, all leading edges of work surfaces shall be marked and temporary guardrails constructed if and where required.

3.3 PAINTED COMPONENTS AND DUST GENERATING OPERATIONS

A. Contractors Responsibilities: Lead based paint has been assumed present on the painted railing poles. The railing poles have also been assumed to contain PCB concentrations greater than 50 ppm. Refer to Section 13286 for details regarding management of assumed PCB components.

B. Any Contractor whose activities may generate leaded dust or impact a leaded surface shall be responsible for regulating their work area in accordance with OSHA 29 CFR 1926.62 Lead in Construction Regulations so that dust migration is contained properly within a regulated area. Once the dust generating work is complete, the same Contractor shall be responsible for the proper clean-up and disposal of painted component dusts and painted materials as defined in OSHA 29 CFR 1926.62.

C. It is expected that most selective demolition of the railings will be done with small hand tools and power tools and impact to painted surfaces will be minimal as complete removal of painted components is likely.

D. If selective demolition activities cause painted dust to become airborne, compliance to OSHA 1926.62 is required including construction of a Regulated Area, respiratory protection, use of protective personal equipment and the use of dust generating power tool devices with HEPA filtration attachments (in areas where dust control containments are not constructed) to capture airborne particulate so as to reduce worker exposure to lead.

E. A Regulated Area for painted component impact work shall be established using warning signs and caution tape. Once work commences, access to the work area shall be limited to Contractor and Owner authorized personnel. Workers shall be trained in the recognition of lead paint hazards and cleanup methods as identified in OSHA 29 CFR 1926.62.

F. Conduct personnel exposure monitoring to determine compliance with Federal and State regulations. All air samples collected by the Contractor shall be analyzed by a laboratory accredited by the American Industrial Hygiene Association. Sampling equipment shall be calibrated before and after each use. At a minimum, baseline personnel monitoring shall include at least 25% of workers at each different job operation or as required by OSHA regulations.

G. Results - Provide the Owner and the Engineer copies of all personnel exposure monitoring results and post them at the work site, immediately after obtaining the results, but not later than 48 hours after monitoring the results.

3.4 PROTECTION

A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent resources, structures and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.

2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to the structure and adjacent areas.

3. Cover and protect surrounding component of structure that are to remain or that are exposed during selective demolition operations.

B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or

collapse of structures and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being selectively demolished.

1. Strengthen or add new supports when required during progress of selective demolition.

2. Cease operations and notify the Owner and the Engineer immediately if safety of structure appears to be endangered. Take precautions to support structure until determination is made for continuing operations.

3. Remove temporary barricades and protections where hazards no longer exist.

3.5 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.

2. Neatly cut members to be removed plumb, square, and true to dimensions required and flush with existing surfaces to remain. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover and vertical openings to remain.

3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.

4. As necessary, erect and maintain dust-proof partitions and closures as required to prevent spread of dust, fumes or debris to surrounding areas outside limits of work and adjacent portions of the structure.

5. Keep outdoors work sprinkled with water to minimize dust. Provide hoses, water connections and the water required and means of transporting for this purpose.

6. Provide temporary weather protection during selective demolition and construction activities until such time that the new components are constructed.

7. If unanticipated mechanical, electrical or structural elements which conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit report to Engineer in written, accurate detail. Pending receipt of directive from Engineer, rearrange selective demolition schedule as necessary to continue overall job progress.

8. Perform selective demolition work in a systematic manner. Provide scaffolding as necessary. Use such methods as required to complete work indicated on Drawings in accordance with demolition schedule and governing regulations.

9. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and

contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.

10. Contact local fire department with respect to flame -cutting operations and maintain fire watch as directed by the local fire department.

11. Maintain adequate ventilation when using cutting torches.

12. Repair selective demolition performed in excess of that required. Return structures and surfaces to remain to condition existing prior to commencement of selective demolition work.

13. Dispose of demolished items and materials promptly.

B. Removed and Salvaged Items:

1. Clean salvaged items.

2. Pack or crate items after cleaning. Identify contents of containers.

3. Store items in a secure area until delivery to Owner.

4. Transport items to Owner's storage area designated by Owner.

5. Protect items from damage during transport and storage.

C. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.

2. Pack or crate items after cleaning and repairing. Identify contents of containers.

3. Protect items from damage during transport and storage.

4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

D. Existing Items to Remain: Protect construction indicated to remain against damage during selective demolition. When permitted by Engineer, items may be removed to suitable, protected storage location during selective demolition and reinstalled in their original locations after selective demolition operations are complete.

3.6 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch (19 mm) at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.

B. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, and then remove concrete between saw cuts.

C. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.

D. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.

3.7 DISPOSAL OF DEMOLISHED MATERIAL

A. General

1. Contractor shall perform any necessary analytical testing to support facility acceptance of the wastes.

2. Remove demolition waste materials from Project site and legally manage off-site in accordance with the contractor's submitted Waste Management Plan.

3. Comply with Section 02226 - Construction Waste Management

4. Do not allow demolished materials to accumulate on-site.

5. Burning of demolition waste is not permitted.

6. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

7. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

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

C. Toxicity Characteristic Leaching Procedure (TCLP) Sample Results: Composite TCLP lead samples have not been collected from various painted building materials presumed to be representative of the intended construction / demolition waste stream generated during the renovation.

D. It is anticipated that the painted railing poles will be recycled. If recycled, these materials would be exempt from the RCRA disposal requirements and management at a facility that can accept scrap metal coated with material(s) containing assumed heavy metals constituents and assumed PCBs would be appropriate. The receiving facility should be notified of the presence of assumed metals and PCBs in the paint/coating as standard hazard communication.

3.8 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION

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SECTION 02250

PRESSURE GROUTING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Grouting of the embankment soil behind upstream right stone masonry wall and right training wall to reduce seepage.

1.2 DEFINITIONS

A. **Admixture:** Substance added to the grout to control bleed and/or shrinkage, improve flowability, reduce water content, or retard setting time.

B. **Maximum Target Pressure in the Soil**: 0.5 pound per square inch (psi) per foot of depth below the ground surface.

C. **Obstruction:** An obstruction shall be defined herein as steel, timber or other material that prevents the advancement of the drill string. Concrete, masonry stone, and other similar materials used to construct the dam shall not be considered obstructions. The Contractor shall make every effort to penetrate all materials encountered by drilling or other methods acceptable to the Owner's Engineer.

D. **Stage Refusal Criterion:** Stage refusal is defined as a grout take of less than 0.5 gallons per minute (gpm) over a 5-minute period at maximum allowable pressure for each grouting stage.

E. **Reduction Ratio:** As applicable for spilt-spaced grouting, is the simple measure of average overall grout takes from a subsequent phase to the previous phase. Reduction Ratios greater than 75% indicate further grouting phases are necessary. Ratios less than 25% indicate grouting is complete except potentially for treating localized high take areas. The need for additional grouting shall be made by the Owner's Engineer.

F. **Spilt Spacing:** The procedure by which additional grout injection holes are generally located equidistant from previously grouted holes.

G. **Stage:** One complete operational cycle of drilling, cleaning, pressure washing (foundation bedrock only), water pressure testing (foundation bedrock only), pressure grouting, and grout cleanout within a zone. The depths of stages in any hole depend on conditions encountered in drilling that dictate where drilling should stop and the grouting should commence.

H. **Downstage Grouting:** The grouting of progressively deeper zones in stages. The hole is drilled for a single stage, which is then tested and grouted. After the grout in this stage has set, the hole is redrilled to the next stage and grouted. This process is repeated until the hole has reached its final depth.

I. **Upstage Grouting:** The hole is drilled to full depth and then grouted in stages starting at the bottom of the hole and working upward.

1.3 RELATED SECTIONS

A. Section 01450 – Quality Control

B. Section 01451 – Independent Testing Services

C.

1.4 REFERENCE STANDARDS

A. Latest version of American Society for Testing and Materials (ASTM) standards:

1. ASTM C33 Concrete Aggregate

2. ASTM C109 Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 inch or 50 mm Cube Specimens)

3. ASTM C143 Standard Test Method for Slump of Hydraulic Cement Concrete

4. ASTM C150 Compliance Standard for Portland Cement

5. ASTM C618 Fly Ash for Use as a Mineral Admixture in Portland Cement Concrete

6. ASTM C685 Standard Specification for Concrete Made by Volumetric Batching and Continuous Batching

7. ASTM C942 Standard Test Method for Compressive Strength of Grouts for Preplaced-Aggregate Concrete in the Laboratory

B. NSF International Standard / American National Standard – NSF/ANSI 61 -2016 – Drinking Water System Components – Health Effects

C. Latest version of American Association of State Highway and Transportation Officials (AASHTO) standards:

1. AASHTO M85 Portland Cement

D. Latest version of United States Army Corps of Engineers (USACE) manuals:

1. EM 1110-2-3506 Grouting Technology (March 31, 2017)

2. ER 1110-1-1807 – Drilling and Invasive Activities at Dams and Levees (June 2, 2023)

1.5 GROUTING CONTRACTOR QUALIFICATIONS

A. The Subcontractor performing the grouting work described in this Specification must have successfully completed at least three dam grouting projects of similar size and/or complexity within the last ten years. The Subcontractor shall furnish references from at least three similar dam projects completed within the last ten years.

B. The Subcontractor shall utilize a qualified engineer, to prepare submittals and to be present onsite for all drilling and grouting activities. The Subcontractor's Engineer shall be a licensed professional engineer with at least ten years of experience in the design and construction of dam grouting projects.

C. The Subcontractor shall assign a permanent Superintendent and driller(s) with the following minimum qualifications.

1. The Superintendent shall have at least five years of grouting experience with at least three dam grouting projects.

2. The drillers shall have at least three years of experience as a driller (not including time spent as a driller's helper) on at least two dam grouting projects.

D. The Subcontractor shall furnish resumes for their Engineer, Superintendent, and each driller proposed to perform work at the site.

1.6 SUBMITTALS

A. Submit the qualifications of the Subcontractor performing the drilling and grouting as outlined in Article 1.05 in accordance with Section 01300. Submit a list containing at least three similar projects completed within the last ten years. For each project, the Contractor shall include with this submittal, at a minimum:

1. Name of client contact, address, and email address and telephone number;

2. Location of project;

3. Contract value; and

4. Scheduled completion date and actual completion date for the project.

B. Submit the qualifications of the proposed independent testing laboratory to be used for grout testing. The submittal shall include the firm's name, address, as well as the contract information (phone and email addresses) of the lab's registered professional engineer and responsible officer.

C. Grouting Work Plan

1. Submit at least 14 days prior to mobilizing drilling and grouting equipment to the site, a grouting plan which includes the following:

a. A shop drawing showing the proposed grout hole layout/spacing/inclination, including the proposed sequence and schedule.

b. A description of drilling methods and equipment to be used, including drill hole diameters, casing size, and installation/withdrawal methodology.

c. A description of the approach to measure, maintain and modify drill hole verticality/inclination.

d. A Contingency plan to be utilized if drilling methods are observed to be causing distress to the dam or if an obstruction is encountered. Such plans shall include a list of the priorities of the modifications to the drilling methods which will serve to mitigate the impact of drilling on the dam. A description of the equipment to be maintained onsite during drilling to abandon a drill hole (i.e., packers, grout, additional casing, etc.) shall also be provided.

e. A description of the means and methods of controlling drilling and grouting by-products (including water, drill cuttings, and grout) within the Limit of Work to prevent environmental impacts to the impoundment, downstream channel, the air, and surrounding environment.

f. A description of the grouting methods and equipment to be used, including but not limited to, mixers, pumps, delivery lines, and other appurtenances.

g. Submit proposed grout mix designs for grouting including the proposed constituents, any admixtures/additives, proposed compressive strengths, specific gravity, Marsh Funnel values, and anticipated initial and final set times. This shall include at least two alternate/contingency grout mixes.

1.7 QUALITY ASSURANCE

A. The Work shall be performed under the observation of the Engineer. The observation of the work shall not relieve the Contractor of any obligations to fulfill the terms of the Contract as herein required, including, but not limited to the protection of the condition and integrity of the existing dam.

B. The Contractor shall assist the Owner's Engineer, with every reasonable facility and assistance, to allow the Owner's Engineer to keep their own records and ascertain whether or not the Work is performed in accordance with the requirements and intent of the plans and specifications. The Engineer reserves the right to review and comment on the sequence in which the Work shall be undertaken, suspended, or completed.

C. The Contractor shall correct all deficiencies and nonconformities identified by the Owner's Engineer at no additional cost to the Owner.

D. No discharge of wastewater (such as equipment wash water or other turbid or otherwise contaminated water generated by the grouting process) to the impoundment or downstream channel will be permitted.

E. The Contractor shall be responsible for retaining the services of an Independent Testing Laboratory in accordance with Section 01451 to provide routine quality control testing on grout used during the execution of the work. The cost of all such testing, including field testing, preparation of samples, transport, laboratory testing, and reporting shall be considered incidental to the Contractor's price bid for grouting, where applicable. No additional payment shall be made for testing or other routine quality control activities including the grout verification drilling and borehole geophysical work, all of which is considered incidental to the work.

F. All field testing and sample preparation shall be performed in the presence of the Engineer.

1. Unconfined Compression Test (UCS)

a. For every 100 cubic feet of grout pumped or at least once a day or when the mix design changes, one set of three 2-inch by 2-inch by 2-inch grout cube samples shall be obtained by the Contractor and tested at the Contractor's expense.

b. The Contractor shall test one grout sample for compressive strength at 7 days and one at 28 days following preparation. Test specimens and compressive strength testing shall be performed in accordance with ASTM C-109. Laboratory strength results shall meet the minimums specified in this Section.

G. Routine QA/QC Tests:

1. The Baroid Mud Balance shall be run to check specific gravity on at least one sample of each mixed used per day.

2. The Marsh funnel shall be run to check viscosity on at least one sample of each mixed used per day.

H. The Engineer may perform sampling/testing as a check/verification of the Contractor's or the independent testing agency's results.

1.8 FACILITIES TO BE FURNISHED BY THE CONTRACTOR

A. The Contractor shall provide all equipment, labor, and materials as required to perform the drilling and grouting work as shown on the Contract Drawings. The means of access proposed by the Contractor shall be such that they do not detrimentally affect the existing condition of the Dam and surrounding appurtenances.

B. The Contractor shall provide all material and take all steps necessary to protect the condition of the existing top of dam and concrete/masonry. Loading limits for public roads and bridges (used to reach the site) shall be adhered to. Equipment or materials shall be positioned so as to not detrimentally affect utilities, walls, and other structures adjacent to the dam.

C. The Contractor shall provide all equipment, labor, and materials as required to properly execute the drill holes, grouting, ad water testing to demonstrate compliance with the specifications provided herein. This shall include, but not be limited to, all casing, bits, and other drilling material, grout, pumps, hoses, anchors, couplings, and grout containment and recovery systems.

D. The Contractor shall provide all equipment, labor, and materials as required to properly protect the impoundment and downstream channel from all drilling and grouting spoils. The Contractor will be required to develop an appropriate methodology for spoil containment and off-site disposal.

E. The Contractor shall provide all equipment, labor, and materials as required for providing the safe conduct of the work in accordance with all OSHA requirements applicable for this work.

F. The cost of all these items shall be included in the unit bid prices, and no separate and/or additional payment will be made.

G. Employ a registered land surveyor that is experienced with this type of work. The surveyor shall establish lines and levels and be responsible for the correct location of the drilling and grout locations. The Contractor's surveyor shall also be responsible for confirming the locations of the internal features in the dam near the anchor installations prior to drilling and performing the as-builts for the grout locations.

PART 2 PRODUCTS

2.1 MATERIALS

A. Cement

1. The cement shall conform to the requirements of ASTM C150 for Portland cement and shall be Type III. Other types may be used subject to Engineer's review. Cement shall be fresh, sieved, and free of lumps.

2. Cement can be provided in bags or by bulk delivery. Bulk delivery cement shall be stored in appropriate silos or other containers specifically designed for cement storage. Cement storage facilities shall be subject to Engineer's review.

B. Water

1. Water used in the grout shall be clean, potable, and free of excessive sediments, organic and other deleterious materials and other impurities that adversely affect the set or hydration of the grout mixture. Lake or river water shall not be used without proper filtration and approval from the Owner.

2. The Contractor shall be responsible for verifying their source water is acceptable via laboratory testing for the presence of deleterious material and shall be responsible for providing any treatment, filtration, or alternative source, as needed at their own expense.

C. Foam Flush

1. The use of foaming agent with water to improve cutting removal during drilling may be considered by the Contractor provided the material is compliant with NSF-61 standards and the Contractor provides adequate work area controls for spoil handling/disposal such that it does not negatively affect the Work nor the Engineer's ability to observe and assess the Work.

D. Bentonite

1. Bentonite shall be commercial grade sodium bentonite (sodium montmorillonite). Bentonite shall be supplied and utilized in powdered form only. Bentonite shall be pre-hydrated for a minimum of 12 hours prior to incorporation in the grout mixes.

E. Sand

1. Sand for grout, if used, shall consist of hard, durable uncoated particles free of mica with a fines content (percent passing No. 200 sieve) of not less than 10 percent and not more than 30 percent. Fine portion may be supplemented with fly/ash, bentonite, or aggregate washings with approval from the Engineer.

F. Other Admixtures

1. Other admixtures (including but not limited to, silica fume, Class F Fly-Ash, viscosity modifiers (i.e., diutan gum), superplasticizers, retarders, and accelerators) which control bleed, improve flowability, reduce water content, retard set, improve washout resistance, may be used in the grout mix subject to the review of the Engineer. Any admixtures which are used at the Contractor's option must be reviewed by the the Engineer in advance and must be of a type that will not contaminate the impoundment or downstream channel (compliant with NSF-61).

2.2 EQUIPMENT

A. Drilling Equipment

1. All equipment, including casing, drill rods, core barrels, bits, etc., shall be standard heavy-duty drilling equipment meeting industry standards as defined by Diamond Core Drill Manufacturer Association (DCDMA), National Drilling Association (NDA) or other applicable organizations. All equipment shall be in good and serviceable condition when brought to the site, shall be free of contaminants, and be capable of advancing the grout holes to the required depths.

2. Any rotary drilling system that uses either a water-flushed or foam-flushed technique is suitable for drilling through soil. The use of either temporary casing or approved drilling fluid will be required to stabilize any hole drilled in soil.

3. The use of compressed air as a flushing medium in any drilling operation in or below the dam is strictly prohibited.

4. Drilling equipment may utilize centralizers or rods that are intended to improve hole straightness and linearity. Additional equipment, such as directional drilling equipment, may be used to verify/correct drill hole alignment to meet the required tolerances.

5. Temporary casing may be required to maintain hole stability during drilling and grouting. It will be the responsibility of the Contractor to supply and utilize a suitable methodology which accounts for potential hole collapse and can permit the grouting operation.

    a. All drill holes shall be a minimum diameter of 3 inches. The maximum diameter of all drill holes shall be limited so as to reduce the impact of drilling operations on the dam. The Contractor shall not deviate from these limits without written permission from the Engineer. Within these limits, the diameter of the drill hole shall be dictated by the drilling methods selected by the Contractor. Payment for the Work of this Item shall be independent of the diameter of the drill holes.

B. Grout Pipes

1. Grout pipes and connections shall be of adequate strength to maintain the hole and to withstand the required jacking and pumping pressures. The pipes shall be at least 2.0 inches (50 mm) inside diameter. All casing shall be flush-joint threaded or a single piece tubing to provide a smooth inner wall and unobstructed inside diameter. It shall be the Contractor's responsibility to install casing that does not detrimentally impact the grouting procedure.

2. Grout pipes shall be installed such that grout material will not travel in the annulus area between the pipe and the dam and escape at the surface when pumped.

3. Any grout pipes or holes lost because of broken or otherwise damaged casing, insufficient casing strength, or inability to remove, shall be abandoned, and new replacement holes shall be drilled and grouted at no additional cost to the Owner.

C. Grout Batcher/Mixer

1. The grout mixer shall be capable of precisely proportioning and providing continuous mechanical mixing to produce a uniform, well-blended grout, free of lumps and un-dispersed cement, and all other ancillary equipment necessary to do the work.

2. Batch type mixers may be used provided they include adequate facilities to ensure proper proportioning of the mix components.

3. The grout mixer shall be a high shear (colloidal) mixer. The minimum mixer size shall be 10 cubic feet. The Contractor shall select an appropriately sized mixer to avoid production delays.

4. An agitator is an essential component and shall be used if the grouting operation requires the temporary storage of mixed grout prior to injection. Agitators shall have a capacity larger than the mixer to ensure the agitator does not run dry. The agitator shall have a minimum of four baffles and two paddles and be capable of turning the paddles at 100 rpm.

5. Automatic weight proportioning and mixing systems may be used provided they comply with the requirements of ASTM C685 and/or ACI 304. If used, automatic metering systems must be initially calibrated in the presence of the Engineer prior to the start of the grouting, and at any time during all consolidation and rock mass grouting, if requested by the Engineer. Automated delivery and mixing systems must include calibrated volumetric containers and scales.

6. All solid components are to be batched by weight. All fluid components can be batched by volume.

D. Grout Pumps

1. The grout pump for shall be a progressive cavity or helical rotor pump that provides output at a constant pressure throughout the grouting process. The pump size shall be selected by the Contractor based on the proposed grouting program.

2. Grout pumps must be integrated with the automated monitoring and display system and have the capability of remote operation from the grout injection point. The grout pumps must include an accurate measuring system to measure pressure, quantity and rate of grout injected. The Contractor shall calibrate the measuring system each day of operation in the presence of the Engineer and any time a change in the grout pumping rate has been suspected.

3. The grout delivery line(s) shall be of suitable material and sized appropriately to execute the work.

4. Pressure gauges shall be provided at each grout pump and at the grout injection point. All gauges shall be furnished and maintained in good working order with a maximum pressure reading of no more than 150% of the maximum anticipated grouting pressure. Any gauge suspected of malfunctioning shall be promptly replaced.

5. Standby water flushing equipment shall be maintained available by the Contractor. Standby grout pump(s) and power supply shall be available upon short notice in the event of the failure of the primary pump. The standby water flushing equipment shall utilize a different power source than the grouting equipment, have sufficient capacity to flush out any partially grouted holes if necessary due to blockage or breakdown of grouting equipment, and shall be capable of developing a pressure of at least one hundred pounds per square inch - gage (100 psi).

PART 3 EXECUTION

3.1 GENERAL

A. The Contractor shall visit the site to determine site access and working space before submitting a bid for the Work.

B. The Contractor shall coordinate the drilling and grouting work with the other work/construction/modifications taking place along the dam.

C. No discharge of drilling spoils or grout to the impoundment or downstream channel will be permitted.

3.2 PREPARATION

A. Repair and repoint masonry retaining wall surrounding area to be grouted as shown on the drawings and described in Section 04920.

1. Following removal of old wall mortar, install grout witness ports that penetrate through wall at 5-foot intervals along leaking joints.

2. Grout witness ports shall consist of a ball valve of at least 1 inch diameter, joined to tubing of sufficient length to penetrate through wall into backfill or voids, plus at least four inches.

3. Mortar grout witness ports in place with the tubing extending at least 4 inches from the wall face for ease in witness port removal.

3.3 DRILLING

A. Drilling shall be performed along a single grout line at the locations shown on the Contract Drawings.

B. All grout holes shall be drilled to a minimum depth of 15 feet below the top of the dam or refusal, whichever is less, unless otherwise directed by the Engineer.

C. Primary hole drilling for the proposed grout curtain shall be performed at 4-foot centers along the proposed grout line.

D. Secondary hole drilling can begin after completion of the primary hole drilling. Secondary hole drilling shall be performed at 4-foot centers along the proposed grout line as shown on the Contract Drawings. The secondary holes shall be drilled in a split spaced sequence to result in a 2-foot offset from the primary hole locations.

E. The requirements as to location, depth and spacing of the holes shown on the plans are approximate and subject to revision during the drilling, testing, and grouting procedures.

F. The selection of the appropriate water or foam flush drilling method for drilling shall be made by the Contractor to achieve the drilling objectives while also limiting the potential to cause detrimental effects on the dam, such as observable cracking or displacement of the masonry. If the Engineer judges that the Contractor's drilling operations are detrimental to the dam, the Contractor will be required to stop work and propose an alternative approach to mitigate damage to the dam and to allow the work to continue.

G. Drilling shall be performed in accordance with the reviewed work plan and as specified herein. Installation of temporary casing shall be performed as conditions warrant. Casing shall be sufficiently sealed to mitigate uncontrolled discharge of grout from the annulus between the casing and the dam.

H. The Contractor shall capture and direct all drilling spoils and circulation flush water to an approved disposal location as described in this Section.

I. All drill holes must be open and unobstructed prior to grouting. Each hole shall be cleaned of all debris and dust by a method approved by the Engineer. In the event that casing is used, the casing must be removed during grouting. Casing must not interfere with grouting. All casing shall be removed prior to completion of the work, and it shall remain the property of the Contractor. No drill holes shall be left open overnight without casing.

J. Prior to grouting, each grout hole shall be tested with clean water under continuous pressure up to the required grouting pressure in order to determine rate of take and extent of leakage.

K. Whenever as much as 50 percent of the drill water is lost or the cumulative total of successive water losses is estimated to amount to 50 percent or more, the drilling operations shall be stopped, and the hole shall be washed, pressure tested and grouted before drilling operations are resumed in such hole. The grout remaining in a partially completed hole shall be removed therefrom by washing or other methods before it has set sufficiently to require redrilling. Redrilling required because of the Contractor's failure to cleanout a hole before the grout has set shall be performed at the Contractor's expense.

L. If required, redrilling of grout holes shall be performed with an approved drilling method. The time of grout set before any hole can be re-drilled shall be at least 12 hours, but not more than 48 hours, unless otherwise directed by the Engineer.

3.4 DRILLING TOLERANCES

A. Drill holes shall be advanced either vertically or at a specified inclination as noted in the reviewed work plan. No portion of any drill hole shall deviate from its intended inclination by more than 3 degrees.

B. The Contractor shall measure/record the position and verticality/inclination over the entire length of each drill hole. The use of a 4-foot carpenter's level or equivalent to measure the inclination of the drill rig mast shall not be the only method to monitor/access verticality or inclination. The Contractor shall include proposed verticality/inclination measurement methods in the applicable Work Plans.

C. A minimum of one drill hole per rig day shall be monitored via in-hole verticality measurements, unless directed otherwise by the Engineer. If the Engineer suspects

that a drill hole is out of verticality tolerance, the Contractor shall implement in-hole verticality measurements at no additional cost to the Owner.

D. The Contractor shall adjust the inclination/verticality of the drill holes as necessary based on results of their in-hole verticality measurements. No separate payment will be made for the Contractor to abandon and re-drill a mis-aligned hole. Mis-aligned drill holes shall be regrouted and redrilled in accordance with the Contractor's approved contingency plan to correct a drill hole that does not meet the inclination/verticality requirements as specified herein.

E. The Contractor shall confirm the drill hole depths to the satisfaction of the Engineer prior to initiating end of casing grouting at each hole.

3.5 GROUTING

A. Grouting shall be conducted using the Contractor submitted grouting method(s), as reviewed by the Engineer. All injections, whether with grout or with water, shall be monitored, controlled, displayed, and analyzed in real time by an automated system.

1. Modification of the proposed sequence may be necessary based on the performance of prior grout holes. Grout injection shall not be initiated within a hole that is within 8 feet of holes that were grouted within the previous 12 hours.

B. The Contractor's grout mixing plant shall be located in an approved location. The plant may be located in the staging and lay-down areas identified in the Contract Drawings, or at other areas proposed by the Contractor and approved by the Engineer. Pumping of grout shall be limited to a maximum length of 200 feet from the grout plant to the top of a grout hole unless approved by the Engineer. The Contractor shall provide the Engineer access to the mixing, pumping, and injection locations at all times.

C. The arrangement of the grouting equipment shall provide continuous circulation of grout throughout the system and permit accurate pressure control by operation of a valve on the grout return line, regardless of how small the grout take may be. The equipment and lines shall be prevented from becoming fouled by the constant circulation of grout and by the periodic flushing-out of the system with water. Flushing shall be done with the grout intake valve closed, the water supply valve open and the pump running at 100 percent of its capacity.

D. Grout staging shall be performed through an inflatable packer via downstage (single packer) techniques.

E. Grouting pressures must be controlled such that grouting operations do not cause damage to the dam. Excessive grouting pressures may displace or damage masonry. Grouting pressures as measured via the automated system at the top of the dam should be limited to the maximum pressure as defined in this Section for the grouting stage.

1. Each drilled grout hole and grout connection pipe shall be pressurized from pumping apparatus to, and including the grout hole, with the grout mixture. Pressurizing with air, water or materials other than the grout mixture will not be acceptable.

2. Different grouting pressures may be required for grouting various sections of the grout holes. Pressures shall be as required to completely and thoroughly grout the embankment soil without causing displacement of existing features. In no event will pressures be allowed to exceed the maximum allowable grouting pressure.

3. If excessive pressures are observed, the water/cement ratio shall be increased and/or the mix of mortar/grout changed as may be required to produce the desired results. If necessary to relieve premature stoppage, periodic applications of water under pressure shall be made. Under no conditions shall the pressure or rate of pumping be increased suddenly as either may produce a water-hammer effect, which may promote stoppage.

F. Grouting shall proceed in a continuous manner until either refusal is reached or injection is stopped by the Engineer due to excessive takes. The Contractor shall flush out partially grouted holes whenever grouting is interrupted for two hours or more due to equipment failures. If the Contractor fails to flush out a partially grouted hole, the Engineer shall direct the Contractor to abandon or re-drill the hole and no measurement (or payment) will be taken of the abandoned hole.

1. Grout Refusal Criteria: Refusal is defined as a grout take of less than 0.5 gpm in three minutes at maximum grouting pressure for every grout stage.

2. In areas where cavities are encountered or where the quantity of grout injected becomes excessive, sand, thixotropic stabilizer, bentonite, and other suitable admixtures may be required as ingredients of the grout.

3. In general, if tests indicate a tight hole, grouting shall be started with a thin mix. If an open hole condition exists, as determined by loss of drill water or inability to build up pressure during washing operations, then grouting shall be started with a thicker mix and with a grout pump operating as nearly as practicable at constant speed at all times; the ratio will be decreased, if necessary, until the required pressure has been reached. If this procedure does not produce the desired pressure, mortar grout shall be used and the mix varied as necessary to produce the desired results.

4. If, due to size and continuity of void, it is not possible to reach the required pressure after pumping a reasonable volume of grout at the minimum workable water/cement ratio or mortar grout materials ratio, the speed of pumping shall be reduced or pumping shall be stopped temporarily and intermittent grouting shall be performed, allowing sufficient time between grout injections for the grout to stiffen. Following such reduction in pumping speed, if the desired result is not obtained, grouting in the hole shall be discontinued when directed. In such event, the hole shall be cleaned, the grout allowed to set, and additional drilling and grouting shall then be done in this hole or in the adjacent areas as directed, until the desired resistance is built up.

G. The Contractor shall monitor grout witness ports for grout discharge. Discharge of grout from witness ports will provide an indication that connectivity between grout injection hole and loose soil zones or voids. ‘Dirty’ grout (grout that is incompletely mixed, contains air or soil, etc) shall be purged from the port and the port closed until well-mixed grout of uniform color is flowing. The witness port valve shall then be closed.

1. Witness ports that do not discharge grout will serve as an indication that connectivity has not been achieved and additional grouting is needed in that area.

2. Once grout has set, the Contractor shall cut witness port tubing flush with the mortar face.

H. After completion of the final grouting stage, the top portion of the hole shall be filled with grout by tremie methods.

I. The need for additional rounds of masonry grouting will be determined based on whether the initial attempt results in excessive grout takes and the results of the test program. The maximum number of additional rounds of masonry grouting performed in a given hole shall be established during the test program. The necessary steps to be taken to finish a hole may include redrilling and grouting with a modified grout mix or moving to the next phase of grouting, secondary or tertiary holes located via spilt spacing methodology.

J. Grout that cannot be placed, for any reason, within two hours after mixing shall be discarded. Based on the evolution of the Marsh Cone Values, this criterion may be modified by the Engineer.

1. The Contractor shall contain all wash water, excess grout, etc. and prevent it from entering the surrounding water bodies or wetlands. The Contractor shall properly dispose of these materials and clean excess grout from masonry and surrounding surfaces.

3.6 RECORDS

A. Grout Hole Record: The Contractor shall keep complete records of each hole, including the manner in which the drill hole operation proceeded, the means and methods used to advance the hole, and the grout quantities and pressures achieved. All data shall be recorded electronically in real time and maintained in records to be submitted to the Engineer. The records and logs to be kept by the Contractor shall include at least the following data:

1. Date and time.

2. Engineer, Contractor, and Driller.

3. Location of the top and tip of each grout hole and in reference to the numbering system and the survey data.

4. Ground elevation of the hole to the nearest 0.1 feet (as referenced from plans).

5. Drill hole vertically or inclination measurements to the nearest 0.1 degree at a minimum of 10-foot intervals during drilling. Type of equipment used for measurements.

6. Depth to water within the hole including the time and amount and position of the casing (if any) during the observation.

7. Drilling method, cased/uncased, diameter and type of casing and/or bit.

8. Depths of advancement by each method, depth/elevation of masonry/bedrock interface, and the final bottom of grout hole depth/elevation.

9. Any obstructions or unusual event encountered during drilling, such as the unexpected presence of steel in the dam.

10. Down pressure, drilling fluid pressures, loss of fluid.

11. Time of advancement per foot of drilling.

12. Grout mixes used.

13. Date and time of grouting.

14. Continuous grouting volumes and pressures at intervals of no more than 10 seconds.

15. Grout takes and total volume utilized.

16. Grout refusal criteria achieved.

17. Notation of any other observation related to the grouting operation.

18. Drill penetration rates shall be recorded for each hole, in masonry and in rock.

B. The Contractor shall also maintain a set of "As Built" plans in accordance with Section 01055 on which all changes and deviations from the design plans are clearly and legibly noted.

C. Daily Report. The Contractor shall also provide a daily report delineating the activities for each day that its personnel are on the jobsite. The log shall provide at a minimum the following:

1. Date;

2. Weather;

3. Hole identifications for holes drilled;

4. Hole identifications for holes grouted;

5. Materials received and time of delivery;

6. Names of any visitors and time at the jobsite;

7. Details of any accidents, injuries, or other unusual events including time; and

8. Copies of receipts or delivery tickets for all materials delivered to the jobsite, which shall also be provided to the Engineer.

D. No separate payment will be made for record or report preparation. The cost for as-built drawing preparation will be included under Section 01770.

END OF SECTION

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SECTION 02315

EXCAVATION, BACKFILL, COMPACTION, AND DEWATERING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Excavation, backfill and compaction

2. Temporary dewatering systems

B. Related Sections

1. Section 01570 - Temporary Controls

2. Section 02320 - Borrow Materials

1.2 REFERENCES

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

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

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

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

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

F. 520 CMR 14.00 Excavation and Trench Safety

G. 780 CMR 1705.0 Requirements for Structural Tests and Inspections

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

1.3 DEFINITIONS

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

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

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

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

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

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

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

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

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

1.4 SUBMITTALS

A. Performance data for the compaction equipment to be utilized

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

C. Modified Proctor Test (ASTM D1557) results and soil classification (ASTM D2487) for all proposed backfill materials at the frequency specified below:

1. For suitable soil materials removed during Excavation, perform one test for every 1,000 cubic yards of similar soil type. Similarity of soil types will be as determined by the Engineer.

2. For borrow materials; perform tests at frequency specified in Section 02320, Borrow Materials.

D. Compaction test results (i.e. ASTM D6938 or ASTM D1556) at a frequency of one test for every 100 cubic yards of material backfilled or at a minimum of one test per lift. The Engineer will determine the locations and lifts to be tested. The Contractor shall plan his operations to allow adequate time for laboratory tests and to permit taking of field density tests during compaction.

1. Methods and equipment proposed for compaction shall be subject to prior review by the Engineer. Compaction generally shall be done with vibrating equipment. Static rolling without vibration may be required by the Engineer on sensitive soils that become unstable under vibration. Displacement of, or damage to existing utilities or structure shall be avoided. Any utility or structure damaged thereby shall be replaced or repaired as directed by the Engineer.

2. Additional compaction testing may be required when there is evidence of a change in the quality of moisture control or the effectiveness of compaction.

    a. Any costs associated with correcting and retesting as a result of a failure to meet compaction requirements shall be borne by the Contractor.

3. If all compaction test results within the initial 25% of the total anticipated number of tests indicate compacted field densities equal to or greater than the project requirements, the Engineer may reduce frequency of compaction testing. In no case will the frequency be reduced to less than one test for every 500 cubic yards of material backfilled.

4. The Contractor is cautioned that compaction testing by nuclear methods may not be effective where trenches are so narrow that trench walls impact the attenuation of the gamma radiation, when adjacent to concrete that impacts the accuracy of determining moisture content, or where oversize particles (i.e. large cobbles or coarse gravels) are present. In these cases, other field density testing methods may be required.

1.5 QUALITY ASSURANCE

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

B. The following test procedures will be performed by the Owner's inspection agency. Results will be submitted to the Engineer for review.

1. Modified Proctor Test (ASTM D1557) results and soil classification (ASTM D2487) for all proposed backfill materials at the frequency specified below:

    a. For suitable soil materials removed during excavation, perform one test for every 1,000 cubic yards of similar soil type. Similarity of soil types will be as determined by the Engineer.

    b. For borrow materials; perform tests at frequency specified in Section 02320 - Borrow Materials.

2. Compaction test results (i.e. ASTM D6938 or ASTM D1556) at a frequency of one test for every 100 cubic yards of material backfilled. The Engineer will determine the locations and lifts to be tested.

    a. The Engineer may specify additional compaction testing when there is evidence of a change in the quality of moisture control or the effectiveness of compaction.

b. If all compaction test results within the initial 25% of the total anticipated number of tests indicate compacted field densities equal to or greater than 95% of maximum dry density at optimum moisture content, the Engineer may reduce frequency of compaction testing. In no case will the frequency be reduced to less than one test for every 500 cubic yards of material backfilled.

c. The Contractor is cautioned that compaction testing by nuclear methods may not be effective where excavation sidewalls impact the attenuation of the gamma radiation or where oversize particles (i.e. large cobbles or coarse gravels) are present. In these cases, other field density testing methods may be required.

1.6 PROJECT CONDITIONS

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

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

C. In accordance with 520 CMR 14.00, no person shall, except in an emergency, make an excavation in any public way, public property, or privately owned land until a permit is obtained from the appropriate designated permitting authority. For this project, the permit should be obtained from the Town of Ashby.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

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

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

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

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

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

2.2 DEWATERING MATERIALS

A. Provide erosion control barriers in accordance with drawings.

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

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

PART 3 EXECUTION

3.1 PREPARATION

A. Public Safety and Convenience

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

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

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

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

3.2 CONSTRUCTION

A. Excavation

1. Perform excavation to the lines and grades indicated on the Drawings. Backfill unauthorized over-excavation in accordance with the provisions of this Section.

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

3. Sawcut the existing pavement in the vicinity of the work prior to the start of excavation in paved areas, so as to prevent damage to the paving outside the requirements of construction.

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

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

   a. Excavated material not required or not suitable for backfill shall be removed from the site.

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

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

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

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

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

B. Backfill and Compaction

1. Unless otherwise specified or indicated on the Drawings, use satisfactory material removed during excavation for backfilling trenches. The Engineer may require stockpiling, drying, blending and reuse of materials from sources on the Project.

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

3. Soil subgrades shall be protected against freezing and the elements at all times. If construction is performed during freezing weather, excavations shall be backfilled as soon as possible. Insulation blankets or other means shall be used for protection against freezing at the discretion of the Engineer or Owner..

4. Soil bearing surfaces shall be protected against freezing and the elements before and after concrete placement. If construction is performed during freezing weather, structures shall be backfilled as soon as possible after they are constructed. Insulating blankets or other means shall be used for protection against freezing at the discretion of the Engineer or Owner.

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

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

6. Backfilling and compaction methods shall attain 90% of maximum dry density at optimum moisture content as determined in accordance with ASTM D1557.

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

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

C. Dewatering

1. Provide, operate and maintain adequate pumping, diversion and drainage facilities to maintain the excavated area sufficiently dry from groundwater and/or surface runoff so as not to adversely affect construction procedures nor cause excessive disturbance of underlying natural ground. Locate dewatering system components so that they do not interfere with construction under this or other contracts.

2. Conduct operations so as to prevent at all times the accumulation of water, ice and snow in excavations or in the vicinity of excavated areas so as to prevent water from interfering with the progress or quality of the work.

3. Take actions necessary to ensure that dewatering discharges comply with permits applicable to the Project. Dispose of water from the trenches and excavations in such a manner as to avoid public nuisance, injury to public health or the environment, damage to public or private property, or damage to the work completed or in progress.

4. Repair any damage resulting from the failure of the dewatering operations and any damage resulting from the failure to maintain all the areas of work in a suitable dry condition.

5. Take precautions to protect new work from flooding during storms or from other causes. Control the grading in the areas surrounding all excavations so that the surface of the ground will be properly sloped to prevent water from running into the excavated area. Where required, provide temporary ditches for drainage. Upon completion of the work, all areas shall be restored to original condition.

6. Brace or otherwise protect pipelines and structures not stable against uplift during construction.

7. Do not excavate until the dewatering system is operational and the excavation may proceed without disturbance to the final subgrade.

8. Unless otherwise specified, continue dewatering uninterrupted until the structures, pipes, and appurtenances to be installed have been completed such that they will not float or be otherwise damaged by an increase in groundwater elevation.

9. Temporarily lower the groundwater level at least two feet below excavations to limit potential “boils,”loss of fines, or softening of the ground. If any of these conditions are observed, submit a modified dewatering plan to the Engineer within 48 hours. Implement the approved modified plan and repair any damage incurred.

10. When subgrades are soft, weak, or unstable due to improper dewatering techniques, remove and replace the materials in accordance with Section 02320 at no cost to the Owner.

11. Notify the Engineer immediately if any settlement or movement is detected of survey points adjacent to excavations being dewatered. If settlement is deemed by the Engineer to be related to the dewatering, submit a modified dewatering plan to the Engineer within 24 hours. Implement the approved modified plan and repair any damage incurred to the adjacent structure at no cost to the Owner.

12. Dewatering discharge:

    a. Install sand and gravel, or crushed stone, filters in conjunction with sumps, well points, and/or deep wells to prevent the migration of fines from the existing soil during the dewatering operation.

    b. Do not discharge water into any sanitary sewer system.

    c. Provide separately controllable pumping lines.

    d. The Engineer reserves the right to sample discharge water at any time.

13. Removal

    a. Do not remove dewatering system without written approval from the Engineer.

    b. Backfill and compact sumps or ditches with screened gravel or crushed stone in accordance with Section 02320.

    c. Remove well points and deep wells. Backfill abandoned well holes with cement grout having a water cement ratio of 1 to 1 by volume.

3.3 PROTECTION

A. Protection of Existing Structures

1. All existing foundations, conduits, wall, pipes, wires, poles, fences, property line markers and other items which the Engineer decides must be preserved in place without being temporarily or permanently relocated, shall be carefully supported and protected from damage by the Contractor. Should such items be damaged, they shall be restored by the Contractor to at least as good condition as that in which they were found immediately before the Work began.

B. Accommodation of Traffic

1. Streets and drives shall not be unnecessarily obstructed. The Contractor shall take such measures at his own expense to keep the street or road open and safe for two-way traffic unless otherwise indicated.

2. Construct and maintain such adequate and proper bridges over excavations as may be necessary or as directed for the safe accommodation of pedestrians and vehicles. Provide substantial barricades at crossings of trenches, or along the trench to protect the traveling public.

3. Where deemed necessary, such additional passageways as may be directed shall be maintained free of such obstructions. All material piles, open excavations, equipment, and pipe which may serve as obstructions to traffic shall be protected by proper lights, signage, or guards as necessary.

4. All traffic controls shall be in accordance with the Manual on Uniform Traffic Control Devices for Streets and Highways, latest edition.

C. Erosion and Sedimentation Control

1. Take all necessary steps to prevent soil erosion.

2. Plan the sequence of construction so that only the smallest practical area of land is exposed at any one time during construction.

3. Temporary vegetation and/or mulching shall be used to protect critical areas exposed during construction as judged by the Engineer.

END OF SECTION

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SECTION 02320

BORROW MATERIALS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Gravel Borrow
2. Processed Gravel Borrow for Pavement Sub-base
3. Granular Fill
4. Sand Borrow
5. Stone Borrow

B. Related Sections

1. Section 02315 – Excavation, Backfill, Compaction and Dewatering

1.2 REFERENCES

A. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

B. ASTM C117 - Standard Test Method for Materials Finer than 75 μm (No. 200) Sieve in Mineral Aggregates by Washing

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

D. ASTM D1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lb./ft3)

E. ASTM D2434 - Standard Test Method for Permeability of Granular Soils (Constant Head)

F. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System)

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

H. AASHTO – Standard Specification for Transportation Materials and Methods of Sampling and Testing, 1986 Edition as amended

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

1.3 SUBMITTALS

A. Representative Samples of borrow materials taken from the source. Tag, label, and package the Samples as requested by Engineer. Provide access to the borrow site for field evaluation and inspection.

B. Provide sieve analysis (ASTM C136) and permeability analysis (ASTM D2434) from certified soils testing laboratory for all borrow materials. Take and test a sample, at no additional cost to the Owner for each 1,500 c.y. of borrow material placed.

C. Provide modified proctor analysis (ASTM D1557) from certified soils testing laboratory for all borrow materials.

D. Provide sieve analysis (ASTM 422) from certified soils testing laboratory for all borrow materials (including hydrometer analysis for silts and clays).

E. The Engineer reserves the right to require more frequent testing than that which is specified above should the borrow characteristics change.

1.4 QUALITY ASSURANCE

A. No borrow shall be placed prior to the approval of Samples by the Engineer.

1.5 PROJECT/SITE CONDITIONS

A. Existing Conditions

1. Comply with any environmental requirements and restrictions.

2. Keep all public and private roadway surfaces clean during hauling operations and promptly and thoroughly remove any borrow or other debris that may be brought upon the surface before it becomes compacted by traffic. Frequently clean and keep clean the wheels of all vehicles used for hauling to avoid bringing any dirt upon the paved surfaces.

PART 2 PRODUCTS

2.1 GRAVEL BORROW

A. Gravel Borrow shall consist of inert material that is hard, durable stone and coarse sand, free from loam and clay, surface coatings, and deleterious materials. The coarse aggregate shall have a percentage of wear, by the Los Angeles Abrasion Test, of not more than 50.

Gradation requirements for Gravel Borrow shall be determined by AASHTO-T11 and T27 and shall conform to the following:

Sieve	Percent Passing
½ inch	50 – 85
No. 4	40 – 75
No. 50	8 – 28
No. 200	0 - 10

Maximum size of stone in Gravel Borrow shall be 2 inches.

2.2 PROCESSED GRAVEL BORROW FOR PAVEMENT SUBBASE

A. The compacted Processed Gravel Borrow to be used for gravel access roads and pavement subbase, or other area where a firm, free-draining subgrade is needed shall consist of inert material that is hard, durable stone and coarse sand, free from loam

and clay, surface coatings and deleterious materials. The coarse aggregate shall have a percentage of wear, by the Los Angeles Abrasion Test, of not more than 50.

B. Gradation requirements shall conform to the following:

Sieve	Percent Passing
3"	100
1 ½"	70 – 100
¾"	50 – 85
No. 4	30 – 60
No. 200	0 - 10

C. Stockpile the processed materials in such a manner to minimize segregation of particle sizes. All processed gravel shall come from approved stockpiles.

2.3 GRANULAR FILL

A. Granular Fill to be used as fill material to achieve gravel base grade beneath structures, pavement, or other area requiring structural fill shall consist of inert material that is hard, durable stone and sand, free from loam and clay, surface coatings and deleterious materials. The coarse aggregate shall have a percentage of wear, by the Los Angeles Abrasion Test, of not more than 50.

B. Gradation requirements for Granular Fill shall conform to the following:

	Percent by Weight Passing Through	
Sieve Size	**Minimum**	**Maximum**
2/3rds loose lift thickness	100	--
No. 10	30	95
No. 40	10	70
No. 200	0	15

2.4 STONE BORROW

A. Riprap Borrow

1. Riprap shall consist of hard, durable, and sound angular stone that is resistant to weathering and shall meet the gradation requirement specified. Neither breadth nor thickness of a single stone should be less than one-third its length. The parent rock for riprap stones shall be igneous or metamorphic rock. Sedimentary rock types such as shale, sandstone, or similar soft stone will not be allowed. The stone shall be free of ice, snow, overburden, spoil, silt, clay, loam, organics, and other deleterious matter.

2. Riprap stone shall have a minimum dry unit weight of 165 pounds per cubic foot.

3. Gradations of riprap stone material shall be based upon the thickness of the riprap layer as shown on the plans. Riprap layer thickness shall be defined as the typical layer thickness as measured perpendicular to ground surface or slope. In all cases, no more than 5 percent by weight shall pass a 2-inch sieve. Diameter refers to the equivalent-volume spherical stone diameter as defined by the US Army Corps of Engineers in EM 1110-2-1601.

   a. Rip Rap Type 2

Percent of Stones Smaller	Diameter (in.)	Percentage of Stones Weighing Less Than	Weight (lbs.)
D_{100}	24	100	690
D_{50}	16	50	200
D_{15}	12	15	100

B. Rounded cobbles

1. Streambed cobbles and boulders shall be sound, clean, and rounded. Pieces with a breadth of less than 60% of the length shall not be allowed. Parent rock shall be igneous or metamorphic rock. The stone shall be free of ice, snow, overburden, spoil, silt, clay, loam, organics and other deleterious matter.

2. Diameter refers to the equivalent-volume spherical stone diameter as defined by the US Army Corps of Engineers in EM 1110-2-1601.

   a. Rounded Cobbles

Percent of Stones Smaller	Diameter (in.)	Percentage of Stones Weighing Less Than
D_{84}	15	85
D_{50}	10	50
D_{15}	4	15

3. All stream bed stone placed at the site shall be of the same parent rock from the same quarry and shall be visually similar.

C. Crushed Stone Borrow

1. Crushed stone borrow shall consist of one of the following materials:

   a. Durable crushed rock consisting of the angular fragments obtained by breaking and crushing solid or shattered natural rock, and free from a detrimental quantity of thin, flat, elongated or other objectionable pieces. A detrimental quantity will be considered as any amount in excess of 15% of the total weight. Thin stones shall be considered to be such stones whose average width exceeds 4 times their average thickness. Elongated stones shall be considered to be stones whose average length exceeds 4 times their average width.

b. Durable crushed gravel stone obtained by artificial crushing of gravel boulders or fieldstone with a minimum diameter before crushing of 8 inches.

2. The crushed stone shall be free from clay, loam or deleterious material and not more than 1.0% of satisfactory material passing a No. 200 sieve will be allowed to adhere to the crushed stone.

3. The crushed stone shall have a maximum percentage of wear as determined by the Los Angeles Abrasion Test (AASHTO-T-96) as follows:

a. For Class 1 Bit. Conc. 30%**

b. For Cement Concrete Aggregate 45%***

c. Crushed Stone for Subbase 45%

**Crushed stone for this use shall consist of crushed or shattered natural rock only. Crushed gravel stone will not be permitted.

***Except for 5000 psi or greater cement concrete and prestressed concrete which shall be 30%.

4. The crushed stone shall conform to the grading requirements shown in the following grading Table.

	Percent by Weight Passing Through	
Sieve Size	**Minimum**	**Maximum**
1 ½" Crushed Stone		
2"	100	--
1 ½"	95	100
1"	35	70
¾"	0	25
1/2" Crushed Stone		
1/2"	100	--
3/8"	90	100
1/4"	10	50
1/8"	0	20
No. 4	0	5

5. Stone gradations shall vary depending on field use and shall be determined by Engineer.

D. Dense Graded Stone Borrow

1. The crushed stone used for backfill shall be a dense graded mixture and conform to the following gradation requirements.

Sieve Size (Square Openings)	Percent by Weight Passing Through	
	Minimum	Maximum
5/8″	100	100
½″	85	100
3/8″	15	45
#4	0	15
#8	0	5

PART 3 EXECUTION

3.1 INSTALLATION

A. Prior to the placement of borrow material, site preparation shall be completed as required by the Contract Documents, and approved by the Engineer.

B. Ensure that all materials are properly stockpiled on site to prevent contamination by other materials.

C. Place borrow material over the entire area in uniform lifts and compact in accordance with Section 02315.

D. Utilize on-site soils prior to using off-site borrow provided on-site soils meet the requirements of the specifications.

E. Utilize gravel borrow in all locations where a surface treatment has not been specified but requires a firm finish surface.

F. Processed gravel for pavement subbase is intended to provide a stable foundation for driveways, sidewalk and roadway repair where a gravel base has been specified.

G. Borrow shall be used as a replacement for unsuitable materials where poor soil conditions are encountered during the progress of the work, where approved by the Engineer. Borrow type will be determined by the Engineer. Borrow material used as a replacement for unsuitable soil is not intended to be an aid to dewatering.

H. Shape borrow used for pipe foundation material so that it supports the pipe properly and will not damage the pipe, bells, collars, or the pipe fittings.

I. Place all borrow to keep it free of other materials and to prevent segregation.

J. Carry out compaction testing in accordance with ASTM D1556 (sand cone), or D6938 (Nuclear Methods), as specified in Section 02315.

K. Maintain and repair all eroded areas during the life of this contract at no additional cost to the Owner.

END OF SECTION

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SECTION 02516

HIGH DENSITY POLYETHYLENE PIPE AND FITTINGS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. High density polyethylene (HDPE) pipe for:

a. Storm drainage lines

2. Types of HDPE piping specified in this Section include:

a. Smooth exterior, smooth interior, perforated HDPE pipe

B. Related Sections

1. Section 02315 – Excavation, Backfill, Compaction and Dewatering

2. Section 02320 – Borrow Materials

1.2 REFERENCES

A. AASHTO M252 –Corrugated Polyethylene Drainage Pipe

B. AASHTO M294 – Corrugated Polyethylene Pipe, 300- to 1200-mm Diameter

C. AASHTO MP7 – Corrugated Polyethylene Pipe, 1300- to 1500-mm Diameter

D. ASTM D1248 – Standard Specification for Polyethylene Plastics Extrusion Materials For Wire and Cable

E. ASTM D2239 – Standard Specification for Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter

F. ASTM D2321 – Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications

G. ASTM D2412 – Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading

H. ASTM D2683 – Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing

I. ASTM D2737 – Standard Specification for Polyethylene (PE) Plastic Tubing

J. ASTM D2774 – Standard Practice for Underground Installation of Thermoplastic Pressure Piping

K. ASTM D3261 – Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing

L. ASTM D3350 – Standard Specification for Polyethylene Plastics Pipe and Fittings Materials

M. ASTM F714 – Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter.

N. NSF/ANSI Standard 61 – Drinking Water System Components

1.3 SUBMITTALS

A. Submit product data on the pipe, fittings, and accessories.

B. Prior to first shipment of pipe, submit certified test reports that the pipe for this Contract was manufactured and tested in accordance with the appropriate ASTM standards specified herein.

C. Submit resumes for all personnel performing heat fusion joining.

1.4 QUALITY ASSURANCE

A. Conform to the methods outlined in the following sections:

B. Personnel performing heat fusion joining shall have adequate training and experience in the procedure, demonstrated by at least twelve months applicable experience.

C. Use an adequate number of skilled laborers, equipment of adequate size, capacity, and quantity to perform the work of this Section, and its related Sections, in a timely manner.

D. Materials to be used in conjunction with potable water systems shall conform to NSF/ANSI 61 (Drinking Water System Components).

1.5 DELIVERY, STORAGE AND HANDLING

A. When lifting with slings, only wide fabric choker slings capable of safely carrying the load shall be used. Wire rope or chain shall not be used to handle pipe.

PART 2 PRODUCTS

2.1 MANUFACTURER – GENERAL

A. The manufacturer shall have manufacturing and quality assurance facilities capable of producing and assuring the quality of the pipe and fittings required by these specifications.

B. Pipe and fittings from different manufacturers shall not be interchanged for the same type of pipe and application.

2.2 PIPE IDENTIFICATION

A. The following shall be continuously indent printed on the pipe or spaced at intervals not exceeding five-feet:

1. Name and/or trademark of the pipe manufacturer.

2. Nominal pipe size.

3. Dimension ratio.

4. The letters “PE” followed by the polyethylene grade in accordance with the ASTM designation, followed by the hydrostatic design basis in PSI.

5. A production code from which the date and place of manufacture can be determined.

2.3 SMOOTH INTERIOR/SMOOTH EXTERIOR PERFORATED HDPE PIPE

A. Approved manufacturers include Performance Pipe, a Division of Chevron Phillips Chemical Company LP, or equal.

B. Pipe shall be made of virgin, extra high molecular weight polyethylene compounds equaling a PE 4710 designation, which meet or exceed the requirements of ASTM D-3350, Cell Class 445574C.

C. Pipe shall be manufactured in accordance with ASTM F-714.

D. The pipe and fittings shall be free from foreign inclusions and visible defects. The ends of the pipe shall be cut squarely and cleanly so as not to adversely effect joining.

E. Pipe and fittings shall be joined by butt fusion welding.

F. Polyethylene fittings shall be fabricated to the same outside diameter, wall thickness, and tolerances as the mating pipe.

G. Standard laying lengths shall be 40-feet.

H. All smooth HDPE pipe and fittings shall have SDR ratings as shown on the project drawings.

I. 8 Perforations per foot; perforation diameter = 3/8”

J. Water Distribution Piping

2.4 FITTINGS FOR SMOOTH INTERIOR/EXTERIOR HDPE PIPE

A. General

1. Fittings shall be made from material meeting the same requirements as the pipe. Polyethylene fittings shall be molded or fabricated by the manufacturer of the pipe.

2. Molded fittings shall be manufactured in accordance with ASTM D3261 (butt fused) and shall be so marked.

3. Fittings shall meet the requirements of AWWA C906.

B. Mechanical Joints

1. Mechanical joint connections shall require the use of a stainless steel stiffener insert for the HDPE piping at is mechanically locked into the adapter in accordance with the manufacturers recommendations.

2. Use Series 2100 Megaflange with HDPE insert, as manufactured by Ebaa Iron, Inc. at transitions requiring flange by flange connections, such as valves.

C. Joint Couplings

1. Joint couplings shall consist of an external joint collar and fastening straps.

2. The collar shall consist of a band 12 inches wide. The band shall have an outer layer of polyethylene with an under layer of rubberized mastic that is reinforced with woven polypropylene fabric. There shall be a peelable protective paper against the mastic that is removed when the collar is applied to the joint.

3. Within the collar, there shall be 3 steel straps 5/8 inch wide. The straps shall be in tubes that isolate them from the mastic and allow them to slip freely when tightened around the pipe.

4. The collar shall be designed so that when it is applied around the joint, the ends overlap by at least 6 inches and when the straps are secured, a layer shall completely cover the straps protecting them from moisture and rust.

D. Lateral Pipe Connectors

1. Branch connections to the main shall be made with saddle fittings or tees.

2. Watertight, flexible seal using NPC Kor-N-Tee saddle with stainless steel hardware and bands for pipe-to-pipe connector.

3. As an alternative, penetrating hole-mounted sleeves may be used, as authorized by the Engineer. Tee connectors shall be Inserta Tee, or equal.

4. Fully-bolted, wrap-around tapping sleeve could also be used.

5. Reconnection of service laterals to incorporate elastomeric tube connectors secured with stainless steel band clamps.

E. Pipe Connectors at Structures

1. HDPE pipe connections to non-polyethylene manholes and structures may be made with a mechanical seal such as a link seal, a chemical seal such as packing with oakum rope saturated with water activated polyurethane sealant, or other means approved by the Engineer. The seal should be finished-off in the manhole with non-shrink grout.

PART 3 EXECUTION

3.1 PREPARATION

A. The Contractor shall verify that the surface has been prepared to the proper line and grade by shooting invert elevation grades.

3.2 INSTALLATION

A. Open-Cut Installations

1. Polyethylene pipe and fittings shall be installed in accordance with ASTM Standards, and the manufacturer's recommendations.

2. Pipe is to be lifted or rolled into position, not dragged over the prepared bedding.

3. The pipe is to be set at the slope and grades indicated on the plans. Ensure pipe remains at proper grades by shoring it.

4. All HDPE piping shall be bedded in 6" of crushed stone unless noted otherwise.

5. Crushed stone shall be used as backfill to a point of 6" above the top of the pipe unless noted otherwise.

6. Open-Trench Installations - Prepare the area in accordance with Section 02315 – Excavation, Backfill and Compaction.

7. No single piece of pipe shall be laid unless it is generally straight. The centerline of the pipe shall not deviate from a straight line drawn between the centers of the openings at the ends of the pipe by more than 1/16 inch per foot of length. If a piece of pipe fails to meet this requirement check for straightness, it shall be rejected and removed from the site. Laying instructions of the manufacturer shall be explicitly followed.

8. Install piping and fittings true to alignment and grade. If necessary, each length of pipe shall be cleaned out before installation.

B. Joint Couplings

1. Joint couplings shall be installed in accordance with manufacturer's recommendations.

2. Remove the protective paper and wrap the collar around the pipe with the mastic side to the pipe. The overlap shall be at the top of the pipe.

3. Secure the steel straps.

4. The closing flap shall cover the exposed straps.

5. Encase the entire joint with a minimum of 8 inches of concrete on all sides. The concrete encasement shall extend along the pipe 12 inches on each side of the joint.

C. Mechanical Joint and Flange Installation

1. Mechanical joint (MJ) and flange connections shall be installed in accordance with the manufacturer's recommended procedure.

2. MJ adapters and flanges shall be centered and aligned to each other before assembling and tightening bolts.

3. In no case shall the MJ gland or flange bolts be used to draw the connection into alignment.

4. Bolt threads shall be lubricated, and flat washers should be used under the nuts.

5. Bolts shall be evenly tightened according to the tightening and torque pattern of the manufacturer.

3.3 PIPE JOINING

A. Heat Fusion Joining

1. Joints between plain end pipes and fittings shall be made by means of butt fusion.

2. Joints between the main and saddle branch fittings shall be made using saddle fusion procedures, as recommended by the manufacturer.

3. Fusion of pipes of the same nominal diameter but with different wall thickness is acceptable, with previous written approval of the Engineer, if the difference in wall thickness is limited to one SDR.

4. For transitions between pipes of the same nominal diameter with wall thicknesses that differ by more than one SDR, transition nipples will be required.

B. Joining by Other Means

1. The use of flanged connections, mechanical couplings, and electofusion require written approval of Engineer.

C. Joint testing

1. Butt Fusion Testing - On every day that butt fusion is to be performed, the first fusion of the day will be performed on a trial joint. After the trial joint has been allowed to cool completely, three test coupons will be cut across the joint. Each coupon shall then be bent until its opposing ends come in contact. If any of the coupons fail at the joint, the fusion will be considered unsatisfactory.

2. Vary the fusion setup and procedure and rerun the test as necessary to produce a satisfactory joint. Production butt fusion will not commence until the trial joint has satisfactorily passed this test.

3. Coupon length shall be the lesser of either twelve inches or thirty times the wall thickness. The joint shall be centered in the coupon. Coupon width shall be the greater of one inch or one and one half times the wall thickness.

END OF SECTION

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SECTION 02530

MANHOLES AND CATCHBASINS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Precast concrete manholes
2. Precast concrete catch basins
3. Cast iron manhole frames and covers
4. Cast iron catch basin frames and grates

B. Related Sections

1. Section 02503 - Testing of Sanitary Sewer and Storm Drainage Systems

1.2 REFERENCES

A. AASHTO – American Association of State Highway and Transportation Officials, Standard Specifications for Highways and Bridges, most recent edition

B. ASTM C32 - Standard Specification for Sewer and Manhole Brick (made from clay or shale)

C. ASTM A48 – Standard Specification for Gray Iron Castings

D. ASTM C150 – Standard Specification for Portland Cement

E. ASTM C207 – Standard Specification for Hydrated Lime for Masonry Purposes

F. ASTM C478 – Standard Specification for Precast Reinforced Concrete Manhole Sections

G. ASTM C443 – Standard Specification for Joints for Circular Concrete Sewer and Culvert Piping Using Rubber Gaskets

H. ASTM C923 - Standard Specification for Resilient Connectors between Reinforced Concrete Manhole Structures, Pipes and Laterals

I. ASTM C990 – Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants

J. ASTM C1157 - Standard Performance Specification for Hydraulic Cement

1.3 SUBMITTALS

A. Submit Shop Drawings, showing all details of construction, including, but not limited to, structure dimensions, reinforcing, joints, and pipe connections to structures.

B. Submit on all materials and products included in this specification, including, but not limited to, precast concrete structures, manhole rungs, manhole frames and covers, dampproofing coating, brick masonry, mortar, non-shrink water-proof grout, and catch basin frames and grates.

C. Submit weights of manhole frames and covers and catch basin frames and grates.

D. Submit design calculations including verification of adequate anti-flotation features and lateral earth pressures. Calculations shall verify that the manhole structure has been designed to withstand the burial depth, submergence due to flooding, flotation, and dead and live loads.

E. As specified in Section 01330, submit certifications regarding all iron or steel products that all manufacturing processes occurred in the US.

1.4 QUALITY ASSURANCE

A. The quality of materials, the process of manufacture, and the finished sections shall be subject to inspection and approval by the Engineer, or other representative of the Owner. Such inspection may be made at the place of manufacture, or at the Site after delivery, or at both places, and the materials shall be subject to rejection at any time on account of failure to meet any of the Specification requirements, even though samples may have been accepted as satisfactory at the place of manufacture. Material rejected after delivery to the job shall be marked for identification and shall be removed from the job at once. Materials which have been damaged after delivery will be rejected, and if already installed, shall be acceptably repaired, if permitted, or removed and replaced, at no additional cost to the Owner.

B. At the time of inspection, the materials will be carefully examined for compliance with the latest ASTM designation specified and these Specifications, and with the approved manufacturer's drawings. Manhole sections will be inspected for general appearance, dimension, "scratch-strength," blisters, cracks, roughness, and soundness. The surface shall be dense and close-textured.

C. Imperfections in manhole sections may be repaired, subject to the approval of the Engineer, after demonstration by the manufacturer that strong and permanent repairs result. Repairs will be carefully inspected before final approval. Cement mortar used for repairs shall have a minimum compressive strength of 4,000 psi at 7 days and 5,000 psi at 28 days, when tested in 3 inch by 6 inch cylinders stored in the standard manner. Epoxy mortar may be utilized for repairs subject to the approval of the Engineer.

D. Personnel shall have confined space entry training as appropriate for the work to be performed.

E. Manholes and catch basins shall be designed for lateral earth pressures and to resist flotation.

PART 2 PRODUCTS

2.1 AMERICAN IRON AND STEEL

A. All iron and steel products included in this section shall be manufactured in the US. Refer to Section 00800 for further description of the American Iron and Steel requirement.

2.2 PRECAST CONCRETE MANHOLE AND CATCH BASIN SECTIONS

A. Precast concrete barrel sections and transition top sections, shall conform to ASTM C478 and the following requirements:

1. The wall thickness shall not be less than 5 inches for 48 inch diameter reinforced barrel sections, 6 inches for 60 inch diameter reinforced barrel sections and 7 inches for 72 inch diameter reinforced barrel sections.

2. Top sections shall be eccentric except that flat top sections shall be used where shallow cover requires a top section less than 4 feet.

3. Barrel sections shall have tongue and groove joints.

4. All sections shall be cured by an approved method and shall not be shipped nor subjected to loading until the concrete compressive strength has attained 3,000 psi and not before 5 days after fabrication and/or repair, whichever is longer.

5. Precast concrete barrel sections with precast top slabs and precast concrete transition sections shall be designed for a minimum of AASHTO HS20-44 loading plus the weight of the soil above at 120 pcf.

6. The date of manufacture and the name and trademark of the manufacturer shall be clearly marked on each precast section.

7. Precast concrete bases shall be monolithically constructed. The thickness of the bottom slab of the precast bases shall not be less than the barrel sections or top slab whichever is greater. Precast concrete bases shall be constructed with a 6 inch extended base, unless otherwise shown on the Drawings.

8. Knock out panels for piping shall be provided in precast sections at the locations shown on the Drawings. They shall be integrally cast with the section, 2½ inches thick and shall be sized as shown on the Drawings. There shall be no steel reinforcing in knock out panels.

9. The side wall height of the base section shall be a minimum of 12 inches above the top of the pipe coming into the manholes and catch basins.

10. A 4'-0" deep sump shall be provided below catch basin outlet pipes.

2.3 BRICK MASONRY

A. Bricks shall be good, sound, hard and uniformly burned, regular and uniform in shape and size, of compact texture. Underburned or salmon brick will not be acceptable and only whole brick shall be used unless otherwise permitted. In case bricks are rejected by the Engineer, they shall be immediately removed from the site of the work and satisfactory bricks substituted, at no additional cost to the Owner.

1. Bricks for the channels and shelves shall comply with the latest specifications of ASTM C32 for Sewer Brick, Grade SM.

2. Bricks for building up and leveling manhole frames shall conform to ASTM C32 Grade MS.

3. Poured concrete inverts will not be allowed.

B. Mortar used in the brickwork shall be composed of one part Type II portland cement conforming to ASTM C150 to two parts sand to which a small amount of hydrated lime not to exceed 10 lbs. to each bag of cement shall be added.

C. Sand used shall be washed, cleaned, screened, sharp and well graded as to different sizes and with no grain larger than will pass a No. 4 sieve. Sand shall be free from

vegetable matter, loam, organic or other materials of such nature or of such quantity as to render it unsatisfactory.

D. Hydrated lime shall conform to ASTM C207, Type S.

2.4 MANHOLE FRAMES AND COVERS

A. Manhole frames and covers shall be of good quality, strong, tough, even grained cast iron, smooth, free from scale, lumps, blisters, sand holes and defects of any kind. Manhole covers and frame seats shall be machined to a true surface. Castings shall be thoroughly cleaned and subject to hammer inspection. Cast iron shall conform to ASTM A48, Class 30B or ASTM A48, Class 35B.

B. Manhole covers shall have a diamond pattern, pickholes and the word "SEWER" or “DRAIN”, as appropriate, cast in 3 inch letters. Manhole frame and covers shall be manufactured by East Jordan Iron Works; Mechanics Iron Foundry; Neenah Foundry or equal.

C. Manhole frames and covers shall be approved for use by the Massachusetts Department of Transportation – Highway Division.

D. Manhole frames and covers shall comply with the detail shown on the Drawings.

E. Manhole frames and covers shall be designed for a minimum of AASHTO HS20-44 loading.

F. Watertight manhole frames and covers shall be bolted and gasketed.

2.5 CATCH BASIN FRAMES AND GRATES

A. Catch basin frames and grates shall be of good quality, strong, tough, even grained cast iron, smooth, free from scale, lumps, blisters, sand holes and defects of any kind which render them unfit for the service for which they are intended. Grate and frame seats shall be machined to a true surface. Castings shall be thoroughly cleaned and subject to hammer inspection. Cast iron shall conform to ASTM A48, Class 30B or ASTM A48, Class 35B.

B. The catch basin frames and grates shall comply with the details shown on the Drawings.

C. Catch basin frames and grates shall be designed for a minimum of AASHTO HS20-44 loading.

2.6 JOINTING PRECAST MANHOLE SECTIONS

A. Tongue and groove joints of precast manhole sections shall be sealed with a preformed flexible joint sealant. The preformed flexible joint sealant shall conform to ASTM C990.

2.7 MANHOLE RUNGS

A. Manhole rungs shall be drop front design, 14 inches wide with an abrasive step surface, steel reinforced, copolymer, polypropylene, plastic. Manhole rungs shall conform to OSHA requirements.

2.8 FLEXIBLE PIPE TO-STRUCTURE CONNECTORS

A. The flexible pipe-to-structure connectors shall be designed to provide a positive seal between the connector and the structure wall and between the connector and the pipe.

B. The flexible boot shall be manufactured of EPDM synthetic rubber in accordance with ASTM C443 and C923 and shall be 3/8 inch thick or greater.

C. The external bands shall be made entirely of 304 series non-magnetic stainless steel.

D. The flexible connectors shall be provided with a wedge-type or toggle-type expander to secure the pipe in the structure opening.

E. The flexible connectors shall meet the following criteria, in accordance with ASTM C923:

1. Shall not leak when subjected to a head pressure of 10 psi for 10 minutes.

2. Shall have the ability to deflect 7 degrees in any direction without leakage under the head pressure conditions described above.

3. Shall not leak when subject to a load of 150 lbs./in. pipe diameter and the head pressure conditions described above.

2.9 DAMPPROOFING

A. Dampproofing is required for all sanitary sewer structures.

B. Provide two coats of bituminous dampproofing on outer surfaces of precast manholes at the rate of 20-25 square feet per gallon in accordance with manufacturer's instructions.

C. Dampproofing coating shall be a factory-applied asphalt compound specially made to adhere to below grade concrete structures.

2.10 NON-SHRINK, HYDRAULIC CEMENT

A. Hydraulic cement shall be non-shrink, fast-setting, complying with ASTM C1157.

B. Hydraulic cement shall have a minimum 7-day compressive strength of 3,000 psi and a minimum 28-day compressive strength of 5,000 psi.

PART 3 EXECUTION

3.1 INSTALLATION

A. Installation

1. Construct manholes and catch basins to the dimensions shown on the Drawings and as specified. Protect all work against flooding and flotation.

2. Set precast concrete barrel sections so as to be plumb and with sections in true alignment with a ¼ inch maximum tolerance to be allowed.

3. Install the precast sections in a manner that will result in a watertight joint. Seal the joints of precast concrete barrel sections with the preformed flexible joint sealant used in sufficient quantity to fill 75% of the joint cavity. Fill the outside and inside precast section joints with hydraulic cement and finish flush with the adjoining surfaces. Plug holes in the concrete barrel sections required for

handling or other purposes with a hydraulic cement or concrete and rubber plugs, and finish flush on the inside.

4. Backfilling shall be done in a careful manner, bringing the fill up evenly on all sides.

B. Pipe Connections

1. Stubs

a. Connect pipe stubs for future extensions to the structures as shown on the Drawings and close the stub end by a suitable watertight plug.

2. For pipes with smooth exterior surfaces (PVC, ductile iron, HDPE pressure pipe, steel, etc), use flexible pipe-to-structure connectors.

3. Where flexible pipe-to-structure connectors cannot be used, such as pipes with rough, irregular or corrugated exterior surfaces (concrete, corrugated metal, HDPE drainage pipe, etc):

a. After the new pipe has been set in place, completely fill the hole around the new pipe and structure with non-shrink, hydraulic cement.

b. Place a 6 inch thick concrete encasement a total of 12 inches in length around the pipe stub adjacent to the exterior wall of the structure. Concrete shall have a 28 day compressive strength of 3,000 psi.

C. Manhole Rung Installation

1. Steel reinforced copolymer polypropylene plastic steps shall be press fitted by hand driven hammer into preformed holes in cured precast sections, on 12 inch centers, by the precast concrete manufacturer.

D. Brickwork

1. Mix mortar only in such quantity as may be required for immediate use and use before the initial set has taken place. Do not retain mortar for more than one and one-half hours and constantly work over with a hoe or shovel until used. Anti-freeze mixtures will not be allowed in the mortar. No masonry shall be laid when the outside temperature is below 40°F unless provisions are made to protect the mortar, bricks, and finished work from frost by heating and enclosing the work with tarpaulins or other suitable material. The Engineer's decision as to the adequacy of protection against freezing shall be final.

2. Construct channels and shelves of brick as shown on the Drawings. The brick channels shall correspond in shape with the lower half of the pipe. The top of the shelf shall be set at the elevation of the crown of the highest pipe and shall be sloped 1 inch per foot to drain toward the flow through channel. Construct brick surfaces exposed to sewage flow with the nominal 2 inch by 8 inch face exposed (i.e., bricks on edge).

3. Set manhole covers and frames and catch basin frames and grates in a full mortar bed and bricks, a maximum of 12 inches thick for conical tops and 6 inches thick for flat top sections, utilized to assure frame and cover are set to the existing grade. Reset the manhole frames and covers and catch basin frames and grates to final grade prior to placement of final paving.

3.2 LEAKAGE TEST

A. Leak test sewer manholes in conjunction with the pipeline in accordance with Section 02503.

3.3 CLEANING

A. Clean new manholes and catch basins of silt, debris and foreign matter of any kind, prior to final inspection.

END OF SECTION

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SECTION 02635

REINFORCED CONCRETE PIPE AND FITTINGS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Reinforced concrete pipe and fittings,

a. Storm drains

B. Related Sections

1. Section 02315 - Excavating, Backfill, Compaction, and Dewatering

2. Section 02320 - Borrow Material

3. Section 02530 – Precast Concrete Manholes and Catchbasins

1.2 REFERENCES

A. ASTM C14 – Standard Specification for Concrete Sewer, Storm Drain, and Culvert Pipe

B. ASTM C33 – Standard Specification for Concrete Aggregates

C. ASTM C76 – Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe

D. ASTM C150 – Standard Specification for Portland Cement

E. ASTM C330 – Standard Specification for Lightweight Aggregates for Structural Concrete

F. ASTM C361 – Standard Specification for Reinforced Concrete Low-Head Pressure Pipe

G. ASTM C443 – Standard Specification for Joints for Concrete Sewer and Culvert Piping, Using Rubber Gaskets

H. ASTM C444 – Standard Specification for Perforated Concrete Pipe

I. ASTM C478 – Standard Specification for Precast Reinforced Concrete Manhole Sections

J. ASTM C497 – Standard Test Methods for Concrete Pipe, Manhole Sections, or Tile

K. ASTM C506 – Standard Specification for Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe

L. ASTM C507 – Standard Specification for Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe

M. ASTM C655 – Standard Specification for Reinforced Concrete D-Load Culvert, Storm Drain, and Sewer Pipe

N. ASTM C822 – Standard Terminology Relating to Concrete Pipe and Related Products

O. ASTM C923 – Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals

P. ASTM C924 – Standard Practice for Testing Concrete Pipe Sewer Lines by Low-Pressure Air Test Method

Q. ASTM C969 – Standard Practice for Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines

R. ASTM C985 – Standard Specification for Nonreinforced Concrete Specified Strength Culvert, Storm Drain, and Sewer Pipe

S. ASTM C1103 – Standard Practice for Joint Acceptance Testing of Installed Concrete Pipe Sewer Lines

T. ASTM C1131 – Standard Practice for Least Cost (Life Cycle) Analysis of Concrete Culvert, Storm Sewer, and Sanitary Sewer Systems

U. ASTM C1214 – Standard Test Method for Concrete Pipe Sewerlines by Negative Air Pressure (Vacuum) Test Method

V. ASTM C1244 – Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill

W. ASTM C1433 – Standard Specification for Precast Reinforced Concrete Box Sections for Culverts, Storm Drains, and Sewers

X. ASTM D412 – Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers - Tension

Y. ASTM D2240 – Standard Test Method for Rubber Property – Durometer Hardness

Z. ASTM D3034 – Standard Specification for Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings

AA. ASTM F477 – Standard Specifications for Elastomer Seals (Gaskets) for Joining Plastic Pipe

BB. AWWA C301 –Prestressed Concrete Pressure Pipe, Steel Cylinder Type, for Water and Other Liquids

CC. AWWA C302 – Reinforced Concrete Pressure Pipe, Noncylinder Type

1.3 SUBMITTALS

A. Manufacturer's product data including shop drawings showing dimensions and details of pipe joints and fittings.

B. Installation instructions.

C. Provide Certificates of Compliance on pipe materials.

D. As specified in Section 01330, submit certifications regarding all iron or steel products that all manufacturing processes occurred in the US.

1.4 QUALITY ASSURANCE

A. The manufacturer shall be responsible for the performance of all acceptance tests as specified in ASTM C76.

B. Pipe shall not be shipped until the compressive strength of the concrete has attained 4,000 psi and not before 5 days after manufacture, and/or repair, whichever is the longer.

C. All materials furnished by the Contractor are subject, at the discretion of the Engineer, to inspection and approval at the plant of the manufacturer. All inspection will be carried out by the Engineer and will be carried out at no direct expense to the Contractor.

1.5 DELIVERY, STORAGE AND HANDLING

A. All pipe which has been damaged after delivery will be rejected and immediately removed from the site.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Oldcastle Precast;

B. Kerr Concrete Pipe;

C. Rinker;

D. or equal.

2.2 MATERIALS

A. Standard laying length of pipe shall be not less than 7'-6", except for fittings and manhole stubs.

B. The pipe interior shall be smooth and even, free from roughness, projections, indentations, offsets, or irregularities of any kind. The concrete mass shall be dense and uniform.

C. The pipe shall be clearly marked as outlined in ASTM C76. The markings may be at either end of the pipe for the convenience of the manufacturer, but for any one size shall always be at the same end of each pipe length.

D. After manufacture, each length of pipe shall be checked against the length noted on the shop drawings. Variations in length of the same pipe shall not exceed ASTM C-76 requirements.

2.3 NON-WATERTIGHT APPLICATIONS

A. Reinforced concrete pipe for non-watertight applications shall be either:

1. Bell and Spigot Type

2. Tongue and Groove Type

3. Straight Wall Joint Type

4. Slip Joint Type

B. Pipe with collar in lieu of integral bells will not be acceptable.

C. Pipe shall be Class 4 with a minimum concrete strength of 4,000 psi.

D. Joints shall be mortar type.

E. Field leakage testing is not required.

F. Grout shall be non-shrink type and shall be premixed.

2.4 REPAIR APPLICATIONS

A. Joints for reinforced concrete pipe shall be caulked with cement mortar on the interior and exterior faces of the joint.

B. Cement mortar shall be composed of one part Portland cement and two parts sand by volume.

C. Mortar shall be used within 30 minutes after the mixing of water has occurred.

D. Concrete collars shall be Class A concrete, 6 inches thick and 12 inches minimum on either side of the joint with 6" wide strip of filter fabric around the joint.

PART 3 EXECUTION

3.1 PREPARATION

A. All materials to be used on the project are subject to inspection in the field by the Engineer.

B. Prepare the area prior to placement of the pipe by removing stones and other hard foreign matter that could damage the pipe, impede consistent compaction, or cause improper bedding and invert grades of the pipe.

C. Excavation, trenching and back filling procedures shall be in accordance with Section 02315.

D. No pipe is to be laid in water, in an unsuitable trench or during unsuitable weather conditions.

E. Excavate bell holes at each joint to permit correct assembly and inspection of entire joint.

F. Verify that the surface has been prepared to the proper line and grade by shooting invert elevation grades.

G. Lift or roll pipe into position. Do not drag over the prepared bedding.

3.2 INSTALLATION

A. General

1. Concrete pipe shall be installed in accordance with ASTM Standards and the manufacturers recommendations.

2. Pipe laying shall proceed upgrade with the spigot ends pointing in the direction of flow.

3. No single piece of pipe shall be laid unless it is generally straight. The centerline of the pipe shall not deviate from a straight line drawn between the centers of the openings at the ends of the pipe by more than 1/16 inch per foot

of length. If a piece of pipe fails to meet this requirement check for straightness, it shall be rejected and removed from the site. Laying instructions of the manufacturer shall be explicitly followed.

4. Thoroughly clean pipe and fittings before installing. Keep them clean until they are used in the work, and conform to the lines, grades, and dimensions required when installed.

5. All materials found to have cracks, flaws or other defects, during the progress of the work, will be rejected by the Engineer. All defective materials furnished by the Contractor shall be promptly removed by him from the site at no additional cost to the Owner.

6. Bell or spigot joint surfaces that are out of round shall be aligned to meet this requirement or shall be rejected as unsatisfactory and removed from the job, at the sole discretion of the Engineer.

7. Pipe sections connecting to manholes shall have a joint in each line within 2 feet of the outside face of each manhole or structure.

8. Plug or close off pipes, which are stubbed off for a manhole, concrete structure, or for future connection by others, with temporary watertight plugs.

9. Set pipe at the slope and grades indicated on the Drawings. Ensure pipe remains at proper grades by shoring it.

10. Pipe bedding shall form a continuous and uniform bearing and support for the pipe barrel between joints. Pipe shall not rest directly on the bell or pipe joint.

11. Backfill around the sides of the pipe with the approved bedding material up to the crown of the pipe.

B. Non-Watertight Joints

1. After cement mortar is applied, wrap joints with filter fabric, 24-inch wide strips of filter fabric overlapping ends in 12-inch minimum. Secure with tape.

C. Repair Joints

1. When laying bell and spigot type pipe, the spigot end shall be centered in the bell and the pipe forced home and brought to correct line and grade.

2. The pipe shall then be secured in place with approved backfill material tamped under the pipe and around the barrel of the pipe in the vicinity of the middle of the length. This material in to be placed and tamped prior to cementing the joint.

3. Joints of concrete pipe in the trench, which cannot be cemented immediately, shall be maintained in a dry condition and a cloth covering shall be laid over the top of the joint so as to prevent the entry of dirt or other deleterious material.

3.3 CLEANING

A. Prior to final acceptance and final manhole-to-manhole inspection of the system by the Engineer, flush and clean all parts of the system. If any foreign matter is still

present in the system, reflush and clean the sections and portions of the lines as required.

B. Remove all accumulated construction debris, rocks, gravel, sand, silt, and other foreign material from the sewer system at or near the closest downstream manhole. If necessary, use mechanical rodding or bucketing equipment.

END OF SECTION

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SECTION 02730

STABILIZED AGGREGATE SURFACING

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 this work consists of all materials, equipment, labor and services required to supply and place STABILIZED GRANITE AGGREGATE PAVING as indicated on the Contract Documents and as specified.

B. Supplying, mixing, and placing Stabilized Granite Aggregate Paving shall include but not be limited to the following:

1. Stabilized granite aggregate paving with Organic-Lock binder

1.3 REFERENCES

A. Comply with applicable requirements of:

1. Commonwealth of Massachusetts, MassDOT Standard Specifications and Supplements, latest edition, Boston, Massachusetts.

2. Other authorities having jurisdiction. Provide labor, materials, equipment and services to comply with requirements.

3. ASTM C136 / C136M – 14, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates, ASTM International, West Conshohocken, PA, 2014, www.astm.org

4. ASTM D2419 – 14, Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregates, ASTM International, West Conshohocken, PA, 2014, www.astm.org

5. ASTM F1951 – 14, Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment, ASTM International, West Conshohocken, PA, 2014, www.astm.org

1.4 SUBMITTALS

A. At least 30 days prior to intended use, the Contractor shall provide the following samples and submittals for approval in conformance with the requirements of Division 1 Section, SUBMITTALS. Do not order materials until DCR Project Manger'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 Project Manager reserves the right to reject on or after delivery any material that does not meet these Specifications.

1. Manufacturer's product data sheet and installation instructions.

2. 1-quart sample of base course.

3. 1-quart sample of stabilized crushed aggregate paving.

4. Base Course gradation indicating that the product meets specifications

5. Stabilized crushed aggregate gradation indicating that the product meets specifications.

6. Manufacturer's Material Safety Data Sheet.

1.5 QUALITY ASSURANCE

A. Qualifications: Contractor shall have minimum five years' experience in installation of stabilized granite aggregate paving.

B. Regulatory Requirements

1. Secure permits, licenses, and pay fees including traffic control.

2. Comply with laws, regulations, and quarantines for agricultural and horticultural products.

1.6 MOCKUP

A. Install 20 square feet minimum of stabilized crushed aggregate paving including base course and edge conditions at location approved by DCR Project Manager.

1. Rework mockup as required for approval.

2. Actual installation work shall match approved mockup in workmanship and appearance.

3. Protect and maintain approved mockup, undisturbed and undamaged until final installation is approved.

B. Allow DCR Project Manager to view mockup before proceeding with rest of stabilized crushed aggregate paving.

C. Remove mockup after acceptance of work specified in this Section.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Packing and Shipping: deliver materials in unopened containers bearing the manufacturer's name. Transport materials without damage. Protect finishes from abrasion, dirt, oils, grease, and chemicals. Pack materials to protect from weather.

B. Delivery:

1. Delivery of Organic-Lock is available from the manufacturer or select Organic-Lock dealers. Please contact the manufacturer for more information.

2. Delivery of Organic-Lock pre-blended with aggregate is available from select dealers. Contact your closest dealer or the manufacturer for more information.

C. Handling:

1. Wear appropriate respirator when ventilation is inadequate. Avoid contact with skin and eyes.

D. Storage:

1. Protect stabilized crushed aggregate mix from contamination. Store under cover.

1.8 PROJECT/SITE CONDITIONS

A. Environmental Requirements: Do not work soils when dry, wet, or frozen.

B. Ensure that the subgrade and base are properly graded and compacted to required specifications.

C. Do not install the Organic-Lock pathway aggregate during rain. Rain within 3-5 days after installation will increase curing time.

D. Do not install Organic-Lock Aggregate when temperatures are below 40 degrees Fahrenheit.

E. Protect all nearby surfaces, plants, and structures from possible contamination from materials or damage by equipment.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Organic-Lock for Organic-Lock stabilized pathway aggregate provided by:

1. Envirobond Products Corporation, 6191-2100 Bloor Street West, Toronto, Canada M6S 5A5. Phone: (866) 636-8476. Email: info@envirobond.com. Websites: www. Envirobond.com and www.organic-lock.com

B. Local Supplier:

1. Read Custom Soils (A.D. Makepeace), 5 Pond Park Road, Hingham, MA, 02043, phone: (781) 828-6300.

2.2 MATERIALS

A. Crushed Aggregate Materials:

1. Crushed Granite Aggregate Material shall consist of sound, angular, durable particles.

a. Color: Beige – as per Read Custom Soils Stonedust Color Chart

B. Gradation, in accordance with ASTM C136:

Optimal Gradation		
Sieve	Sieve Size (mm)	Percent Passing
4	4.75	80-100%
8	2.36	65-90%
16	1.18	40-65%
30	0.6	25-55%
50	0.3	15-35%

100	0.15	10-20%
200	0.075	5-15%

C. Organic-Lock Binder

1. Patented powdered organic binder designed to be blended with crushed aggregate.

2. Made from 100% naturally occurring materials.

D. Base Course: Dense-Graded Crushed Stone: shall conform to the requirements of item M2.01.7 of the MHD Standard Specifications for Highways and Bridges, dated 1988, Dense-graded crushed stone shall be used at the locations shown on the Drawings or indicated in the Specifications.

PART 3 EXECUTION

3.1 PREPARATION

A. Prepare the Subgrade

1. Excavate the area to the depth required so that finish grade can be established as noted on plans.

2. Light traffic pathways will require a full depth of 12 - 16 inches: 8 - 12 inches of compacted base depth together with 4 inches of compacted Organic-Lock Pathway Aggregate.

3. Compact the subgrade to 95% Modified Proctor Density.

B. Prepare the Base

1. Spread the base material to approved depth. Crushed, granular road base such as 3/4" minus is an optimal base material.

2. Light Traffic Pathway will require 8 - 12 inches of compacted base material.

3. Depending upon the method of compaction the installation of base material may require separate lifts. 4 inches can be compacted in a single lift with a minimum 2-ton compaction roller.

4. Compact the subgrade to 95% Modified Proctor Density using a single or double drum static roller or vibratory compactor.

5. Install temporary wood form edges secured to the ground.

3.2 WATERSHED MANAGEMENT

A. Crowns and/or cross-slopes must be incorporated into the compacted base material.

B. If the slope is 2% or lower, a crown should be incorporated into the pathway.

C. If the slope is greater than 2%, incorporate a cross-slope.

D. Note: The addition of crowns and cross-slopes is heavily dependent upon surrounding watershed.

3.3 SPREADING

A. Install stone screenings/binder surfacing according to manufacturer's guidelines, directions, recommendations and as specified herein.

B. Promptly after mixing is completed, place, spread, screed and rake stone screenings/binder mixture to required grade, cross section and depth, smoothly finished, using steel tine rake.

1. Avoid segregation by placing in two 2" lifts for 4" thickness or as otherwise indicated on drawings in lifts no more than 3" deep.

2. Compact material with one-ton compactor, making three to four passes. Do not use vibratory unit.

a. 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.

3. Compaction will vary with different aggregates due to particle shape and size. It will compact 20-25%, less if using paving machinery. This level of compaction needs to be monitored as early as possible (starting during the test plot) to determine the actual degree of compaction. It is better to put down too much material and to remove it from the top than to put down too little and add a layer later.

4. Compact to 95% Modified Proctor Density.

C. Water lightly, but thoroughly, with spray nozzle set to light spray to achieve full depth moisture penetration. Adjust pressure so as not to disturb leveled surface.

1. Because water activates binder, assure that full depth of stone screenings/binder material is wetted.

2. When water sheen has disappeared and surface looks damp, compact again.

a. If surface lifts because it is too wet, re-rake area to a depth of 1" – 2", level with back of rake and re-roll.

3. Provided the moisture content of the Organic-Lock 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 the Organic-Lock Installation Guidelines Brochure for more information.

D. Plan operations so as to work away from finished work, not across or over it, to avoid spoiling surface finish.

3.4 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, a minimum of 24-72 hours.

3.5 REPAIRS AND PROTECTION

A. Excavate the damaged area and scarify exposed Organic-Lock Pathway Aggregate.

B. Pre-blend the replacement crushed stone aggregate material with Organic-Lock at 28-34 lbs/imperial ton. Apply the material to the excavated area and compact. Thoroughly water the material to achieve 8-10% moisture content. Use the "snowball test" to determine moisture content - refer to Organic-Lock Installation Guidelines Brochure for details.

C. Allow the newly installed Organic-Lock Pathway Aggregate to cure, but not completely dry out.

D. Re-compact the material, ensuring that the final grade and crown are maintained.

3.6 MAINTENANCE

A. All outdoor products require a level of maintenance analysis. It is recommended to do a thorough analysis of your installed Organic-Lock blended aggregate 7 days after installation followed by monthly analysis to ensure no alterations are required.

END OF SECTION

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SECTION 02740B

BITUMINOUS CONCRETE PAVEMENT

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Hot Mix Asphalt (HMA) paving

2. Porous Pavement

B. For the purposes of this Section, Hot Mix Asphalt (HMA) and bituminous concrete have the same meaning.

C. Related Requirements

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

1.2 REFERENCES

A. Massachusetts Department of Transportation (MassDOT)

1. Standard Specifications for Highways and Bridges 2026 Edition (hereafter referred to as the Standard Specifications)

a. Division II – Construction Details

b. Division III – Materials Specifications

B. ASTM D2041 - Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures

C. AASHTO Standard Specifications for Transportation Materials and Methods of Sampling and Testing, 1990 Edition, as amended

D. AASHTO M 320

E. AASHTO T 96 – L.A. Abrasion Test

F. AASHTO T 195 (Ross Count)

G. TAI - (The Asphalt Institute) - MS-3 Asphalt Plant Manual

H. TAI - (The Asphalt Institute) - MS-8 Asphalt Paving Manual

1.3 RELATIONSHIP OF SECTION 03930 TO MASSDOT STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS

A. Conflicts between the Standard Specifications and Section 02740 shall be resolved in favor of the Standard Specifications. Conflicts between the Standard Specifications and the remainder of the project manual shall be resolved in favor of the Standard Specifications.

1.4 SUBMITTALS

A. Job mix formula for each mix specified under this Section.

B. Product data sheets for all additives proposed in the mix design.

C. Certificate indicating the mixes specified meet or exceed the requirements specified herein.

D. In place HMA compaction test results.

E. Certificate indicating the mix plant conforms to TAI Manual MS-3, and Subsection 450 of the Standard Specifications

F. Equipment Data Sheets for all equipment proposed for use placing the Hot Mix Asphalt (HMA).

G. A contract specific Quality Control Plan (QCP).

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with TAI Manual MS-8., and Subsection 450 of the Standard Specifications.

B. Mixing Plant: Conform to TAI Manual MS-8., and Subsection 450 of the Standard Specifications.

C. Obtain materials from same source throughout.

D. Prior to placing permanent HMA, hold a pre-paving meeting on the Site. All parties directly involved in the preparation and placement of permanent HMA on the Project shall attend, including but not limited to the paving subcontractor(s) project manager(s), QC representative, crew foreman, General Contractor's Superintendent, and the Engineer.

E. In place compaction of HMA shall be performed every 100 ft., along the roadway alignment, for each individual lift.

F. Material samples shall be taken at the plant for every 500 tons or daily, whichever is more frequent, and analyzed for asphalt content and theoretical maximum density. Test results from the design mix material will not be accepted.

G. Schedule crews and equipment to perform rolling operations in accordance with the heat flow model outlined in the latest version of the paving software "PaveCool," developed by University of Minnesota and weather data input into the software. Weather data shall be gathered approximately 12 hours prior to paving operations, using the website, www.weather.com, for forecasted conditions for the time of paving.

PART 2 PRODUCTS

2.1 MATERIALS

A. General

1. Bituminous materials shall conform to the requirements of these Specifications.

2. Bitumen delivered to the Project or to a mix plant must be accompanied by a proper certificate signed by the producer's authorized representative. Shipments of material not accompanied by a certificate will not be accepted for use in the Work.

B. HMA paving along the roadway shall be Superpave Surface Course - 9.5 and Superpave Leveling Course – 9.5 in accordance with Subsection 450 of the Standard Specifications. HMA paving along the bridge shall be Superpave Bridge Surface Course – 9.5 and Superpave Bridge Protective Course – 9.5 in accordance with Subsection 450 of the Standard Specifications.

C. Hot Mix Asphalt

1. These mixtures shall be composed of mineral aggregate, mineral filler (if required), bituminous material, and reclaimed asphalt pavement (RAP). The use of RAP shall be at the Contractor's option unless otherwise provided by the special provisions of the contract.

2. Plants producing recycled mix shall be equipped so that they can properly proportion, blend and mix all components of a recycled mixture so that the end product is in conformance with the designated job-mix formula.

3. The mineral aggregate, filler (if required), bituminous material, asphalt modifier (if required) and RAP shall be proportioned and mixed to conform with the designated mixture as indicated by MassDOT.

4. In order to obtain standard texture, density and stability, provide a specific Job-Mix Formula for the particular uniform combination of materials and sources of supply to be used on the Project. The Job-Mix Formula for each mixture shall establish a single percentage of aggregate passing each required sieve size, a single percentage of bituminous material to be added to the aggregate and for batch plants, the number of seconds for dry mixing time and the number of seconds for wet mixing time. AASHTO T 195 (Ross Count) with a coating factor of 98% will be used when necessary to evaluate proper mixing time. The Job-Mix Formula shall also specify a single source or uniform blend of particular sources for fine aggregate, a single source for each nominal size of coarse aggregate, a single source of supply for minor filler and sources for asphalt. The Job-Mix Formula shall bind the Contractor to furnish paving mixtures not only within the master ranges, but also conforming to the exact formula thus set up for the Project, within allowable tolerances as follows:

No. 4 and larger sieve	±7.0%
No. 8 and smaller sieves, except No. 200	±4.0%
Passing No. 200 sieve	±2.0%
Asphalt	±0.4%

5. The use of RAP will be permitted at the option of the Contractor and provided that the end product is in conformance with the designated Job-Mix Formula. The proportion of RAP to virgin aggregate shall be limited to a maximum of 40% for drum mix plants and 20% for modified batch plants. The maximum amount of RAP for surface courses shall be 10%.

6. Two or more Job-Mix Formulas may be approved for a particular plant; however, only material conforming to one Job-Mix Formula will be permitted to be used on any given calendar day. The Job-Mix Formula shall bind the Contractor to furnish paving mixtures not only within the master ranges, but also conforming to the exact formula thus set up for the Project.

7. Coarse Aggregate

   a. The coarse mineral aggregate shall be clean, crushed rock consisting of the angular fragments obtained by breaking and crushing shattered natural rock, free from a detrimental quantity of thin or elongated pieces, free from dirt or other objectionable materials, and shall have a percentage of wear, as determined by the Los Angeles Abrasion Test (AASHTO T 96), of not more than 30. It shall be surface dry and shall have a moisture content of not more than 0.5% after drying. The use of crushed gravel stone will not be permitted.

8. Fine Aggregate

   a. The fine aggregate shall consist of one of the following:

      1) 100% Natural Sand

      2) 100% Stone Sand

      3) A blend of sand and stone screenings the proportions of which shall be approved by the Engineer

      4) A blend of natural sand and stone sand

   b. Natural sand shall consist of inert, hard, durable grains of quartz or other hard, durable rock, free from topsoil or clay, surface coatings, organic matter or other deleterious materials. When the primary source of material, passing the No. 200 sieve, is obtained from natural sand, these fines must be approved prior to use.

   c. Stone sand shall be a processed material prepared from stone screenings to produce a consistently graded material conforming to specification requirements.

   d. The stone screenings shall be the product of a secondary crusher and shall be free from dirt, clay, organic matter, excess fines or other deleterious material.

   e. The fine aggregate as delivered to the mixer shall meet the following requirements:

	Percent Passing	
Sieve Designation	Minimum	Maximum
3/8 in.	95	100
No. 8	70	95
No. 50	20	40
No. 200	2	16

f. In the fine aggregate sieve analysis (passing No. 8), the amount between two successive sieves (No. 16, No. 30, No. 50 and No. 100) shall not exceed 33% of the fine aggregate total.

g. Plants that experience a large variation in the quality and gradation of their primary fine aggregate sources and have difficulty in consistently providing fine aggregate that conforms to the requirements of this specification, shall be equipped with an approved fine aggregate system for processing fine aggregate that *will* meet the requirements of this specification.

D. Porous Pavement

1. The mineral aggregate, filler (if required), bituminous material, asphalt modifier (if required) and RAP shall be proportioned and mixed to conform with the table below:

Standard Sieves	Porous Pavement
2 in.	
1 in.	
3/4 in.	100
5/8 in.	
1/2 in.	85-100
3/8 in.	55-75
No. 4	10-25
No. 8	5-15
No. 16	
No. 30	
No. 50	
No. 100*	
No. 200	2-4
Bitumen	5.8-6.5

*Percentages shown in table above for aggregate sizes are stated as proportional percentages of total aggregate for the mix.

E. Reclaimed Asphalt Pavement (RAP)

1. Reclaimed Asphalt Pavement (RAP) shall consist of the material obtained from highways or streets by crushing, milling or planing existing pavements. This material shall be transported to the mix plant yard and processed through an approved crusher so that the resulting material will contain no particles larger than 1½ inches. The material shall be stockpiled on a free draining base and kept separate from the other aggregates. The material contained in the stockpiles shall have a reasonably uniform gradation from fine to coarse and shall not be contaminated by foreign materials.

F. Mineral Filler

1. Mineral filler shall consist of approved Portland Cement, limestone dust, hydrated lime, stone float or stone dust. Stone dust shall be produced from crushed ledge stone and shall be the product of a secondary crusher so processed as to deliver a product of uniform grading. Mineral filler shall completely pass a No. 50 sieve and at least 65% shall pass a No. 200 sieve.

G. Bituminous Materials

1. The asphalt cement for the mixture shall be the grade designated by the Engineer and shall conform to the requirements of Materials Section M3 of the Standard Specifications. When required an approved anti-stripping additive conforming to Section M3 of the Standard Specifications shall be added to the asphalt cement.

2. The asphalt for the porous pavement mixture shall be the grade designated by the Engineer and shall conform to the requirements of Materials Section M3 of the Standard Specifications.

3. Asphalt mixture for porous pavement shall be designed in accordance with AASHTO R 113 and conform with requirements of Table M3.06.4-7 of Materials Section M3 of the Standard Specifications.

4. Tack coat shall consist of anionic emulsified asphalt, Grade RS-1 conforming to Materials Section M3.03.1.

5. For any bituminous mixture containing RAP, submit in addition to the Job-Mix Formula, the amount and type of asphalt modifier to be added to the mixture to restore the asphalt properties of the RAP to a level that is reasonably consistent with the requirements of current specifications for new asphalt. The restored asphalt when recovered by the Abson Method from the recycled mixture shall have a minimum penetration at 77 degrees Fahrenheit of 50 and a maximum absolute viscosity at 140 degrees Fahrenheit of 800 pascal seconds.

6. Only Performance Graded Asphalt Binder grades PG 64-28 or PG 52-34 will be used as modifiers and shall meet the requirements of AASHTO M 320.

PART 3 EXECUTION

3.1 PAVING – GENERAL

A. Maintain pavement under this Contract during the guarantee period of one year and promptly (within 3 days of notice given by the Engineer) refill and repave areas which have settled or are otherwise unsatisfactory for traffic.

B. All pavement thicknesses referred to herein are compacted thicknesses. Place sufficient mix to ensure that the specified thickness of pavement results.

C. Paving operations shall be conducted so that there is no physical or thermal segregation of the hot mix asphalt material during transport or placement of the mix. Should segregation be observed by the Engineer, suspend paving operations immediately. The Engineer may reject material, which appears to be defective based on observation. Such rejected material shall not be used in the Work and shall be removed and replaced by the Contractor at no additional cost to the Owner.

D. Existing drainage patterns shall not be altered by the new pavement construction unless otherwise shown on the Drawings.

E. Furnish and spread calcium chloride on disturbed surfaces to control dust conditions when necessary, or upon direction of the Engineer.

F. No permanent mixtures shall be placed when the air temperature is below 40 degrees Fahrenheit, or when the material on which the mixtures are to be placed contains frost or has a surface temperature that the Engineer considers too low.

G. When the air temperature falls below 50 degrees Fahrenheit, extra precautions shall be taken in drying the aggregates, controlling the temperatures of the materials and placing and compacting the mixtures.

H. In no case will pavement be placed until the gravel base is dry and compacted to at least 92.0% maximum density at optimum moisture content.

I. All pavement edges that have been damaged shall be sawcut again if necessary to re-establish a straight clean line between the existing pavement and trench patch.

J. Tack Coats

1. Apply tack coat on the binder prior to placing the top course. The tack coat shall be RS-1 emulsion and shall be applied at a rate of 0.05 gallons per square yard on binder courses and streets to be overlaid.

2. Perform a test pass with tack truck. Test pass shall be used to determine how long the tack coat needs to cure prior to beginning paving operations and for operator to adjust spray bar and nozzles as necessary. Tack shall be uniformly sprayed; "streaking" will not be allowed. Placement of top course shall not occur until the tack coat cures or "breaks," with color changing from brown to black.

3. The edges of the existing pavement where the joints are to be formed shall be thoroughly coated with tack coat to ensure adhesion between the two pavements.

4. The contact surfaces of curbs, castings, and other structures shall be painted with a tack coat prior to placement of paving.

K. Place temporary HMA as soon as possible after the gravel base has been prepared, shaped and compacted for all streets, driveway and sidewalk repair. Temporary HMA shall be placed no later than the Friday following the work.

L. Temporary Pavement Guarantee Period

1. No permanent paving shall proceed until a minimum of 90 days has elapsed since placement of any temporary pavement.

M. Until such time as the final paving is performed, maintain all temporary HMA by filling any holes that may develop and by adding additional bituminous material to maintain the surface of the trench even with the adjacent pavement.

N. No pavement used as temporary trench repair shall remain as part of a final or permanent repair.

O. Top course mixes for porous pavement shall provide for 16%-19% in place air void content, all other top course mixes shall provide for 4% air voids in the finished product. The initial in-place voids shall not exceed 7.5%. Final in-place voids for non-porous shall not be below 2.5%. Additional asphalt content shall not be added for the sole purpose of reducing the in-place voids. If the in-place voids are too high or

the paving is expected to occur during cold weather, more compactive effort will be required to adjust the void content rather than increasing the asphalt content.

P. Breakdown rolling shall not occur before the HMA has cooled to a temperature of 320 degrees Fahrenheit, and shall be completed before the HMA mat has cooled to a temperature of 275 degrees Fahrenheit. Intermediate rolling shall be completed prior to the HMA mat attaining a temperature of 200 degrees Fahrenheit. Finish rolling shall be completed prior to the HMA mat attaining a temperature of 150 degrees Fahrenheit. Roller and paver speeds shall be agreed upon with the Engineer prior to placing HMA to ensure mix temperature requirements will be met.

Q. Thermal segregation of the HMA shall be limited to a maximum of 20 degrees Fahrenheit.

R. Cascading HMA material on the top of the finished mat with rakes or shovels will not be permitted. Coarse Aggregate dislodged as a result of unavoidable hand work shall be removed from the surface prior to rolling.

S. Place and compact HMA materials by steel-wheeled rollers of sufficient weight to compact the HMA to 92.5% of the calculated Theoretical Maximum Density (TMD) in accordance with ASTM D2041.

T. Along curbs, structures and all other places not accessible with a roller, the paving mixture shall be thoroughly compacted with tampers. Such tampers shall not weigh less than 25 pounds and shall have a tamping face no more than 50 square inches in size. The surface of the mixture after compaction shall be smooth and true to the established line and grade.

U. No vehicular traffic shall be permitted on the newly completed pavement until adequate stability has been attained and the material has cooled to below 140 degrees Fahrenheit or sufficiently to prevent distortion or loss of fines. HMA delivery trucks (loaded or empty) shall not be permitted on the newly completed pavement until the asphalt has cooled to below 90 degrees Fahrenheit. If the climatic or other conditions warrant, the period of time before opening to traffic may be extended at the discretion of the Engineer.

V. Following all paving, the area along the edge of all pavement shall be backed up with gravel, or loam and seed as required, so that it is flush with the adjacent paving. Whenever possible, the final surface of the backup material shall slope away from the surface edge for drainage runoff.

W. Following all paving, clean all catch basins and remove and dispose of all debris.

3.2 PAVING – HMA PAVING, PERMANENT, WEARING, BINDER, AND BASE COURSE FOR ROADS

A. Prior to placing full-width permanent HMA, notify Engineer of the intended work area at least 24 hours prior to start of work, so that Engineer can adequately inform residents regarding impacts to road access, driveways, detours, and work hours.

B. When placing permanent HMA, a pneumatic tired roller shall be used for intermediate rolling on each lift. Three rollers will be required for these roads with the pneumatic tired roller being used between the breakdown roller and the finish roller. The pneumatic

tired roller shall not be used as a breakdown roller. In addition to compaction, the purpose of this roller will be to provide a more tightly-knit, traffic resistant surface.

3.3 PAVING – BASE AND BINDER COURSE

A. Place base course as soon as possible after the gravel base has been prepared, shaped and compacted for all streets.

B. Binder course shall be placed on reclaimed or fully reconstructed roads as shown on the Drawings and as specified herein in preparation for the full-width top course.

C. Structure Adjustments

1. All manhole frames, catch basin frames and utility boxes are to be lowered prior to placement of the base course. After placing the binder course, they shall be raised to the grade of the binder course until such time as the top course is placed, unless the period of time between the placement of the binder course and the placement of the top course is less than 2 weeks, in which case the frames may be raised to the grade of the top course. All excavated materials removed for raising of the frames and utility boxes are to be replaced with concrete. This ring of concrete shall be filled flush with the surrounding binder course.

2. Adjustments to existing municipally owned utility structures and appurtenances such as drainage manholes, catch basins and gate valve boxes, both within the area of excavation and within the existing paved surface, will be carried out by the Contractor prior to installation of the top course. The raising of other structures (privately owned utilities) as required to properly complete the final paving work should be completed by the structure owners. It is the responsibility of the Contractor to coordinate all such work and to assure that all structures are properly raised in a timely manner.

D. Maintain base course in a condition suitable for traffic throughout the construction period. Defects shall be repaired within 3 days of notification.

E. Prepare the base course for placement of the top course. The base shall be graded prior to the placement of the binder course. The binder course shall be regraded, placing additional HMA where settling has occurred, repairing the existing surface and replacing broken or damaged sections at no additional cost to the Owner. The binder course surface shall be in all respects acceptable to the Engineer before the final pavement is placed. The surface shall then be broom cleaned.

3.4 FULL-WIDTH TOP COURSE

A. Roads shall be cold planed, reclaimed, or fully reconstructed as shown on the Drawings and as specified herein in preparation for the full-width binder and/or top course.

B. Prior to the start of spreading the permanent HMA top course the road surface shall be prepared. This shall include, but not be limited to sweeping, repairing, removing of debris, adjustment of all structures for the finished, compacted overlay thickness, and tack coating the surface of the road to be overlaid.

C. Surface preparation shall also include filling and shimming all trench repair and pavement areas that have not been milled, reclaimed or reconstructed which require

preparation prior to the placement of the overlay. Overlays shall not be placed over pavement areas with open seams, substantial cracks, pot-holes, depressions or other defects until proper filling and shimming has been completed.

D. The final surface shall be properly graded and cambered to provide a smooth surface of proper cross-section and blended into all adjacent existing pavements. Any permanent pavement repair that in the opinion of the Engineer does not meet this requirement, or that will form puddles 1/16-inch deep or greater shall be repaired or replaced at the Contractor's expense.

E. The finished top course shall blend smoothly with all rim elevations of catch basins, manhole covers, gate box covers, and any other utilities, and shall in no way interfere with or alter the existing surface drainage.

3.5 TEMPORARY HMA TRENCH REPAIR IN ROADWAYS

A. All manhole frames, catch basin frames and utility boxes are to be set to the grade of the trench patch until such time that permanent paving is performed. They shall then be adjusted as required by the type of permanent paving called for in this Section. Frames and utility boxes shall not be allowed to protrude above the surface of the trench patch.

B. Prior to the excavation, sawcut the existing pavement in the vicinity of the work to prevent damage to the pavement outside of the specified paylines and/or the requirements of construction. Sawcut shall be straight and neat in appearance, any milled areas adjacent to the trench patch area shall have the edges sawcut.

C. Immediately after completing the backfill, or in no event later than the end of the work day, place and compact a gravel subbase in 2 lifts of equal thickness. The gravel subbase shall be provided at a thickness that will result in a final thickness of 12-inches after permanent paving is performed. The Contractor will be allowed to backfill the remaining trenches to grade with gravel during the work week.

D. All temporary pavement and structures shall be set to the existing roadway elevations. Care shall be taken to avoid the formation of puddles.

E. A temporary HMA top course with a thickness shall then be placed and compacted so that the upper surface shall provide the proper roadway cross-section.

3.6 TEMPORARY HMA DRIVEWAY AND SIDEWALK TRENCH REPAIRS

A. Sidewalk and driveway trench repairs and preparation

1. Prior to the start of trench excavation, sawcut the existing pavement or concrete in the vicinity of the trench to prevent damage to the paving outside of the specified paylines and/or the requirements of construction. Sawcut shall be straight and neat in appearance.

2. Immediately after completing the backfill, or in no event later than the end of the work day, place and compact a gravel subbase in 2 lifts of equal thickness. The gravel subbase shall be provided at a thickness that will result in a final thickness of 12-inches after permanent paving is performed. The Contractor will be allowed to backfill the remaining trenches to grade with gravel during the work week.

3. A 2-inch thick temporary HMA top course shall then be placed and compacted so that the upper surface shall provide the proper cross-section for the sidewalk or driveway.

4. If there is no trench in a sidewalk or driveway but there is incidental construction related damage (cracks, peeling, etc.), saw cut and remove damaged pavement and complete repair in accordance with above.

3.7 HMA POROUS PAVEMENT (ACCESSIBLE PARKING SPACES AND WALKWAYS)

A. Porous pavement shall be placed in two uniform thick lifts as soon as possible after the sub base has been prepared, shaped and compacted for all areas.

B. Minimize equipment and vehicle traffic on the first course throughout the construction period. Defects shall be repaired within 3 days of notification.

C. Prepare the first course for placement of the top course. The first course shall be regraded, placing additional HMA where settling has occurred, repairing the existing surface and replacing broken or damaged sections and be broom cleaned at no additional cost to the Owner. The first course surface shall be in all respects acceptable to the Engineer before the final pavement is placed. The top surface shall then be broom cleaned and maintained free of sediment throughout the project.

3.8 QUALITY CONTROL

A. Provide a written Quality Control Plan (QCP) for the Project. As a minimum, the QCP shall contain the following information:

1. QCP shall be contract specific, stating how the contractor proposes to control the materials, equipment, and construction operations including subcontractors and suppliers as well as production facilities and transportation modes to the Project for the HMA pavement operations.

2. The QCP shall be submitted no later than 15 days prior to commencing the paving operations.

3. The QCP shall contain the name, telephone number, duties, and employer of all quality control personnel necessary to implement the QCP. A Quality Control Technician (QCT) shall be required. The person(s) responsible for conducting quality control and inspection activities to implement the QCP. There may be more than one QCT on a project.

4. The Engineer may require the replacement of ineffective or unqualified equipment or Quality Control personnel. Construction operations may be required to stop until Quality Control corrective actions are taken.

B. All roller operators shall use infrared pistol thermometers to measure the temperature of the mat during rolling operations.

3.9 ACCEPTANCE

A. When placing permanent HMA, in-place density shall be evaluated by comparing the in-place density to the TMD. The TMD shall be determined using an actual sample of plant produced HMA for production placement according to ASTM D2041 - 03a Standard Test Method for Theoretical Maximum Specific Gravity and Density of

Bituminous Paving Mixtures. The TMD shall be calculated each day. The TMD calculated during the mix design will not be accepted. A nuclear density gauge may be used for spot checking in-place density and developing roller patterns but acceptance testing will be solely based bulk density measurement of cores taken from the final in-place mat.

B. One core sample is to be taken for every 9000 square yards, per lift, or at least one per street, per lift (whichever is greater), at a location randomly selected by the Engineer. Cores taken for the purpose of acceptance testing shall extend the full depth of the pavement structure. Cores shall be taken no sooner than the day following placement of the HMA. The core shall be allowed to air dry 24 hours prior to measuring density. Drying in an oven will not be permitted. Pavement at core locations shall be repaired with new HMA and made consistent with adjacent surfaces with infrared technology.

C. Acceptance testing shall prove density of the HMA to be at least 92.5% of the TMD, not to exceed 97%.

END OF SECTION

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SECTION 02760

PAVEMENT STRIPING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. All labor, materials, accessories, service and equipment necessary to furnish and apply all pavement striping, parking stalls, and traffic markings as indicated on the Drawings and as specified herein.

a. New painted pavement markings

b. Replacement of pavement markings disturbed as part of construction activities

c. Replacement of pavement markings in permanent pavement repair areas

1.2 REFERENCES

A. AASHTO Standard Specifications for Transportation Materials and Methods of Sampling and Testing, 1986 Edition, as amended.

B. Commonwealth of Massachusetts Department of Transportation – Highway Division "Standard Specifications for Highways and Bridges." Current Edition

1.3 SUBMITTALS

A. Submit manufacturers literature and material specifications for all materials furnished under this Section including, but not limited to, the following:

1. Pavement marking paint

2. Paint application system and equipment

B. Submit affidavit stating submitted materials comply with the above-noted Standards.

1.4 WARRANTY

A. Provide a written one-year unconditional guarantee against fading, chipping, peeling, wearing, etc.

PART 2 PRODUCTS

2.1 MATERIALS

A. Waterborne Pavement Marking Paint

1. In accordance with the Commonwealth of Massachusetts Department of Public Works "Standard Specifications for Highways and Bridges", 1988 Edition, as amended, pavement marking paint shall conform to the requirements of Articles M.7.01.10 and M.7.01.11 for waterborne pavement marking paint.

2. In accordance with Connecticut Department of Transportation – Standards for Roads, Bridges and Incidental Construction, Form 816, 2004, as amended,

pavement marking paint shall conform to the requirements of Article M.07.20 for waterborne pavement marking paint.

3. All paint for parking stall and traffic markings shall be fast drying white or yellow traffic paint complying with the applicable paragraphs of the Standard Specifications. The paint shall be capable of being applied to bituminous and portland cement concrete pavements with striping equipment that does not require heating above ambient temperatures.

4. The following additional pavement marking paint requirements shall be met:

   a. The total nonvolatile content shall not be less than 70% by weight.

   b. Pigment shall be 45-55% by weight.

   c. Weight per gallon shall not be less than 12.5 pounds.

   d. Drying time to no pickup shall be 15 minutes.

5. No reflective glass beads will be required.

6. The material shall not lift from the pavement in the freezing weather, and shall not smear or spread under normal traffic conditions or at temperature below 120 degrees F.

7. The paint shall not deteriorate by contact with sand, sodium, chloride, calcium chloride or other chemicals used against the formation of ice on the pavement, because of the oil content of pavement materials, or from gasoline, grease and oil drippings from vehicles.

PART 3 EXECUTION

3.1 PREPARATION

A. Protect the building, walks, pavement, curbing, trees, shrubs, mulch, etc. from over-spray of paint and damage.

B. Clean and sweep all areas to be striped or re-striped of all sand, dirt, grease, oil, etc. Large areas of tar, grease or foreign materials may require sand blasting, steam cleaning or power brooming to accomplish complete removal.

C. Application of markings shall not proceed until authorization is received from Engineer.

D. Bituminous concrete pavements shall have been in place for at least 7 days prior to the application of pavement markings.

3.2 INSTALLATION

A. Installation shall be by skilled workers who are experienced and normally employed in the Work of installing pavement markings.

B. All permanent pavement repair areas shall be repainted to match the original pavement markings.

C. New pavement markings shall be as shown on the Drawings and as specified herein.

D. Painting shall be in accordance with Section 860 of the Massachusetts DPW "Standard Specifications for Highway and Bridges", 1988 Edition, as amended.

E. All stripes shall be applied one coat with brush, spray or marking machine over dry clean pavement only.

F. All paint shall be installed at a rate of not more than 300 linear feet of 4- inch wide lines per gallon of paint (approximately 0.016 inch dry film thickness).

G. If material is applied to the pavement by an extrusion method, one side of the shaping die shall be the pavement and the other three sides are contained by, or are part of, suitable equipment for controlling the flow of paint.

H. Where entire areas are to be cross-hatched as directed by the Drawings, the 4-inch-wide straight white parallel stripes 36 inches on center shall be laid out and painted in solid lines.

I. After application and proper drying time, the material shall show no appreciable deformation or discoloration under traffic conditions and in air and/or road temperature ranging from 0 - 120 degrees F.

J. The stripe shall maintain its original dimensions and placement. The exposed surface shall be free from tack. Cold ductility of the material shall permit normal movement with the pavement surface without chipping or cracking.

K. No paint or pavement marking material shall be heated above the temperature allowed per manufacturer's instructions.

L. All painting shall be performed in a neat and workmanlike manner.

M. Lines shall sharp and clear with no feathered edging or fogging.

N. If, for any reason, material is spilled or tracked on the pavement or any markings applied by Contractor, in Engineer's judgment, are not acceptable, then the Contractor shall remove such material by a method that shall not damage the roadway surface and is acceptable to Engineer, clean and prepare the surface for a reapplication of markings, and reapply the markings as directed.

O. Application Requirements

1. Marking paint shall be applied at a rate of 100 to 115 square feet per gallon.

2. Material application temperature shall be from 40°F to 120°F.

3. No thinners shall be used for the above listed pavement marking applications except in accordance with the manufacturer's specifications and at the direction of the Engineer.

4. Minimum finished paint thickness shall be 15 mils.

3.3 PROTECTION

A. Markings shall remain protected until sufficiently dry to bear traffic on roadways that are open to traffic.

B. Precautions shall be taken to prevent tracking by tires of the striping equipment.

C. Traffic cones used for protection of markings shall be not less than 28 inches in height.

END OF SECTION

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SECTION 02890

TRAFFIC SIGNAGE AND SUPPORTS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Signage

2. Sign supports and hardware

1.2 REFERENCES

A. Manual of Uniform Traffic Control Devices, U.S. Department of Transportation

B. Commonwealth of Massachusetts Department of Public Works "Standard Specifications for Highways and Bridges," 2020 Edition as amended

C. Commonwealth of Massachusetts Department of Public Works "Standard Drawings for Signs and Supports," 1990 Edition as amended

D. Commonwealth of Massachusetts Department of Public Works “The Massachusetts Amendments to the 2009 Manual on Uniform Traffic Control Devices and the Standard Municipal Traffic Code,” January 2012 Edition as amended.

1.3 SUBMITTALS

A. Submit complete Shop Drawings of all signs, supports, and hardware specified in this Section

1.4 PRODUCTS

A. Signs

1. Signs shall be fabricated in accordance with the 2009 Manual on Uniform Traffic Control Devices (MUTCD) included the Massachusetts Amendments, and the Contract Drawings.

B. Supports

1. Supports for ground mounted signs shall be Breakaway P-5 Post Assemblies and shall meet the requirements set forth by relevant provisions of Section 800 of the Massachusetts Highway Department’s Standard Specifications for Highways and Bridges and the Standard Drawings for Signs and Supports.

C. Hardware

1. Hardware for mounting signs shall meet the requirements set forth by relevant provisions of Section 800 of the Massachusetts Highway Department’s Standard Specifications for Highways and Bridges and the Standard Drawings for Signs and Supports.

PART 2 EXECUTION

2.1 INSTALLATION

A. Install signs, posts, and hardware in accordance the Drawings and the relevant provisions of Section 800 of the Massachusetts Highway Department's Standard Specifications for Highways and Bridges, the 2009 Manual on Uniform Traffic Control Devices (MUTCD), and the Standard Drawings for Signs and Supports.

END OF SECTION

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SECTION 02920 OR 32 92 00

LAWNS AND GRASSES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Restoration of all vegetated areas disturbed during construction including:

a. Grass surfaces

2. New loam and seed areas

3. Restoration of vegetated areas abutting wetland resource areas

4. Loam, starter fertilizer, lime, lawn seed, and hydric seed

5. Reinforced Turf Paving System

6. Mulch

1.2 SUBMITTALS

A. Lawn seed mixture including percent by weight of each seed type, and manufacturer/Supplier name.

B. Suitable laboratory analysis of the topsoil to determine the quantity of fertilizer and lime to be applied.

C. Lime and starter fertilizer application rates based on laboratory soil tests.

D. A sworn certificate indicating each variety of seed, weed content, germination of seed, net weight, date of shipment and manufacturer's name shall accompany each seed shipment.

1.3 QUALITY ASSURANCE

A. Place seed only between the periods from April 15th to June 1st, and from August 15th to October 1st, unless otherwise approved by the Engineer.

PART 2 PRODUCTS

2.1 MATERIALS

A. Seed

1. Seed shall be of the previous year's crop.

2. Required properties:

a. Purity > 90% (>97% for athletic fields)

b. Germination > 80% (>85% for athletic fields)

c. Crop < 0.5%

d. Weed < 0.3%

e. Noxious Weed – 0%

f. Inert < 8%

3. Grass seed shall conform to the following mixtures in proportion by weight and weed content and shall pass the minimum percentages of purity and germination as indicated for same.

4. Recreation mix shall be used in existing open space areas used by the public, including disturbed areas near the beaches and in the geocell overtopping protection areas.

5. In naturalized areas, wetland mix or dry sites restoration mix will be used as appropriate given ground conditions.

Recreation Mix	**% Weight**
Creeping Red Fescue	40%
Pennifine Perennial Ryegrass	35%
Birds Foot Trefoil (Empire Variety	15%
Ladino Clover	10%

Wetland Mix
As shown on drawings

Dry Sites Restoration Mix

As shown on drawings

6. All seed shall comply with State and Federal seed Laws and Regulations.

PART 3 EXECUTION

3.1 PREPARATION

A. After rough grading of the subgrade has been completed and approved, the subgrade surface shall be scarified to a depth of four (4) inches. Then furnish and install a layer of loam providing a rolled four (4) inch thickness. Any depressions which may occur during rolling shall be filled with additional loam, regraded and rerolled until the surface is true

to the finished lines and grades. All loam necessary to complete the Work under this section shall be supplied by the Contractor.

B. The ground surface shall be fine graded and raked to prepare the surface of the loam for lime, fertilizer and seed.

C. The loam shall be prepared to receive seed by removing stones and grading to eliminate water pockets and irregularities prior to placing seed. Finish grading shall result in straight uniform grades and smooth, even surfaces without irregularities to low points.

D. All stones over one-half (½) inch in diameter remaining on the surface after raking shall be removed.

E. Shape the areas to the lines and grades required. The Contractor's attention is directed to the scheduling of Loaming and Seeding of graded areas to permit sufficient time for the stabilization of these areas.

F. All areas disturbed by construction within the property lines and not covered by structures, pavement, or bark mulch shall be loamed and seeded.

G. Limestone shall be thoroughly incorporated into the loam layer at a minimum rate of 3 ton per acre or more as recommended by the loam analysis in order to provide a pH value of 5.5 to 6.5.

H. Fertilizer shall be spread on the top layer of loam at the minimum rate of 500 pounds per acre or more as recommended by the loam analysis and worked into the surface

3.2 LOAM AND SEED AREAS

A. For temporary protection of disturbed areas, seed shall be applied at the following rates:

Winter Rye (fall seeding)	2.5 pounds per 1,000 square feet
Oats (spring seeding)	2.5 pounds per 1,000 square feet
Mulch	1.5 tons per acre

B. The seed mixtures shall be applied at a minimum rate of 200 pounds per acre, or 4.5 pounds per 1,000 square feet.

C. Seed shall be sown at the rates indicated above by rotary or drop spreader. Sowing shall be done on a calm, dry day. Immediately before seeding, the soil shall be lightly raked. One half the seed shall be sown in one direction and the other half at right angles to the original direction. It shall be lightly raked into the soil to a depth not over 1/4 inch and rolled with a hand roller weighing not over 100 pounds per linear foot of width.

1. Straw mulch shall be applied immediately after seeding at a rate of 1.5 to 2 tons per acre. Mulch that blows or washes away shall be replaced immediately and anchored using appropriate techniques.

2. The surface shall be watered and kept moist with a fine spray as required, without eroding the soil, until the grass is well established. Any areas, which are not satisfactorily covered with grass, shall be reseeded, and all noxious weeds shall be removed.

D. Unless otherwise approved, seeding shall be done between the periods from April 15th to June 1st, and August 15th to October 1st, when soil conditions and weather are suitable for such Work.

3.3 MAINTENANCE

A. Maintenance shall include watering, weeding, removal of stones and other foreign objects over one half (½) inch in diameter, cutting the grass until final acceptance. Mow at least weekly, removing no more than 30-40 percent of the leaf tissue using well sharpened blades. Mow grass between one (1) and two (2) inches high in the spring and fall. Mowing heights shall be an additional one-half to an inch in the summer to reduce temperature stress. Leave the clippings in place to help recycle essential plant nutrients needed for growth. All bare or dead spots which become apparent shall be properly prepared, re-loamed, limed, aerated, fertilized, and reseeded as many times as necessary to secure a good growth. The entire area shall be maintained, watered and cut until final acceptance of the lawn installation.

B. The dressed and seeded areas shall be sprinkled with water as necessary from time to time. Signs and barricades should be placed to protect the seeded areas.

C. To be acceptable, seeded areas shall consist of a uniform stand without bare or dead spots of at least 90 percent established permanent grass species, with uniform count of at least 200 plants per square foot.

D. The Engineer shall determine whether maintenance shall continue in any part.

E. After all necessary corrective Work and clean-up has been completed, and maintenance instructions have been received by the Owner, the Engineer will certify in writing the acceptance of the lawns.

F. Substantial Completion will not be achieved until the seeded areas have demonstrated a satisfactory stand of growth as determined by the Engineer. Seeded areas not demonstrating satisfactory stands as outlined above, as determined by the Engineer, shall be renovated, reseeded and maintained meeting all requirements as specified herein.

END OF SECTION

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SECTION 02921

VEGETATIVE SUPPORT MATERIAL

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Topsoil

1.2 SUBMITTALS

A. Provide representative samples of borrow materials taken from the source. Tag, label, and package the samples as requested by the Engineer. Provide access to the borrow site for field evaluation and inspection.

B. Provide analytical test results at the rate specified. All samples shall be representative and analyzed for the following:

pH
Nitrogen
Phosphorus
Potash
Grain size
Organic content

PART 2 PRODUCTS

2.1 MATERIALS

A. Vegetative Support Material

1. Vegetative support material shall consist of fertile, friable, natural topsoil typical of the locality without admixture of subsoil, refuse or other foreign materials and shall be obtained from a well-drained arable site. It shall be such a mixture of sand, silt and clay particles as to exhibit sandy and clayey properties in and about equal proportions. It shall be reasonably free of stumps, roots, heavy or stiff clay, stones larger than 1-inch in diameter, lumps, coarse sand, noxious weeds, sticks, brush or other litter. Topsoil as delivered to the site or stockpiled shall have pH between 6.0 and 7.0 and shall contain not less than 5 percent or more than 8 percent organic matter as determined by loss of ignition of moisture-free samples dried at 100 degrees Celsius. The topsoil shall meet the following mechanical analysis:

	Percentage Finer
1-in screen opening	100
No. 10 mesh	95 to 100
No. 270 mesh	35 to 75
0.002 mm*	5 to 25

*Clay size fraction determined by pipette or hydrometer analysis.

2. Prior to stripping, the topsoil shall have demonstrated; by the occurrence upon it of healthy crops, grass or other vegetative growth; that it is reasonably well drained and that it does not contain toxic amounts of either acid or alkaline elements.

B. Alternate Vegetative Support Layer Materials

1. Other organic materials or blends of organic materials that are free of pathogens and capable of sustaining a thick stand of vegetation, over the design life of the landfill, may be used wholly or partially as vegetative support material with prior written approval of both the Engineer and the Massachusetts Department of Environmental Protection

2. Approval of alternate materials may be contingent upon the Contractor's ability to demonstrate that a quantity equal to that indicated in the bid form can be procured or processed within the time constraints of this project.

2.2 EQUIPMENT

A. Earth Moving Equipment

B. Adequate types and number of equipment shall be used to ensure that the vegetative support material is spread evenly and at the proper depth to all areas intended to be covered without damaging underlying soil layers or structures.

PART 3 EXECUTION

3.1 INSTALLATION

A. Vegetative support material shall be placed over approved areas to a depth sufficiently greater than required so that after natural settlement and light rolling, the complete work will conform to the lines, grades and elevations indicated. No loam shall be spread in water or while frozen or muddy.

B. The vegetative support material shall be hauled, deposited, spread, compacted, tracked and raked to the lines and grades shown on the Plans or as directed by the Engineer. After the vegetative support material has been spread, it shall be carefully prepared for seeding by spading or harrowing, and raking. All large, stiff clods, lumps, stones, brush, roots, stumps, litter, and other foreign material shall be removed.

C. The compaction shall be equivalent to that produced by a hand roller weighing from 75 to 100 pounds per foot of width. The compaction may be obtained by rolling, dragging or any method that produces satisfactory results. All depressions caused by settlement or rolling shall be filled with additional materials and the surfaces shall be regraded and rolled until it presents a reasonably smooth and even finish and is up to the required grade.

D. During hauling operations, all public and private roadway surfaces shall be kept clean and any topsoil or other dirt which may be brought upon the surface shall be removed

promptly and thoroughly before it becomes compacted by traffic. If necessary, the wheels of all vehicles used for hauling shall be cleaned frequently and kept clean to avoid bringing any dirt upon the surface.

3.2 QUALITY CONTROL

A. The responsibility for satisfactory results on work carried out under this item rests entirely on the Contractor regardless of the prior approval of the materials and methods on the part of the Engineer.

B. The Contractor shall provide laboratory test results for the vegetative support material intended for use as specified herein, at a frequency of 1 round per 1,000 cy of material.

C. The Engineer shall randomly sample the borrow material and have a certified analytical laboratory perform testing as described herein. The testing shall be a verification of the results submitted by the Contractor and shall be entirely at the Contractor's expense.

END OF SECTION

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SECTION 02922

HYDROSEEDING & MULCHING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Lime
2. Fertilizer
3. Seed
4. Bonded Fiber matrix
5. Water

B. Related Sections

1. Section 02921 – Vegetative Support Material

1.2 SUBMITTALS

A. Results of vegetative support material nutrient analysis and recommendation for limestone and fertilizer application rates.

B. Product data and specifications for the Bonded Fiber Matrix

C. Product data and specifications for the fertilizer and lime.

D. Product data for seed mixtures.

E. Based on results of vegetative support material nutrient analysis to be provided by the Owner, submit recommendation for limestone and fertilizer application rates.

1.3 QUALITY ASSURANCE

A. Provide seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging, and location of packaging. Damaged packages are not acceptable.

B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

C. Deliver lime in waterproof bags showing weight, chemical analysis, and name of manufacturer.

1.4 TESTS

A. Provide vegetative support material structure and nutrient analysis made by an independent laboratory approved by the Engineer in accordance with Section 02921, and provide limestone and fertilizer in accordance with the types and rates specified by said laboratory.

B. A certified statement shall be furnished to the Engineer by the Contractor prior to the start of work, stating the number of pounds of limestone, fertilizer, seed, and mulch, per 100 gallons of water and shall also specify the number of square yards of seeding that can be covered with the solution specified above.

PART 2 PRODUCTS

2.1 LIME

A. Lime shall consist of pulverized limestone obtained by grinding either calcareous or dolomitic limestone so that 100% of the material will pass a No. 1 sieve, 80% shall pass a 100-mesh sieve and 45% shall pass a 200-mesh sieve. The ground limestone shall have a neutralizing value satisfactory to the Engineer. Lime as herein described shall be applied at the rate of not less than 50 pounds per 1,000 square feet, or higher, depending upon soil requirements as determined above.

2.2 FERTILIZER

A. Fertilizer shall be a commercial grade, chemical fertilizer for lawns, the elements of which are derived from organic sources and shall contain the percentages by weight recommended in the laboratory analyses.

B. The availability of the various elements shall conform to the standards of the "Association of Official Agricultural Chemists". A minimum of 50% of the nitrogen content by weight shall be derived from organic materials.

C. All fertilizer shall arrive on the job site in standard size bags, bearing the manufacturer's name, the content, weight and guaranteed analysis.

D. The Contractor shall be responsible in every respect for the fertilizer, and it shall be stored in a weatherproof enclosure on dunnage in such a manner that its effectiveness will not be impaired.

E. Fertilizer shall be applied to areas acceptable to the Engineer as ready for seed at a rate recommended by a state and/or federally supported soil experiment lab.

2.3 SEED

A. Seed shall be of the previous year's crop.

B. Required ranges:

1. Purity > 90%
2. Germination > 80%
3. Crop < 0.5%
4. Weed < 0.3%
5. Noxious Weed – 0%
6. Inert < 8%

C. The standard seed mixture shall be applied at a minimum rate of 175 lbs./acre, 4 lbs/1,000 s.f.

D. Grass seed shall conform to the mixes shown on the drawings.

D. All seed shall comply with State and Federal seed laws.

E. A sworn certificate indicating each variety of seed, weed content, germination of seed, net weight, date of shipment and manufacturer's name shall accompany each seed shipment. Regardless of approval by the Engineer to sow the seed, complete responsibility for satisfactory results shall rest entirely on the Contractor.

2.4 BONDED FIBER MATRIX

A. Bonded fiber matrix shall be a hydraulically applied system of long strand residual wood fibers produced by thermo-mechanical defibration of wood chips and joined together by a high-strength non-toxic adhesive to create a continuous three dimensional blanket that adheres to the soil surface to form a bonded fiber matrix. The system shall be applied to the soil as a viscous mixture, which upon drying creates a high-strength, porous and erosion resistant mat. Upon drying, the matrix shall not inhibit the germination and growth of plants in and beneath the layer. The matrix shall retain its form despite rewetting.

B. The bonded fiber matrix shall be hydraulically applied at the rate of 4,000 pounds per acre, or in accordance with the manufacturer's recommendations and application requirements/specifics. The resultant coverage must be at least 1/8 inch thick over the entire surface area. The bonded fiber matrix shall be applied from alternate directions to alleviate shadowing. Bonded fiber matrix shall not be applied within 24 hours of an expected rainfall.

C. Production Specifications:

1. Composition - Refined wood fiber 90% by weight, blended hydrocolloidal based binder 10% by weight

2. Color - Natural

3. Moisture - 9%-15%

4. Application - Conventional hydraulic seeding equipment with mechanical agitation at a rate of 4,000 pounds per acre

5. Thickness 1/8-1/4 inch after application

6. Mixing 40 pounds of fiber per 100 gallons of water

2.5 WATER

A. Provide water for hydroseeding.

2.6 MULCH

A. Mulch shall be virgin wood fiber mulch applied at a rate of 1,500-lbs/acre or hay mulch applied at a rate of 3,500-lbs/acre.

PART 3 EXECUTION

3.1 HYDROSEEDING & MULCHING

A. Tracking of the vegetative support layer prior to hydroseeding shall be completed in accordance with Section 02921 and Part 3.1(I) below.

B. Lime, fertilizer, seed, and mulch shall be simultaneously applied in one operation by the use of an approved spraying machine. The materials shall be mixed with water in the machine and kept in an agitated state in order that the materials may be uniformly suspended in water. The spraying equipment shall be so designed that when the solution is sprayed over an area, the resulting deposits of limestone, fertilizer, seed, and mulch shall be equal in quantity to those specified above.

C. Bonded fiber matrix shall be applied to all seeded areas. The thickness of the matrix after application shall be 1/8 inch to ¼ inch thick.

D. Seed shall be sown only between the periods from April 15th to June 1st, and from August 15th to October 1st.

E. If as a result of rain, the prepared seedbed becomes eroded, the Contractor shall rework the topsoil until it is smooth and re-hydroseed such reworked areas.

F. No seeded area will be acceptable until it is covered with a satisfactory, healthy stand of quality grass of the variety specified. A satisfactory stand of grass, as determined by the Engineer, shall consist of a uniform stand of at least 60% established permanent grass species, with a uniform count of at least 100 plants per square foot. If the results of the spray operation are unsatisfactory, the Contractor will be required to repeat the hydroseeding process as needed to achieve a thick stand of grass.

G. The Contractor shall protect seeded areas from damage and shall repair and maintain all areas at his own expense at no additional cost to the Owner until a certificate of final acceptance is issued by the Engineer. The Contractor shall repair and reseed all defective or non-growth grass areas during the following season.

H. After side slopes have received vegetative support material, they shall be traversed by a bulldozer to create ridges running perpendicular to the slope to impede the travel of stormwater runoff. The tracking shall be done prior to hydroseeding.

I. The Contractor is fully responsible for providing adequate amounts of water to the seeded areas to provide an adequate growth.

J. All areas to be seeded shall be hydroseeded. Hand seeding will not be allowed.

3.2 MAINTENANCE AND PROVISIONAL ACCEPTANCE

A. Keep all planted areas watered and mowed and in good condition, all areas if and when necessary until a good, healthy, uniform growth is established over the entire area and shall maintain all these areas in an approved condition until final acceptance.

B. The Engineer will inspect all work for provisional acceptance at the end of the 10 week maintenance period, upon the written request received at least 10 days before the anticipated date of inspection. The maintenance period must occur during the

growing season between March 31 and October 1 and shall include a minimum of three mowings.

C. A satisfactory turf will be defined as:

1. No bare spots larger than 2 sq. ft.

2. No more than 10 percent of total area with bare spots larger than 1 sq. ft.

3. No more than 15 percent of total area with bare spots larger than 6-in. square.

4. No invasive plant growth.

D. After the inspection has occurred but prior to provisional acceptance, a soil test shall be performed to determine if additional soil fertilization should occur. If necessary additional fertilized not to exceed 30 lbs/1,000 sq. ft. of 20-10-10 shall be applied as directed by the Engineer.

E. Furnish full and complete written instructions for maintenance of the planted areas to the Owner at the time of provisional acceptance.

F. The inspection by the Engineer will determine whether maintenance shall continue. Continue maintenance until all areas of the site meet the minimum requirements specified above.

G. After all necessary corrective work and clean-up has been completed, and maintenance instructions have been reviewed by the Owner, the Engineer will certify in writing the provisional acceptance of the turf areas. Maintenance of all turf areas shall cease on receipt of provisional acceptance.

3.3 GUARANTEE PERIOD AND FINAL ACCEPTANCE

A. All seeded areas shall be guaranteed for not less than 1 full year from the time of final acceptance.

B. At the end of the guarantee period, inspection will be made by the Engineer upon written request submitted at least 10 days before the anticipated date. Seeded areas not demonstrating satisfactory stands as outlined above, as determined by the Engineer, shall be renovated, reseeded and maintained meeting all requirements as specified herein.

C. After all necessary corrective work has been completed, the Engineer shall certify in writing the final acceptance of the seeded areas.

END OF SECTION

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DIVISION 3 - CONCRETE

SECTION 03100

CONCRETE FORMS AND ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Wood Form Material
2. Prefabricated Forms
3. Formwork Accessories

B. Related Sections

1. Section 03300 - Cast-in-Place Concrete

1.2 REFERENCES

A. Massachusetts Department of Transportation (MassDOT)

1. Standard Specifications for Highways and Bridges 2026 Edition (hereafter referred to as the Standard Specifications)
   a. Division II – Construction Details
   b. Division III – Materials Specifications

B. American Association of State Highway and Transportation Officials (AASHTO)

1. AASHTO LRFD Bridge Manual (9th Edition)

American Concrete Institute (ACI)

2. ACI 301 - Specifications for Structural Concrete for Buildings
3. ACI 318 - Building Code Requirements for Reinforced Concrete
4. ACI 347 - Guide to Formwork for Concrete

C. American Society for Testing and Materials (ASTM)

1. D4 - Standard Test Method for Bitumen Content
2. D6 - Standard Test Method for Loss on Heating of Oil and Asphaltic Compounds
3. D71 - Standard Test Method for Relative Density of Solid Pitch and Asphalt (Displacement Method)
4. D217 - Standard Test Method for Cone Penetration of Lubricating Grease
5. D1056 - Specification for Flexible Cellular Materials - Sponge or Expanded Rubber

6. D1751 - Standard Specifications for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types)

7. D1752 - Standard Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction

8. D4397 - Standard Specification for Polyethylene Sheeting for Construction, Industrial and Agricultural Applications

D. National Institute of Standards and Technology (NIST)

1. Voluntary Product Standard PS 1-95 - Construction and Industrial Plywood

1.3 SUBMITTALS

A. Product Data on form release agent, permanent formwork and inserts.

B. Formwork design package in conformance with other sections of this specification.

1.4 DESIGN REQUIREMENTS

A. Design formwork and shoring at the Contractor's expense by a Professional Engineer registered in the State where the work will be performed to conform to all design and code requirements in Subsection 901 of the Standard Specifications, ACI 301, ACI 318 and ACI 347 and other applicable regulations and codes. The design shall consider any special requirements that may result due to the use of super plasticized and/or retarded set concrete.

1.5 RELATIONSHIP OF SECTION 03100 TO MASSDOT STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS

A. Conflicts between the Standard Specifications and Section 03100 shall be resolved in favor of the Standard Specifications. Conflicts between the Standard Specifications and the remainder of the project manual shall be resolved in favor of the Standard Specifications.

PART 2 PRODUCTS

2.1 GENERAL

A. All products shall conform to the relevant provisions of Subsection 901 of the Standard Specifications, and the following requirements:

2.2 WOOD FORM MATERIALS

A. Plywood: Class I High Density Overlay plyform, exterior grade, not less than 5 ply nor less than 5/8 inches thick conforming to Voluntary Product Standard PS 1-95

B. Lumber: Douglas Fir species, No. 1 grade S4S with grade stamp clearly visible

2.3 PREFABRICATED FORMS

A. Manufacturers:

1. Symons Corporation, DesPlains, Illinois

2. HICO Corporation, Bronx, NY

3. Or equal

B. Preformed Steel Forms: Minimum 16 gage (1.5 mm), tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearances of finished concrete surfaces; with clean, warp free, undented, ungouged, undamaged surfaces

C. Glass Fiber Fabric Reinforced Plastic Forms: Matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearances of finished concrete surfaces

2.4 FORMWORK ACCESSORIES

A. Form Ties:

1. Ties for foundation walls shall be metal and designed with removable setback cones so that after removal of the projecting part, no metal shall remain within 1½ inches of the face of the concrete.

2. Form ties for tanks, wet wells, pump chambers, below grade structures and other water retaining structures shall have a neoprene waterstop washer placed on each form tie, or on the inside tie rods for systems which use she bolts, and shall have setback cones.

3. Flat bar snap ties for panel forms shall have plastic or rubber inserts with 1½ inch minimum depth to allow patching of tie hole after removal.

4. Setback cones shall be wood or plastic tapered cones 1 inch diameter and 1½ inches deep to allow filling and patching of the concrete surface after removal.

5. Common wire ties shall not be used.

B. Form Release Agent:

1. Non-staining and non-emulsifiable type which will not stain concrete or absorb moisture nor interfere with adherence of any material to be applied to concrete surfaces.

2. Form release agent shall be vegetable oil based.

C. Corners:

1. Chamfered No. 1 Poplar wood strips; ¾ inch by ¾ inch, or size to match existing structures edge profile; maximum possible lengths

PART 3 EXECUTION

3.1 GENERAL

A. All work shall conform to the relevant provisions of Subsection 901 of the Standard Specifications and the following requirements:

B. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with Drawings.

C. Review all work prepared by others to receive work of this Section and correct any defects affecting installation. Commencement of work by the Contractor will be construed as complete acceptance of preparatory work by others.

D. Handle and store materials separately in such manner as to prevent intrusion of foreign matter, segregation, or deterioration. Do not use foreign materials or those containing frozen material. Remove improper and rejected materials immediately from point of use. Cover materials and accessories during construction period.

3.2 EARTH FORMS

A. Earth forms are not permitted.

3.3 FORM PREPARATION

A. Coat contact surfaces of forms with a form release agent prior to form installation.

B. Thoroughly clean steel forms between uses using high pressure water or jet or sand blasting to remove all mill scale, concrete laitance or other ferrous deposits from the contact surfaces of the forms.

C. Before re-use of wood forms, thoroughly clean form contact surfaces, repair damaged areas and remove projecting nails. A partial or complete steel lining on wood sheathing or plywood will not be allowed.

3.4 ERECTION - FORMWORK

A. Erect formwork, shoring and bracing to achieve design requirements of ACI 301 and the following additional requirements:

1. Variation from plumb in the lines and surfaces of columns, piers, and in walls

   a. In any 10 feet of length ¼ inch

   b. Maximum for entire length ½ inch

2. Variation of the linear building lines from established position in plan and related positions of columns, walls and partitions:

   a. In any bay ¼ inch

   b. In any 20 foot of length ¼ inch

   c. Maximum for the entire length ½ inch

3. Variation in cross-sectional dimensions of columns and beams and in thickness of slabs and walls:

   a. Minus $^{1}/_{8}$ inch

   b. Plus ¼ inch

3.5 JOINTS

A. Construction and expansion joints indicated on the Drawings are mandatory and shall not be omitted.

B. Use premolded joint filler at expansion joints unless otherwise noted.

C. Form construction and expansion joints with a keyway and waterstop unless otherwise shown on the Drawings. The depth of the keyway shall be approximately 3 inches, and the minimum width of keyway shall be one-third the width of the wall or floor section unless otherwise shown on the Drawings. The maximum width of any key at a joint with waterstop shall be 3 inches. Construction and expansion joints are to be formed in place prior to notifying the Engineer for inspection of formwork.

D. Where joints other than those shown are required, obtain approval prior to installation.

E. For structural slabs reinforced with deformed bars where construction joints are not shown on the Drawings, the maximum area will be approximately 900 square feet. Slab dimensions between construction joints for the splash apron shall be as "square" as possible, but the length shall not exceed 1.5 times the width under any circumstances.

F. Joints shall be straight and true. Brace all slab bulkheads adequately to keep joints straight. Construction joints in slabs exceeding 5 inches in thickness shall be keyed using a keyway nominally 3-5/8 inches by 1/3 of the slab thickness but not greater than 3 inches wide.

G. Joints not indicated or specified shall be placed to least impair strength of structure and shall be subject to approval of the Engineer.

3.6 INSERTS, EMBEDDED ITEMS, AND OPENINGS

A. Provide formed openings where required for items to be embedded in or passing through concrete work in conformance with requirements of ACI 318, paragraph 6.3, “Conduits and pipes embedded in concrete.”

B. Locate and set in place items that will be cast directly into concrete.

C. Coordinate work of other Sections in forming and placing openings, slots, reglets, recesses, chases, sleeves, wall pipes, anchor bolts and other inserts.

D. Install accessories in accordance with manufacturer's instructions, straight, level and plumb. Ensure items are not disturbed or damaged during placement of concrete.

E. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at the bottom of forms to allow flushing water to drain.

F. Close temporary openings with tight fitting panels, flush with inside face of forms and neatly fitted so that joints will not be apparent in exposed concrete surfaces after concrete placement.

3.7 FORM REMOVAL

A. The Contractor shall be responsible for damage resulting from form removal. Forms and shoring for structural slabs or beams shall remain in place in accordance with requirements in ACI 301. Form removal shall also conform to the requirements specified in Section 03300.

3.8 INSPECTION

A. The Engineer shall be notified when the forms are complete and ready for inspection at least thirty-six hours prior to the proposed concrete placement.

B. Failure of the forms to comply with the requirements specified herein, or to produce concrete complying with requirements of these Specifications, shall be grounds for rejection of that portion of the concrete work. Rejected work shall be repaired or replaced at no additional cost to the Owner. Such repair or replacement shall be subject to the requirements of these Specifications and approval of the Engineer.

END OF SECTION

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SECTION 03200

CONCRETE REINFORCEMENT

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Reinforcing Steel Bars

2. Reinforcing Accessories

B. Related Sections

1. Section 03100 - Concrete Forms and Accessories

2. Section 03300 - Cast-in-Place Concrete

1.2 REFERENCES

A. Massachusetts Department of Transportation (MassDOT)

1. Standard Specifications for Highways and Bridges 2026 Edition (hereafter referred to as the Standard Specifications)

a. Division II – Construction Details

b. Division III – Materials Specifications

B. American Association of State Highway and Transportation Officials (AASHTO)

1. AASHTO LRFD Bridge Manual (9th Edition)

C. American Concrete Institute (ACI)

1. ACI 117 - Standard Tolerance for Concrete Construction and Materials.

2. ACI 301 - Specifications for Structural Concrete for Buildings.

3. ACI 315 - Details and Detailing of Concrete Reinforcement.

4. ACI 318 - Building Code Requirements for Reinforced Concrete, American Concrete Institute.

5. ACI 350R - Environmental Engineering Concrete Structures.

6. ACI SP-66 - Detailing Manual.

D. American Society for Testing and Materials (ASTM)

1. A185 - Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.

2. A615 - Specification for Deformed and Plain Billet - Steel Bars for Concrete Reinforcement.

3. A675 - Specifications for Steel Bars, Carbon, Hot Wrought, Special Quality, Mechanical Properties.

E. Concrete Reinforcing Steel Institute (CRSI)

1. CRSI 63 - Recommended Practice for Placing Reinforcing Bars.

2. CRSI 65 - Recommended Practice for Placing Bar Supports, specifications and nomenclature.

1.3 RELATIONSHIP OF SECTION 03200 TO MASSDOT STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS

A. Conflicts between the Standard Specifications and Section 03200 shall be resolved in favor of the Standard Specifications. Conflicts between the Standard Specifications and the remainder of the project manual shall be resolved in favor of the Standard Specifications.

1.4 SUBMITTALS

A. Provide shop drawings in accordance with Subsection 901 of the Standard Specifications and the recommendations of ACI 315, "Details and Detailing of Concrete Reinforcement" and show the following: elevations, dimensions of concrete work with specified reinforcement clearances; ledges, brackets, openings, sleeves or other items furnished by other Sections, where interference with reinforcement may occur; bending diagrams; assembly diagrams; splices and laps of reinforcement; temperature and shrinkage reinforcement; construction joint reinforcement and shape; dimensions, grade designations, and details of reinforcement and accessories. Show dowels with concrete work to be placed first. Shop drawings shall be drawn to scale.

B. Bar Bending Details – In accordance with the relevant provisions of Subsection 901 of the Standard Specifications and the following:

1. The bars shall be referenced to the same identification marks shown on the placement drawings. Bars to have special coatings and/or to be of special steel or special yield strength are to be clearly identified.

C. Prior to delivery of reinforcing steel or concrete to job site, submit certified mill test reports of reinforcing steel and cement (including names and locations of mills and shops, and analyses of chemical and physical properties), properly correlated to concrete to be used in this project.

1.5 DELIVERY, HANDLING AND STORAGE

A. In accordance with the relevant provisions of Subsection 901 of the Standard Specifications and the following:

1. Reinforcing steel shall be substantially free from mill scale, rust, dirt, grease, or other foreign matter.

2. Reinforcing steel shall be covered and stored off the ground, protected from moisture, and kept free from dirt, oil, or other foreign matter.

PART 2 PRODUCTS

2.1 GENERAL

A. All products shall conform to the relevant provisions of Subsection 901 of the Standard Specifications, and the following requirements:

2.2 REINFORCING STEEL BARS

A. Reinforcing steel bars shall be newly rolled billet steel conforming to ASTM A615, Grade 60.

B. Minimum yield strength shall be 60,000 psi.

C. Where reinforcing steel bars are called for to be grouted into existing concrete, the anchorage shall develop an allowable bond strength equal to 24,000 psi times the cross section area of the bar, or an ultimate strength equal to the tensile strength of the bar.

1. For installations in non-submerged concrete with an ambient temperature greater than or equal to 40 degrees Fahrenheit, the epoxy adhesive shall be, Hilti HIT_HY 200 or approved equal.

2. For installation in wet or submerged concrete with an ambient temperature greater than or equal to 40 degrees Fahrenheit, the epoxy adhesive shall be Hilti HIT RE-500SD or approved equal.

3. For installation in concrete below 45 degrees Fahrenheit the epoxy adhesive shall be Hilti HIT ICE, Simpson AT-XP or equal.

2.3 REINFORCEMENT ACCESSORIES

A. Reinforcement accessories shall conform to Product Standard PS7-766, National Bureau of Standards, Department of commerce, Class C, as produced by Dayton Superior Corporation; R.K.L. Building Specialties Co., Inc. or equal approved by the Engineer.

B. Reinforcement accessories shall include spacers, chair ties, slab bolsters, clips, chair bars, and other devices for properly assembling, placing, spacing, supporting, and fastening reinforcement.

C. Tie wire shall be of sufficient strength for all intended purpose, but not less than No. 18 gauge. Metal supports shall be of such type as not to penetrate surface of formwork and show through surface of concrete.

D. Accessories touching interior formed surfaces exposed to view shall have not less than 1/8 inch of plastic between metal and concrete surface. Plastic tips shall extend not less than 1/2 inch up on metal legs.

E. Individual and continuous slab bolsters and chairs shall be of type to suit various conditions encountered and must be capable of supporting 300 pound load without damage or permanent distortion.

PART 3 EXECUTION

3.1 GENERAL

A. All work shall conform to the relevant provisions of Subsection 901 of the Standard Specifications and the following requirements:

3.2 EXAMINATION

A. Review all work prepared by others to receive work of this Section. Commencement of work will be construed as complete acceptance of preparatory work by others.

3.3 PREPARATION

A. Notify the Engineer prior to the start of any phase of the reinforcing work so as to provide the opportunity to inspect the work. Such notification shall be made at least 24 hours in advance of reinforcement placements and at least 36 hours in advance of other inspections (forms, etc.).

3.4 REINFORCING BAR FABRICATION

A. Fabrication of reinforcement shall be in accordance with the recommendations of CRSI.

B. Reinforcing bars shall be cold bent and shall not be straightened or re-bent. Bars shall not be field bent unless approved by the Engineer.

C. Reinforcing bars shall be bent around a revolving collar having a diameter of not less than that recommended by the CRSI.

D. Reinforcing bar ends that are to be butt spliced or threaded, shall have the applicable end saw-cut. Such ends shall terminate in flat surfaces at a right angle to the axis of the bar.

3.5 INSTALLATION

A. Reinforcement shall be placed in accordance with requirements of CRSI -63 - "Recommended Practice for Placing Reinforcing Bars" and CRSI 65, "Recommended Practice for Placing Bar Supports" and with further requirements below.

B. Reinforcement shall be accurately placed in accordance with Contract Documents and shall be firmly secured in position by wire ties, chairs, spacers, and hangers, each of type approved by the Engineer. For slabs, grade beams, etc. where concrete is poured on grade, use additional setup bars and concrete brick to provide required cover over reinforcement.

C. Bending, welding or cutting reinforcement in field in any manner other than as shown on Drawings, is prohibited, unless specific approval for each case is given by the Engineer.

D. Reinforcement shall be continuous through construction joints unless otherwise indicated on Drawings.

E. Reinforcement shall be spliced only in accordance with requirements of Contract Documents or as otherwise specifically approved. Splices of reinforcement at points of maximum stress shall generally be avoided.

F. Proceed with installation of embedded items, and reinforcement, but do not place concrete into or around such items until the Engineer has approved work.

3.6 FIELD QUALITY CONTROL

A. The Engineer shall have the right to postpone or stop concrete operations when in his judgment, reinforcement and embedded item installation has not been properly

completed or the quality of construction will impair strength and durability or desired finished product. Costs arising from delays due to noncompliance will not be considered.

B. Any material or workmanship that is rejected, either at the batch plant or at the site, shall be replaced promptly at no additional cost to the Owner.

C. Before concrete is placed, reinforcement shall be free of excessive rust, dirt, oil, scale or other foreign matter that will destroy or reduce bond requirements. Reinforcement expected to be exposed to weather for a considerable length of time shall be painted with a heavy coat of cement grout. Protect stored materials so as not to bend or distort bars in any way. Bars that become damaged will be rejected.

D. Before concrete is placed, check all installed reinforcement to ensure that it conforms to Contract Documents and approved Shop Drawings. Such checking shall be done only by qualified experienced personnel. In addition, the Engineer shall be notified at least 36 hours prior to concrete placement and given opportunity to inspect completed reinforcement. Prior approval of Shop Drawings shall in no way limit the Engineer's right to require modifications or additions to reinforcement or accessories.

3.7 ADJUSTING

A. Carry out corrections without delay as directed by the Engineer when construction operations indicate that requirements of Contract Documents or prudent construction practices are being or are about to be violated.

END OF SECTION

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SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Concrete Materials
2. Admixtures
3. Concrete Mix
4. Miscellaneous Concrete Materials

B. RELATED SECTIONS

1. Section 03100 - Concrete Forms and Accessories
2. Section 03200 – Concrete Reinforcement
3. Section 03930- Concrete Repair

1.2 REFERENCES

A. Massachusetts Department of Transportation (MassDOT)

1. Standard Specifications for Highways and Bridges 2026 Edition (hereafter referred to as the Standard Specifications)
   a. Division II – Construction Details
   b. Division III – Materials Specifications

B. American Association of State Highway and Transportation Officials (AASHTO)

1. AASHTO LRFD Bridge Manual (9^{th} Edition)

C. American Concrete Institute (ACI)

1. ACI 301- Specifications for Structural Concrete for Buildings
2. ACI 305 - Hot Weather Concreting
3. ACI 306.1 - Standard Specifications for Cold Weather Concreting
4. ACI 318 - Building Code Requirements for Reinforced Concrete", American Concrete Institute

D. American Society for Testing and Materials (ASTM)

1. C33 – Standard Specification for Concrete Aggregates
2. C39 – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

3. C40 - Standard Test Method for Organic Impurities in Fine Aggregates for Concrete

4. C42 – Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete

5. C87 - Standard Test Method for Effect of Organic Impurities in Fine Aggregate on Strength of Mortar

6. C94 - Standard Specification for Ready-Mixed Concrete

7. C131 - Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

8. C150 – Standard Specification for Portland Cement

9. C260 - Standard Specification for Air-Entraining Admixtures for Concrete

10. C309 – Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete

11. C494 - Standard Specification for Chemical Admixtures for Concrete

12. C535 - Standard Test Method for Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

13. C618 – Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete

14. C685 – Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing

15. C881 – Standard Specification for Epoxy-Resin Base Bonding Systems for Concrete

16. C989 – Standard Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars

17. C1059 – Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete

1.3 RELATIONSHIP OF SECTION 03300 TO MASSDOT STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS

A. Conflicts between the Standard Specifications and Section 03300 shall be resolved in favor of the Standard Specifications. Conflicts between the Standard Specifications and the remainder of the project manual shall be resolved in favor of the Standard Specifications.

1.4 SUBMITTALS

A. All submittals shall be in accordance with the relevant provisions of Subsection 901 of the Standard Specifications and the requirements herein.

B. Submit concrete mix proposed for use, indicating design strength, supplier, batch quantities, and constituents. Provide test report copies indicating prior satisfactory performance in accordance with ACI 301.

C. Submit data and descriptive literature for concrete constituents including admixtures, aggregate tests, bond breaker, bonding agent, and repair grout.

D. Submit detailed methods proposed for curing and protection of concrete. This submittal shall be made not less than 10 days prior to the placement of any concrete.

E. Submit a truck load ticket for every concrete delivery. Ticket information shall include batch time and date, weights of all constituents, quantity of admixtures, water added at the batch plant and moisture content of coarse and fine aggregates.

F. Maintain an accurate daily record of the locations and quantity of concrete placed.

1.5 QUALITY ASSURANCE

A. All work shall be in accordance with the relevant provisions of Subsection 901 of the Standard Specifications and the requirements herein.

B. Provide inspection of cast-in-place concrete work, and testing, including slump tests, air content, and standard compression testing. Materials and workmanship shall be subjected to inspection and testing in mill, shop and/or field by the Engineer. Such inspection and testing shall not relieve Contractor of his responsibility to provide his own inspection, testing, and quality control as necessary to furnish materials and workmanship in accordance with requirements of this Section.

C. Provide notification prior to the start of any phase of concrete placement work so as to provide the opportunity to inspect the work. Such notification shall be made at least 24 hours in advance of concrete placements and at least 36 hours in advance of other inspections (forms, rebar, etc.).

D. Facilitate inspection and testing by an Independent Testing Agency, and furnish the following:

1. Safe access to the work at all times to allow proper inspection of the work

2. Full and ample means and assistance for sampling and testing materials and proper facilities for inspection of work in plant and at project site

3. Covered box large enough to contain twenty-four standard concrete cylinders. At temperatures below 60°F, box shall be electrically heated and thermostatically controlled to maintain inside temperature of 60° to 80°F. Cylinders shall be placed in box immediately after molding and shall be covered with moist burlap until delivery to laboratory, 24 to 72 hours after molding.

4. Access by the Engineer or his representative to the batch plant supplying the concrete at any time.

E. Compression tests shall consist of one set of 4 cylinders for each test made, cured, and tested by testing laboratories during progress of job. 6 cylinders shall be required for each test made with concrete mix containing fly ash or ground granulated blast furnace slag. One set of cylinders shall be taken for every 100 cubic yards of concrete or fraction thereof placed in any one day.

1. 1 cylinder of each set shall be tested for 7-day compressive strength; 2 cylinders shall be tested for 28-day compressive strength. The remaining cylinder shall

be tested for 56-day compressive strength if either one of the 28-day tests are below the specified strength, otherwise the 56-day test will be eliminated.

2. For modified mix with fly ash or ground granulated blast furnace slag, 1 cylinder of each set shall be tested for 7-day compressive strength, 2 cylinders shall be tested for 28-day compressive strength and 2 cylinders shall be tested for 56-days compressive strength. The remaining cylinder shall be tested for 84-day compressive strength if either one of the 56-day tests are below the specified strength, otherwise the 84-day test will be eliminated.

3. The Contractor will provide and pay for the services of an approved testing laboratory to test the cylinders. Compression strength test of cylinders shall conform to ASTM C39, latest revision. The cost of all testing work under this Section will be borne by the Owner. The testing laboratory will submit certified copies of the test results directly to the Engineer and the Owner within 24 hours after tests are made.

4. Sampling, molding, curing and testing of cylinders shall conform to ASTM requirements. Specimens shall be cured under laboratory conditions. The Engineer may require additional cylinders to be cured under field conditions when unusual conditions may tend to reduce concrete strength.

5. Report of tests shall include: name of project, date and location of concrete placement, design strength of concrete, mix data, slump, air content (if tested), compressive strength, age and condition of test cylinder, type of fracture, and type of curing.

F. Slump test, to check consistency, shall be made from the sample used to mold cylinders. Additional slump tests may be taken of every batch delivered to job site.

G. Tests for determination of air content shall be made as required to verify conformance with the specifications.

H. The strength level of the concrete mix shall be considered satisfactory if both of the following criteria are satisfied:

1. Every arithmetic average of any three consecutive strength tests equals or exceeds the specified design strength.

2. No individual strength test (average of two cylinders from the same test group) falls below the specified design strength by more than 500 psi when the specified design strength is 5000 psi or less or by more that 10 percent of the specified design strength when the design strength is more than 5000 psi.

I. When tests of control specimens fall below these requirements, the Engineer will require 56 day or 84 day cylinder tests or core specimens taken from concrete in question and tested in accordance with ASTM C42. If these specimens do not meet strength requirements, the Engineer has the right to require additional curing, load tests, strengthening or removal and replacement of those parts of the structure which are unacceptable, and in addition, removal of such sound portions of structure as necessary to ensure safety, appearance, and durability of structure. Additional testing, load tests, strengthening or removal and replacement of parts or structure and any costs associated with delay of project shall be at no additional cost to the Owner.

J. Any material or workmanship which is rejected, either at the batch plant or at the site, shall be replaced promptly at no additional cost to the Owner.

K. If arrangements for corrections and/or replacements are not made within seven days after notice of rejection, the Owner has the right to have corrections and/or replacement made and charge cost thereof and any costs associated with delay of project against balance of monies withheld.

L. Acceptance of work and admixtures at the batch plant shall not prevent final rejection at job site upon arrival or after it has been installed, if work is found to be defective.

M. Portions of a structure which do not meet the requirements of the Contract Documents based on appearance or for any other aesthetic reason, shall be corrected or removed and replaced at no additional cost to the Owner.

N. Work on new concrete structures shall conform to the requirements of ACI 306.1, Standard Specifications for Cold Weather Concreting, except as modified herein.

PART 2 PRODUCTS

2.1 CONCRETE MATERIALS

A. All concrete materials shall be in accordance with the relevant provisions of Subsection 901 of the Standard Specifications.

PART 3 EXECUTION

3.1 GENERAL

A. All work shall conform to the relevant provisions of Subsection 901 of the Standard Specifications and the following requirements:

3.2 EXAMINATION

A. Verify cover requirements over all reinforcement.

B. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not cause hardship in placing concrete.

C. Verify site conditions to ensure that full access is available for placement of concrete.

3.3 JOINTS

A. Construction and expansion joints indicated on Drawings are mandatory and shall not be omitted. Construction joints shall conform to the requirements of Section 03100 and the following:

1. Before placing new concrete against concrete already in place and hardened, the surface shall again be cleaned with a jet where practical. The exposed aggregate shall then be mopped with a mortar composed of the same proportions of sand and placed and mopped in place immediately prior to the placing of concrete and shall not have set up or hardened prior to the placing of concrete.

2. Where joints other than those shown are required, they shall be made at such locations as the Engineer may allow, and shall in no case impair the structural strength of the structure.

B. Joints not indicated or specified shall be placed to least impair strength of structure and shall be subject to approval of the Engineer.

3.4 MIXING, CONSISTENCY, AND DELIVERY OF CONCRETE

A. Concrete shall be ready-mixed, produced by a central batch plant. Hand or site mixing shall not be allowed. Constituents, including admixtures, shall be batched at the central batch plant. Admixtures shall be premixed in solution form and dispensed as recommended by the manufacturer.

B. Central plant and rolling stock equipment and methods shall conform to Truck Mixer and Agitator Standard of Truck Mixer Manufacturer's National Ready-Mixed Concrete Association, ASTM C94, ASTM C685, and Contract Documents. Consistency of concrete at time of placement shall be at a 3 inch slump, +/- 1 inch.

C. Ready mixed concrete shall be transported to the site in watertight agitator or mixer trucks loaded not in excess of rated capacities. Discharge at site shall be within one and one-half hours after cement is first introduced into the aggregates. Concrete with a temperature greater than 90°F. shall be rejected and removed from the site.

D. During any of the following conditions: high ambient temperature, high concrete temperature, low relative humidity, increased wind velocity, high solar radiation, when the temperature of the concrete is 85°F or above, the time between the introduction of cement to the aggregates and discharge shall not exceed one hour. In addition, when the rate of evaporation on the surface of the concrete is expected to approach 0.2 $lb/ft^2/hr$. (see chart in ACI 305R) special precautions shall be taken against the formation of plastic shrinkage cracking on the surface of the concrete after placement.

E. During any period when for more than three successive days the average daily outdoor temperature drops below 40°F, the concrete temperature at the time of placement shall be as specified in Table C below.

TABLE C
Concrete Temperature During Cold Weather

Least dimension of section, inches.	Minimum temperature of concrete as placed and maintained during the protection period, °F	Maximum gradual decrease in surface temperature during any 24 hours after end of protection, °F
Less than 12	55	50
12 to less than 36	50	40
36 to 72	45	30
Greater than 72	40	20

F. Central mixed concrete shall be plant mixed a minimum of five minutes. Agitation shall begin immediately after premixed concrete is placed in truck and shall continue without interruption until discharged. Transit mixed concrete shall be mixed at mixing speed for at least ten minutes immediately after charging truck followed by agitation without interruption until discharged.

G. Retempering of concrete which has partially hardened by mixing with or without additional cement, aggregates, or water shall not be permitted.

3.5 PLACING CONCRETE

A. Remove excess water and foreign matter from forms and excavations. Do not place concrete on frozen soil. Provide adequate protection against frost action during freezing weather.

B. Transport concrete from mixer to place of final deposit as rapidly as practical by methods which prevent separation of ingredients and displacement of reinforcements, and which avoid re-handling. Do not deposit partially hardened concrete. When concrete is conveyed by chutes, equipment shall be of such size and shape to ensure continuous flow in chute. Flat (coal) chutes shall not be used. Chutes shall be of metal or metal lined and uniformly sloped. Slope shall not be less than 25° nor more than 45° from horizontal. Concrete shall be lowered and maintained as near to the surface of deposit as practicable. The chute shall be thoroughly cleaned before and after each use and debris and any water shall be discharged outside of the forms. Concrete shall not be allowed to flow horizontally over distances exceeding 10 feet or dropped vertically over 6 feet.

C. Place concrete in such a manner as to prevent segregation and accumulations of hardened concrete on forms or reinforcement above the grade of concrete being placed. Suitable hoppers and spouts with restricted outlets and tremies shall be used as required.

D. Thoroughly consolidate each layer of concrete by rodding and vibrating using internal type mechanical vibrator. Vibration shall be done by experienced operators under close supervision and shall be carried on only enough to produce homogeneity and optimum consolidation without permitting segregation of constituents or "pumping" of air. Vibrators used for normal weight concrete shall operate at speeds of not less than 7,000 vpm and be of suitable capacity. Do not use vibrators to move concrete.

Vibration shall be supplemented by spading to remove bubbles and honeycombs adjacent to visible surfaces. At least one vibrator shall be on hand for every 10 cubic yards of concrete placed per hour, plus one spare. Vibrators shall be operable and on site prior to starting concrete placement.

E. Deposit concrete continuously, and in layers of such thickness that no concrete will be deposited on concrete which has hardened sufficiently to cause formation of seams and planes of weakness within the section. If a section cannot be placed continuously between planned construction joints, as specified, field joints and additional reinforcement shall be introduced at the Contractor's expense to preserve structural continuity.

F. Cold joints, particularly in exposed concrete, including "honeycombs", are unacceptable. If they occur in concrete surfaces exposed to view, the Engineer will require that entire section in which blemish occurs be removed and replaced with new materials at the Contractor's expense.

3.6 CURING AND PROTECTION

A. When concrete is placed at or below an ambient air temperature of 40°F. or whenever this temperature or lower values are likely to occur within 48 hours after placement of concrete, cold weather concreting procedures, according to ACI 306.1 and as specified herein, shall be followed. The entire area affected shall be protected by adequate housing or covering, and heating. No salt, chemicals or other foreign materials shall be used in the mix to lower the freezing point of concrete. No oil or kerosene heaters shall be utilized. Vent flue gases from combustion heating units to the outside of the enclosure.

B. No frozen materials shall be used in batching concrete and any ice shall be removed from coming into contact with the concrete.

C. Protect concrete work against injury from heat, cold, and defacement of any nature during construction operations.

D. Concrete shall be treated and protected immediately after concreting or cement finishing is completed, to provide continuous moist curing above 50°F. for at least 7 days, regardless of ambient air temperatures.

E. All concrete shall be cured immediately after finishing in accordance with the following requirements:

1. Curing shall be accomplished by a continuous soaking process such as the use of soaker hose or sprinklers, or by use of plastic roll materials to cover the concrete, which shall be thoroughly wetted at least once a day or more often as required in very hot weather. Such plastic shall be placed as soon as possible after finishing of concrete so that scarring of the surface will not occur. Plastic shall be held in place on the surface of the concrete in such a manner and means as will not allow it to be blown off or otherwise dislodged from the concrete surface. Curing procedures shall be maintained continuously for a period of at least 7 days.

2. All methods of curing shall be subject to approval of the Engineer, and each method employed shall be practical and adequate for the curing required. Curing compounds in lieu of wet curing will not be allowed.

F. Keep permanent temperature records showing date and outside temperature during concreting operations. Thermometer readings shall be taken at start of work in morning, at noon, and again late in afternoon. Locations of concrete placed during such periods shall likewise be recorded in such manner as to show any effect temperatures may have had on construction.

3.7 REMOVAL OF FORMWORK

A. Forms shall not be removed until concrete has attained sufficient strength to support its own weight, construction loads to be placed thereon and lateral loads, without damage to structure or excessive deflection.

B. With the exception of construction joint bulkheads and keyways, forms and supports shall remain in place for not less than the minimum time periods noted below.

1. Unless specifically authorized by the Engineer, forms for vertical surfaces shall not be removed before the concrete has attained a strength of not less than 30 percent of the minimum allowable prescribed compressive strength nor not less than the minimum time period specified in Table D.

2. Unless specifically authorized by the Engineer, forms for horizontal surfaces shall not be removed before the concrete has attained a strength of not less than 60 percent of the minimum allowable prescribed compressive strength nor not less than the minimum time period specified in Table D.

TABLE D
Minimum Degree Day Requirement for Form Removal

Form Use	Degree-Days
Walls and Vertical Surfaces	200

3. Definition of degree-days - Total number of days times mean daily air temperature at the surface of the concrete. For example, 5 days at temperature of 60°F. equals 300 degree-days. Days or fractions of days in which temperature is below 50°F. shall not be included in calculation of degree-days except where modified by Table C above.

C. Forms for construction joint bulkheads and keyways may be removed the following day, after the concrete pour. Extreme caution must be used to avoid damage to the concrete surface and keyway.

D. Any test cylinders required to verify the specified minimum strengths for form removal shall be field cured under the same conditions as the concrete they represent. Such cylinders and testing shall be at the Contractor's expense.

3.8 FINISHING OF CAST-IN-PLACE CONCRETE

A. Upper Horizontal Surfaces

1. Horizontal surfaces not subjected to wear, such as tops of parapets, copings, walls, etc., shall be formed by placing an excess of material in the forms and removing or striking off such excess with a template, forcing the coarse aggregate below the surface of the mortar.

2. Horizontal surfaces shall be attained by striking off excess concrete and in no case shall concrete be added to the tops of walls, etc., once initial set has taken place.

3. The top of such surfaces shall be finished in a manner as required and dictated by the necessary appearance of the part being finished. For covered surfaces, a wood float finish will in most cases be sufficient. Steel troweling may be necessary where concrete is exposed to view and adjacent surfaces have a steel trowel finish. In other cases, a "broom" finish may be required.

B. Formed Surfaces

1. Immediately after the end of the wet cure period, remove form ties and patch all tie-holes, rat holes, and other surface voids with a non-metallic, non-shrink grout, which most nearly matches the color and texture of the concrete surface. All protrusions shall be ground smooth with an approved mechanical grinder.

C. Surfaces Requiring Rub Finish

1. Rubbed finish of surfaces shall be provided on all poured interior and exterior vertical concrete surfaces and the underside of horizontal surfaces exposed to view, including all d surfaces. Rubbing shall include but not be limited to:

   a. The top horizontal surface of the Dam Wall, the vertical surfaces of the Dam Wall, Spillway and Gatehouse above the normal water line.

2. Surfaces requiring a rubbed finish shall, when completed, shall present a smooth, even textured surface and proper appearance. The Engineer shall be the sole judge of the acceptability of a rubbed finish. Cement utilized in rubbing shall be of the same type manufacturer and source as that used in batching the concrete. The following procedure shall be required for all surfaces requiring a rubbed finish.

   a. Immediately upon removal of the forms, snap all form ties and fill tie holes with non-shrink grout to a point slightly indented from the finished surface. Hand chip all air pockets and laitance covered holes greater than 1/4 inch. A mechanical grinder of a type approved by the Engineer shall then be used to remove any form marks, ribs, or bulges, or other protruding surface defects.

   b. The surface shall then be wetted with clean water and a cement (4 parts), presifted fine sand (5 parts), and water grout shall be evenly applied utilizing a sponge float filling all exposed voids. The surface shall be rubbed with a burlap bag and allowed to thoroughly dry.

   c. The surface shall again be wetted and the grout reapplied with the sponge float and again rubbed with burlap, removing all excess material.

   d. After the final rubbing is completed, the surface shall be thoroughly drenched and kept wet for a period of 7 days unless otherwise directed by the Engineer. No other cement powder, grout or other surface coating will be allowed. Plastering of surfaces requiring a rubbed surface will NOT be tolerated.

3.9 REPAIRING OF HARDENED CONCRETE SURFACES

A. Defective concrete and honeycombed areas shall not be patched unless examined and approval is given by the Engineer. After approval, areas involved shall be cut back to a minimum depth of 1 inch from the finished surface, or as otherwise directed, whichever is greater. Edges of areas to be repaired shall be cut square to a minimum depth of 3/4 inch. Feathered edges will not be allowed. Any voids or honeycomb around reinforcing steel shall be chipped away to provide at least 3/4 inch clearance all around to permit proper placement of repair concrete around the steel to the parent, sound concrete.

B. Exposed surfaces shall be thoroughly cleaned of all mud, paint, grime, scum, laitance, organic matter, detritus, calcareous growth and other foreign matter by sand and water blasting or other acceptable means. Immediately after cleaning, the surface shall be checked by the Engineer for proper surface preparation, including fractured concrete or loose aggregate. Any such material shall be removed using pneumatic or hand tools. The final surfaces shall be thoroughly rinsed with clean water to remove remaining dirt and dust.

C. Premoisten the prepared surface for at least 2 hours to reduce the absorption of water by the parent concrete and to provide a reservoir for moist curing at the interface of the repair. The substrate should be saturated surface dry with no standing water. While the concrete surface is still damp, apply a thin 1/16 inch coat of neat cement slurry (mixed to the consistency of a heavy paste) with a bristle brush to provide a bond coat throughout the entire cavity of the repair. Before the slurry has dried or changed color, promptly install the repair concrete or dry-pack, as may be required or selected.

D. For relatively small areas, ram repair concrete into this portion of the formed void. This concrete shall comprise a crumbly-dry 1-1-1.5 mixture of cement, concrete sand and pea gravel (or 3/4 inch gravel) mixed slightly damp to the touch (just short of "balling"). The "dry-pack" consistency of the concrete shall be zero slumps, but moist enough so that when it is rodded and tamped until dense, an excess of paste will appear on the surface in the form of a spider web. In cases of unformed voids of thinner section, do not build-up repair in excess of a depth which will sag with the weight of the fresh mortar or concrete. Trowel smooth with heavy pressure.

E. The concrete shall be of the driest possible consistency and mix composition so that it can be worked into the corners and angles of forms and around the reinforcement, without permitting the materials to segregate or free water to collect on the surface, due consideration being given to the methods of placing and compacting. Source and mixture of concrete shall be submitted for approval.

F. Concrete shall be deposited continuously, or in layers of such thickness that no concrete will be deposited which has hardened sufficiently to cause the formation of seams and planes of weakness within the section. Concrete shall be thoroughly consolidated and trowelled dense, smooth and plane. Avoid premature and excessive trowelling which could cause sagging.

G. Repair areas and adjacent parent concrete surfaces shall be continuously moist cured immediately after finishing for at least 7 days. Surfaces shall be covered with damp

burlap and sealed with taped polyethylene. Membrane curing compounds shall not be used.

H. For cracks in recently poured concrete during this contract, refer to 03900 for crack injection repair requirements. Defective concrete and cracked areas shall not be repaired unless examined and approval is given by the Engineer.

I. Leave finished work and adjacent concrete surfaces in a neat, clean condition with no evidence of spillovers or staining.

3.10 CLEANING

A. Concrete surfaces shall be cleaned of objectionable stains as determined by the Engineer. Materials containing acid in any form or methods which will damage the "skin" of concrete surfaces shall not be employed, except where otherwise specified.

END OF SECTION

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SECTION 03930

CONCRETE REPAIR

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Scaled/ spalled concrete to be repaired with polymer-modified portland-cement trowel-grade mortar.

2. Bridge beams are to be repaired with cementitious, polymer-modified, self-consolidating concrete mix.

3. Bridge deck repairs as indicated on the drawings.

4. Membrane Waterproofing for Bridge Decks (following deck repairs and prior to paving)

5. Other concrete repairs as indicated on the drawings.

B. RELATED SECTIONS

1. Section 03100 – Concrete Forms & Accessories

2. Section 03200 – Concrete Reinforcement

3. Section 03300 – Cast-in-Place Concrete

1.2 REFERENCES

A. Massachusetts Department of Transportation (MassDOT)

1. Standard Specifications for Highways and Bridges 2026 Edition (hereafter referred to as the Standard Specifications)

a. Division II – Construction Details

b. Division III – Materials Specifications

B. American Association of State Highway and Transportation Officials (AASHTO)

1. AASHTO LRFD Bridge Manual (9th Edition)

C. American Concrete Institute (ACI)

1. ACI 318- Building Code Requirements for Reinforced Concrete

2. ACI-503 – Use of Epoxy Compounds with Concrete

D. American National Standards Institute (ANSI) / National Science Foundation (NSF)

1. NSF/ANSI Standard 61 – Drinking Water System Components – Health Effects

E. American Society for Testing and Materials (ASTM)

1. A615 – Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
2. C33 - Standard Specification for Concrete Aggregates
3. C78 - Standard Test Method for flexural Strength of Concrete (Using Simple Beam with Third-Point Loading)
4. C109 - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. Cube Specimens)
5. C150 – Standard Specification for Portland Cement
6. C293 - Standard Test Method for Flexural Strength of Concrete (Using Simple Beam With Center-Point Loading)
7. C297 - Standard Test Method for Rubber Products- Chemical Analysis
8. C496 - Standard Test Method for Splitting Tensile Strength of Cylindrical Concrete Specimens
9. C666 - Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing
10. C882 - Standard Test Method for Bond Strength of Epoxy-Resin Systems used With Concrete By Slant Shear
11. C884 – Standard Test Method for Thermal Compatibility Between Concrete and an Epoxy-Resin Overlay.
12. C1583 – Standard Test Method for Tensile Strength of Concrete Surfaces and Bond Strength of Tensile Strength of Concrete Repair and Overlay Materials by Direct Tension (Pull-off Method)
13. D93 - Standard Test Method for Flash Point by Pensky-Martens Closed Cup Tester
14. D412 – Standard Test Method for Vulcanized Rubber and Thermoplastic Elastomers - Tension
15. D624 – Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
16. D638 - Standard Test Method for Tensile Properties of Plastic
17. D695 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics
18. D732 – Standard Test Method for Shear Strength of Plastics by Punch Tool
19. D790 - Standard Test Method for Flexural Properties of Unreinforced Plastics and Electrical Insulating Materials
20. D903 – Standard Test Method for Peel or Stripping Strength of Adhesive Bonds
21. D1042 - Standard Test Method for Linear Dimensional Changes of Plastics
22. D1622 - Standard Test Method for Apparent Density of Rigid Cellular Plastics

23. D1623 - Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics

24. D2126 - Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging

25. D2196 - Standard Test Method for Rheological Properties of Non-Newtonian Materials by Rotational (Brookfield Type) Viscometer

26. D2369 - Standard Test Method for Volatile Content of Coatings

27. D3418 – Standard Test Method for Transition Temperatures and Enthalpies of Fusion and Crystallization of Polymers by Differential Scanning Calorimetry

28. D3574 – Standard Test Method for Flexible Cellular Materials – Slab, Bonded, and Molded Urethane Foams

29. D3800 – Standard Test Method for Measuring Comparative Burning Characteristics of Solid Plastics in a Vertical Position

30. D4541 - Standard Test Method for Active Matter in Anionic Surfactant by Potentiometer Titration

1.3 RELATIONSHIP OF SECTION 03930 TO MASSDOT STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS

A. Conflicts between the Standard Specifications and Section 03930 shall be resolved in favor of the Standard Specifications. Conflicts between the Standard Specifications and the remainder of the project manual shall be resolved in favor of the Standard Specifications.

1.4 DELIVERY, STORAGE, AND HANDLING

A. All materials shall be delivered, stored, and handled in accordance with the relevant provisions of Subsections 901 and 965 of the Standard Specifications and the requirements herein.

B. All materials must be delivered in original, unopened containers with the manufacture's name, labels, product identification, and batch numbers. Damaged material must be removed from the site immediately.

C. Store all materials off the ground and protect from rain, freezing or excessive heat until ready for use.

D. Condition the specified product as recommended by the manufacturer.

1.5 JOB CONDITIONS

A. Environmental Conditions: Do not apply material if it is raining or snowing or if such conditions appear to be imminent. Minimum application temperature 40°F (5°C) and rising.

B. Protection: Precautions should be taken to avoid damage to any surface near the work zone due to mixing and handling of the specified repair materials.

C. Contractor shall express an abundance of caution to prevent demo and construction materials from entering the water around the work.

D. The Contractor's demolition and construction operations shall take into account any utilities or adjacent structures to the proposed work. The Contractor shall be solely responsible for maintaining the stability of the existing structures at all times during demolition and construction operations. The Contractor shall notify the Engineer immediately if any condition threatens the stability or safety of the bridge or surrounding structures.

1.6 SUBMITTALS

A. All submittals shall be in accordance with the relevant provisions of Subsections 901 and 965 of the Standard Specifications and the requirements herein.

B. Submit Methods of Repair/ Construction three weeks prior to starting work, describing methods, sequence of construction, manpower and type of equipment proposed for use for providing all repair of concrete deficiencies & deterioration work. This submission shall not relieve Contractor of his responsibility for providing proper methods, equipment, workmanship, and safety precautions. This submittal should be sufficient to demonstrate a thorough understanding of the Work to be completed and the means that will be implemented to safely complete the Work within the Contract Time without damage to surrounding structures or resources. The Engineer will review the submittal for completeness, but will not "Approve" the means and methods.

C. Waste Management Plan to indicate the types of wastes to be generated and the proposed disposal or recycling locations.

D. Concrete Repair Materials Containment Plan to indicate how debris and waste generated from concrete repair work will be contained and prevented from falling into water or to the ground below.

E. Submit data and descriptive literature for all products proposed to complete the work under this section.

F. Submit detailed methods proposed for curing and protection of concrete repairs not less than 10 days prior to the placement of any repair.

G. Submit drawings showing details of any proposed corrective work.

H. Submit documents for Spray-Applied Waterproofing Membrane system to be installed in accordance with Subsection 965 of the Standard Specifications.

1.7 QUALITY ASSURANCE

A. All work shall be in accordance with the relevant provisions of Subsections 901 and 965 of the Standard Specifications and the requirements herein.

B. Contractor qualifications: Contractor shall be qualified in the field of concrete repair. The contractor shall have minimum of 5 years experience performing work similar in method and extent.

C. Contractor shall use equipment adequate in size, capacity and number sufficient to accomplish the work of this Section in a timely manner.

D. Inspection of concrete deficiency repairs, including construction joint, expansion joint, cracks, spalls, form tie holes, pipe penetrations and honeycombed areas will be

performed by the Engineer. Materials and workmanship shall be subjected to inspection and testing in mill, shop and/or field by the Engineer. Such inspection and testing shall not relieve Contractor of his responsibility to provide his own inspection, testing, and quality control as necessary to furnish materials and workmanship in accordance with requirements of this Section.

E. Provide source of and allow access to materials required to be sampled and tested.

F. Provide notification prior to the start of any phase of concrete crack, expansion joint or construction joint repair so as to provide the opportunity to inspect the work. Such notification shall be made at least 24 hours in advance of performance of repairs.

G. Install materials in accordance with all safety and weather conditions required by manufacturer, or as modified by applicable rules and regulations of local, state and federal authorities having jurisdiction. Consult Material Safety Data Sheets for complete handling recommendations.

H. Facilitate inspection and testing by the Engineer, and furnish the following:

1. Representative sample pieces requested for testing

2. Safe access to the work at all times to allow proper inspection of the work

I. Provide a written warranty from the manufacturer against defects of materials for a period of one (1) year, beginning with date of substantial completion of the project.

J. The Contractor shall warranty all repairs to be free of water infiltration/leaks and delamination for a minimum of one year from the date of substantial completion of the project.

K. One year from substantial completion of the specified repairs, the Owner shall determine the soundness of the repairs. Any repairs found to be deficient at that time shall be repaired by the Contractor at no additional cost to the owner.

PART 2 PRODUCTS

2.1 GENERAL

A. All materials shall be in accordance with the relevant provisions of Subsections 901 and 965 of the Standard Specifications and the requirements herein.

2.2 POLYMER-MODIFIED PORTLAND CEMENT REPAIR MORTAR FOR EXISTING SPALLED CONCRETE SURFACES

A. Polymer-modified Portland-cement trowel-grade mortar conforming to the following properties:

1. Compressive Strength (ASTM C-109)

a. 1 day: 2,500 psi min.

b. 7 days: 5,500 psi min.

c. 28 day: 7,000 psi min.

2. Splitting Tensile Strength (ASTM C-496) at 28 days: 700 psi min.

3. Flexural Strength (Modulus of Rupture) (ASTM C-293) at 28 days: 1,500 psi min.

4. Freeze/Thaw Resistance (ASTM C-666): 300 cycles - 98%

5. Bond Strength (ASTM C-882 Modified) at 28 days: 2,500 psi min.

6. Thermal Compatibility (ASTM C-884 Modified): passes test min.

7. The polymer-modified Portland cement mortar shall not produce a vapor barrier.

8. Repair mortar for horizontal surfaces shall be Sika Top 122 Plus or approved equal.

9. Repair mortar for overhead and vertical surfaces shall be Sika Top 123 Plus or approved equal. The polymer-modified Portland cement mortar must be applicable from 1/8" to 1 ½" in depth per lift for vertical applications and 1/8" to 1" in depth for overhead applications.

10. Repair mortar for form and pour repairs shall be SikaTop 111 Plus or approved equal.

2.3 POLYMER-MODIFIED, SELF CONSOLIDATING CONCRETE MIX FOR CONCRETE REPAIRS

A. One component, cementitious, polymer-modified, self consolidating concrete mix conforming to the following properties:

1. Contain factory blended coarse aggregate

2. Compressive Strength (ASTM C-39)

a. 1 day: 2,000 psi min.

b. 7 days: 4,500 psi min.

c. 28 days: 5,000 psi min.

3. Splitting Tensile Strength (ASTM C-496) at 28 days: 750 psi min.

4. Shrinkage (ASTM C-157) at 28 days: less than 0.05%

5. Product shall be Sikacrete-211 SCC Plus or equal.

2.4 EPOXY RESIN FOR REPAIR OF STRUCTURAL CRACKING

A. Structural crack repair shall be through the injection of a 100% solids epoxy resin adhesive.

B. Epoxy resin shall meet the following requirements:

STRUCTURAL EPOXY TECHNICAL DATA

Solids volume %	100%
Product Type	Amine Cured Epoxy

Color	Clear, amber
Compressive Strength (ASTM D695)	13,600 psi min
Flatwise Tensile Strength of Sandwich Constructions (ASTM C297)	2600 psi min
Tensile Strength (ASTM D638)	8,900 psi (neat) at 7 days
Tensile Elongation (ASTM D638)	5.4% (neat) at break
Flexural Strength (ASTM D790)	14,000 psi
Shear Strength (ASTM D732)	5,100 psi at 14 days
Bond Strength – Concrete (ASTM C882)	2,800 psi at 2 days, dry cure
Water Adsorption (ASTM D570)	0.2% (24 hour immersion)

C. Product shall be Sikadur 35, Hi-Mod LV or approved equal

2.5 REINFORCING STEEL BARS

A. Reinforcing steel bars shall be newly rolled billet steel conforming to ASTM A615, Grade 60.

B. Minimum yield strength shall be 60,000 psi.

2.6 SPRAY-APPLIED WATERPROOFING MEMBRANE

A. Spray-Applied Waterproofing Membrane shall meet the requirements of Materials section M9.08.1 of the Standard Specifications.

PART 3 EXECUTION

3.1 GENERAL

A. All work shall conform to the relevant provisions of Subsections 901 and 965 of the Standard Specifications and the requirements herein.

3.2 EXAMINATION

A. Verify cover requirements over all reinforcement.

B. Verify that any necessary anchors, seats, plates, reinforcement and other items to be cast into concrete repairs are accurately placed, cleaned to a bright metal finish with no visible signs of rust or corrosion, positioned securely, and will not cause hardship in placing repair material.

C. Verify site conditions to ensure that full access is available for placement of concrete.

3.3 REPAIRS TO EXISTING SPALLED CONCRETE SURFACES

A. These repair procedures are limited to the spalled concrete surfaces with and without exposed steel reinforcing.

B. Edges of areas to be repaired shall be cut square to a minimum depth of 1/2 inch with a diamond tip blade so that there will be no feathered edges or the repair area. Existing spalled surfaces shall be mechanically prepared to remove deteriorated concrete. Concrete shall be chipped away to provide a minimum of ¾ inch of clearance all around any exposed steel reinforcement to permit proper placement of repair mortar or concrete around the steel to the parent, sound concrete. Spalled surfaces shall be thoroughly cleaned of mud, paint, grime, scum, laitance, organic matter, detritus, calcareous growths and other foreign matter, by sand-and-water blasting or other acceptable means as approved by the Engineer. Immediately after cleaning, the surface shall be checked by the Engineer for proper condition, including fractured concrete or loose aggregate. Any such material shall be removed by pneumatic or hand tools. The final surfaces shall be thoroughly rinsed with clean water to remove all remaining dirt and dust. Prepare all surfaces to be repaired in accordance with all repair material manufacturer's recommendations.

C. Where reinforcing steel with active corrosion is encountered, sandblast the steel to a white metal finish to remove all contaminants and rust. Where corrosion has occurred due to the presence of chlorides, the steel shall be high pressure washed after mechanical cleaning. Prime steel with two coats of bonding agent or per bonding agent product data sheet.

D. Polymer-modified Portland cement mortar shall be mechanically mixed in accordance with the manufacturer's recommendations. Extending repair mortar with coarse aggregate is not permitted.

E. At least 2 hours prior to application of the repair mortar or concrete, the prepared surface shall be thoroughly moistened with clean water to reduce absorption and provide a reservoir for moist curing at the interface of the repair. The substrate should be saturated surface dry with no standing water.

F. Mix and proportion epoxy resin/ Portland cement adhesive bonding agent according to manufactures specifications. Bonding agent shall be mixed for a minimum of three minutes until uniform with no lumps. Mix only the quantity that can be applied within its pot life. Apply prepared bonding agent mixture with a stiff-bristle brush, broom or "hopper type" spray equipment (if spraying can be done without excessive over spray onto areas not being repaired). Ensure all voids of hardened concrete and exposed reinforcement are completely coated all around. Place fresh, plastic concrete/ mortar while the bonding bridge adhesive is "wet" or within open times indicated in section 2.2.B.2. Adhere to all limitations and cautions for the epoxy resin/ Portland cement adhesive in the manufactures current printed literature.

G. In locations requiring repair mortar, the mortar shall be scrubbed into the moistened substrate to completely fill all pores and voids. Allow mortar or concrete to set to desired stiffness. Sponge float finish remaining repair areas to provide a smooth uniform textured surface.

H. Repair areas and adjacent parent concrete surfaces shall be treated immediately after finishing, providing continuous moist curing without change in color for at least 7 days. Surfaces shall be covered with damp burlap and sealed with taped polyethylene. Membrane curing compounds shall not be used. Protect newly applied material from rain, sun, and wind until compressive strength is 70% of the 28 day compressive

strength. To prevent from freezing cover with insulating material. Setting time is dependent on temperature and humidity.

I. Leave finished work and adjacent concrete surfaces in a neat, clean condition with no evidence of spillovers or staining.

3.4 REPAIRS OF HARDENED CONCRETE SURFACES

A. Defective concrete including form tie holes not previously patched and honeycombed areas. Areas shall not be patched unless examined and approval is given by the Engineer. After approval, areas involved shall be cut back to a minimum depth of 1 inch from the finished surface, or as otherwise directed, whichever is greater. Edges of areas to be repaired shall be cut square to a minimum depth of 3/4 inch. Feathered edges will not be allowed. Any voids or honeycomb around reinforcing steel shall be chipped away to provide at least 3/4 inch clearance all around to permit proper placement of repair mortar or concrete around the steel to the parent, sound concrete. Prepare all surfaces to be repaired in accordance with repair material manufacturer's recommendations.

B. Exposed surfaces shall be thoroughly cleaned of all mud, paint, grime, scum, laitance, organic matter, detritus, calcareous growth and other foreign matter by sand and water blasting or other acceptable means. Immediately after cleaning, the surface shall be checked by the Engineer for proper surface preparation, including fractured concrete or loose aggregate. Any such material shall be removed using pneumatic or hand tools. The final surfaces shall be thoroughly rinsed with clean water to remove remaining dirt and dust.

C. Premoisten the prepared surface for at least 2 hours or reduce absorption of water by the parent concrete and to provide a reservoir for moist curing at the interface of the repair. The substrate should be saturated surface dry with no standing water. While the concrete surface is still damp, apply a thin 1/16 inch coat of neat cement slurry (mixed to the consistency of a heavy paste) with a bristle brush to provide a bond coat throughout the entire cavity of the repair. Before the slurry has dried or changed color, promptly install the repair concrete or dry-pack, as may be required or selected.

D. For relatively small areas, ram repair concrete into this portion of the formed void. This concrete shall comprise a crumbly-dry 1-1-1.5 mixture of cement, concrete sand and pea gravel (or ¾″ gravel) mixed slightly damp to the touch (just short of "balling"). The "dry-pack" consistency of the concrete shall be zero slump, but moist enough so that when it is rodded and tamped until dense, an excess of paste will appear on the surface in the form of a spider web. In cases of unformed voids of thinner section, do not build-up repair in excess of a depth which will sag with the weight of the fresh mortar or concrete. Trowel smooth with heavy pressure.

E. Large areas may be repaired with concrete in conformance with Paragraph 2.2 of this section.

F. The concrete shall be of the driest possible consistency and mix composition so that it can be worked into the corners and angles of forms and around the reinforcement, without permitting the materials to segregate or free water to collect on the surface, due consideration being given to the methods of placing and compacting. Source and mixture of concrete shall be submitted for approval.

G. Concrete shall be deposited continuously, or in layers of such thickness that no concrete will be deposited which has hardened sufficiently to cause the formation of seams and planes of weakness within the section. Concrete shall be thoroughly consolidated and trowelled dense, smooth and plane. Avoid premature and excessive toweling that could cause sagging.

H. Repair areas and adjacent parent concrete surfaces shall be treated immediately after finishing providing continuous moist curing without change in color for at least 7 days. Surfaces shall be covered with damp burlap and sealed with taped polyethylene. Membrane curing compounds shall not be used.

I. Leave finished work and adjacent concrete surfaces in a neat, clean condition with no evidence of spillovers or staining.

3.5 REPLACEMENT OF DETERIORATED REBAR FOR DAM WALL REPAIRS

A. Deteriorated rebar shall be replaced as instructed by the Engineer.

B. Replacement rebar shall be the same diameter as the as-built rebar.

C. Replacement rebar shall be lap spliced to existing deteriorated rebar. Lap length shall be a full splice length on each end of repair. Splice length shall be measured from point where existing rebar has a full cross section.

D. Concrete shall be chipped away to provide a minimum of ¾ inch of clearance all around any exposed steel reinforcement to permit proper placement of repair mortar or concrete around the steel to the parent, sound concrete.

E. Repair concrete spall in accordance with Paragraph 3.3 and details on drawings.

3.6 STRUCTURAL EPOXY INSTALLATION

A. All concrete that is not sound shall be moved to a sound concrete surface. All containments including: all oils, grease, incompatible existing coatings, efflorescence, sealers, or other contaminants shall be removed.

B. Surfaces to receive protective structural epoxy coating shall be cleaned and abraded to produce a sound concrete surface with adequate profile and porosity to provide a strong bond between the structural epoxy and the substrate. The substrate shall be prepared in accordance with manufacturer's recommendations.

C. Active water leakage through the joint or crack to be repaired with structural epoxy shall be stopped prior to the application of the structural epoxy, by methods in conformance with this specification.

D. Application procedures shall conform to the recommendations of the manufacturer, including material handling, mixing, environmental controls during application, safety and equipment and material thickness.

E. Structural epoxy repair of cracks, construction and expansion joints shall have a minimum thickness of structural epoxy to achieve a watertight repair.

F. The equipment should be specifically designed to accurately ration and apply the specified materials and shall be regularly maintained and in proper working order.

G. Structural epoxy repairs shall have a minimum bond strength to the concrete substrate of 200 psi in accordance with ASTM D4541. Structural epoxy repairs with bond strength less than specified shall be evaluated by the Engineer.

3.7 SURFACE PREPARATION AND REPAIR REQUIREMENTS FOR CONCRETE BRIDGE DECK REPAIRS

A. Temporary Shielding

1. Erect a temporary shielding system beneath the existing structure prior to removal of existing concrete to prevent demolition and construction debris from falling into the water below or onto areas where vehicular or pedestrian traffic exists, and to aid in other construction procedures on the bridge. Shielding shall be in place prior to commencing any concrete removal.

2. Shielding shall extend the full length of the bridge and a sufficient distance above and beyond the deck overhang at the fascias.

3. Shielding shall function as a containment system during construction. All spaces along the perimeter and at the seams shall be sealed to prevent dust and debris from escaping and falling below the bridge.

4. Shielding shall be designed to safely withstand all loads that is will be subjected to. The allowable design stresses shall in accordance with 2002 AASHTO Standard Specifications for Highway Bridges. The shielding shall be designed to withstand impact of the maximum segment to be removed during demolition.

5. Shielding shall be installed and removed only upon approval of the Engineer.

6. Welding, drilling, or cutting into existing beams will not be permitted without prior approval of the Engineer.

7. All materials of the shielding system shall become the property of the Contractor and shall be removed from the site at the completion of the project.

8. Submit calculations and detailed drawings of the proposed shielding to the Engineer for review and approval. Calculations and drawings shall be stamped by a Professional Engineer registered in Massachusetts. The submittal shall consider all loadings and other details relevant to the function of the system.

B. Extent, location, and repair type of all concrete repairs to be field verified and approved by the engineer after the contractor has sounded and marked out all repair areas. Repair configurations should be kept as simple as possible, preferable with square corners.

C. Saw cut along neat lines around repair area prior to concrete removal. Use saw cut depth of ½" or less as required to avoid cutting reinforcing steel.

D. Remove deteriorated and delaminated concrete, undercut exposed reinforcing steel to provide a 1" minimum clearance around bars, remove additional concrete as required to provide minimum required thickness of repair material.

E. If reinforcing steel is exposed, then clean by mechanical cleaning and then high pressure washing with water that contains no detergents or bond inhibiting chemicals.

Where active corrosion has occurred that would inhibit bonding, abrasion blast steel to white metal finish.

F. After removals and edge preparations are complete, remove bond inhibiting materials (dirt, grease, loosely bonded aggregate) by abrasion blasting or high pressure water blasting with water that contains no detergents or bond inhibiting chemicals. Check the concrete surfaces after cleaning to ensure that surface is free from additional loose aggregate or that additional delamination's are not present.

G. Apply bonding agent per contract provision to existing concrete and reinforcing steel prior to placement of concrete repair materials.

H. Place appropriate repair material for specific repair type. Placement and subsequent curing shall be in accordance with the manufacture's recommendations and cold and hot weather curing procedures referred to in specification section 03300.

I. Partial depth repair shall be used in areas if sound concrete is reached more than 1 ½" in depth from the top of the deck slab and/ or reinforcing steel is encountered. Deteriorated concrete shall be removed to a minimum depth of 1" below the bottom of the top layer of existing reinforcing steel or up to a maximum of 50% of the thickness of the concrete deck.

J. Full depth repair shall be used in areas if sound concrete is not reached until a depth equal to or greater than one-half (1/2) the thickness of the deck slab.

K. New steel reinforcement shall be placed to supplement an existing reinforcement bar when an existing bar has a section loss of 25% or more of the original cross section, as determined by the engineer, or the existing reinforcement is broken. Refer to S-505 for new reinforcement bar development lengths which shall extend from locations where the existing reinforcement bar has a section loss of 25% or more, or the existing reinforcement bar is broken. In lieu of supplementing a bar adjacent to a deteriorated bar, the contractor may cut out the deteriorated bar a mechanically splice the new bar to existing reinforcement.

L. The top deck surface of the concrete for all repairs shall be even with the adjacent existing deck slab and shall maintain the existing grades and cross slopes.

M. Upon approval of the engineer, modify the limits of concrete removal as shown in the limits of repair area (plan view) when supplementary reinforcement bars are required.

N. Deck reinforcement bar details shown on the drawings are general. Actual reinforcement bar size, spacing and locations will vary from location to location.

O. The new reinforcement bar shall be placed at the same level along the existing deteriorated or broken reinforcement bar.

3.8 SPRAY-APPLIED WATERPROOFING MEMBRANE INSTALLATION

A. Concrete surface preparation and application of the spray-applied waterproofing membrane shall be in accordance with Subsection 965 of the Standard Specifications.

B. Installation of spray-applied waterproofing membrane includes all relevant components including, but not limited to, primer, spray applied membrane, aggregate for keycoat, polymer modified tack coat, and all incidentals to complete the installation.

END OF SECTION

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DIVISION 4 - MASONRY

SECTION 04920

STONE MASONRY JOINT RESTORATION

PART 1 GENERAL

1.1 SUMMARY

A. Section includes:

1. Pointing and repointing of stone masonry training walls, bridge façade, abutments, pilasters and all other areas indicated on the drawings.

2. Chinking of stone masonry walls as indicated on the drawings.

3. Pilaster cap replacement

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. C144 – Standard Specification for Aggregate for Masonry Mortar

2. C91 – Standard Specification for Masonry Cement

3. C157 – Standard Test Method for Length Change of Hardened Hydraulic-Cement, Mortar, and Concrete

4. C270 – Standard Specification for Mortar for Unit Masonry

5. C780 – Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry

B. American Concrete Institute (ACI)

1. ACI 530 – Building Code Requirements for Masonry Structures.

1.3 SUBMITTALS

A. Mortar and grout design mixes and test reports to demonstrate compliance with specified requirements.

B. Specification data sheets for Integral Liquid Polymeric Water Repellent mortar admixtures.

C. Quality Control Submittals prior to commencement of Stone Masonry Restoration:

1. Methods of repointing, chinking and replacing stone masonry work as indicated on the drawings proposed for stone masonry restoration. This submittal should be sufficient to demonstrate a thorough understanding of the Work to be completed and the means that will be implemented to safely complete the Work within the Contract Time without damage to surrounding structures or resources. The Engineer will review the submittal for completeness, but will not "Approve" the means and methods.

2. Waste Management Plan to indicate the types of wastes to be generated and the proposed disposal or recycling locations.

3. Stone Masonry Restoration Materials Containment Plan to indicate how debris and waste generated from stone masonry restoration work will be contained and prevented from falling into water or to the ground below.

4. Copies of any authorizations and permits required to perform the work, including disposal/recycling facility permits and building permits.

1.4 QUALITY ASSURANCE

A. Single Source Responsibility for Mortar Materials – Obtain mortar ingredients of uniform quality, including color, for exposed masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.

B. Prior to commencing masonry work, test each type mortar, and mortar materials proposed for exterior exposure to ensure freedom from efflorescence.

1. Mortar Test: Prepare a 3 oz. mortar specimen for each proposed mix, using as little water as possible. While still in a plastic condition and prior to initial set, place each mortar specimen and a stone tested efflorescence free set on end, in a receptacle of such size that 4 ounces of water will have a depth between ½ and 1 inch. Thoroughly stir distilled water and mortar for 5 minutes before placing stone in water. Maintain water level by addition of distilled water. Remove brick after 7 days and air dry for 24 hours. Visible efflorescence on stone at 10 feet with normal vision under an illumination to affect its appearance when compared to untreated stone, shall be cause for rejection of mortar.

2. If tests show mortar is cause of efflorescence, test components in separate receptacles, each containing a stone on end which has been tested free of efflorescence. Fill and maintain receptacle with distilled water to a depth between ½ and 1 inch. Use one ounce of each cementitious ingredient and 3 ounces of each aggregate for testing, each mixed in 4 ounces of distilled water. Visual test of material for efflorescence, and rejection of faulty materials, shall be as described for mortar, in previous paragraph.

1.5 MOCKUP

A. Erect a minimum of two masonry mockups prior to beginning of masonry work, to verify selections made for color and textural characteristics. Masonry wall mockups shall represent completed masonry work for qualities of appearance, materials, and construction.

B. Construct one mock up 6 feet long by 6 feet high, on one of the existing portions of the stone walls to be repointed.

C. Construct one mockup of a complete existing pilaster complete with stone masonry repointing and new cap. Cap profile is to match existing and gradually slope from the center down to finished edges along perimeter of pilasters. Grout finish should be sand/ grit texture similar to existing caps.

D. The masonry wall mockup may incorporate multiple colors and textures as required by the Engineer and DCR to finalize material and color selections.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store cementitious materials off the ground, under cover and in dry location.

B. Store aggregates where grading and other required characteristics can be maintained.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Protection of Work - During repointing, cover partially completed joints with waterproof sheeting when work is not in progress.

B. Staining - Prevent mortar or soil from staining the face of masonry to be left exposed. Remove immediately mortar in contact with such masonry.

C. Cold Weather Protection:

1. Do not lay masonry units that are wet or frozen.

2. Remove any ice or snow formed on masonry bed by carefully applying heat until top surface is dry to the touch.

3. Remove masonry damaged by freezing conditions.

4. Perform the following construction procedures while the work is progressing. Temperature ranges indicated below apply to the air temperatures existing at the time of installation. In heating mortar materials, maintain the mixing temperature selected within 10°F (6°C). Do not heat water for mortar to above 160°F (70°C).

a. 40°F (4°C) to 32°F (0°C):

1. Mortar - Heat mixing water to produce mortar temperature between 40°F (4°C) and 120°F (49°C).

b. 32°F (0°C) to 25°F (-4°C):

1. Mortar - Heat mixing water and sand to produce mortar temperatures between 40°F (4°C) and 120°F (49°C); maintain temperature of mortar on boards above freezing.

c. 25°F (-4°C) to 20°F (-7°C):

1. Mortar - Heat mixing water and sand to produce mortar temperatures between 40°F (4°C) and 120°F (49°C); maintain temperature of mortar on boards above freezing.

3. Heat - Both wall under construction using salamanders or other heat sources.

4. Use windbreaks or enclosures when wind is in excess of 15 mph.

d. 20°F (-7°C) and below:

1. Mortar - Heat mixing water and sand to produce mortar temperatures between 40°F (4°C) and 120°F (49°C).

4. Provide enclosure and auxiliary heat to maintain an air temperature of at least 40°F (4°C) for 24 hours after repointing joints.

5. Protect completed masonry and masonry not being worked on in the following manner.

   a. 40°F (4°C) to 32°F (0°C) - Protect masonry from rain or snow for at least 24 hours by covering with weather-resistive membrane.

   b. 32°F (0°C) to 25°F (-4°C) - Completely cover masonry with weather-resistive membrane for at least 24 hours.

   c. 25°F (-4°C) to 20°F (-7°C) - Completely cover masonry with weather-resistive insulating blankets or similar protection for at least 24 hours, 48 hours for grouted masonry.

   d. 20°F (-7°C) and below - Except as otherwise indicated, maintain masonry temperature above 32°F (0°C) for 24 hours using enclosures and supplementary heat, electric heating blankets, infrared lamps and other methods proven to be satisfactory.

PART 2 PRODUCTS

2.1 MORTAR AND GROUT MATERIALS

A. Masonry Cement: ASTM C91

B. Mortar Aggregate: ASTM C144, standard masonry type.

C. Water: Clean and potable.

D. Water Repellant Granular or liquid type. Water repellent admixture shall be Hydrocide powder manufactured by Sonneborn, Omicron by Master Builders Co., Integral Waterpeller by Euclid Chemical, or approved equal.

E. Admixtures: The use of admixtures, other than water repellent admixtures, is prohibited unless specifically submitted and approved by the Engineer.

2.2 MORTAR AND GROUT MIXES

A. Mortar Mixes:

1. Mortar for all masonry repointing: ASTM C270, Type N using Proportion specification.

2. Mortar for pilaster caps: ASTM C270, Type O using Proportion specification. Pilaster cap mortar mix shall utilize a water repellent admixture.

B. Mortar Mixing:

1. Thoroughly mix mortar ingredients in accordance with ASTM C270 in quantities needed for immediate use.

2. Achieve uniformly damp sand immediately before mixing process.

3. Add mortar color and admixtures to achieve uniformity of mix and coloration.

4. Re-temper only within two hours of mixing.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify field conditions are acceptable and are ready to receive work.

3.2 PREPARATION

A. Remove deteriorated mortar using a power chisel until sound mortar is found or to a minimum depth of 2 ½ times the thickness of the mortar joint, whichever is greater.

B. The depth to the bottom of the cleaned joint shall be uniform across the width of the joint.

C. Exercise care so that the stone masonry is not damaged when using power chisels or other mechanical methods.

D. Wash out dust and dirt within the prepared joints with a jet of water prior to repointing.

E. Contain wash water.

F. Filter wash water to remove particulates prior to discharging. Do not introduce solids into reservoir.

3.3 INSTALLATION

A. Repointing of previously mortared joints

1. Place approximately ¼ inch of mortar in the back of the joint.

2. Pack mortar into the corners and bottom of the opening.

3. Apply next ¼ inch layer when previous layer is thumb-print hard.

4. Continue applying ¼ inch layers until joint has been filled.

5. Do not overfill the joint; stop filling joint just short of flush with the outer face of the stone masonry.

6. Tool the joint to form profile which matches the existing masonry when the final layer of mortar has become thumb-print hard.

7. Moist cure for a minimum of 72 hours

B. Pointing of joints not previously mortared

1. Fully mortar joints between dry laid stones.

2. Apply mortar until refusal up to 12 inches in depth. Total, minimum mortar thickness is 2 inches.

3. Final lift of mortar to be tool finished shall be ¼" in thickness.

4. Do not overfill the joint; stop filling joint just short of flush with the outer face of the stone masonry.

5. Tool the joint to form profile which matches the existing pointed masonry when the final layer of mortar has become thumb-print hard.

6. Moist cure for a minimum of 72 hours

3.4 FIELD QUALITY CONTROL

A. Field-testing of the mortar mixes during construction shall be performed in accordance with ASTM C780. The Owner's Project Representative shall determine when samples will be taken.

3.5 CLEANING

A. Remove excess mortar and mortar smears as work progresses.

B. Replace defective mortar. Match adjacent work.

C. Clean soiled surfaces with cleaning solution.

D. Use non-metallic tools in cleaning operations.

E. Efflorescence that blooms prior to final completion of the project shall be cleaned from exposed masonry surfaces at no additional cost to the Owner.

END OF SECTION

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DIVISION 5 - METALS

SECTION 05500

MISCELLANEOUS METALS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Stainless steel bar rack
2. Fasteners for Miscellaneous Metals Items
3. Steel pipe for bridge rail

B. Related Sections

1. Section 09900 – Painting

1.2 REFERENCES

A. The Commonwealth of Massachusetts State Building Code, Latest Edition

B. American Iron and Steel Institute (AISI), Stainless Steel Types

1. AISI Type 316 - Stainless Steel Bolts, Bars, Sheets and Shapes
2. AISI Type 316L - Stainless Steel Bars, Shapes, Plates and Pipe

C. American Society for Testing and Materials (ASTM)

1. A53, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
2. A123, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
3. A143, Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedures for Detecting Embrittlement
4. A240, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
5. A276, Standard Specification for Stainless Steel Bars and Shapes
6. A384, Standard Practice for Safeguarding Against Warpage and Distortion During Hot-Dip Galvanizing of Steel Assemblies
7. A385, Standard Practice for Providing High-Quality Zinc Coatings (Hot-Dip)
8. A780, Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
9. F593, Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs
10. F594, Standard Specification for Stainless Steel Nuts

D. International Conference of Building Officials (ICBO): Evaluation Reports for Concrete and Masonry Anchors.

E. Steel Structures Painting Council (SSPC)

F. American Welding Society (AWS)

1. B2.1, Specification for Welding Procedure and Performance Qualification

2. D1.1, Structural Welding Code – Steel

3. D1.3, Structural Welding Code - Sheet Steel

4. D1.6, Structural Welding Code - Stainless Steel

5. QC 1, Standard for AWS Certification of Welding Inspectors

G. The Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities.

1.3 SUBMITTALS

A. Product Data:

1. Concrete and Masonry Drilled Anchors:

a. Manufacturer's product descriptions

b. Specific installation instructions, including drilled hole size, preparation, placement procedures, and instructions for safe handling of anchoring systems

2. Prime Paint

3. Bitumastic Troweling for Surfaces in Contact with Concrete

4. Bridge Railing Components

B. Welder’s Certificates – Submit Manufacturer’s Certificate certifying welders employed on the Work have passed the AWS qualification tests within the previous 12 months.

C. Shop Drawings:

1. Detailed shop drawings, including erection drawings, for all metal fabrications including bar rack, including welding and fastener information, and bridge railing components:

a. Submit for approval before fabrication

b. Identify sizes of structural members, grade and strength of steel, method of assembly, anchorage, and connection to other members

2. Setting drawings, templates, and directions for the installation of anchor bolts.

D. Quality Control Submittals:

1. Concrete and Masonry Drilled Anchors:

a. Current test data or ICBO evaluation report

b. Adhesive Anchor Installer Certification

2. Welding: In accordance with the requirements of AWS.

3. Provide Certificates of Compliance on other materials as requested by the Engineer.

1.4 QUALITY ASSURANCE

A. Shop Assembly: Pre-assemble items in shop to the greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

B. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

C. Qualifications for Welding Work:

1. Qualify welding processes and welding operators in accordance with the latest edition of AWS "Standard Qualification Procedure".

2. Provide certification that welders to be employed in the work have satisfactorily passed AWS qualification tests within the previous 12 months and have been welding regularly.

3. Perform shop and/or field welding required in connection with the work of this Section in strict accordance with pertinent recommendations of the American Welding Society.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Handle and stack materials carefully to prevent deformation or damage.

B. Store materials carefully on substantial timbers and blocking, so arranged that materials will be free from earth and properly drained, preventing any splattering with dirt or accumulation of water or snow in or about materials.

C. Prevent accumulation of mud, dirt, or other foreign matter on materials. Any accumulation shall be completely removed prior to erection.

D. Protect painted, hot-dip galvanized, and other finishes from damage due to metal banding and rough handling. Use padded slings and straps.

E. Adhesive Anchor Systems:

1. Store adhesive cartridges on pallets or shelving in covered storage area, in accordance with manufacturer's written instructions.

2. Cartridge Markings: Include manufacturer's name, product name, material type, batch or serial number, and adhesive expiration date.

3. Dispose of cartridges if shelf life has expired.

2.1 MATERIALS

A. Unless otherwise indicated, meet the following requirements:

Item	ASTM Reference
Steel Pipe	A53, Grade B (SCH80)
Stainless Steel:	
Bars and Angles	A276, AISI Type 316
Shapes	A276, AISI Type 304
Steel Plate, Sheet, and Strip	A240, AISI Type 316
Bolts, Threaded Rods, Anchor Bolts, and Anchor Studs	F593, AISI Type 316
Nuts	F594, AISI Type 316
Washer	A240, AISI 304 or AISI 316

2.2 MANUFACTURED UNITS

A. Concrete and Masonry Drilled Anchors

1. General: Materials shall be AISI Type 316 stainless as shown in Data Sheet – 05500 – A, FASTENER MATERIALS SCHEDULE, at end of this section.

2. Adhesive Anchors:

a. Threaded Rod:

1) ASTM F593 stainless steel threaded rod, diameter as shown on Drawings.

2) Length as required, to provide minimum depth of embedment.

3) Clean and free of grease, oil, or other deleterious material.

4) For hollow-unit masonry, provide galvanized or stainless steel wire cloth screen tube to fit threaded rod.

b. Adhesive:

1) Disposable, self-contained cartridge system capable of dispensing both components in the proper mixing ratio and fitting into a manually or pneumatically operated caulking gun.

2) Two-component, designed to be used in adverse freeze/thaw environments, with gray color after mixing.

3) Cure Temperature, Pot Life, and Workability: Compatible for intended use and environmental conditions.

4) Nonsag, with selected viscosity base on installation temperature and overhead application where applicable.

c. Manufacturers and Products:

1) Hilti, Inc., Tulsa, OK; HIT Injection Adhesive System, HIT HY 200 or equal

3. Adhesive Threaded Inserts:

a. Stainless steel, internally threaded insert

b. Manufacturer and Product: Hilti, Inc., Tulsa, OK; HIS-R Insert with HIT HY 200 adhesive

2.3 SHOP FABRICATION

A. General

1. All dimensions shall be verified at the site before fabrication is started.

2. Galvanized items shall be shop fabricated and completely welded prior to galvanizing.

3. Fit and shop assemble items in largest practical sections, for delivery to site.

4. Fabricate items with joints tightly fitted and secured.

5. Welding shall be in accordance with the requirements of the American Welding Society (AWS).

6. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

7. Exposed Mechanical Fastenings: Flush countersunk screws or bolts, unobtrusively located, consistent with the design of the component, except where specifically noted otherwise.

8. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

9. Miscellaneous metals work shall be formed true to detail, with clean, straight, sharply defined profiles and smooth surfaces of uniform color and texture and free from defects impairing strength or durability.

10. Metal Surfaces: For fabrication of miscellaneous metal work that will be exposed to view, use only materials that are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness.

11. Connections and accessories shall be of sufficient strength to safely withstand stresses and strains to which they will be subjected. Accessories and connections to steel or cast iron shall be steel, unless otherwise specified. Threaded connections shall be made so that the threads are concealed by fittings.

12. Castings shall be of good quality, strong, tough, even-grained, smooth, free from scale, lumps, blisters, sand holes, and defects of any kind which render them unfit for the service for which they are intended. Castings shall be thoroughly cleaned and will be subjected to a hammer inspection in the field by the Engineer. Finished surfaces shown on the Drawings and/or specified shall be machined to a true plane

surface and shall be true and seat at all points without rocking. Allowances shall be made in the patterns so that the thickness specified or shown shall not be reduced in obtaining finished surfaces. Castings will not be acceptable if the actual weight is less than 95% of the theoretical weight computed from the dimensions shown.

13. No splicing of any member or part of the work will be allowed where full-length members are commercially available.

14. Screws, bolts, studs and other connecting devices required in the work shall be concealed wherever possible. On all finish work where fasteners must be exposed to view, they shall be countersunk and finished flush with the exposed surfaces. All screws, bolts and other fastening devices used for exterior work shall be aluminum, bronze or stainless steel, whichever is appropriate for the work in which it is to be used.

B. Fabrication Tolerances:

1. Squareness: 1/8 inch maximum difference in diagonal measurements

2. Maximum Offset Between Faces: 1/16 inch

3. Maximum Misalignment of Adjacent Members: 1/16 inch

4. Maximum Bow: 1/8 inch in 48 inches

5. Maximum Deviation From Plane: 1/16 inch in 48 inches

2.4 FINISHES

A. Surface Preparation and Painting

1. Surface Preparation and prime painting shall be as specified in Section 09900.

a. All structural steel is to be thoroughly cleaned of dust and grit before the primer is applied.

b. Prime paint utilized by the Miscellaneous Metals fabricator shall conform to the requirements and be of the same manufacturer as that provided under Section 09900.

B. Steel To Be Left Unpainted

1. Clean steel surfaces in accordance with SSPC-SP3 for the following surfaces:

a. Faying surfaces of slip critical (SC) bolted connections.

b. Surfaces within 2 inches of field-welded connections.

c. Steel members to be completely encased in reinforced concrete, coated with cementitious fireproofing, or hot-dipped galvanized.

d. Bearing surfaces.

e. Surfaces to be weld-spliced in field.

2.5 SOURCE QUALITY CONTROL

A. Miscellaneous Metals fabrications, materials, and workmanship shall be subjected to inspection and testing in mill, shop and/or field by the Engineer.

B. Inspection and testing of shop welding shall be in accordance with the requirements of the American Welding Society (AWS). Repair and retest defective welds as specified in American Welding Society (AWS) standards.

C. Maintain inspection and quality control records of shop and field work.

D. The Contractor shall maintain records of each impact wrench used in the shop, showing dates, sizes of bolts tested and the corresponding torque values. Certified copies of the records shall be made available to the Engineer, upon request.

E. Notify the Engineer prior to start of any fabrication, the start of cleaning and painting, or other phases of work so as to afford them reasonable opportunity to inspect work.

F. Furnish the Engineer upon request, with the following:

1. Complete sets of approved Shop Drawings and corrective work procedures at fabricating shop(s) and in field.

2. Cutting lists, order lists, material bills, and shipping lists.

3. Information as to time and place of all rollings and shipments of material to shops and field.

4. Representative sample pieces requested for testing.

5. Full and ample means and assistance for testing materials, and proper facilities for inspection of work, in mill, shop and field.

G. Do not remove any marks or tags identifying rejected work.

H. Any work found deficient shall be corrected or replaced in accordance with these specifications. Deficient welds shall be cut out to sound material and re-welded. Deficient assemblies shall be taken apart, corrected and reassembled, using new materials as required.

I. Miscellaneous Metals work that has been rejected by the Engineer in the mill or shop shall be corrected without delay and at no expense to the Owner.

3.1 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

B. Verify that anchor bolts, bearing plates, and other items furnished to be installed by others have been installed correctly.

3.2 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

B. All steel and aluminum surfaces to come in contact with exposed concrete or masonry shall receive a protective coating of an approved heavy bitumastic troweling applied in accordance with manufacturer's instructions prior to installation.

3.3 FIELD FABRICATION

A. No fabricated section shall be cut in the field without the permission of the Engineer.

B. All miscellaneous metals work shall be formed true to detail, with clean, straight, sharply defined profiles and smooth surfaces of uniform color and texture and free from defects impairing strength or durability.

C. Connections and accessories shall be of sufficient strength to safely withstand stresses and strains to which they will be subjected. Accessories and connections to steel or cast iron shall be steel, unless otherwise specified. Threaded connections shall be made so that the threads are concealed by fittings.

D. No splicing of any member or part of the work will be allowed where full-length members are commercially available. Jointing shall meet the approval of the Engineer.

E. Screws, bolts, studs and other connecting devices required in the work shall be concealed wherever possible. On finish work where fasteners must be exposed to view, they shall be countersunk and finished flush with the exposed surfaces. Screws, bolts and other fastening devices used for exterior work shall be aluminum, bronze or stainless steel, whichever is appropriate for the work in which it is to be used.

3.4 INSTALLATION

A. Install all items furnished except items to be imbedded in concrete or masonry. Items to be attached to concrete or masonry after such work is completed shall be installed in accordance with the details shown. Fastening to wood plugs in masonry will not be permitted.

B. Where aluminum contacts wood, apply two coats of aluminum metal and masonry paint to the wood.

C. Pack grout solidly between concrete or masonry bearing surfaces and plates to ensure that no voids remain.

3.5 ANCHOR BOLTS

A. Accurately locate and hold anchor bolts in place with templates at the time concrete is placed.

B. Use sleeves for location adjustment and provide two nuts and one washer per bolt of same material as bolt.

3.6 CONCRETE AND MASONRY DRILLED ANCHORS

A. Begin installation only after concrete or masonry to receive anchors has attained design strength.

B. Install in accordance with manufacturer's instructions.

C. Provide minimum embedment, edge distance, and spacing as follows, unless indicated otherwise by anchor manufacturer’s instructions or shown otherwise on Drawings:

Anchor Type	Min. Embedment (bolt diameters)	Min. Edge Distance (bolt diameters)	Min. Spacing (bolt diameters)
Adhesive	9	9	13.5

D. Use only drill type, bit type, and diameter recommended by anchor manufacturer. Clean hole of debris and dust with brush and compressed air.

E. For undercut anchors, use special undercutting drill bit and rotary hammer drill and apply final torque as recommended by anchor manufacturer.

F. When embedded steel or rebar is encountered in the drill path, slant drill to clear obstruction. If drill must be slanted more than 10 degrees to clear obstruction, notify Engineer for direction on how to proceed.

G. Adhesive Anchors:

1. Do not install adhesive anchors when temperature of concrete is below 40 degrees F or above 100 degrees F.

2. Remove any standing water from hole with oil-free compressed air. Inside surface of hole shall be dry where required by manufacturer's instructions.

3. Do not disturb anchor during recommended curing time.

4. Do not exceed maximum torque as specified in manufacturer's instructions.

3.7 FIELD QUALITY CONTROL

A. The fact that Miscellaneous Metals work has been accepted at the shop shall not prevent its final rejection at the job site, even after it has been erected, if it is found to be defective in any way.

B. Miscellaneous Metals erection, materials, and workmanship shall be subjected to inspection and testing in mill, shop and/or field by the Engineer.

C. Maintain inspection and quality control records of shop and field work.

D. Notify the Engineer prior to start of any miscellaneous metals erection, or other phases of work so as to afford them reasonable opportunity to inspect work.

E. Furnish the Engineer upon request, with the following:

1. Complete sets of approved Shop Drawings and corrective work procedures at fabricating shop(s) and in field.

2. Full and ample means and assistance for testing materials, and proper facilities for inspection of work, in mill, shop and field.

F. Do not remove any marks or tags identifying rejected work.

G. Any work found deficient shall be corrected or replaced in accordance with these specifications, without delay and at no expense to the Owner.

3.8 ADJUST AND CLEAN

A. Touch-Up Painting - Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as approved for use for shop painting.

B. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils.

3.9 FASTENERS

A. Anti-seizing Lubricant: Use on all stainless steel threads.

B. Do not use adhesive anchors to support fire-resistive construction or where ambient temperature will exceed 120 degrees F.

C. Provide fasteners in accordance with Data Sheet – 05500 – A, following this section, unless otherwise noted on the drawings.

DATA SHEETS ON FOLLOWING PAGE

DATA SHEET 05500 - A
Fastener Materials Schedule

Service Use and Location	Product	Remarks
Drilled Anchors for Metal Components to Concrete (Ladders, Handrail Posts, Electrical Panels, and other Equipment)		
Exterior and Interior Wet and Dry Areas	Hot-dip galvanized steel or stainless steel sleeve, wedge, or expansion anchors, or stainless steel adhesive anchors	Use zinc-plated undercut anchors for overhead and ceiling installations.
Submerged or Corrosive Areas	Stainless steel adhesive anchors	

END OF SECTION

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DIVISION 9 - FINISHES

SECTION 09900

PAINTING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Surface preparation and application of coatings.

2. Sampling and testing for lead based paint on existing railings.

B. Related Sections

1.2 REFERENCES

A. The Society for Protective Coatings (SSPC):

1. Surface Preparation Specifications

a. SP-1 - Solvent Cleaning

b. SP-2 - Hand Tool Cleaning

c. SP-3 - Power Tool Cleaning

d. SP-5 - White Metal Blast Cleaning

2. SSPC-PA 1 – Shop, Field and Maintenance Painting

3. SSPC-PA 2 - Measurement of Dry Coating Thickness with Magnetic Gages

4. SSPC Visual Standards SSPC VIS 1-89

5. SSPC Guide 4 – Guide to Maintenance Repainting with Oil Base or Alkyd Painting Systems

6. SSPC Guide 6 – Guide for Containing Debris Generated During Paint Removal Operations

B. Occupational Safety and Health Administration (OSHA) Standards

C. American Society for Testing and Materials (ASTM)

1. ASTM D4263 – Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method

2. ASTM F1869 – Standard Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride

D. International Concrete Repair Institute (ICRI)

1. ICRI 310 - Selecting And Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair

1.3 SCOPE OF WORK

A. Items of work include but are not limited to the surface preparation and coating of the following:

1. Preparation and painting of existing and replaced pipe railings as shown on the drawings

2. Existing railings and railing embeds to be prepped and painted are assumed to contain lead based paint. Do not disturb existing paint.

B. The Contractor shall furnish to the Owner, at no charge, for use duration of this Project, dry film thickness gauge, wet film thickness gauge, adhesion testing, surface preparation testing, temperature / climate condition detectors, electrical flaw gauge and / or holiday detection equipment.

1.4 SUBMITTALS

A. Applicator qualifications for general coatings.

B. List of coating products and systems proposed, giving brand, type and manufacturer.

C. Manufacturer's current printed recommendations and product data sheets for each system, and ASTM performance criteria.

D. Paint manufacturer's compatibility guide, to be a complete listing of all compatible paint systems/combinations produced by the paint manufacturer.

E. Copies of manufacturer’s complete color charts for each coating system.

F. When requested by the Engineer, provide product container labels and labeled mixing instructions for products utilized in the Work.

G. Prior to commencement of surface preparation and painting work submit Methods to be used, including a Surface Preparation and Painting Materials Containment Plan to indicate how debris and waste generated from surface preparation and painting work will be contained and prevented from entering the water or falling to the ground below.

H. Do not disturb existing paint, which is assumed to contain lead.

1. Keep and maintain the following records and disposal documentation throughout the project in chronological order in a 3-ring notebook with appropriate tabbed dividers as follows:

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

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

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

d. Copies of all recycling/disposal receipts

I. Pre-surface preparation and painting Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as

damage caused by surface preparation or painting operations. Comply with Section 01320 "Construction Photographs." Submit before Work begins.

1.5 QUALITY ASSURANCE

A. Use adequate number of skilled workmen who are trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and methods required for proper performance of the work in this Section.

B. Applicator Qualifications – Minimum 5 years experience in application of specified products.

C. Regulatory Requirements – Meet federal, state and local requirements limiting the emission of volatile organic compounds.

D. A qualified and experienced representative of the paint manufacturer shall meet with Contractor and Engineer to coordinate items requiring painting and to schedule the Work. Monthly field visits shall occur to ensure proper application of the painting system. The Contractor shall coordinate with the paint manufacturer to schedule site visits.

E. Use equipment of adequate size, capacity, and quantity to accomplish the work of this Section in a timely manner.

1.6 DELIVERY, HANDLING, STORAGE AND PROTECTION

A. Deliver materials to painter's area in original, unbroken, containers with name and analysis of product, manufacturer's name, and shelf life date. Do not use or retain contaminated, outdated, prematurely opened, or diluted materials.

B. Storage of materials shall be in accordance with the paint manufacturer’s recommendations.

C. Store coated items carefully. Store paints and painter's materials only in areas designated solely for this purpose. Avoid damaging or dirtying coatings by contact with soil, pavement or other harmful materials that might necessitate special cleaning. Use suitable blocking during storage.

D. Confine mixing, thinning, clean-up and associated operations, and storage of painting debris before authorized disposal, to these areas.

E. Do not expose primed surfaces to weather for more than six months before top coating. Allow less time if recommended by coating manufacturer.

F. Do not use plumbing fixtures, piping or mechanical equipment for mixing or disposal of paint materials.

G. Store waste temporarily in closed, nonflammable containers until final disposal. Keep no rubbish in painter's area longer than 24 hours. Finally, dispose of waste in an approved disposal system.

H. During surface preparation, cleaning and painting operations, protect all surfaces not to be painted.

I. Protect coated items, whether prime or finish, from damage due to shipping and handling. Use padding, blocking, fabric slings and extra care as required.

J. Upon completion of field painting, ensure coatings are undamaged and in good condition. Repair damaged or deteriorated coating, resulting from failure to observe foregoing requirements.

1.7 PROJECT/SITE CONDITIONS

A. Environmental Requirements:

1. Comply with manufacturer's recommendations as to environmental conditions under which coatings and coating systems can be applied.

2. Do not apply coatings when dust is being generated.

3. Practice an abundance of caution to contain all preparation and paint work.

B. Cover or otherwise protect work by other trades and surfaces not being painted during all painting operations. Protect waterside edge to not allow material to fall into the water.

C. All shop primed ferrous metals shall be primed using the same coatings specified in the paint schedule.

1.8 EXTRA MATERIALS

A. Provide one spare 1 gallon paint container for each type and color applied.

B. Multi-component products shall have sufficient unopened quantities of each component to produce the required amount of mixed paint for future maintenance.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Coating systems are designated by reference to Tnemec Company, Inc. and Sherman Williams products to establish the type and quality required. Equal products as manufactured by International Protective Coatings, PPG Industries, Carboline Company or equal will be considered if provided with a “Product for Product” listing with the submittal. The Engineer reserves the right to request and receive detailed technical literature of each proposed coating system before approval.

B. No coating systems will be considered that decrease the film thickness, decrease the number of coats, decrease the effectiveness of the surface preparation or change the type of coating specified in the schedule of this section.

2.2 MATERIALS, GENERAL

A. Paint Coatings - Suitable for intended use, recommended by their manufacturer for intended service. All coatings, unless otherwise specified, shall be suitable for severe service.

B. Products Used - Minimum of five years satisfactory use under similar service conditions.

C. Use products of one manufacturer in any one paint coating system; all coating materials compatible. Coatings for touch-up - same as original.

D. Equipment prime or finish painted by the equipment manufacturer shall be painted in strict accordance with this Section and the equipment's individual specification section.

E. Bear entire responsibility in providing complete compatibility of all shop and field painting systems.

F. It is recognized that the specific application of the coating products varies for each specific manufacturer (number of coats, mil thickness per coat, etc.). Therefore, these Specifications represent the minimum to be provided under this contract and shall be increased in accordance with each manufacturer's recommendations.

2.3 COLORS AND FINISHES

A. All finish colors will be selected from manufacturer's color chips. The Owner will select the colors. Match final colors to selected color chips, as scheduled.

B. To provide contrast between successive coats, lightly tint each coat to distinguish it from preceding coats.

C. Unless otherwise indicated, use gloss or semi-gloss for finish paint.

2.4 COATING TYPES

A. Coating types and minimum acceptable percent (by volume) of component solids are described in Schedule 09900-A Coating Types. Description of coating systems including surface preparation and dry film thicknesses are included in Schedule 09900-B Coating Systems.

PART 3 EXECUTION

3.1 GENERAL

A. Examine surfaces scheduled to receive paint and finishes for conditions that will adversely affect execution, permanence or quality of work and which cannot be put into an acceptable condition through preparatory work.

B. Do not proceed with surface preparation or coating application until conditions are suitable.

C. The following shop and field instruments shall be used to inspect surface preparation and dry film thickness.

1. SSPC visual standards SSPC-VIS 1-89

2. Testex Press-O-Film replica type x-coarse

3. Surface temperature thermometer

4. Sling psychrometer and psychrometric tables

5. Type I or Type II dry film thickness gauges

6. SSPC-PA2 methods

3.2 PREPARATION

A. Basic Steps

1. Arrange to do all preparation and paint work in heated enclosure unless ambient weather conditions ensure still, dry air and a minimum of 50 degree F temperature. Do not apply paints to surfaces in direct sunlight.

2. Coordinate cleaning and painting operations to eliminate contamination of one by the other.

3. Maintain all coating materials at manufacturer's recommended mixing and application temperatures for not less than 24 hours before use. Have clean, proper containers, spray equipment, applicators and accessory items ready for use before decanting or mixing paint materials.

4. Ensure proper coordination of materials to be applied hereunder with previous coatings on affected surfaces. Have all manufacturer's written directions on hand, and follow them strictly, except where otherwise specified.

5. Carefully coordinate preparation and material compatibility requirements of paint systems used by manufacturers to shop prime equipment.

B. Before any paint application, carefully clean all surfaces to be coated of dust, dirt, grease, rust, mill scale, paint unsuitable for top coatings, efflorescence, oil, moisture, foreign matter or conditions detrimental to coating bond and durability. However, do not disturb existing paint due to lead paint concerns.

1. Following cleaning, apply preparatory treatment in strict accordance with manufacturer's written instructions.

2. Fill imperfections and holes in surfaces to be painted.

C. Metals

1. Prepare all field and shop primed ferrous metals, including galvanized ferrous metals, in accordance with Schedule 09900-B Coating System Schedule included under this Section.

2. A needle gun may be used for field welds and shop welds which occur in narrow, unprimed areas in an otherwise shop primed surface.

3. Surface preparation for painting of the existing railings shall meet the cleanliness equivalent to SSPC-SP1 Solvent Cleaning, to avoid disturbing the existing paint system.

D. Provide higher degree of cleaning for acceptable equivalent paint products when paint manufacturer recommends in his printed surface preparation recommendations.

E. Concrete for Paint Finishes

1. Clean thoroughly of all form oil, release agents, dirt, dust, grease, paint, loose material and foreign matter. Remove laitance; roughen smooth surfaces by

brush sand blasting in accordance with SSPC-SP13 Surface Preparation of Concrete (Reference ICRI CSP 3-5 visual standards).

F. Before applying field coat, touch-up abraded areas of shop coats with paint of the same type. Apply an entire coat if necessary. Touch-up coats are in addition to, and not a substitute for first field coat. Clean deteriorated surfaces to bare metal before applying touch-up coat.

G. After installation, touch up all scratches and blemishes on all steel.

3.3 APPLICATION

A. Conditions

1. Do not apply paints or other finish to wet or damp surfaces, except in accordance with instructions of manufacturer. Do not apply exterior paint during cold, rainy, or frosty weather, or when temperature is likely to drop to freezing within the paint coatings curing time as specified by the paint manufacturer. Avoid painting of surfaces while they are exposed to direct sunlight.

2. Paint surfaces which have been cleaned, pretreated, or otherwise prepared for painting with first finish coat as soon as practicable after such preparation has been completed, but in any event prior to deterioration of prepared surface.

3. Coat blast cleaned metal surfaces immediately after cleaning, before any rusting or other deterioration or contamination of the surface occurs. Do not coat blast cleaned surfaces later than 8 hours after cleaning under ideal conditions or sooner if conditions are not ideal.

4. Work shall conform to SSPC-PA 1.

B. Methods

1. Prepare surfaces, mix and apply paint materials in strict accordance with manufacturer's printed instructions and recommendations, except where specifically directed otherwise. Control temperature of materials upon mixing and application, surface temperature and condition, thinning and modifying.

2. Protect surfaces to be coated, before, during and after application unless ambient weather conditions are favorable.

C. Workmanship

1. Apply coating materials to meet manufacturer's spreading rate and dry film thickness recommendations. Dry film thicknesses specified are constant for brush, spray, roller or other form of application.

a. Control thinning for spray use and to manufacturer's printed instructions, and produce specified dry film thickness on level surfaces, interior and exterior angles.

b. Record quantities of materials of each type, for each coat used.

2. Apply paints and coatings using skilled painters, brushed or rolled or sprayed out carefully to a smooth, even coating without runs or sags. Allow each coat of paint to dry thoroughly, on the surface and throughout the film thickness, before the next coat is applied. High polymer coatings may be exempted from the drying requirement if recoat time is specified by manufacturer.

3. Finish surfaces - Uniform in finish and color, and free from flash spots and brush marks.

4. Accessory items, finish hardware, lighting fixtures, escutcheons, plates, trim and similar finish items not to be painted: Remove or carefully mask before painting adjacent surfaces; carefully replace and reposition upon completion of adjacent painting and cleaning work.

3.4 EXISTING SURFACES TO BE RECOATED

A. Surface preparation for steel shall, in general, be as specified in SSPC Guide 4.

3.5 PROTECTION, CLEAN-UP

A. Protect all materials and surfaces painted or coated under this Section, from the time of surface preparation until the final coat has fully dried. Also protect all adjacent work and materials from touch-up painting by the use of sufficient drop cloths during the progress of this work. Upon completion of the work, clean up all paint spots, oil, and stains from floors, glass, hardware, and similar finished items.

3.6 PAINT SCHEDULE

A. Coordinate, schedule and confirm the various cleaning, touch-up and finishing operations. Ensure the transmission of materials data, color selections and coating system methods between the coating applicators. Take responsibility for not exceeding exposure and recoat time limits.

B. Color code all piping in accordance with Schedule 09900-C, Color Schedule.

3.7 FIELD QUALITY CONTROL

A. Leave staging and lighting in place until the Engineer has inspected surface or coating. Replace staging removed prior to approval by the Engineer. Provide additional staging and lighting as requested by the Engineer.

B. Unsatisfactory Application

1. If surface has an improper finish color or insufficient film thickness, clean surface and topcoat with specified paint material to obtain specified color and coverage. Obtain specific surface preparation information from coating manufacturer.

2. Evidence of runs, bridges, shiners, laps or other imperfections is cause for rejection.

3. Repair defects in accordance with written recommendations of coating manufacturer.

C. Damaged coatings, Pinholes and Holidays

1. Feather edges and repair in accordance with recommendations of paint manufacturer.

2. Hand or power sand visible areas of chipped, peeled or abraded paint, and feather the edges. Follow with primer and finish coat. Depending on the extent of repair and appearance, a finish sanding and topcoat may be required.

3. Apply finish coats, including touchup and damage repair coats in a manner that will present a uniform texture and color-matched appearance.

3.8 FINAL TOUCH-UP

A. Prior to final completion and acceptance, examine painted and finished surfaces and retouch or refinish as necessary to leave surfaces in perfect condition.

Schedule 09900-A - Coating Types

Tnemec Company Inc.	**Sherwin-Williams**	**Type of Coating System (Solids Content by Volume)**
Series 20HS Pota-Pox	Macropoxy 646 PW Potable Water Epoxy or Macropoxy 5500 Low VOC Epoxy	Polyamide Epoxy (77.0 ± 2.0%)
Series FC20HS Pota-Pox (Fast Cure)	Macropoxy 646 PW Potable Water Epoxy or Macropoxy 5500 Low VOC Epoxy	Polyamide Epoxy (77.0 ± 2.0%)

Schedule 09900-B - Coating Systems

Surface	**System Surface Preparation (Shop/Field)**	**System Finishes**		
		Primer	**2nd**	**Final**
		DFT = Dry Film Thickness, Mils		
Ferrous Metals, Exterior Non-Submerged	SSPC-SP-6 (shop) / SSPC-SP-1 (field)	Series 1 (2.5-3.5 DFT)	Series 66HS (3.0-5.0 DFT)	Series 73 (2.5-5.0 DFT)
		Corothane I Galvapac 2K	*Macropoxy 646 FC Epoxy*	*Acrolon 218 HS Polyurethane .*
Ductile and Cast Iron Pipe, Interior and Exterior, Non-submerged	NAPF 500-03-04 (shop) / SSPC-SP-1 (field)	Series 66HS (3.0-5.0 DFT)	Series 66HS (3.0-5.0 DFT)	Series 73 (2.5-5.0 DFT)
		Macropoxy 646 FC Epoxy	*Macropoxy 646 FC Epoxy*	*Acrolon 218 HS Polyurethane*

Schedule 09900-B - Coating Systems				
	System Surface Preparation	System Finishes		
		Primer	2nd	Final
Surface	(Shop/Field)	DFT = Dry Film Thickness, Mils		

Notes

(1) Tnemec Products are listed in the first row for each surface and Sherwin-Williams products are listed in italics on the second row for each surface without a dry film thickness. Refer to Paragraph 2.1 for “or equal” products.

Schedule 09900-C - Colors	
Item	**Color**
Railings	Green (Match Existing Color)

END OF SECTION

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DIVISION 13 - SPECIAL CONSTRUCTION

SECTION 13285

ASBESTOS CEMENT PIPE ABATEMENT

PART 1 GENERAL

1.1 SUMMARY

A. Asbestos-cement (AC) pipe has been identified as part of the Massachusetts Department of Conservation and Recreation's (the "Owner") Damon Pond Dam Repairs and Area Improvements Project (the "Project") and will be impacted by the project.

B. The work covered in this section includes the minimum procedures that shall be employed during abatement of the asbestos-containing material (ACM).

C. Refer to other Sections of these Specifications to determine the type and extent of work therein affecting the work of this Section, whether or not such work is specifically mentioned herein.

D. This Section was prepared by Massachusetts licensed Asbestos Project Designer Francisco J. Rodrigues (License No. AD040130).

1.2 RELATED INFORMATION

A. Related Drawings

1. Tighe & Bond Project Drawings titled "Department of Conservation and Recreation, Damon Pond Dam Repairs and Area Improvements."

1.3 PROJECT DESCRIPTION / ABATEMENT QUANTITIES

A. This section addresses the abatement of AC pipe only. Furnish all labor, materials and equipment and perform all work required to safely remove and legally dispose of the ACM. Provide all insurance, certifications and licenses necessary for the work.

B. The Work to be performed includes but is not limited to the proper removal, handling, and disposal of ACM proposed to be disturbed during the Project at the Site.

C. Handling and disposal of AC pipe shall include removal of approximately 50 feet of 6-inch diameter AC (Transite) outfall pipe at Damon Pond. The abatement of the AC pipe is necessary to accommodate the improvement project, as well as segregation of asbestos contaminated debris from soil in the event breakage occurs. It is the sole responsibility of the Contractor to visit the site or review the Contract Documents and determine the quantities of ACM to be removed when developing their Bid.

D. Under the work of this Section, "Engineer" is defined as a third-party representative working on behalf of the Owner, who will conduct periodic monitoring and air sampling, if necessary, during the course of abatement operations to determine the effectiveness of work procedures; perform final visual inspections and collect final air clearance samples, if required, for certifying work areas as clean following removal and cleanup tasks.

E. File all necessary notices, obtain all permits and licenses, and pay all governmental taxes, fees, and other costs in connection with the work. Obtain all necessary approvals of all governmental departments having jurisdiction.

F. Obtain, prepare, and submit applicable forms and permits required for asbestos abatement.

1.4 DEFINITIONS AND ABREVIATIONS

A. Abatement: Procedures to control fiber release from ACM; includes removal, encapsulation, and enclosure.

B. Air Monitoring: The process of measuring the total airborne fiber concentration of an area, or a person.

C. Amended Water: Water to which a surfactant (wetting agent) has been added.

D. AIHA: American Industrial Hygiene Association.

E. Asbestos: The name given to a number of naturally occurring fibrous silicates. This includes the serpentine forms and the amphiboles, and includes chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite, or any of these forms, which have been chemically altered.

F. Asbestos Containing Materials (ACM): Any materials containing more than one percent (1%) asbestos. (For work in Massachusetts – greater than or equal to 1%).

G. Asbestos Fibers: Those particles with a length greater than five (5) microns and a length to diameter ratio of 3:1 or greater.

H. Asbestos Work Area: A regulated area as defined by OSHA Title 29 CFR, Part 1926.1101 where asbestos abatement operations are performed, which is isolated by physical barriers to prevent the spread of asbestos dust, fibers, or debris. The regulated area shall comply with requirements of regulated area for demarcation, access, respirators, prohibited activities, competent persons and exposure assessments and monitoring.

I. Clearance Sampling: Final air sampling performed aggressively after the completion of abatement activities to evaluate compliance with the specification and State and Federal regulations.

J. Competent Person: As defined by OSHA Title 29 CFR, Part 1926.1101, a representative of the Abatement Contractor who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure. The Competent Person has authority to take prompt corrective measures, and to eliminate such hazards during asbestos removal. The Competent Person shall be properly trained in accordance with EPA's Model Accreditation Plan (MAP).

K. Containment: An enclosure within the building which establishes a contaminated area and surrounds the location where ACM and/or other toxic or hazardous substance removal is conducted and establishes a Control Work Area.

L. Decontamination Enclosure System: A series of connected areas, with curtained doorways between any two adjacent areas, for the decontamination of workers and equipment. A decontamination enclosure system always contains at least one airlock and is adjacent and connected to the regulated area, where possible.

M. Friable Asbestos Materials: Any material that contains more than 1% asbestos by weight, which can be crumbled, pulverized, or reduced to powder by hand pressure.

N. HEPA Filter: High Efficiency Particulate Air (HEPA) filter in compliance with ANSI Z9.2 1979.

O. HEPA Vacuum Equipment: Vacuum equipment fitted with a HEPA filter system for filtering the effluent air from the unit.

P. MassDEP: Massachusetts Department of Environmental Protection

Q. MADLS: Massachusetts Department of Labor Standards

R. NESHAPs: National Emissions Standard for Hazardous Air Pollutants regulations enforced by the EPA.

S. NIOSH: National Institute for Occupational Safety and Health

T. OSHA: Occupational Safety and Health Administration

U. PCM: Phase Contrast Microscopy

V. Project Monitor: A professional capable of conducting air monitoring and analysis of schemes. This individual should be an industrial hygienist, an environmental scientist, or an Engineer with experience in asbestos air monitoring and worker protection equipment and procedures. This individual should have demonstrated proficiency in conducting air sample collection in accordance with OSHA Title 29 CFR, Parts 1910.1001 and 1926.1101.

W. Regulated Area: An area established by the employer to demarcate where Class I, II, and III asbestos work is conducted and any adjoining area where debris and waste from such asbestos work accumulate, and a work area within which total airborne fiber concentrations exceed, or there is a reasonable possibility that they may exceed the PEL.

X. Transite: Brand name for Johns Manville, an American company, for a line of asbestos-cement products, including boards and pipes.

Y. Transport Vehicle: A motor vehicle or rail car used for the transportation of cargo by any mode. Each cargo-carrying body (e.g., trailer, railroad freight car) is a separate transport vehicle.

Z. USEPA: United States Environmental Protection Agency.

AA. WSR: Waste Shipment Records

1.5 REFERENCES

A. Comply with the most recent asbestos removal and disposal requirements established by applicable federal, state, and applicable local government laws, statutes, regulations, ordinances, standards, and guidelines including the following:

1. USEPA National Emissions for Hazardous Air Pollutants (NESHAP) Regulations (Title 40 CFR, Part 61, Subpart M).

2. USEPA Asbestos Hazard Emergency Response Act (AHERA) Regulations (Title 40 CFR, Part 61, Subpart E).

3. US Department of Labor, OSHA Asbestos Regulations, 29 CFR 1926.1101

4. NIOSH air sampling and evaluation standards

5. AIHA Standards

6. MassDEP Regulations 310 CMR 7.15, 310 CMR 18.0, and 310 CMR 19.00

7. MADLS Regulations 454 CMR 28.00.

8. All applicable local ordinances, regulations, or rules pertaining to asbestos. Including its storage, transportation, and disposal.

1.6 SUBMITTALS

A. Prior to the start of the abatement work, prepare and submit the following items. Do not commence work activities until submittals are reviewed and accepted by the Engineer.

1. Submit detailed site-specific work plan which identifies:

   a. Methods, materials, excavation / hoisting equipment to be used to access, handle and abate AC pipe.

   b. Methods for removing lengths of asbestos-cement pipe at bell connections/logical end points and efforts to ensure breakage will not occur.

   c. Methods and materials necessary in the event asbestos-cement pipe breakage must occur to remove lengths of pipe.

   d. Methods intended for waste packaging, labeling and waste shipment container preparation such as intended use of lockable, hard covered dumpsters. Describe proposed temporary on-site dumpster staging plans and location, if necessary.

   e. Methods for providing water and electrical sources as needed for abatement.

   f. Exact locations and details of construction of the Remote Decontamination Facilities and demarcated Regulated Areas from which all abatement will be performed within.

2. Submit copies of all notifications, permits, applications, and like documents required by federal, state, or local regulations obtained or submitted in proper fashion.

3. Submit documentation of asbestos accreditation and training including the 8-hour OSHA Class II Asbestos Training: Asbestos Cement Pipe (ACP) Worker Safety course, OSHA-specified medical examinations (with examiner approval) and successful respirator fit test records of each employee who may be on the Site.

4. Submit the name and address of the waste hauling contractor and proposed landfill to be used. Also submit applicable licenses, current valid operating permits, and approvals.

5. Submit copies of drafts of Waste Shipment Records (WSR) and generator labels to be used for this project. The generator's information shall be included on all copies submitted.

6. Submit a copy of the Contractor's OSHA-required written Respiratory Protection Program, including a fit testing methodology for respirators, maintenance and decontamination details, and make, model and NIOSH approval numbers of respirators to be used at the Site,

7. Submit detailed Safety Data Sheets and product information on all materials and equipment proposed for asbestos abatement work on this project.

8. Submit documentation of Contractor's air sampling laboratory certification for analysis of Contractor's OSHA personal air samples.

B. The Contractor shall submit the following to the Engineer during the course of work:

1. Results of personal air sampling.

2. Certificate, training, medical, and fit-test records for new employees to start work (24 hours in advance of work).

3. Contractor site logs.

4. Revised Notification, if any.

5. Copies of WSRs for waste that has left the site.

C. The Contractor shall submit the following to the Engineer at the completion of work:

1. Completed copies of WSR (within forty-five days).

2. Remaining personal air sampling results and site logs.

3. Completed Post Abatement Visual Inspection Documentation.

1.7 LOCATION OF WORK AND SITE CONSTRAINTS

A. Refer to Drawings for the locations and quantities of AC pipe to be abated. If additional ACMs are encountered, notify the Engineer immediately and have an asbestos abatement team be prepared to abate the material if it to be impacted as part of the work.

B. Temporary Utilities:

1. Water Usage – There are no available water sources at the site. The Abatement Contractor shall be responsible for coordinating with the Owner and General Contractor for a water source usage or supply their own water by other means. The Contractor shall be responsible for the proper hookup of the water utilizing a licensed and experienced plumber and any fees associated with water usage. Maintain all water hoses in good condition. The Contractor will be responsible for any damages caused by inadequate water connections. Refer to Section 01510, Temporary Utilities for temporary utility requirements.

2. Electrical Usage – There are no available electrical sources at the site. The Abatement Contractor shall be responsible for coordinating with the Owner and General Contractor for determining the requirements necessary to provide adequate power to successfully perform abatement activities. The Contractor shall be responsible for the proper connection of ground fault circuit interrupter (GFCI) panels using qualified and licensed tradespersons for each of the power connections and any fees associated with electrical usage. Maintain all electrical utilities in good condition. The Contractor will be responsible for any damages caused by inadequate utility connections. Refer to Section 01510, Temporary Utilities for temporary utility requirements.

C. Site Security: The Contactor shall be responsible for the security of the abatement regulated work areas. The Contractor shall post asbestos abatement warning signs at entrances to the work area and worker decontamination enclosure system. The Contractor shall have a supervisor monitoring the entrance of the worker decontamination chamber during abatement work.

1.8 NOTIFICATION

A. Notify appropriate regulatory agencies of abatement activities.

1. Submit the required written notification and appropriate fee at least 10-working days before the start of the asbestos abatement activity to all required state agencies, including MassDEP.

2. Notify local Building Departments, Board of Health or Health Departments and any other applicable local departments as required.

B. If a potential hazard relating to the asbestos abatement work is observed, immediately notify the Engineer by telephone, followed by written notice, of any risks of adverse health and safety

impacts on the environment, exposure of workers or the general public, or possible failure to comply with the specifications. Promptly notify the Engineer of the reason and required resolution of all observed deficiencies and record them in ink in a hardbound notebook.

1.9 MONITORING AND FINAL CLEARANCE

A. Contractor's Responsibilities

1. Conduct appropriate personal exposure monitoring to determine compliance with OSHA requirements. All air samples shall be analyzed by a laboratory accredited by the AIHA. Sampling equipment shall be calibrated before and after each use.

2. Contractor shall be responsible for the payment of all costs associated with any air sample collection and analysis performed in accordance with OSHA requirements.

3. Post abatement visual inspections to be conducted by Contractor personnel who have completed the 8-hour OSHA Class II Asbestos Training: Asbestos Cement Pipe (ACP) Worker Safety course and Contactor shall provide documentation of such inspections. Refer to Post Abatement Visual Inspection Documentation, appended to this section for details.

B. Owner's Responsibilities

1. The Engineer, a third-party representative working on behalf of the Owner, will conduct periodic monitoring and air sampling, if necessary, during the course of abatement operations to determine the effectiveness of work procedures; perform final visual inspections and collect final air clearance samples, if required, for certifying work areas as clean following removal and cleanup tasks.

2. The Owner will be responsible for the payment of costs associated with the sampling and analysis of air sampling by the Engineer, including the final air clearance samples. The Contractor shall be responsible for the payment of all costs associated with the collection and analysis of additional final clearance air samples if the first set of samples fail to satisfy the clearance criteria.

C. Air Quality Standard: If required, air tests made in proximity to any removal area, and to document "clean air," shall be compared to an air quality standard of 0.010 fibers per cubic centimeter (f/cc) for PCM air samples. If air sample exceeds the air quality standard, immediately stop all work until the cause is identified and corrected.

D. Air Monitoring Methods: If air sampling is performed, use NIOSH Method 7400 to measure levels of airborne asbestos fibers for all PCM air sampling events. All monitoring methods shall comply with the requirements of 29 CFR 1926.1101 and applicable state regulations. Provide copies of all personal exposure monitoring results and post results at work site after obtaining the results, but not later than 48 hours.

E. Following the completion of the encapsulation phase of the work, the Contractor and Engineer shall perform post abatement inspections prior to removal of any regulated or containment areas.

F. Upon completion of all work in any defined work area, the Contractor and the Engineer shall conduct a final inspection for the purpose of certifying compliance with these specifications, State/Federal regulations and work completion. Immediately correct unsatisfactory conditions. The work will be considered complete only after a certificate of completion and all properly completed WSRs Forms are submitted, as required by law.

1.10 WORKER PROTECTION AND SAFETY

A. Prior to commencing work, instruct all workers in all aspects of personnel protection, work procedures, emergency procedures and use of equipment including procedures unique to this project.

B. The Contractor shall monitor airborne asbestos concentrations in the workers' breathing zone to establish conditions and work procedures for maintaining compliance with OSHA Regulations Title 29 CFR Parts, 1910.1001 and Part 1926.1101.

C. All personnel air sampling shall be conducted in accordance with methods described in OSHA standards Title 29 CFR Parts 1910.1001 and Pat 1926.1101.

D. The Contractor is responsible for complying with all additional OSHA regulations while performing work on this project.

1.11 WORKER QUALIFICATIONS AND TRAINING

A. Contractor is required to have a Competent Person supervise each work area at all times work is in progress and shall employ the use of fully accredited and MADLS licensed asbestos workers or workers trained in OSHA Class II Asbestos Training: Asbestos Cement Pipe (ACP) Worker Safety course, during all phases of asbestos abatement activities.

B. The Competent Person shall be thoroughly familiar and experienced with asbestos abatement and related work and shall enforce the use of all safety procedures and equipment. He/she shall be knowledgeable of EPA, OSHA, and NIOSH requirements and guidelines. The Competent Person shall be trained in accordance with applicable state regulations.

PART 2 PRODUCTS

2.1 GENERAL

A. Deliver all materials in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name and product technical description.

B. All materials or equipment delivered to the site shall be unloaded, temporarily stored, and transferred to the work area in a manner that shall not interfere with operation of others at the facility, or employees' access and safety.

C. Damaged or deteriorated materials shall not be used and shall be promptly removed from the premises. Materials that become contaminated with asbestos-containing material shall be thoroughly cleaned, or sealed in plastic bags or sheeting, labeled and legally disposed of in an approved, secure landfill.

D. All materials and equipment shall comply, at a minimum, with all sections of this specification, relevant federal, state, and applicable local codes, and industry standards.

2.2 ABATEMENT EQUIPMENT & SUPPLIES

A. HEPA-Filtered Exhausts (if required): For interior abatement, air inside each work area shall be exhausted through a High Efficiency Particulate Air (HEPA) filter. Commercially manufactured HEPA-filtered exhaust units, with specification plates intact, must be provided for each work area to attain, at a minimum, four air volume changes per hour and an inward flow of clean air into each work area at the Decontamination Facility of at least 100 feet per minute. The HEPA filter shall be preceded by replaceable prefilters, and the unit must be designed so that it cannot be operated unless all filters are in place. The units must also be designed with a gauge to indicate the pressure drop across filters, and lights or audible alarms to indicate that the filters are properly installed, functional, and when they must be changed. Flexible ducting shall be required to allow exhausting to the exterior of the building.

B. Vacuum units, of suitable size and capacities for project, shall have HEPA filter(s) capable of trapping and retaining at least 99.97 percent of all monodispersed particles of 0.3 micrometers in diameter or larger.

C. Fire retardant polyethylene sheeting in a roll size to minimize the frequency of joints shall be delivered to job site with factory label indicating a minimum of 6-mil, unless regulations dictate otherwise. Contractor is responsible for determining if fire rated polyethylene sheeting is required by State or local Fire Marshal.

D. Polyethylene disposable bags shall be true six (6) mil with preprinted labels.

E. Wetting Agent or Surfactant shall be 50 percent polyoxyethylene ester and 50 percent polyoxyethylene ether, or equivalent, mixed in proportion of one ounce of surfactant per five gallons of water. The material shall be odorless, nontoxic, nonirritating, and noncarcinogenic. It shall be applied as a mist using a low-pressure sprayer recommended by the surfactant manufacturer.

F. Tape or adhesive spray will be capable of sealing joints in adjacent polyethylene sheets and for attachment of polyethylene sheets to finished or unfinished surfaces of dissimilar materials and capable of adhering under both dry and wet conditions, including use of amended water.

G. Warning Signs, Asbestos Caution Tape and Labels shall comply with all federal, state, or local codes and regulations.

H. Generator labels shall be preprinted on self-adhesive labels with the generator name, abatement site and contractor's name and address. Labels shall not be photocopied and applied with spray adhesive.

I. Waste Containers and Transportation shall be suitable for loading, temporary storage, transport, and unloading of contaminated waste without risk of ripping, rupture, or exposure to persons, or emissions to the atmosphere. Transportation methods shall comply with the provisions of 40 CFR 61, Subpart M, and with any state or local hazardous or special waste regulations for temporary storage, transport, and disposal if such codes are enforced in states in which the waste will be stored, transported, or disposed of.

2.3 SAFETY SUPPLIES AND EQUIPMENT

A. Respirator Types: Provide all workers with a full or half facepiece respirator that is approved by NIOSH/MSHA for protection against airborne asbestos and meets the requirements of the OSHA Asbestos Standard.

B. Protective Clothing: Provide all workers and approved visitors with disposable coveralls, head and foot coverings, gloves and eye protection (i.e., safety glasses) and half-face respiratory protection including HEPA cartridges.

PART 3 EXECUTION

3.1 WORK AREA PREPARATION

A. Prepare properly demarcated Regulated Work Areas to include at a minimum asbestos signage and barrier tape around the entire area. Regulated areas should be kept clear of any persons not fully trained and protected against exposure.

B. Maintain an operable remote worker decontamination system in accordance with Section 3.2 of this Specification.

C. Maintain a work area access control log for each exterior work area.

3.2 REMOTE PERSONNEL DECONTAMINATION SYSTEM

A. The Contractor shall establish a remote personnel decontamination system adjacent to each specific regulated work area. The use of a remote decontamination unit must be indicated on the state notification forms. Access between the contaminated and uncontaminated areas shall be through this decontamination enclosure only. The decontamination system shall be constructed of two layers of six-mil polyethylene sheeting.

B. Access between rooms in decontamination system shall be through double flap-curtained openings. Clean room and equipment room within decontamination system shall be completely sealed, ensuring that the sole source of air flow through this area originates from uncontaminated areas outside the work area.

C. The equipment room shall be equipped with a cleaning hose used to decontaminate workers and equipment. A shower filtration pump containing two 5-micron sock filters, or the best available technology shall be installed to filter shower water. Filtered shower water shall be discharged into sanitation drains and shall not be discharged into storm drains or onto floor or ground surfaces.

D. The equipment room should have soap and an adequate supply of drying towels. If necessary, provide an adequate number of shower units in accordance with OSHA Title 29 CFR, Part 1926.1101.

3.3 APPROVAL OF CONTAINMENT AREAS

A. After the work area has been prepared as specified, request an inspection by the third-party monitoring firm or Competent Person. No removal or disturbance of asbestos-contaminated materials or systems is to occur until the third-party monitoring firm or Competent Persson has inspected and approved each separate prepared work area.

B. Any deficiencies in the preparation work shall be promptly corrected in a manner satisfactory to the third-party monitoring firm or Competent Person.

3.4 ASBESTOS REMOVAL PROCEDURES

A. Perform asbestos removal procedures in accordance with the MassDEP Asbestos Regulations 310 CMR 7.15 and MADLS Asbestos Regulations 454 CMR 28.00.

B. Abatement Methods shall include at a minimum, the following:

1. Expose only portions of the AC pipe scheduled to be removed or disturbed. In accordance with MassDEP regulations, inoperable or out-of-service facility components containing ACM and located underground do not need to be removed unless they are disturbed or uncovered by excavation. Contractor shall be responsible for all abatement related costs

resulting from MassDEP mandated abatement of AC pipe mistakenly exposed or unearthed by the Contractor. Mechanical excavation shall not be used within six inches of the AC pipe. Soil within six inches of the AC pipe shall be uncovered by hand or with a shovel.

2. For excavations, use proper sloping and shoring as necessary and conduct in accordance with applicable OSHA regulations.

3. Once the pipe has been exposed, an assessment shall be made before proceeding by a person trained per 454 CMR 28.05(9) to determine whether the asbestos-cement pipe is damaged, cracked or broken, and to determine which requirements of 310 CMR 7.15(12A)(c) and 454 CMR 28.14(1)(a)4, apply to the asbestos abatement activity.

4. If the assessment shows that the asbestos-cement pipe is intact and not deteriorated:

   a. Place 6 mil thick polyethylene sheeting under the asbestos cement pipe to prevent soil contamination. Adequately wet the asbestos-cement pipe with amended water using surfactant or liquid soap before and during removal to avoid creating airborne dust.

   b. Separate the asbestos cement pipe at the nearest coupling (bell or compression fitting).

   c. Slide the asbestos-cement pipe apart at the joints (no saw cutting) or use other methods that do not cause the asbestos-cement pipe to break, become friable ACM or otherwise create the potential to release asbestos fibers.

   d. Containerizing the wet asbestos-cement pipe and other debris from the abatement in accordance with 310 CMR 7.15(7)(f)(3) may be done in the trench or adjacent to the trench.

   e. If the trench is filled with water, the placement of polyethylene sheeting is not required.

5. If the asbestos-cement pipe is deteriorated or is not intact, or when the use of mechanical breakage with saws, snap or blade cutting, and/or tapping is necessary:

   a. Place 6 mil thick polyethylene sheeting under the asbestos cement pipe to prevent soil contamination. Adequately wet the asbestos-cement pipe with amended water, where cutting or breaking will occur.

   b. Saw cutting of asbestos-cement pipe shall only be conducted with a HEPA-shrouded vacuum attachment or wet cutting equipment, unless it is conducted within a small enclosure that isolates the area in which the saw cutting is being conducted to prevent the release of asbestos fibers to ambient air.

   c. Wrap wet asbestos cement pipe in two layers of 6 mil polyethylene sheeting, seal with duct tape and label (This may be done either in the trench or adjacent to the trench).

6. Hoist the piping sections with a sling and place the sections into a roll-off container, covered truck, trailer or van protected with two layers 6-mil poly.

7. The waste container shall be covered in a manner to prevent accumulation of rainwater and stored in a secured area until transported to an asbestos landfill.

3.5 FINAL WORK AREA CLEANUP, DECONTAMINATION, AND WASTE DISPOSAL

A. General Requirements

1. After all asbestos-containing or contaminated materials have been removed, remove all waste and perform a final cleanup and decontamination of each work area. Final cleaning shall be performed only after all waste is packaged and removed, but before reinstalling, demolishing any equipment, or dismantling any barrier, Decontamination Facility, or protective covering.

2. Cleaning shall be subject to the approval of the third-party monitoring firm or Competent Person based on a visual inspection and a written record of a passing visual inspection to al level of no visible debris.

B. Cleaning Methods and Approval

1. Thoroughly clean all waste containers and removal equipment with a HEPA-filtered vacuum, decontaminated with the use of the amended water, and then remove from the work area.

2. Once these items have been properly packaged and removed from the work area as contaminated waste, package and properly dispose of all remaining plastic sheeting, disassemble and remove the Decontamination Facility and HEPA exhausts (if applicable).

3. After cleaning, the Engineer or third-party monitor shall inspect the site in accordance with 310 CMR 7.15(12A)(d) and 454 CMR 28.14(1)(a)5. To facilitate, notify the third-party monitor of the anticipated completion of the site cleaning at least 24 hours in advance.

C. Waste Disposal

1. Definition - Asbestos wastes are defined as all asbestos-cement pipe and debris, contaminated soils, disposable clothing and protective equipment, plastic sheeting and tape, exhaust systems or vacuum filters, or any abatement equipment that has been contaminated with asbestos and cannot be completely cleaned by vacuuming and by washing in the Decontamination Facility.

2. General Requirements - All asbestos wastes shall be handled, packaged, stored, transported, and disposed of in accordance with the 310 CMR 7.15(15), 310 CMR 7.15(16) and 310 CMR 7.15(17).

3. Waste Labeling - If waste containers are not already preprinted, warning labels having waterproof print and permanent adhesive shall be affixed to the containers, whether or not these containers are further packaged. Warning labels shall be conspicuous and legible, and conform to the latest OSHA, EPA and DOT labeling requirements.

4. Waste Packaging – It is expected that each asbestos-cement pipe segment will be individually wrapped or “tootsie rolled” in two layers of six mil poly, labeled then placed into a lined dumpster with hoisting equipment. If breakage occurs and soil is affected, the broken pieces and contaminated soil will be placed into asbestos labeled bags in accordance with applicable regulations, goosenecked, sealed and placed into the line dumpster.

D. Waste Container Removal and Disposal Documentation

1. Coordinate location of temporary storage area for waste trailers with Engineer or Owner.

2. To comply with the requirement that waste disposal to an approved landfill be documented, remove waste containers from work areas only under the direction of Engineer and after completing the appropriate documentation for each load of waste removed from the site.

3. Provide advance notice and coordination for the pick-up of the waste from the site to the Engineer and Owner.

4. Accurately measure the volume of each container or load of waste removed from the site.

5. Provide legal transportation of the waste to the disposal landfill, and complete or obtain all required licenses, waste shipment records, dump slips, or other forms. Copies of all waste documentation, etc. and the signed original of the Waste Shipment Record (WSR) for each waste load, shall be given to Owner.

6. Waste may be transported to and temporarily stored at a pre-approved off-site storage area owned by Contractor, but it must ultimately be disposed of at the specified landfill before final payments are approved.

END OF SECTION

APPENDIX A – POST ABATEMENT VISUAL INSPECTION DOCUMENTATION

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SECTION 13286

MANAGEMENT OF ASSUMBED PCB BULK PRODUCT WASTE

PART 1 GENERAL

1.1 SUMMARY

A. This Section establishes requirements for the removal, segregation, management, and disposal of ASSUMED Polychlorinated Biphenyl (PCB) Bulk Product Waste in the form of paint applied to railing poles.

B. The removal and disposal of building materials with PCB concentrations assumed to be greater than equal to (≥) 50 parts per million (ppm) is regulated by the Toxic Substance Control Act (TSCA) pursuant to Federal regulation Title 40 CFR, Part 761.

1. Painted debris with PCBs are regulated as PCB Bulk Product Waste, if PCB concentrations are assumed ≥ 50 ppm as (ref: Title 40 CFR, Part 761.50 (b) (4)).

2. Paints not sampled but are scheduled to be impacted during the improvements are assumed to contain concentrations of PCBs ≥ 50 ppm ("Bulk Product Waste") and are to be managed, removed, cleaned, and disposed as such. Refer to the project drawings for painted rail pole locations.

C. The intent of this Section is to identify applicable regulations the Contractor shall comply with to perform activities for this project related to assumed PCB-containing building materials including, but not limited to, the following:

1. Health and safety procedures

2. Worker training

3. Paint removal procedures

4. Disposal requirements.

D. The Contractor is solely responsible for health and safety procedures related to their work.

E. Contractor is advised that the PCB building materials may also contain heavy metal constituents in the paint.

F. This Section specifies requirements for the removal, management, and disposal of the following PCB-containing wastes:

1. Assumed PCB Bulk Product Waste identified as paints containing ≥ 50 ppm.

G. The Contractor shall also reference specification Section 02225 Selective Demolition.

H. Removal of PCB-contaminated materials will be conducted under an "Assumed Approach" and assumed PCB wastes will be classified as PCB Bulk Product Waste or PCB Remediation Waste.

I. Since sampling for PCBs has not and will not occur in the assumed source materials, the TSCA regulations do not specifically apply to this project. Although in this case, many of the performance requirements of TSCA have been included by reference in this Section as a basis for performing the work.

J. The proposed abatement summarized herein does not require notification or written approval from EPA, which is based on the assumptions presented herein.

K. Under NO circumstances shall the Contractor or affiliates of the Contractor (subcontractors, subconsultants, etc.) contact the EPA with respect to interpretations or the performance of the work specified herein.

1.2 RELATED DOCUMENTATION

A. Related Sections

1. Section 01350 Health & Safety Plan

2. Section 02225, Selective Demolition

1.3 DESCRIPTION OF WORK

A. If there are additional painted building materials not identified in this section, to be impacted by the Contractor as part of renovation activities notify the Engineer immediately. Contractor is responsible for confirming actual quantities to form the basis of their bid.

B. Assumed PCB-contaminated building materials work shall include but not be limited to the painted railing poles.

1. It is the sole responsibility of the Contractor to visit the site, review the Contract Documents and determine the quantities of materials to be removed when developing their Bid.

C. As further detailed in this Section, no sampling and/or analysis by the Contractor or affiliates of the Contractor (subcontractors, subconsultants, etc.) for total PCBs (Soxhlet Extraction) shall be performed at any point during the performance of the work, except as specifically authorized in writing by the Owner and the Engineer.

1. The Contractor shall collect representative samples of the waste stream for PCB analysis via the Toxicity Characteristic Leaching Procedure (TCLP) for waste disposal purposes only.

2. The Contractor is responsible for selecting disposal facilities that can accept PCB wastes with this restriction.

3. If the Contractor or affiliates of the Contractor (subcontractors, subconsultants, etc.) take unauthorized samples and analyze them for total PCBs, then the contractor will be responsible for the cost of any resulting removal required under existing state and federal regulations triggered by their sampling and analysis.

4. The Owner and the Engineer shall specifically review and approve in writing a proposed testing plan prior to samples being submitted for laboratory analysis.

D. In general, the following activities are minimum requirements of this Section and affect the renovations performed on building components identified and/or assumed to contain PCBs:

1. No torch cutting of PCB-contaminated building materials shall be performed.

2. No renovation/demolition activities shall occur that can reasonably be expected to increase the worker's exposure above the Permissible Exposure Limits (PEL) for PCBs unless certain worker protection is implemented.

3. Workers shall be informed of the PCB-contaminated building materials to be removed or encapsulated.

4. At a minimum, worker protection shall comply with applicable Occupational Safety and Health Administration (OSHA) standards. Worker Right to Know and Health and Safety Standards of Title 29 CFR, Part 1926, shall also apply to the work of this Section.

5. Unprotected, untrained workers or trades shall not perform any related work within or adjacent to work areas involving PCB-contaminated building materials.

1.4 SUBMITTALS

A. Prior to the start of the work, prepare and submit the following items. Do not commence work activities until submittals are approved.

1. Written Contractor Work Plan summarizing the Contactor's means and methods related to the removal, containment, management, and disposal of assumed PCB-contaminated building materials and wastes.

2. Pertinent information relating to the transportation and disposal of assumed PCB-containing materials.

a. This includes names of transporters and disposal facilities to be used including proof of permit, license, or authorization to transport and dispose of assumed PCB-containing materials in all affected states.

b. The Contractor shall include information related to disposal facilities ability to accept waste containing PCBs, lead and other heavy metals.

3. Requested sampling plan of any materials the Contractor may require to be sampled. Any waste characterization sampling to be performed by the contractor MUST obtain written approval prior to any samples being submitted for laboratory analysis.

4. Provide certification of either 40-hour OSHA HAZWOPER training or other PCB awareness training that addresses worker health and safety for all workers involved in the handling of assumed PCB materials.

5. Review of Contractor's work plan does not constitute approval of any specified means, methods and health and safety measures to be implemented. Review is for general compliance with this specification.

B. Contract Closeout Submittals (throughout project and prior to authorization of final payment):

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

2. Evidence of lawful disposal of all PCB wastes generated.

1.5 REGULATORY REQUIREMENTS

A. 40 CFR 761 as it relates to the generation, staging, labeling, removal and off-site management of the wastes summarized herein. As stated, TSCA is being cited as a performance criterion to be achieved during the performance of this work, although TSCA does not specifically apply to the work since PCB sampling has not been performed.

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

C. All workers involved with management of assumed PCB materials must either have 40-hour OSHA HAZWOPER training or other PCB awareness training that addresses worker health and safety. Evidence of worker training shall be submitted with the pre-work submittals.

PART 2 PRODUCTS

2.1 ABATEMENT PRODUCTS

A. All materials shall be delivered in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name.

B. Disposal Drums: Metal or fiberboard with locking ring tops, with warning labels as required by OSHA, and/or EPA.

C. Respirators:

1. Type: Approved by the Mine Safety and Health Administration (MSHA), Department of Labor, or the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services.

D. Vacuum Cleaners:

1. Type: Vacuums equipped with HEPA filters.

E. Polyethylene Sheeting:

1. Type: Minimum 6 mil., opaque, fire-retardant polyethylene sheets.

2. Floor Protective Layer (when applicable): Minimum 10 mil., reinforced polyethylene sheets.

F. Cleaning Products:

1. Contractor shall at their discretion utilize specialty cleaning products such as Capsur™, TechXtract™ or other cleaners for use in decontaminating porous and non-porous surfaces to remain.

2. All such products shall be utilized in accordance with manufacturer's specifications as intended. Contractor shall ensure appropriate use and disposal associated with use in accordance with the SDS sheets for each product utilized.

3. It shall be incumbent upon the Contractor to determine the need for use of specialty products to meet required cleaning verification levels established herein and in accordance with the Work Plan.

G. HEPA-Filtered Exhausts

1. Air inside negative pressure enclosures shall be exhausted through a HEPA filter.

2. Commercially manufactured HEPA-filtered exhaust units, with specification plates intact, must be provided for each work area to attain, at a minimum, four air volume changes per hour and an inward flow of clean air into each work area at the Decontamination Facility of at least 100 feet per minute.

3. The HEPA filter shall be preceded by replaceable pre-filters and the unit must be designed so that it cannot be operated unless all filters are in place.

4. The purpose of the containment system is to capture fugitive particulate while removing PCB-contaminated items using mechanical means and/or methods which generate potential PCB-contaminated dust.

H. Warning Signs

1. Warning signs shall be in English and the language of any workers onsite who do not speak English, and be of sufficient size to be clearly legible and display the following or similar language in accordance with Title 29 CFR, Part 1910.1200:

WARNING
HAZARDOUS WASTE WORK AREA
PCBs-POISON
NO SMOKING, EATING OR DRINKING
AUTHORIZED PERSONNEL ONLY
PROTECTIVE CLOTHING IS REQUIRED IN THIS AREA

2.2 GENERAL EQUIPMENT

A. A sufficient supply of disposable mops, rags, and sponges for work area cleaning and decontamination shall be available.

B. A sufficient supply of ladders and hand tools (e.g., scrapers, wire cutters, brushes, utility knives, wire saws, etc.) shall be provided as needed.

C. Media-blasting and/or mechanical grinding may be performed only within a negative pressure containment. Mechanical grinders must have factory-equipped shrouded HEPA vacuum attachments.

2.3 PERSONNEL PROTECTION

A. Safety equipment (e.g., hard hats meeting the requirements of ANSI Standard Z89.1-1981, eye protection meeting the requirements of ANSI Standard Z87.1-1979, safety shoes meeting the requirements of ANSI Standard Z41.1-1967, disposable PVC gloves or other work gloves), shall be provided to all workers and authorized visitors.

B. Non-skid footwear shall be provided to all abatement workers. Disposable clothing shall be adequately sealed to the footwear to prevent body contamination.

C. The contactors specific containment approaches shall also include the following products:

1. Plastic Sheeting ("Poly") - shall be polyethylene or equivalent with two layers with a thickness of at least six mil for all applications.

2. Tape and Glue – Shall be capable of sealing plastic joints and attaching plastic to finished surfaces. The bonding strength and resulting seal integrity shall not be affected by mist or water, wetting agent, or any other materials to be used in the work area.

PART 3 EXECUTION

3.1 REMOVAL METHODS REQUIREMENTS

A. Renovation activities shall be conducted in a manner that prevents the release of potential PCB-contaminated and heavy metal contaminated dusts to areas outside the immediate work zone.

1. Mechanical means and/or methods (i.e., abrasive and or power washing paint removal) which generate potential PCB-contaminated dust shall be conducted within negative pressure enclosures, compliant with SSPC Class 1A or Class 2A containment and filtration systems.

2. The sole use of guards and/or HEPA-vacuums on mechanical equipment is not sufficient.

B. Non-PCB contaminated demolition debris shall be segregated from PCB-contaminated demolition debris and disposed in accordance with this Section.

1. Additional disposal costs resulting from cross contamination of these materials caused by Contractor mismanagement will be the responsibility of the Contractor.

C. Feasible engineering controls (i.e., containment systems, misters, ventilation with HEPA filtration) shall be implemented by the Contractor to minimize the possibility of contamination of areas adjacent to the work area.

D. Workers shall be informed of the painted railing poles that have been identified as containing PCBs and shall implement appropriate personal protection (respiratory, dermal, etc.)

E. All proposed removal methods must be included in the Contractor Work Plan.

3.2 WORKER PROTECTION

A. The Contractor is solely responsible for the health and safety of workers employed by the Contractor, any subcontractor and anyone directly or indirectly employed by any of

them. The Engineer is not responsible for health and safety procedures related to the Contractors work.

B. The Contractor shall be responsible for ensuring OSHA compliance for all personnel working with PCB items, including providing appropriate personal protective equipment and training to use such protective equipment.

C. During renovation/demolition activities, Contractor shall ensure that workers are not exposed to any listed contaminant in excess of the permissible exposure limits (PEL). If exposure cannot be reduced to or below the PEL using engineering controls or revised work practices, the Contractor shall provide the appropriate level of personal protective equipment including, but not limited to, respiratory and dermal protection.

D. Contractor personnel involved in the removal or disturbance of PCB building materials shall be advised of all hazards associated with the work.

E. Contractor is advised that certain PCB building materials may also contain heavy metal constituents.

F. Personal Protective Equipment shall be worn in areas where any disturbance of PCB source materials (Paint, Caulk) or contaminated substrates is performed. This includes but not limited to removal and cleaning.

G. Marking of PCB work areas and PCB storage areas shall be in accordance with Title 40 CFR, Part 761.40 and RCSA 22a-463 through 22a-469.

3.3 WORKER HYGIENE PRACTICES

A. Work Area Entry.

1. Workers shall don personal protective equipment prior to entering work area, including respiratory protection, disposable coveralls, gloves, headgear, and footwear.

B. Work Area Departure.

1. While leaving respirators on, workers shall remove all gross contamination, debris, and dust from disposable coveralls and proceed to change room and remove coveralls and footwear and place in hazardous waste disposal container.

C. Hand washing Facilities.

1. All workers must wash their hands and faces upon leaving the work area.

D. Equipment.

1. All equipment used by workers inside the work area shall be wet wiped or bagged for later decontamination before removal from the work area.

E. Prohibited Activities.

1. Under no circumstances shall workers eat, drink, smoke, chew gum, or tobacco, or remove their respirators in the work area.

F. Shock Hazards.

1. The Contractor is responsible for using safe procedures to avoid electrical hazards. All temporary electrical wiring will be protected by ground fault circuit interrupters (GFCI).

3.4 GENERAL WORK AREA PREPARATION

A. A Competent Person shall be on the job at all times to ensure the establishment of proper separation of the work area from occupied areas, and proper work practices are followed through project completion.

B. Where necessary, shut down electrical power. Provide GFCI devices, temporary power, and temporary lighting installed in compliance with the applicable electrical codes. All installations are to be made by a Connecticut licensed electrician.

C. Shut down and/or isolate heating, cooling, and ventilation air systems or zones to prevent contamination and fiber dispersal to other areas of the structure. During the work, vents around the work area shall be sealed with duct tape and polyethylene sheeting

3.5 WORK AREA PREPARATION FOR NEGATIVE PRESSURE ENCLOSURES

A. Negative pressure enclosures shall be utilized by the Contractor during mechanical removal means and/or methods which generate potential PCB-contaminated dust.

1. Mechanical means and/or methods (i.e., abrasive and or power washing paint removal) which generate potential PCB-contaminated and heavy metal contaminated dust shall be conducted within negative pressure enclosures, compliant with SSPC Class 1A or Class 2A containment and filtration systems, whether equipment is equipped with HEPA-vacuums or not.

B. Provide GFCI devices, temporary power, and temporary lighting installed in compliance with the applicable electrical codes for interior removal. All temporary installations are to be made by a licensed electrician, installed outside work areas, and permitted as required.

C. Shut down electrical power, including receptacles and light fixtures. Lock and tag out circuits associated with the electrical components in the work area(s). Under no circumstances during the abatement and ceiling demolition procedures will lighting fixtures be permitted to be energized.

D. Shut down and/or isolate heating, cooling, and ventilation air systems or zones to prevent contamination and fiber dispersal to other areas of the structure. Lock and tag out circuits associated with heating and cooling units. During the work, vents within the work area shall be sealed with duct tape and polyethylene sheeting.

E. Seal off all openings, including but not limited to windows, corridors, doorways, skylights, ducts, grills, diffuser, and any other penetration of the work areas, with polyethylene sheeting minimum of six mil thick sealed with duct tape. This includes doorways and corridors which will not be used for passage during work areas and occupied areas. Install five-micron water filtration socks in all floor drains prior to sealing.

F. Install two layers of 6- mil polyethylene wall sheeting over all wall surfaces and critical barrier which will not be impacted by paint removal operations. All overlaps shall be sealed with tape or spray adhesive.

G. Cover all floors in the work area with two layers of 6-mil polyethylene sheeting.

1. Extend the polyethylene flooring a minimum of 12 inches up the walls. Ensure that the wall sheeting overlaps the floor sheeting from the top.

H. Maintain emergency and fire exits from the work area or establish alternative exits satisfactory to fire officials.

I. Create pressure differential between work areas and occupied areas by the use of acceptable negative air pressure equipment.

1. Negative air pressure shall be obtained throughout the containment and the total volume of air within the work area shall be changed every 15 minutes.

2. Install one or more portable HEPA-filtered exhausts to maintain negative air pressure to each individual work where containment procedures are utilized.

3. The exhaust(s) must be capable of providing at least an inward speed through any unsealed openings of at least 100 fpm, and four full air changes per hour throughout the work area.

4. All exhaust air shall pass through a HEPA-filter before being discharged outside the building.

5. Exhaust system shall be operated constantly during active disturbance of PCB-containing materials.

J. Post all approaches to each work area with warning signs. Warning signs shall be of size and type that are easily readable and are visible from all approaches to the work areas and adhere to regulatory requirements.

K. Establish a work area access control log at the entrance to each work area. Authorized personnel entering the work area shall sign in upon entering the area and sign out upon exiting the area.

L. Establish airless spray equipment within each work area. Airless spray equipment shall be capable of reaching all areas within each work area.

3.6 DECONTAMINATION SYSTEM

A. Worker Decontamination

1. The Contractor shall establish on-site, a decontamination enclosure consisting of equipment room, shower room, and clean room in series. Decontamination unit shall be contiguous to the work area for negative pressure enclosure work procedures. Component removal work areas shall have a minimum wash station (contiguous or remote).

2. Access between rooms in the decontamination system shall be through double flap-curtained openings. The clean room, shower and equipment rooms within the decontamination enclosure shall be completely sealed.

3. Construct the decontamination system with plastic, wood, or metal framing and cover both sides with a double layer of 6-mil poly, completely sealed with spray adhesive and tape at the joints.

4. The Contractor and the Engineer shall visually inspect barriers routinely to assure effective seal; the Contractor shall repair defects immediately.

3.7 GENERAL WORK PROCEDURES

A. Materials to be impacted by the project that were not previously tested must be considered to contain PCBs ≥ 50 ppm and removed/disposed in accordance with this section.

B. All workers and authorized persons shall enter and leave the Regulated Area through the contiguous airlock, leaving contaminated protective clothing in the airlock for disposal of as PCB-contaminated waste. No one shall eat, drink, smoke, chew gum or tobacco, or apply cosmetics while in the Regulated Area.

C. The Contractor shall employ methods to remove PCB-contaminated materials in a manner which minimizes the generation of dust and spread of PCB contamination.

1. The methods employed must not damage the integrity of the containment structure and shall not create a breach through which dust may escape.

2. The Contractor shall be responsible for all costs associated with decontamination and remediation in the case of a containment breach.

D. Mechanical cutting or grinding of PCB materials is not permitted unless the equipment has factory-equipped HEPA filtered exhaust and is conducted within a negative air enclosure with HEPA filtration exhaust.

E. The Contractor shall promptly place the PCB Bulk Product Waste material in disposal containers as it is removed. As the disposal containers are filled, the Contractor shall promptly seal the containers, apply caution labels, and clean the containers before removal from the work area.

F. All waste containers shall be leak-tight.

1. Containers shall be decontaminated as described in Section 3.8 and HEPA-vacuumed prior to exiting the work area.

2. Clean each container thoroughly before moving to a Waste Holding Area.

G. After completion of PCB removal work, all surfaces from which PCB materials have been removed shall be cleaned and HEPA-vacuumed to remove all visible material.

H. The Contractor shall properly decontaminate the exteriors of the air filtration devices, scaffolding, ladders, extension cords, hoses and other equipment inside the work area via cleaning and HEPA vacuuming.

I. The Contractor shall also remove and containerize all visible accumulations of PCB Waste and/or PCB contaminated debris from within the work areas.

J. Once the Work Area surfaces have dried, perform a thorough post abatement visual inspection. Surfaces within the regulated area, including but not limited to ledges,

beams, and hidden locations will be inspected by the Engineer for visible residue. Evidence of dust contamination that would be indicative of PCB contamination identified during the inspection will necessitate further cleaning as heretofore specified. The area shall be re-cleaned at the Contractor's expense, until the standard of no visible residue is achieved.

K. Prior to dismantling work areas and/or negative pressure containments, the Engineer will perform thorough visual inspections of the remaining substrates and polyethylene sheeting for cleanliness.

L. Remove and dispose of any suspect materials observed on the ground.

3.8 CLEANING PROCEDURES

A. Upon completion of the removal of identified and/or assumed PCB-contaminated building material in any given work area, cleaning will be performed by the Contractor.

1. Cleaning shall also be performed at the end of each workday to prevent the migration of dusts or debris to areas beyond the work limits.

B. A thorough final cleaning shall be performed on all surfaces using the cleaning method described in this Section and HEPA filter-equipped vacuums.

C. Final cleaning includes removal of any contaminated material, equipment or debris (including polyethylene sheeting) from the work area and removal of all visible dusts on surfaces. All polyethylene sheeting shall be packaged for disposal as a PCB Remediation Waste.

D. Special attention shall be given to personal hygiene and cleaning of supplies and/or equipment.

3.9 DECONTAMINATION OF TOOLS

A. Contractor shall decontaminate tools that may have been in contact with PCB materials.

B. Decontamination procedures shall be in accordance with Title 40 CFR, Part 761.79(c)(2)(i), which includes swabbing non-porous tools with a non-chlorinated organic solvent.

3.10 MANAGEMENT OF PCB WASTES

A. The materials summarized above are assumed to contain PCBs and shall be collected, packaged, sampled (AS SPECIFICALLY AUTHORIZED AND STATED BELOW), and labeled by the Contractor according to this Section for off-site disposal.

B. Assumed PCB Bulk Product Waste Management

1. In accordance with the provisions of TSCA and recent EPA interpretations, the following waste stream(s) shall be assumed to be a PCB Bulk Product Waste stream:

a. Paint chips

2. In accordance with the performance-based disposal provisions of 761.62, the assumed PCB Bulk Product Waste streams shall be managed in accordance with

761.62(a), which is generally a TSCA chemical waste/RCRA landfill or 762(b), which is a solid waste landfill.

3. During selection of the disposal facility, the Contractor shall appropriately communicate the requirements to the facility that the sampling of total PCBs is NOT permitted. However, sampling for other receiving facility parameters, including leachable PCBs per 761.62(b)(1)(ii) is permitted.

4. If a 761.62(b) solid waste landfill is selected, the Contractor shall select a landfill that is not located in Massachusetts due to regulatory restrictions in Massachusetts that prohibits the receipt of PCB Bulk Product waste generated in Massachusetts.

C. Non-Liquid PCB Remediation Waste Management

1. The following materials are assumed to contain PCBs and therefore should also be managed for off-site disposal:

a. Debris and dusts generated and collected throughout work activities subject to this Specification.

b. HEPA vacuum bags of assumed PCB dusts/debris.

c. Respirator cartridges, scrapers, tarpaulins, suits, plastic and other materials used for PCB abatement, including ground covers.

2. Management of these materials shall be in accordance with Performance-based disposal provisions established in 761.61(b) and shall ONLY include incineration at TSCA-approved facility or disposal in a TSCA-approved chemical waste landfill. Sampling of this waste stream for total PCBs is NOT permitted. However, sampling by the Contractor for other facility required parameters is permitted, including leachable PCBs. For the purposes of facility approval and waste profiling, total PCBs shall be assumed to be greater than 50 ppm and is non-liquid.

D. Sampling

1. Any sampling specified in this Section shall be performed by Contractor, unless otherwise noted.

2. Written approval for any proposed total PCB sampling by the Contractor MUST be received by the Contractor prior to shipping samples for laboratory analysis.

3. Failure to adhere to the specific sampling program within this Section could result in significant consequential costs/damages to the Owner. In this case, if Contractor violates the required sampling program, Owner will be due from the Contractor the actual value of the consequential costs.

E. Labeling, Manifests and Shipping Documentation

1. All wastes shall be appropriately containerized and labeled based on the individual waste classification related to the presence of PCBs and asbestos.

2. All waste containers and temporary waste storage areas on the site will be labeled with appropriate U.S. DOT labels in accordance with 40 CFR 761.55 and 49 CFR parts 171 through 180. Waste container labels will visibly display proper PCB waste labels on the exterior of the containers inside the work area prior to removing the containers from the work area. On-site storage area trailers or roll-offs will also be labeled with perimeter caution tape, PCB waste signage, and labels at the entrance or opening to the storage containers.

3. Contractor shall provide draft waste profiles for all waste streams generated as part of this project for the OR to review prior to submitting to the facility.

4. Owner will sign as generator on all profiles and shipping documents.

5. PCB Bulk Product Waste (Paragraph 3.08(B)) – transport on a non-hazardous manifest.

   PCB wastes greater than 50 ppm that are generated in Massachusetts are classified as a Massachusetts hazardous waste. Since portions of the PCB Bulk Product Waste stream are assumed to be greater than 50 ppm, typical transport over the road in Massachusetts for these wastes would require a Massachusetts hazardous materials manifest. Once the proposed facility is provided to the Owner, the Contractor shall receive approval from the MassDEP to transport these assumed PCB materials on a non-hazardous materials manifest. This approval requires the materials to be disposed of at an out-of-state facility permitted/licensed to receive PCB Bulk Product waste per applicable sections of TSCA. Contractor shall provide to the Owner the approval letter received from the MassDEP.

6. Non-Liquid PCB Remediation Waste (Paragraph 3.08(C)) – transport on a TCSA manifest.

F. Provide evidence that the PCB waste has been received at legal disposal locations. The means for such proof shall be truck weight slips from an approved disposal facility and copies of applicable waste shipment records (waste profiles, manifests, and bills-of-lading). Transport of all materials off site shall be in accordance with applicable Department of Transportation Regulations.

3.11 ENGINEER'S INSPECTION RESPONSIBILITIES

A. The Engineer will conduct inspection throughout the progress of the removal project.

B. Inspections shall be conducted in order to document the progress of the removal work as well as the procedures and practices employed by the Contractor.

C. The Engineer will perform the following inspections during the course of abatement activities:

1. Pre-commencement Inspection. Pre-commencement inspections will be performed at the time requested by the Contractor. The Engineer will be informed a minimum of 48 hours prior to the time the inspection is needed. If, during the course of the pre-commencement inspection, deficiencies are found, the Contractor shall perform the necessary adjustments in order to obtain compliance.

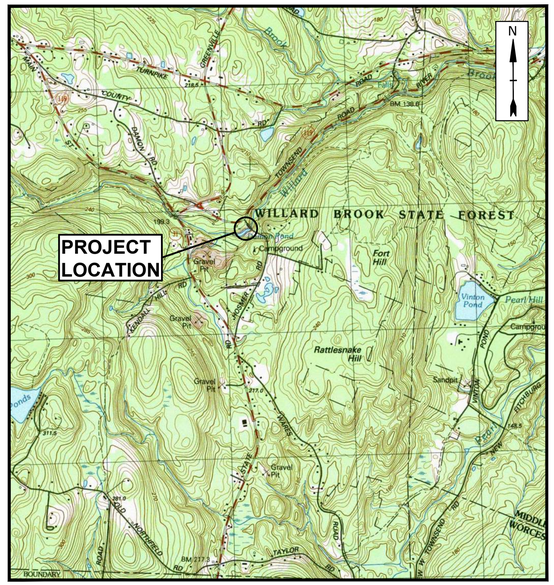
2. Work Area Inspections. Work area inspections will be conducted at the discretion of the Engineer. During the course of the work inspections, the Engineer will observe the Contractor's removal means and/or methods, verify barrier integrity, monitor negative air filtration devices, assess project progress, and inform the Contractor of specific remedial activities if deficiencies are noted.

3. Final Visual Inspection. The Engineer will conduct final visual inspection upon the request of the Contractor. The Engineer shall be informed a minimum of 48 hours prior to the time the inspection is needed. The final visual inspection shall be conducted after completion of the final cleaning procedures. The final visual inspection will verify that all PCB- Containing Material and residual debris have been removed from the work area. If, during the course of the inspection, the Engineer identifies residual dust or debris, the Contractor shall comply with the request of the Engineer in order to render the area “dust free.”

END OF SECTION

MASSACHUSETTS DEPARTMENT OF CONSERVATION AND RECREATION
DAMON POND DAM REPAIRS AND AREA IMPROVEMENTS
WILLARD BROOK STATE FOREST
ASHBY, MASSACHUSETTS
APRIL 2026

LIST OF DRAWINGS		
SHEET NO.	DRAWING NO.	DRAWING TITLE
GENERAL		
1	G-001	COVER SHEET
2	G-002	GENERAL NOTES, LEGEND, AND ABBREVIATIONS
CIVIL		
3	C-101	EXISTING CONDITIONS PLAN
4	C-102	PROPOSED SITE PLAN
5	C-103	DETAILS - 1
6	C-104	EROSION AND SEDIMENT CONTROL DETAILS
7	C-105	SEDIMENT HAUL ROUTE AND DISPOSAL LOCATION SITE PLAN
8	C-106	DRAINAGE DETAILS
9	C-601	TRAFFIC CONTROL PLAN
STRUCTURAL		
10	S-001	STRUCTURAL NOTES
11	S-002	CONSTRUCTION DETAIL
12	S-101	REPAIR AND PHOTO LOCATION PLAN
13	S-501	DEMOLITION DETAILS (1 OF 2)
14	S-502	DEMOLITION DETAILS (2 OF 2)
15	S-503	REPAIR DETAILS (1 OF 3)
16	S-504	REPAIR DETAILS (2 OF 3)
17	S-505	REPAIR DETAILS (3 OF 3)
18	S-506	TRASH RACK DETAILS



LOCATION MAP
1:24000

PREPARED BY:

Tighe&Bond

CHRISTOPHER D. HAKER, PE

CHRISTOPHER HAKER CIVIL No. 47184 REGISTERED PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS
05/05/2026

DANIEL R. BUTTRICK, PE

DANIEL R. BUTTRICK CIVIL No. 48155 REGISTERED PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS
05/07/2026

PREPARED FOR:

MASSACHUSETTS DEPARTMENT OF
CONSERVATION AND RECREATION
OFFICE OF DAM SAFETY
251 CAUSEWAY STREET, SUITE 600
BOSTON, MA 02114

COMPLETE SET 18 SHEETS

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Tighe & Bond: J:\M\M0736 MA DCR Engineering Services MSA\82 - Damon Pond Dam\82A - Design Permitting and Construction\Drawings-Figures\AutoCad\Sheets\M736-Task82A-CoverC.dwg

EROSION AND SEDIMENTATION CONTROL NOTES:

E1. TEMPORARY SEDIMENT AND EROSION CONTROL BY THE CONTRACTOR SHALL BE PERFORMED IN ACCORDANCE WITH THE SPECIFICATIONS LISTED BELOW.

E2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING ALL TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES NECESSARY TO EXECUTE AND COMPLETE THE WORK OF THE CONTRACT, IN COMPLIANCE WITH THE TERMS AND CONDITIONS CONTAINED IN THE CONTRACT AND PROJECT PERMITS. CONTROLS SHOWN ON THE CONTRACT DRAWINGS AND MENTIONED IN THE TECHNICAL SPECIFICATIONS SHALL BE CONSIDERED MINIMUM REQUIREMENTS. THE CONTRACTOR SHALL EMPLOY WHATEVER SUPPLEMENTARY MEASURES NECESSARY TO PROTECT WETLANDS, WATERS, AND ADJACENT AREAS FROM DISTURBANCE OR DISCHARGE OF SEDIMENTS.

E3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING SEDIMENT AND EROSION CONTROLS TO MEET THE CONDITIONS OF ALL APPLICABLE PERMITS AND REGULATIONS. SUCH CONTROLS SHALL BE INSTALLED WHEREVER THE POTENTIAL EXISTS FOR THE DISTURBANCE OF LAND OR THE TRANSPORT OF SEDIMENT.

E4. EROSION AND SEDIMENTATION CONTROLS SHALL CONSIST OF COMPOST WATTLES INSTALLED PER DETAILS PROVIDED ON SHEET 5.

E5. COMPOST WATTLES SHALL BE INSTALLED PRIOR TO COMMENCEMENT OF CLEARING AND GRUBBING ACTIVITIES. LOCATION OF COMPOST WATTLES TO BE ADJUSTED UPON COMPLETION OF CLEARING AND GRUBBING BUT PRIOR TO COMMENCEMENT OF GRADING ACTIVITIES.

E6. ALL EROSION AND SEDIMENTATION CONTROLS SHALL BE MAINTAINED IN GOOD CONDITION AND PROPER WORKING ORDER. NECESSARY REPAIRS SHALL BE MADE IMMEDIATELY.

E7. ALL EROSION AND SEDIMENTATION CONTROLS SHALL BE PROPERLY DISPOSED OFF-SITE UPON COMPLETION OF WORK, SITE STABILIZATION AND/OR AUTHORIZATION FROM THE OWNER.

E8. COFFERDAMS SHALL BE INSTALLED IN PHASES AS INDICATED ON THE CONTRACT DRAWINGS. ALL COFFERDAMS SHALL CONSIST OF NON-ERODIBLE MATERIAL.

BEST MANAGEMENT PRACTICES

INSPECTION AND MAINTENANCE
- SEDIMENT AND EROSION CONTROLS AND BMPS SHALL BE INSTALLED PRIOR TO COMMENCING CONSTRUCTION AT THE SITE. NO WORK WHICH SHALL DISTURB THE SITE OR CREATE THE POTENTIAL FOR SEDIMENT RELEASE SHALL COMMENCE UNTIL THE SEDIMENT AND EROSION CONTROLS HAVE BEEN INSPECTED AND APPROVED BY THE OWNER, ENGINEER, AND REGULATORY AGENCIES. ALL CONTROLS AND BMPS SHALL BE SUBJECT TO INSPECTION BY THE OWNER, HIS REPRESENTATIVE, AND REGULATORY AGENCIES AT ANYTIME THEREAFTER.
- PERIODIC INSPECTION, MAINTENANCE, AND CLEANING OF TEMPORARY EROSION OF SEDIMENT CONTROL MEASURES AND BEST MANAGEMENT PRACTICES (BMPS) SHALL BE REQUIRED. ALL CONTROLS AND BMPS SHALL BE INSPECTED EVERY 7 DAYS AND WITHIN 24 HOURS OF RAINFALL EVENTS OF 0.5 INCHES OR GREATER. ROUTINE INSPECTION AND MAINTENANCE WILL REDUCE THE CHANCE OF POLLUTING STORMWATER BY FINDING AND CORRECTING PROBLEMS BEFORE THE NEXT RAIN EVENT. THE FOCUS OF THE INSPECTION WILL BE TO DETERMINE:
  1) WHETHER OR NOT THE MEASURE WAS INSTALLED / PERFORMED CORRECTLY;
  2) WHETHER OR NOT THERE HAS BEEN ANY DAMAGE TO THE MEASURE SINCE IT WAS INSTALLED OR PERFORMED; AND
  3) WHAT SHOULD BE DONE TO CORRECT ANY PROBLEMS WITH THE MEASURE. EACH MEASURE IS TO BE OBSERVED TO DETERMINE IF IT IS STILL EFFECTIVE.

  IN SOME CASES, SPECIFIC MEASUREMENTS MAY BE TAKEN TO DETERMINE IF MAINTENANCE OF THE MEASURES IS REQUIRED.

SITE MANAGER
- PRIOR TO CONSTRUCTION, A SITE MANAGER WILL BE DESIGNATED BY THE CONTRACTOR TO BE RESPONSIBLE FOR INSTALLATION, MONITORING, INSPECTION, AND CORRECTION OF EROSION AND SEDIMENT CONTROL MEASURES.

CONSTRUCTION SITE ENTRANCE
- TO REDUCE THE TRACKING OF SEDIMENT FROM THE CONSTRUCTION SITE ONTO OTHER AREAS OF THE PROPERTY AND/OR PUBLIC ROADS, AS WELL AS THE PRODUCTION OF AIRBORNE DUST, A STABILIZED CONSTRUCTION ENTRANCE IS TO BE ESTABLISHED AND AT ANY ADDITIONAL AUTHORIZED PERMANENT CONSTRUCTION STAGING AREA.
- THE ENTRANCE IS TO CONSIST OF A 6-INCH THICK PAD OF CRUSHED STONE UNDERLAIN WITH FILTER FABRIC OR A BITUMINOUS CONCRETE APRON. IT IS TO BE REMOVED AND THE AREA RESTORED FOLLOWING CONSTRUCTION.

SITE CLEARING
- DURING SITE CLEARING, EXISTING VEGETATION WITHIN THE OVERALL LIMITS OF CLEARING AND GRUBBING SHALL BE CLEARED AND REMOVED, EXCEPT AS OTHERWISE DIRECTED. THIS INCLUDES ALL VEGETATION ON THE DAM EMBANKMENT AND WITHIN 20 FEET OF THE DAM EMBANKMENT.
- PRIOR TO ANY SITE CLEARING ACTIVITIES, SEDIMENT CONTROL BARRIERS SHALL BE PLACED ALONG THE OUTER LIMIT OF DISTURBANCE.
- CLEARING IS TO BE LIMITED TO THOSE AREAS OF PROPOSED WORK. DISTURBED AREAS ARE TO BE KEPT TO A MINIMUM. NO TREE WITH A BREAST HEIGHT DIAMETER OF GREATER THAN 6 INCHES SHALL BE CLEARED FROM AREAS OUTSIDE THE LIMITS OF CLEARING AND GRUBBING WITHOUT PRIOR APPROVAL FROM THE OWNER.

EROSION CONTROL BARRIERS
- COMPOST WATTLE BARRIERS ARE TO BE PLACED TO TRAP SEDIMENT TRANSPORTED BY RUNOFF BEFORE IT REACHES THE DRAINAGE FEATURES, WATERBODIES, OR WETLANDS, IN ADDITION TO AREAS WHERE HIGH RUNOFF VELOCITIES OR HIGH SEDIMENT LOADS ARE EXPECTED.THE COMPOST WATTLES ARE TO BE REPLACED AS DETERMINED BY PERIODIC FIELD INSPECTIONS.

DUST CONTROL
- STANDARD DUST CONTROL MEASURES, INCLUDING SPRAYING AND MISTING SHALL BE USED AS NECESSARY. CALCIUM CHLORIDE SHALL NOT BE ALLOWED ON THIS PROJECT.

STAGING AREAS
- THE CONTRACTOR SHALL COORDINATE LAYDOWN STAGING AREAS IN WHICH TO STORE EQUIPMENT AND MATERIALS WITH THE OWNER.
- STAGING AREAS SHALL BE SURROUNDED WITH COMPOST WATTLE EROSION BARRIERS ON THE DOWN HILL SIDE.
- DURING AND AFTER CONSTRUCTION, ALL PAVED ROAD AND DRIVEWAY SURFACES ARE TO BE SCRAPED AND BROOMED FREE OF EXCAVATED MATERIALS ON A DAILY BASIS, UNLESS APPROVED BY THE OWNER.

STOCKPILED MATERIALS
- STOCKPILES OF SOIL CREATED DURING CONSTRUCTION ACTIVITIES ARE TO BE SURROUNDED WITH EROSION CONTROL BARRIER AROUND THE PERIMETER OF THE STOCKPILE. STOCKPILES OF ERODIBLE MATERIAL ARE TO BE COVERED PRIOR TO INCLEMENT WEATHER WITH A MINIMUM OF 20 MIL POLYETHYLENE SHEETING. STOCKPILES LEFT UNDISTURBED LONGER THAN 14 DAYS SHALL BE SEEDED OR COVERED.

EQUIPMENT FUELING
- MOBILE EQUIPMENT FUELING AND OTHER ACTIVITIES INVOLVING PETROLEUM, OIL, OR OTHER POTENTIALLY HAZARDOUS SUBSTANCES ARE TO BE PERFORMED AT PRE-APPROVED, DESIGNATED AREAS
- ALL REFUELING SHALL BE PERFORMED WITH APPROPRIATE SPILL PREVENTION AND CONTROL MEASURES. PORTABLE SECONDARY CONTAINMENT IS TO BE USED, AND SORBENT MATERIALS ARE TO BE PLACED AROUND THE PERIMETER OF THE FUELING AREA.

CONSTRUCTION DEWATERING
- CONSTRUCTION DEWATERING SHALL BE REQUIRED DURING PORTIONS OF CONSTRUCTION WHICH REQUIRE EXCAVATION OR OTHER ACTIVITIES WHERE GROUNDWATER MAY INTERFERE WITH THE WORK. CONSTRUCTION DEWATERING DISCHARGE TO A SURFACE WATER BODY SHALL BE PRE-TREATED FOR SEDIMENT REMOVAL BY PASSING THROUGH AN APPROPRIATELY SIZED FILTER SOCK, SILT BAG, FRACTIONATION / SEDIMENTATION TANK, OR SEDIMENT TRAP PRIOR TO DISCHARGE, AS NECESSARY.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING DEWATERING TECHNIQUES AND MAINTAINING DEWATERING PROCEDURES THROUGHOUT THE DURATION OF THE PROJECT.

OUTLET PROTECTION
- APPROPRIATE OUTLET PROTECTION, CONSISTING OF RIPRAP CHANNEL LINING, A LEVEL SPREADER, OR OTHER SUCH MEASURE SHALL BE PROVIDED AT THE OUTLET OF ANY DEWATERING CONDUIT OR STORMWATER CULVERT OR CHANNEL OUTFALL TO REDUCE VELOCITIES AND ENHANCE SEDIMENTATION PRIOR TO DISCHARGE.

SURFACE WATER CONTROL
- MAINTAIN FLOW THROUGH A PORTION OF SPILLWAY AND THE OUTLET STRUCTURE AT ALL TIMES. THE IMPOUNDMENT MAY BE DRAWN DOWN TO ACCOMMODATE THE WORK. THE CONTRACTOR SHALL SUBMIT A WATER CONTROL PLAN THAT WILL ADDRESS EMERGENCY MEASURES TO IMPLEMENT IN THE EVENT A STORM OCCURS DURING CONSTRUCTION.

TURBIDITY MONITORING AND CONTROL
- TURBIDITY SHALL BE MONITORED AND CONTROLLED BY THE CONTRACTOR. A TURBIDITY CURTAIN SHALL BE INSTALLED SURROUNDING AREAS OF EXCAVATION AT AND BELOW THE IMPOUNDMENT WATER LINE.
- IF TURBIDITY LEVELS ARE UNACCEPTABLE AS JUDGED BY THE OWNER, ENGINEER, OR REGULATORY AGENCY, ADDITIONAL MEASURES SHALL BE IMPLEMENTED AT NO EXPENSE TO THE OWNER.

LIMITS OF WORK
- THE CONTRACTOR SHALL LINE THE UPGRADIENT BOUNDARY OF WORK AREAS WITH ORANGE SAFETY FENCING BEFORE THE START OF SITE CLEARING ACTIVITIES.

TEMPORARY STABILIZATION
- WHEN NECESSARY, TEMPORARY SLOPE PROTECTION SHALL BE PROVIDED BY INSTALLING SEDIMENT TRAP BARRIERS AT THE TOE OF FILLS OR CUT SLOPES. IF ADDITIONAL STABILIZATION IS NEEDED, THEN THE CONTRACTOR SHALL INSTALL MULCH LOGS, MATTING, SUCH AS STRAW, JUTE, WOOD FIBER, OR BIODEGRADABLE MESH. A TACKIFIER SHALL BE USED ON LOOSE MATERIALS USED FOR TEMPORARY EROSION CONTROL.
- IN THE EVENT THAT DISTURBED AREAS AT THE SITE ARE TO BE LEFT UN-WORKED FOR MORE THAN TWO WEEKS, THE AREAS SHALL BE MULCHED WITH STRAW AT A RATE OF 100 LBS. PER 1,000 S.F. TO HELP CONTROL EROSION. 100% BIODEGRADABLE EROSION CONTROL BLANKETS OR TWO INCHES OF WOOD CHIP MULCH MAY ALSO BE USED AS TEMPORARY COVER.
- IN THE EVENT THAT DISTURBED AREAS AT THE SITE ARE TO BE LEFT UN-WORKED FOR MORE THAN ONE MONTH, THE AREAS SHALL BE TOPSOILED AND SEEDED AS PER THE SPECIFICATIONS AND AT NO ADDITIONAL COST TO THE OWNER.
- LEAVE THE SURFACE OF ALL EXCAVATIONS AND FILLS IN A FIRM AND STABLE CONDITION AT THE END OF EACH DAY. ROLL OR OTHERWISE TREAT THE SURFACE AS NEEDED.

SITE RESTORATION
- STABILIZATION OF DISTURBED AREAS OR NEW SOIL FILLS SHALL BE IMPLEMENTED WITHIN 14 DAYS AFTER GRADING OR CONSTRUCTION ACTIVITIES HAVE PERMANENTLY CEASED. APPROPRIATE VEGETATIVE SOIL STABILIZATION IS TO BE USED TO MINIMIZE EROSION. TEMPORARY AND PERMANENT VEGETATIVE COVER IS TO BE ESTABLISHED IN ACCORDANCE WITH THE PROJECT PLANS AND SPECIFICATIONS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORATION OF PREVIOUSLY VEGETATED UPLAND AREAS DISTURBED BY CONSTRUCTION ACTIVITIES. RESTORATION OF UPLAND AREAS CONSIST OF REPLACEMENT OF TOPSOIL AND APPROPRIATELY SEEDED AND STABILIZED.
- DISTURBED UPLAND AREAS SHALL THEN BE HYDROSEEDED WITH AN APPROVED SEED MIX AT THE RATE RECOMMENDED BY THE MANUFACTURER. SEEDING RATE SHALL BE DOUBLED FOR DORMANT SEEDING. SEED MIX SHALL BE AS FOLLOWS OR AS APPROVED BY THE ENGINEER:

THE NEW ENGLAND EROSION CONTROL/RESTORATION MIX FOR DRY SITES:

COMMON NAME	BOTANICAL NAME
CREEPING RED FESCUE	*Festuca rubra*
CANADA WILD RYE	*Elymus canadensis*
ANNUAL RYEGRASS	*Lolium multiflorum*
PERENNIAL RYEGRASS	*Lolium perenne*
BLUE GRAMA	*Bouteloua gracilis*
LITTLE BLUESTEM	*Schizachyrium scoparium*
INDIAN GRASS	*Sorghastrum nutans*
ROUGH BENTGRASS/TICKLEGRASS	*Agrostis scabia*
UPLAND BENTGRASS	*Agrostis perennans*

THE NEW ENGLAND EROSION CONTROL/RESTORATION MIX FOR MOIST SITES:

COMMON NAME	BOTANICAL NAME
RIVERBANK WILD RYE	*Elymus riparius*
RED FESCUE	*Festuca rubra*
LITTLE BLUESTEM	*Schizachyrium scoparium*
SWITCH GRASS	*Panicum*
BIG BLUESTEM	*Andropogon gerardii*
BLUE VERVAIN	*Verbena hastata*
UPLAND BENTGRASS	*Agrostis perennas*
NODDING BUR MARIGOLD	*Bidens cernua*
HOLLOW-STEM JOE PYE WEED	*Eupatorium fistulosum*
BONESET	*Eupatorium perfoliatum*
NEW ENGLAND ASTER	*Aster novae-angliae*
WOOL GRASS	*Scirpus cyperinus*
SOFT RUSH	*Juncus effusus*

- 100% BIODEGRADABLE EROSION CONTROL BLANKETS MAY BE USED IN LIEU OF HYDROSEEDING AT THE CONTRACTOR'S DISCRETION TO PROVIDE ADDITIONAL EROSION PROTECTION AND MUST BE USED FOR STABILIZATION OF SLOPES IN EXCESS OF 3H:1V.
- FINAL STABILIZATION SHALL BE CONSIDERED COMPLETE WHEN ALL SOIL-DISTURBING ACTIVITIES HAVE BEEN COMPLETED AND A UNIFORM, PERENNIAL VEGETATIVE COVER WITH A DENSITY OF EIGHTY PERCENT HAS BEEN ESTABLISHED OR EQUIVALENT STABILIZATION MEASURES (SUCH AS THE USE OF MULCHES OR EROSION CONTROL MATTING) HAVE BEEN EMPLOYED ON ALL UNPAVED AREAS AND AREAS NOT COVERED BY PERMANENT STRUCTURES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF ALL VEGETATED SURFACES, INCLUDING WATERING, FERTILIZING, REPAIRING EROSION, AND RE-SEEDING UNTIL ESTABLISHMENT CONDITIONS ARE MET AND UNTIL THE END OF THE CONTRACTUAL MAINTENANCE PERIOD.

GENERAL NOTES:

1. THE EXISTING CONDITIONS PLAN WAS PREPARED BY WSP FROM A FIELD SURVEY PERFORMED IN JANUARY 2019 AND IN OCTOBER 20, 2020. NO SUBSURFACE UTILITY RESEARCH WAS CONDUCTED FOR THIS SURVEY.
2. THE HORIZONTAL DATUM SHOWN HEREON IS THE MASSACHUSETTS STATE COORDINATE GRID, NORTH AMERICAN DATUM OF 1983 (NAD-83), BASED UPON VRS-GPS OBSERVATIONS FROM STATION "CMTS" MAINTAINED BY MAINE TECHNICAL SOURCE.
3. THE VERTICAL DATUM SHOWN HEREON REFERENCES THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD-88), BASED UPON VRS-GPS OBSERVATIONS FROM STATION "CMTS" MAINTAINED BY MAINE TECHNICAL SOURCE.
4. WETLAND RESOURCE AREAS WERE DELINEATED BY TIGHE & BOND, INC. AND LOCATED BY WSP USA IN JANUARY 2019.
5. THE 100-YEAR FLOODING LIMIT WAS ESTABLISHED BASED ON MODELING BY TIGHE & BOND USING SCS TR-55 AND HEC RAS METHODS AS OUTLINED IN 310 CMR 10.57 (2)(a)(3).
6. EDGE OF WATER DEPICTED ON SURVEY WAS LOCATED IN JANUARY 2019 WHEN DAMON POND WAS IN WINTER DRAWDOWN.

ABBREVIATIONS

AC	ASBETOS CEMENT
BIT	BITUMINOUS PAVEMENT
BLSF	BORDERING LAND SUBJECT TO FLOODING
BTM	BOTTOM
B/FTG	BOTTOM OF FOOTING
CONC	CONCRETE
CRW	CONCRETE RETAINING WALL
DIA	DIAMETER
EF	EACH FACE
EJ	EXPANSION JOINT
ELEV,EL	ELEVATION
EOP	EDGE OF PAVEMENT
EOW	EDGE OF WATER
EW	EACH WAY
HMA	HOT MIX ASPHALT
HORIZ	HORIZONTAL
IPF	IRON PIN FOUND
MIN	MINIMUM
MAX	MAXIMUM
OC	ON CENTER
PSI	POUNDS PER SQUARE INC
PVC	POLYVINYLCHLORIDE PIPE
R&D	REMOVE AND DISPOSE
RET	RETAINING
SCH	SCHEDULE
SHT	SHEET
SPK	SPIKE
SRW	STONE RETAINING WALL
SS	STAINLESS STEEL
T	TOP
TBM	TEMPORARY BENCHMARK
T/WALL	TOP OF WALL
TYP	TYPICAL
VERT	VERTICAL
WGR	WOODEN GUARD RAIL

LEGEND

CATCH BASIN
CUVLERT END
GUY WIRE
UTILITY POLE
DECIDUOUS TREE
CONIFER TREE
SHRUB
SIGN (SINGLE POSTED)
POST
APPROXIMATE BORING LOCATION
APPROXIMATE SEDIMENT LOCATION
26.3 — SPOT ELEVATION
EDGE OF WATER
OE — OVERHEAD WIRES
EXISTING TREE LINE
45 — INTERMEDIATE CONTOUR
40 — INDEX CONTOUR
40 — TOP OF SEDIMENT
WF 1E-30 — BORDERING VEGETATED WETLAND LINE WITH WETLAND FLAG AND NUMBER
100-FOOT BUFFER ZONE
200-FOOT RIVERFRONT AREA
LAND SUBJECT TO FLOODING (BLSF)
EROSION CONTROL BARRIER
PROPOSED COFFERDAM
TURBIDITY CURTAIN
LIMIT OF WORK
INLAND BANK

Tighe&Bond

COMMONWEALTH OF MASSACHUSETTS
CHRISTOPHER HAKER
CIVIL
No. 47184
REGISTERED PROFESSIONAL ENGINEER
05/05/2026

COMMONWEALTH OF MASSACHUSETTS
DANIEL R. BUTTRICK
CIVIL
No. 48155
REGISTERED PROFESSIONAL ENGINEER
05/07/2026

Department of Conservation and Recreation

Damon Pond Dam Repairs And Area Improvements

Ashby, Massachusetts

MARK	DATE	DESCRIPTION
LAA	2024/10/03	Refueling note update

PROJECT NO:	M736/82A
DATE:	4/2026
FILE:	M736-Task82A-LendNotes - 2024_10_03.dwg
DRAWN BY:	LPT
CHECKED:	DRB
APPROVED:	CDH

GENERAL NOTES, LEGEND AND ABBREVIATIONS

SCALE: NO SCALE

G-002

SHEET 2 OF 18

Last Saved: 1/16/2026
Plotted: Oct 03, 2024 - 3:15pm By: LPT
Tighe & Bond: J:\M\M0736 MA DCR Engineering Services MSA\82 - Damon Pond Dam\82A - Design Permitting and Construction\Drawings-Figures\AutoCad\Sheets\M736-Task82A-LendNotes - 2024_10_03.dwg

Tighe&Bond

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No. 47184
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Damon Pond Dam Repairs And Area Improvements

Ashby, Massachusetts

MARK	DATE	DESCRIPTION

PROJECT NO:	M736/82A
DATE:	4/2026
FILE: M0736-Task82A-ExistSiPlan.dwg	
DRAWN BY:	LPT,BL
CHECKED:	CDH,DRB
APPROVED:	CDH

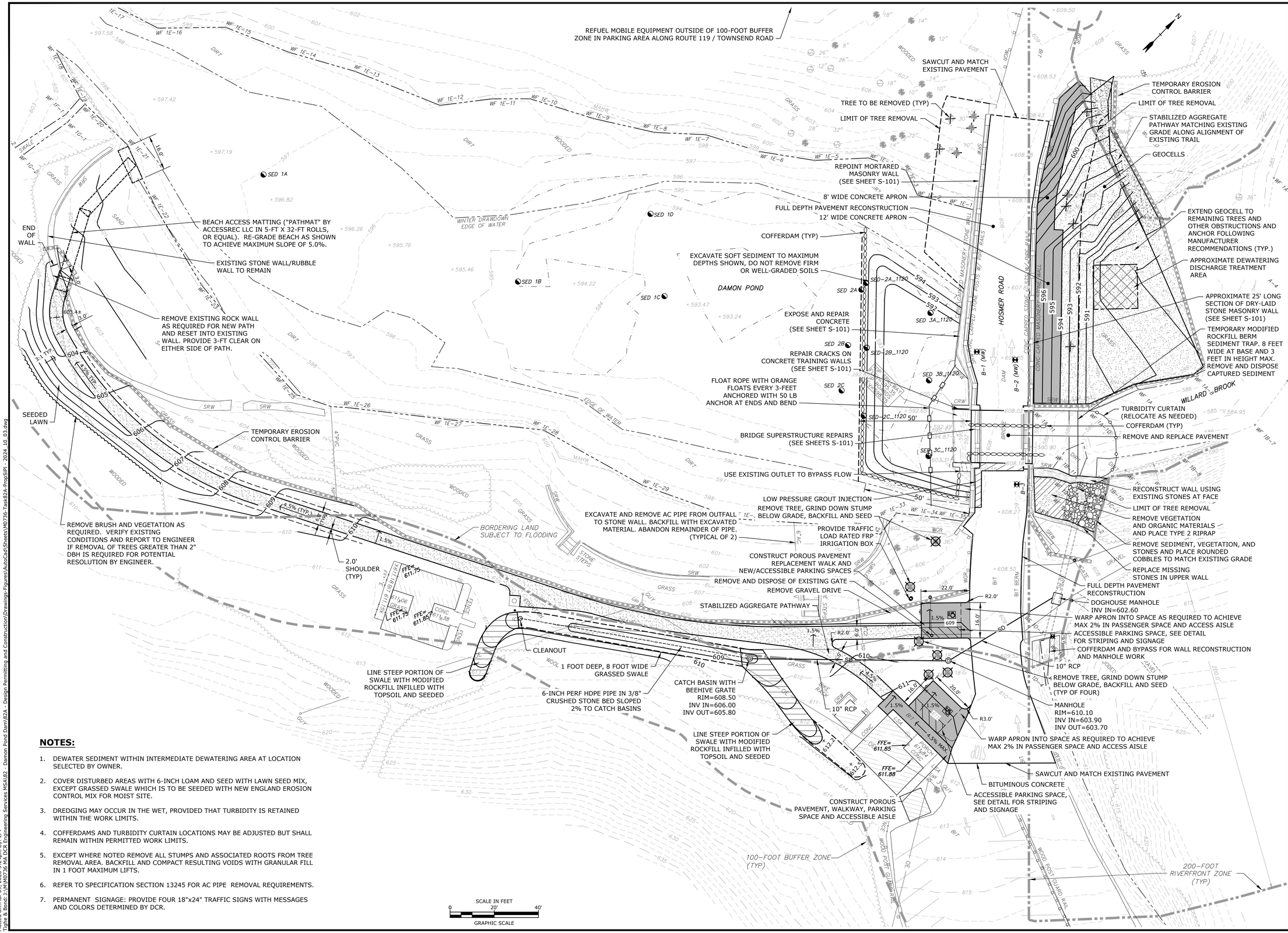
EXISTING CONDITIONS PLAN

SCALE: 1"=20'

C-101
SHEET 3 OF 18

SCALE IN FEET
0 20' 40'
GRAPHIC SCALE

Last Saved: 3/6/2026
Plotted: Dec 08, 2026 - 3:21pm By: LPT
Tighe & Bond: J:\M\M0736 MA DCR Engineering Services MSA\82 - Damon Pond Dam\82A - Design Permitting and Construction\Drawings-Figures\AutoCad\Sheets\M0736-Task82A-ExistSiPlan.dwg



NOTES:

1. DEWATER SEDIMENT WITHIN INTERMEDIATE DEWATERING AREA AT LOCATION SELECTED BY OWNER.
2. COVER DISTURBED AREAS WITH 6-INCH LOAM AND SEED WITH LAWN SEED MIX, EXCEPT GRASSED SWALE WHICH IS TO BE SEEDED WITH NEW ENGLAND EROSION CONTROL MIX FOR MOIST SITE.
3. DREDGING MAY OCCUR IN THE WET, PROVIDED THAT TURBIDITY IS RETAINED WITHIN THE WORK LIMITS.
4. COFFERDAMS AND TURBIDITY CURTAIN LOCATIONS MAY BE ADJUSTED BUT SHALL REMAIN WITHIN PERMITTED WORK LIMITS.
5. EXCEPT WHERE NOTED REMOVE ALL STUMPS AND ASSOCIATED ROOTS FROM TREE REMOVAL AREA. BACKFILL AND COMPACT RESULTING VOIDS WITH GRANULAR FILL IN 1 FOOT MAXIMUM LIFTS.
6. REFER TO SPECIFICATION SECTION 13245 FOR AC PIPE REMOVAL REQUIREMENTS.
7. PERMANENT SIGNAGE: PROVIDE FOUR 18"x24" TRAFFIC SIGNS WITH MESSAGES AND COLORS DETERMINED BY DCR.

Tighe&Bond

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Department of Conservation and Recreation

Damon Pond Dam Repairs And Area Improvements

Ashby, Massachusetts

MARK	DATE	DESCRIPTION
LAA	2024/10/03	Refueling area update

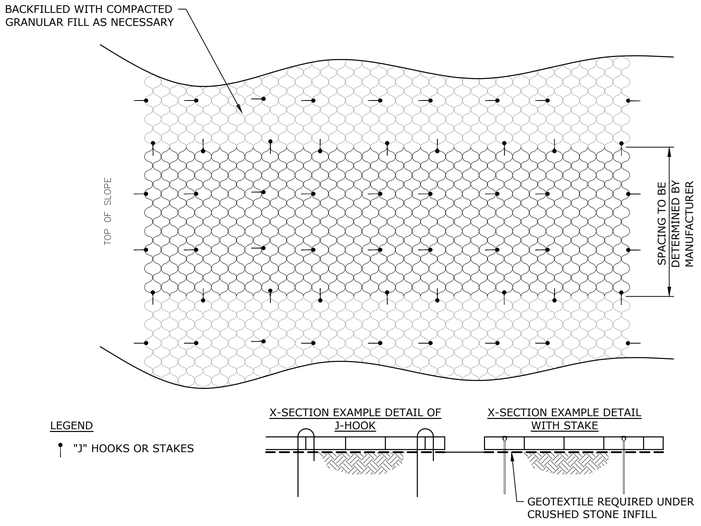
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FILE:	M0736-Task82A-PropSiPl - 2024_10_03.dwg
DRAWN BY:	LPT,BL
CHECKED:	CDH,DRB,PP
APPROVED:	CDH

PROPOSED SITE PLAN

SCALE: 1"=20'

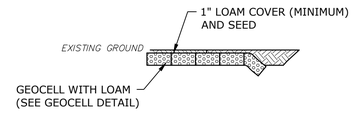
C-102
SHEET 4 OF 18

Last Saved: 3/6/2026
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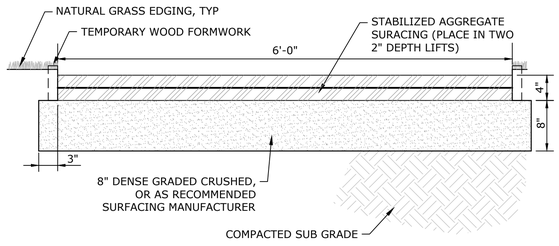


NOTES:
1. APPROXIMATE STAKING PATTERN SHOWN. FINAL STAKING PATTERN SHALL BE AS RECOMMENDED BY THE MANUFACTURER
2. J-HOOK OR STAKE SIZE AND EMBEDMENT SHALL BE AS RECOMMENDED BY THE MANUFACTURER.
3. PROVIDE 4-INCH GEOCELL DESIGNED FOR 1' OF OVERTOPPING.

GEOCELL STAKE PATTERN
NO SCALE

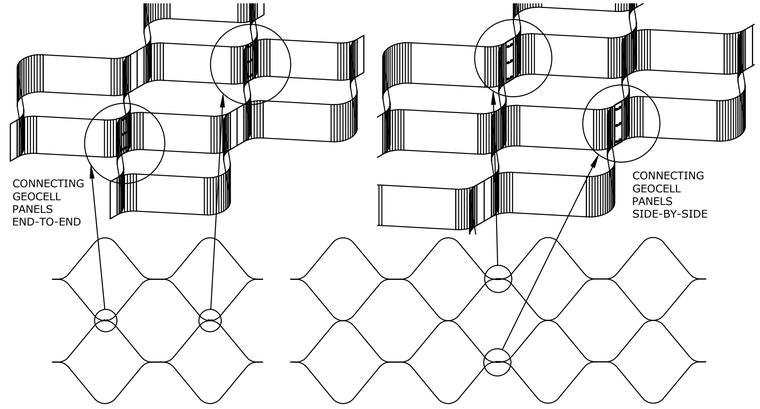


TYPICAL GEOCELL WITH LOAM DETAIL
NO SCALE

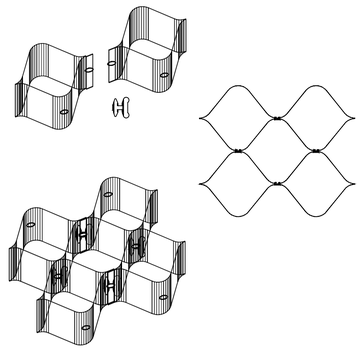


NOTES:
1. ORGANIC-LOCK PATHWAY AGGREGATE MUST ALWAYS BE PRE-WET FOR INSTALLATION IN HIGH SLOPE AREAS.
2. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
3. ALL DIMENSIONS ARE CONSIDERED TRUE AND REFLECT MANUFACTURER'S SPECIFICATIONS.
4. DO NOT SCALE DRAWINGS.
5. THIS DETAIL IS FOR INFORMATION PURPOSES ONLY. ALL INFORMATION CONTAINED HEREIN WAS CURRENT AT THE TIME OF DEVELOPMENT, BUT MUST BE REVIEWED AND APPROVED BY THE PRODUCT MANUFACTURER TO BE CONSIDERED ACCURATE.
6. CONTRACTOR'S NOTE: FOR PRODUCT AND COMPANY INFORMATION VISIT: www.CADdetails.com/info REFERENCE NUMBER 2643-001A
7. WHERE STABILIZED AGGREGATE PATHWAY IS INSTALLED THROUGH GEOCELL, PROVIDE 1" TOPPING LAYER TO COMPLETELY COVER GEOCELL.

ORGANIC LOCK PAVING
STABILIZED AGGREGATE SURFACING
NO SCALE

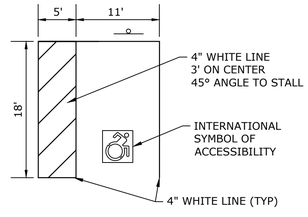


TYPICAL GEOCELL PANEL STAPLING DETAILS
NO SCALE



TYPICAL GEOCELL KEY DETAILS
NO SCALE

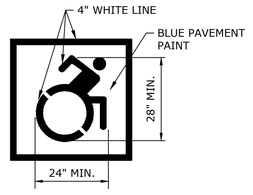
NOTES:
1. APPROXIMATE CONNECTION DETAILS SHOWN. FINAL CONNECTION DETAILS SHALL BE AS RECOMMENDED BY THE MANUFACTURER.
2. MANUFACTURER CONNECTIONS ARE TYPICALLY COMPOSED OF EITHER STAPLES OR KEYS, NOT BOTH.



VAN ACCESSIBLE



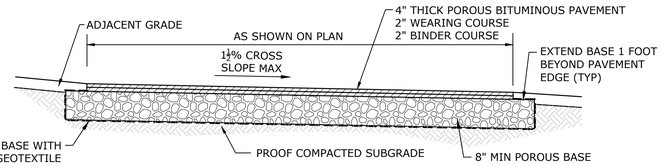
SIGN



INTERNATIONAL SYMBOL OF ACCESSIBILITY

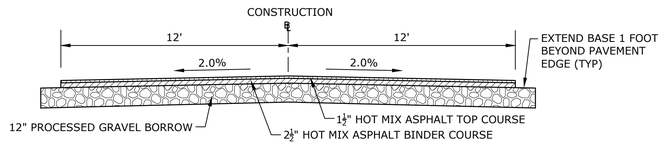
NOTES:
1. SIGNS LOCATED AT ALL HANDICAPPED PARKING SPACES ARE: SIGN BACKROUND - BLUE REFLECTIVE; LETTERS, GRAPHICS & BORDERS - WHITE REFLECTIVE.

ACCESSIBLE PARKING STRIPING DETAILS
NO SCALE



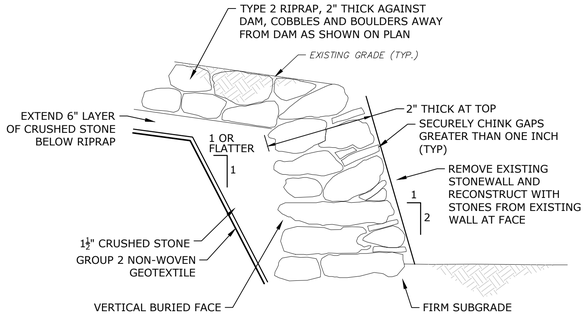
POROUS BITUMINOUS PAVEMENT
NO SCALE

NOTES:
1. SEE SITE PLAN FOR POROUS ASPHALT LOCATIONS, LAYOUTS, AND GRADES.
2. POROUS ASPHALT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST SPECIFICATIONS FROM THE UNH STORMWATER CENTER FOR POROUS ASPHALT.



ROADWAY CROSS SECTION
NO SCALE
* TOLERANCE FOR CONSTRUCTION ±.5%

NOTES:
1. ROAD SECTION SHOWN SHALL BE CONSIDERED TYPICAL. FIELD MODIFICATIONS TO MATCH EXISTING CONDITIONS ARE ANTICIPATED.
2. TACK COAT APPLIED AT 0.05 GAL/SY BETWEEN LIFTS.



NOTES:
1. SUPPLEMENT STONES WITH OFF-SITE MATERIAL IF NEEDED. SUPPLEMENTAL STONES SHALL BE OF SIMILAR COLOR AND PARENT MATERIAL TO EXISTING WALL.
2. AT LEAST 75% OF STONES USED SHALL BE LARGER THAN 24 INCHES IN THEIR LARGEST DIMENSION.

MASONRY WALL RECONSTRUCTION
NO SCALE

Tighe&Bond

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Department of Conservation and Recreation

Damon Pond Dam Repairs And Area Improvements

Ashby, Massachusetts

MARK	DATE	DESCRIPTION

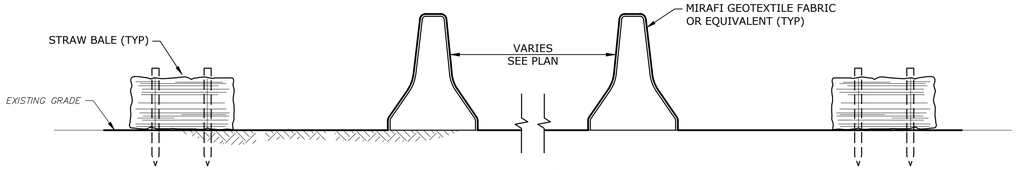
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DATE:	4/2026
FILE: M736-Task82A-Details.dwg	
DRAWN BY:	LPT,BL
CHECKED:	DRB
APPROVED:	CDH

DETAILS - 1

SCALE: AS SHOWN

C-103
SHEET 5 OF 18

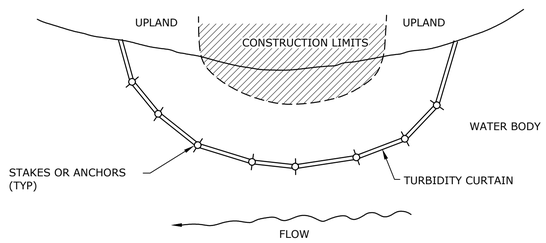
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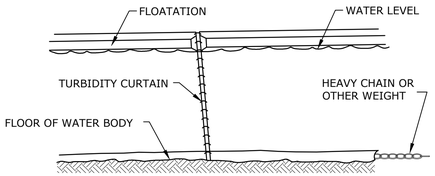
ELEVATION

NOTES:
1. A MINIMUM OF TWO WOOD STAKES ARE REQUIRED PER HAY BALE.
2. STEEL DOWELS MAY BE USED WHERE WOOD STAKES CANNOT BE DRIVEN INTO THE GROUND.
3. FACILITY IS TO BE WITHIN THE PARK AT A LOCATION ESTABLISHED BY OWNER.
4. ONCE SEDIMENT CONTAINS NO FREE DRAINING LIQUID AS DETERMINED BY PAINT FILTER TEST, REMOVE BARRIERS, GEOTEXTILE, STRAW BALES, AND OTHER TEMPORARY MEASURES AND RELOCATE SEDIMENT TO AN ADJACENT STOCKPILE LOCATION DETERMINED BY THE OWNER.

INTERMEDIATE SEDIMENT DEWATERING FACILITY
NO SCALE

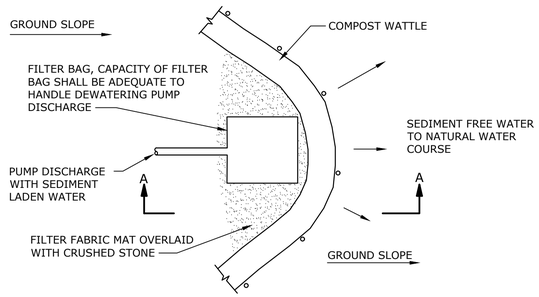


PLAN VIEW

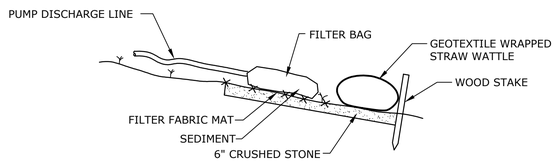


DETAILS

TEMPORARY TURBIDITY CURTAIN DETAIL
NO SCALE

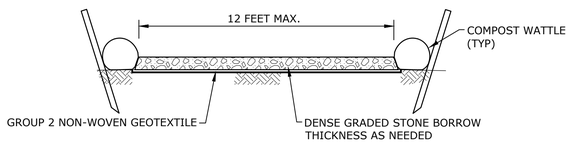


PLAN



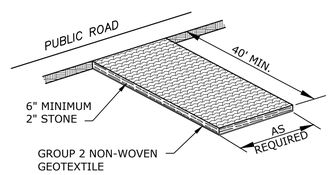
SECTION A-A

SEDIMENT TRAP
NO SCALE



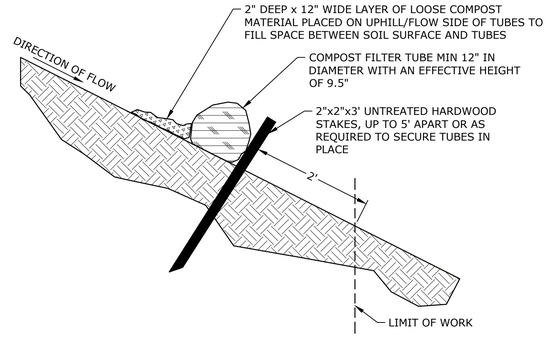
NOTES:
1. USE ABOVE DETAIL IN WET OR SOFT UPLAND AREAS TO PREVENT SINKING OF EQUIPMENT AT NO ADDITIONAL COST TO THE OWNER.
2. UPON COMPLETION OF THE PROJECT, REMOVE ALL MATERIAL, LOOSEN THE TOPSOIL, RESTORE PRE-PROJECT GRADES, LOAM AND SEED.
3. TOPSOIL MAY BE STRIPPED, STOCKPILED, AND REPLACED FOLLOWING CONSTRUCTION AT THE DESCRETION OF THE CONTRACTOR.
4. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES MAY BE REQUIRED.

TYPICAL CROSS-SECTION TEMPORARY ACCESS ROAD
NO SCALE



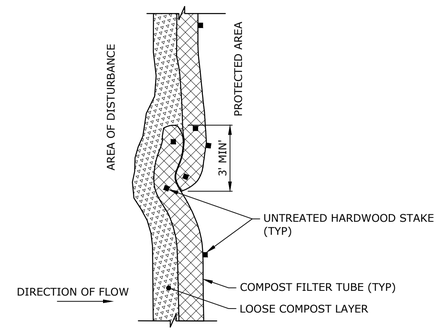
NOTE:
1. REMOVE FOLLOWING CONSTRUCTION.

TEMPORARY CONSTRUCTION ENTRY PAD
NO SCALE



SECTION VIEW

NOTES:
1. TUBES FOR COMPOST FILTERS SHALL BE JUTE MESH OR APPROVED BIODEGRADABLE MATERIAL. ADDITIONAL TUBES SHALL BE USED AT THE DIRECTION OF THE ENGINEER.
2. TAMP TUBES IN PLACE TO ENSURE GOOD CONTACT WITH SOIL SURFACE. IT IS NOT NECESSARY TO TRENCH TUBES INTO EXISTING GRADE.
3. WHEN STAKING IS NOT POSSIBLE, SUCH AS WHEN TUBES MUST BE PLACED ON PAVEMENT, HEAVY CONCRETE OR CINDER BLOCKS CAN BE USED BEHIND TUBES UP TO 5' APART OR AS REQUIRED TO SECURE TUBES IN PLACE.



PLAN VIEW - JOIN DETAIL

EROSION CONTROL BARRIER COMPOST FILTER TUBE
NO SCALE

NOTES:
1. PROVIDE 3' MINIMUM OVERLAP AT ENDS OF TUBES TO JOIN IN A CONTINUOUS BARRIER AND MINIMIZE UNIMPEDED FLOW.
2. STAKE JOINING TUBES SNUGLY AGAINST EACH OTHER TO PREVENT UNFILTERED FLOW BETWEEN THEM.
3. SECURE ENDS OF TUBES WITH STAKES SPACED 18" APART THROUGH TOPS OF TUBES.

GENERAL COMPOST FILTER TUBE NOTES:
1. PROVIDE A MINIMUM TUBE DIAMETER OF 12" FOR SLOPES UP TO 50' IN LENGTH WITH A SLOPE RATIO OF 3H:1V OR STEEPER. LONGER SLOPES OF 3H:1V MAY REQUIRE LARGER TUBE DIAMETER OR ADDITIONAL COURSING OF FILTER TUBES TO CREATE A FILTER BERM. REFER TO MANUFACTURER'S RECOMMENDATIONS FOR SITUATIONS WITH LONGER SLOPES OR STEEPER SLOPES.
2. INSTALL TUBES ALONG CONTOURS AND PERPENDICULAR TO SHEET OR CONCENTRATED FLOW.
3. DO NOT INSTALL IN PERENNIAL, EPHEMERAL OR INTERMITTENT STREAMS.
4. CONFIGURE TUBES AROUND EXISTING SITE FEATURES TO MINIMIZE SITE DISTURBANCE AND MAXIMIZE CAPTURE AREA OF STORMWATER RUN-OFF.
5. TUBES CAN BE PLACED DIRECTLY ON EXISTING PAVEMENT WHEN NECESSARY.
6. PLACING TUBES AGAINST THE UPHILL SIDE OF WELL-ANCHORED, STATIONARY FEATURES SUCH AS EXISTING TREES, CAN PROVIDE ADDITIONAL BRACING.
7. CURVE ENDS UPHILL TO PREVENT DIVERSION OF UNFILTERED RUN-OFF.
8. STRAW WATTLES WITH A 100% BIODEGRADABLE MESH MAY BE SUBSTITUTED IN AREAS INACCESSIBLE FOR FILTER TUBE INSTALLATION EQUIPMENT.

Tighe&Bond

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DATE:	4/2026
FILE: M736-Task82A-DetailsEC.dwg	
DRAWN BY:	LPT,BL
CHECKED:	DRB
APPROVED:	CDH

EROSION AND SEDIMENT CONTROL DETAILS

SCALE: AS SHOWN

C-104
SHEET 6 OF 18

Last Saved: 1/2/2026
Plotted: May 06, 2026 2:28pm By: LPT
Tighe & Bond: J:\M\M736 MA DCR Engineering Services MSA\82 - Damon Pond Dam\82A - Design Permitting and Construction\Drawings-Figures\AutoCad\Sheets\M736-Task82A-DetailsEC.dwg

HOSMER ROAD GATES TO BE CLOSED TO PUBLIC TRAFFIC ON TUESDAY, SEPTEMBER 8, 2026 AND REOPEN BY 6AM MAY 17, 2027. INCIDENTAL CLOSURES MAY BE PERMITTED BY PARK STAFF BASED ON CONSTRUCTION ACTIVITY WITH PRIOR NOTICE.

DESIGNATED STAGING AND EQUIPMENT REFUELING AREA

MINIMIZE TREE CLEARING TO THE EXTENT NECESSARY FOR CONSTRUCTION ACCESS PRIOR TO NOVEMBER 1, 2026 AND AFTER APRIL 15, 2027. TREE CLEARING PERMITTED BETWEEN NOVEMBER 1 AND APRIL 15.

NO TURBIDITY GENERATING ACTIVITY PERMITTED BETWEEN OCTOBER 1, 2026 AND APRIL 20, 2027. SUCH ACTIVITIES INCLUDE SETTING OR REMOVING COFFERDAMS OR UNCONFINED IN-WATER WORK.

WILLARD BROOK STATE FOREST CONTACT STATION

APPROXIMATE LIMIT OF SITE WORK

MAINTAIN VEHICULAR ACCESS TO PARKING AREA AND CONTACT STATION WHILE PARK GATES ARE OPEN. MAINTAIN FOOT TRAFFIC ACEESS TO CONTACT STATION WHILE PARK GATES ARE CLOSED.

APPROXIMATE ROUTE ON EXISTING GRAVEL ACCESS DRIVE

APPROXIMATE DEWATERING AND DISPOSAL AREA

TOWNSEND ROAD

119

HOSMER ROAD

Willard Brook

Damon Pond

012/011.0-0011-0001.0

012/011.0-0011-0004.0

012/011.0-0

N

Tighe&Bond

COMMONWEALTH OF MASSACHUSETTS
CHRISTOPHER HAKER
CIVIL
No. 47184
REGISTERED PROFESSIONAL ENGINEER
05/05/2026

COMMONWEALTH OF MASSACHUSETTS
DANIEL R. BUTTRICK
CIVIL
No. 48155
REGISTERED PROFESSIONAL ENGINEER
05/07/2026

Department of Conservation and Recreation

Damon Pond Dam Repairs And Area Improvements

Ashby, Massachusetts

MARK	DATE	DESCRIPTION

PROJECT NO:	M736/82A
DATE:	4/2026
FILE:	M736-Task82A-SitePl-GIS.dwg
DRAWN BY:	LPT,GIS
CHECKED:	DRB
APPROVED:	CDH

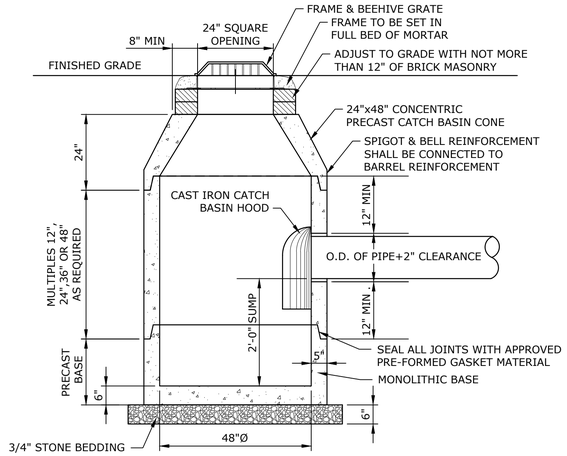
SEDIMENT HAUL ROUTE AND DISPOSAL LOCATION SITE PLAN

SCALE: NO SCALE

C-105

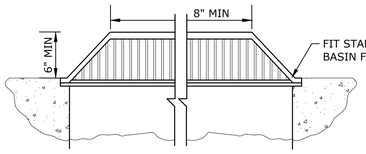
SHEET 7 OF 18

Last Saved: 3/6/2026
Plotted: Mar 06, 2026 - 3:31pm By: LPT
Xrefs: None
Tighe & Bond: J:\M\M0736 Ma DCR Engineering Services MSA\82 - Damon Pond Dam\82A - Design Permitting and Construction\Drawings-Figures\AutoCad\Sheets\M736-Task82A-SitePl-GIS.dwg

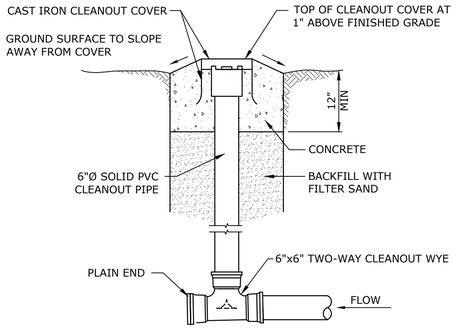


NOTES:
1. PROVIDE RUBBER BOOT FOR PIPE TO CATCH BASIN CONNECTIONS SIMILAR TO MANHOLE DETAIL.

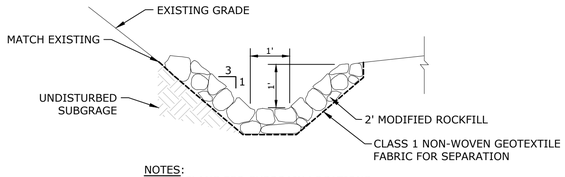
PRECAST CONCRETE CATCH BASIN
NO SCALE



CAST IRON BEEHIVE CATCH BASIN GRATE
NO SCALE

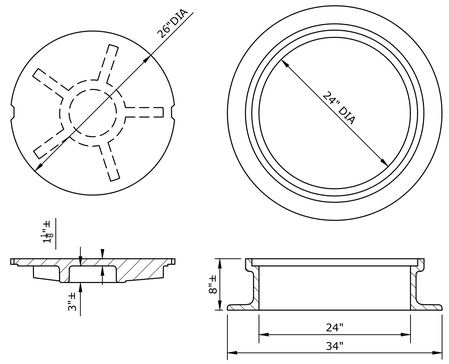


TOE DRAIN CLEANOUT
NO SCALE



NOTES:
1. SEE PLANS FOR SUBDRAIN LOCATIONS.
2. IF ROCK IS ENCOUNTERED COORDINATE DEPTH OF SUBDRAIN WITH ENGINEER.

ROCK LINED DRAINAGE SWALE
NO SCALE

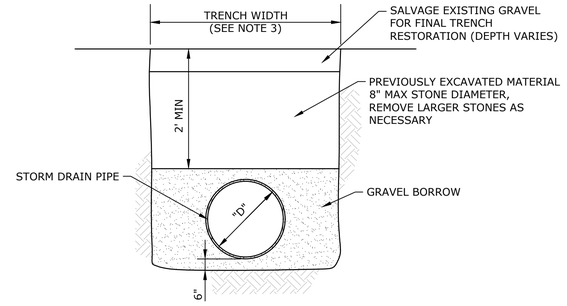


STANDARD MANHOLE COVER
MINIMUM WEIGHT: 200 LBS.

STANDARD MANHOLE FRAME
MINIMUM WEIGHT: 240 LBS.

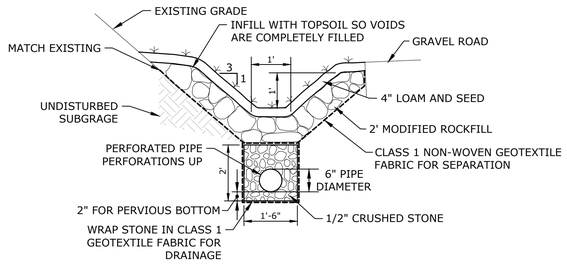
NOTES:
1. FRAME AND COVER SHALL BE PROVIDED FROM THE SAME MANUFACTURER.
2. LETTERING SHALL BE CAST INTO COVERS AS SPECIFIED.

MANHOLE FRAME & COVER
NO SCALE



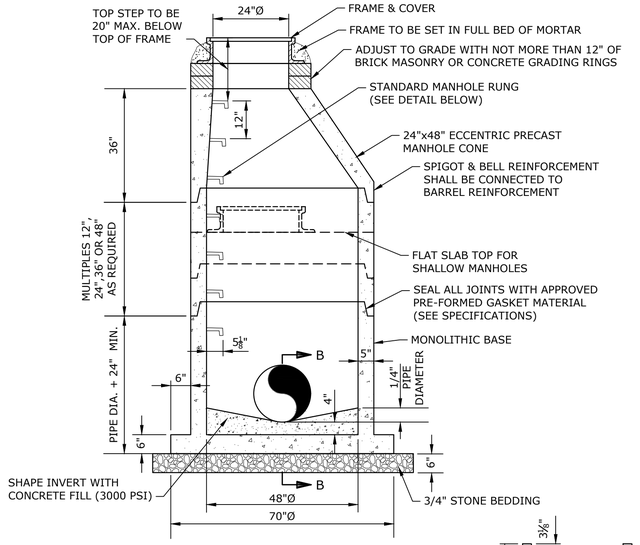
TYPICAL TRENCH
NO SCALE

NOTES:
1. COMPACT ALL BACKFILL MATERIAL WITH VIBRATORY PLATE EQUIPMENT (MINIMUM TWO PASSES) TO A MINIMUM DENSITY OF 95 PERCENT OF THE STANDARD PROCTOR DENSITY AS DETERMINED BY ASTM D698.
2. PLACE BACKFILL MATERIAL IN MAXIMUM ONE FOOT LIFTS.
3. THE TRENCH WIDTH SHALL BE 5.0'.

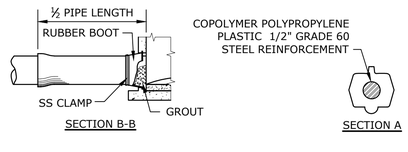


NOTES:
1. SEE PLANS FOR SUBDRAIN LOCATIONS.
2. IF ROCK IS ENCOUNTERED COORDINATE DEPTH OF SUBDRAIN WITH ENGINEER.

GRASS LINED DRAINAGE SWALE
NO SCALE

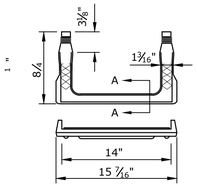


48" PRECAST DRAIN MANHOLE
NO SCALE

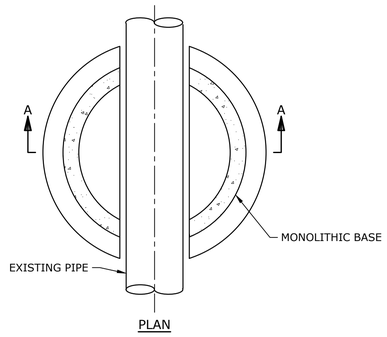


SECTION B-B

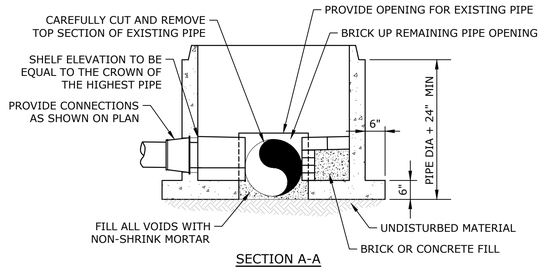
SECTION A



STANDARD MANHOLE RUNG



PLAN



SECTION A-A

NOTES:
1. MANHOLE BASE SECTION SHOWN, ALL OTHER SECTIONS AND CONSTRUCTION DETAILS SHALL COMPLY WITH THE APPROPRIATE MANHOLE DETAIL.
2. VERIFY PIPE SIZES AND ELEVATIONS PRIOR TO ORDERING.

PRECAST "DOGHOUSE" MANHOLE BASE
NO SCALE

Tighe&Bond

COMMONWEALTH OF MASSACHUSETTS
CHRISTOPHER HAKER
CIVIL
No. 47184
REGISTERED PROFESSIONAL ENGINEER
05/05/2026

COMMONWEALTH OF MASSACHUSETTS
DANIEL R. BUTTRICK
CIVIL
No. 48155
REGISTERED PROFESSIONAL ENGINEER
05/07/2026

Department of Conservation and Recreation

Damon Pond Dam Repairs And Area Improvements

Ashby, Massachusetts

MARK	DATE	DESCRIPTION

PROJECT NO:	M736/82A
DATE:	4/2026
FILE:	M736-Task82A-DrainageDetails.dwg
DRAWN BY:	LPT
CHECKED:	DRB
APPROVED:	CDH

DRAINAGE DETAILS

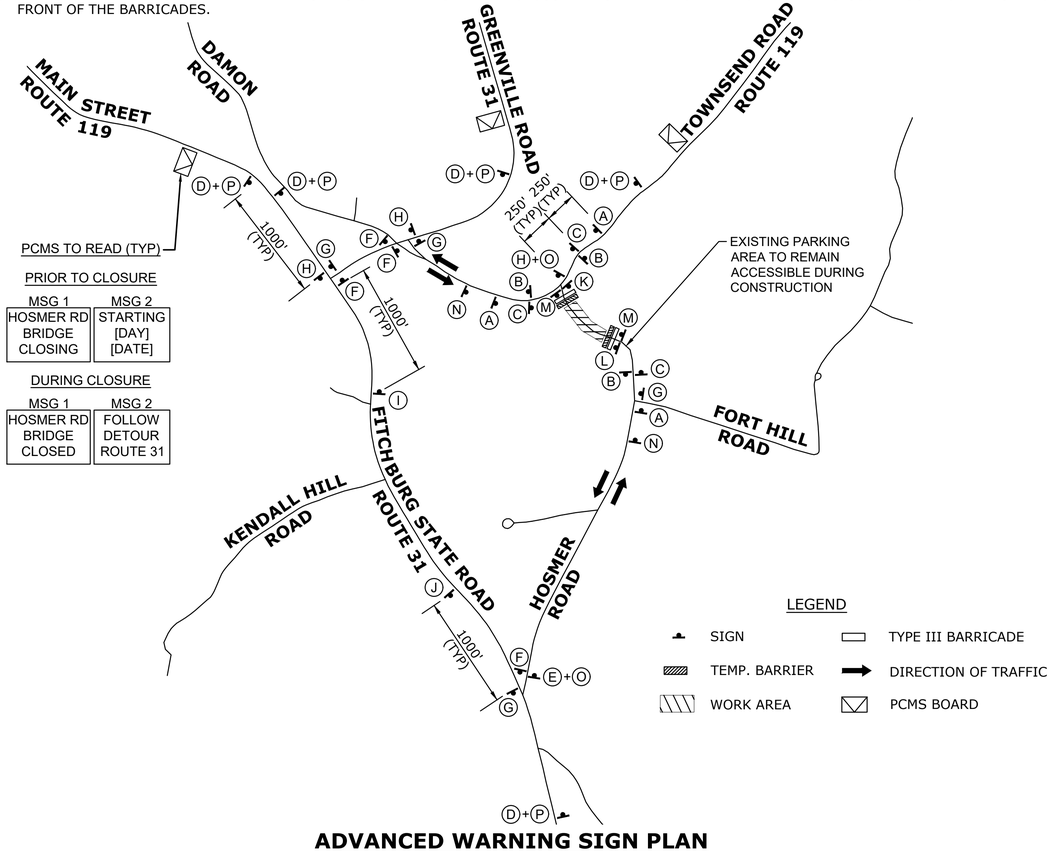
SCALE: AS SHOWN

C-106
SHEET 8 OF 18

Last Saved: 1/16/2026
Plotted: Dec 16, 2025 - 3:23pm By: LPT
Tighe & Bond J:\MW\M0736 MA DCR Engineering Services MSA\82 - Damon Pond Dam\82A - Design Permitting and Construction\Drawings-Figures\AutoCad\Sheets\M736-Task82A-DrainageDetails.dwg

TEMPORARY TRAFFIC CONTROL NOTES

1. DETOUR AND ASSOCIATED TEMPORARY TRAFFIC CONTROL SIGNAGE AND MATERIALS ARE ONLY ANTICIPATED IF CONSTRUCTION ACTIVITIES WILL OCCUR BETWEEN MEMORIAL DAY AND LABOR DAY.
2. ALL TEMPORARY TRAFFIC CONTROL SIGNAGE AND BARRICADES ASSOCIATED WITH THE WORK ZONE SHALL BE KEPT IN PLACE YEAR ROUND. THESE SIGNS INCLUDE A, B, C, E, K, L, AND M.
3. ALL TEMPORARY TRAFFIC CONTROL WORK SHALL CONFORM TO THE LATEST EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND ALL REVISIONS, UNLESS SUPERCEDED BY THESE PLANS.
4. ALL SIGN LEGENDS, BORDERS, AND MOUNTING SHALL BE IN ACCORDANCE WITH THE MUTCD.
5. TEMPORARY CONSTRUCTION SIGNING AND ALL OTHER TRAFFIC CONTROL DEVICES SHALL BE IN PLACE PRIOR TO THE START OF ANY WORK.
6. TAPER FORMULA:
   L = S X W FOR SPEED > OR = 45
   L = (S X S X W)/60 FOR SPEED < 45
7. TEMPORARY CONSTRUCTION SIGNING, BARRICADES, AND ALL OTHER NECESSARY WORK ZONE TRAFFIC CONTROL DEVICES SHALL BE REMOVED FROM THE HIGHWAY OR COVERED WHEN THEY ARE NOT REQUIRED FOR CONTROL OF TRAFFIC.
8. SIGNS AND SIGN SUPPORTS LOCATED ON OR NEAR THE TRAVELED WAY, CHANNELIZING DEVICES, BARRIERS, AND CRASH ATTENUATORS MUST PASS THE CRITERIA SET FORTH IN NCHRP REPORT 350, "RECOMMENDED PROCEDURES FOR THE SAFETY PERFORMANCE EVALUATION OF HIGHWAY FEATURES" AND/OR "MANUAL FOR ASSESSING SAFETY HARDWARE" (MASH).
9. NOTIFY EACH ABUTTER AT LEAST 24 HOURS IN ADVANCE OF THE START OF ANY WORK THAT WILL REQUIRE THE TEMPORARY CLOSURE OF ACCESS, SUCH AS CONDUIT INSTALLATION, EXISTING PAVEMENT EXCAVATION, TEMPORARY DRIVEWAY PAVEMENT PLACEMENT, AND SIMILAR OPERATIONS.
10. THE ADVISORY SPEED LIMIT, IF REQUIRED, SHALL BE DETERMINED BY THE ENGINEER.
11. DISTANCES ARE A GUIDE AND MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER.
12. MAXIMUM SPACING OF TRAFFIC DEVICES IN A TAPER (DRUMS OR CONES) IS EQUAL IN FEET TO THE SPEED LIMIT IN MPH.
13. MINIMUM LANE WIDTH IS TO BE 11 FEET UNLESS OTHERWISE SHOWN. MINIMUM LANE WIDTH TO BE MEASURED FROM THE EDGE OF DRUMS OR MEDIAN BARRIER.
14. ALL SIGNS SHALL BE MOUNTED ON THEIR OWN STANDARD SIGN SUPPORTS.
15. PCMS MESSAGE BOARDS SHALL BE PLACED AT LEAST 2 WEEKS PRIOR TO ROAD CLOSURE AND CONVEY MESSAGES AS INDICATED IN THE ADVANCED WARNING SIGN PLAN BELOW.
16. TEMPORARY BARRIERS AND TYPE III BARRICADES SHALL BE INSTALLED ACROSS THE FULL WIDTH OF THE ROAD AT THE CLOSURE LOCATION. PLACE DRUMS IN FRONT OF THE BARRICADES.



ADVANCED WARNING SIGN PLAN

NOT TO SCALE

TOWN	ROAD	CASE	DETAIL	DETAIL ISSUE DATE
ASHBY	HOSMER ROAD	CONES & DRUMS	CONES & DRUMS DWG NO. 851.1.1	JAN 2025
ASHBY	HOSMER ROAD	TYPE III BARRICADE	TYPE III BARRICADE DWG NO. 851.2.1	JAN 2025

TEMPORARY CONSTRUCTION SIGN LEGEND

I.D. NUMBER	SIGN CODE	SIZE OF SIGN (IN) WIDTH	SIZE OF SIGN (IN) HEIGHT	UNIT AREA IN SQ. FT.	TEXT *	COLOR BACK-GROUND	COLOR LEGEND	COLOR BORDER	NUMBER OF SIGNS REQUIRED	AREA IN SQ. FT.
Ⓐ	W20-1a	36	36	9	ROAD WORK AHEAD	FLUORES-CENT ORANGE	BLACK	BLACK	3	27
Ⓑ	MA-R2-10e	36	48	12	END ROAD WORK / DOUBLE FINES END	FLUORES-CENT ORANGE / WHITE	BLACK	BLACK	3	36
Ⓒ	MA-R2-10a	48	36	12	WORK ZONES / SPEEDING FINES DOUBLED	FLUORES-CENT ORANGE	BLACK	BLACK	3	36
Ⓓ	W20-2	36	36	9	DETOUR AHEAD	FLUORES-CENT ORANGE	BLACK	BLACK	5	45
Ⓔ	W20-3	36	36	9	ROAD CLOSED AHEAD	FLUORES-CENT ORANGE	BLACK	BLACK	1	9
Ⓕ	M4-9R	30	24	5	DETOUR →	FLUORES-CENT ORANGE	BLACK	BLACK	4	20
Ⓖ	M4-9L	30	24	5	DETOUR ←	FLUORES-CENT ORANGE	BLACK	BLACK	4	20
Ⓗ	M4-9V	30	24	5	DETOUR ↑	FLUORES-CENT ORANGE	BLACK	BLACK	3	15
Ⓘ	M4-9aR	30	24	5	DETOUR ↱	FLUORES-CENT ORANGE	BLACK	BLACK	1	5
Ⓙ	M4-9aL	30	24	5	DETOUR ↰	FLUORES-CENT ORANGE	BLACK	BLACK	1	5
Ⓚ	M4-10R	48	18	6	DETOUR →	FLUORES-CENT ORANGE	BLACK	BLACK	1	6
Ⓛ	M4-10L	48	18	6	← DETOUR	FLUORES-CENT ORANGE	BLACK	BLACK	1	6
Ⓜ	R11-2	48	30	10	ROAD CLOSED	WHITE	BLACK	BLACK	2	20
Ⓝ	M4-8a	24	18	3	END DETOUR	FLUORES-CENT ORANGE	BLACK	BLACK	2	6
Ⓞ	CUSTOM - 1	60	30	12.5	WILLARD BROOK STATE FOREST DAMON POND PARKING LOT OPEN	WHITE	BLACK	BLACK	2	25
Ⓟ	W16-8p	48	18	6	HOSMER RD	FLUORES-CENT ORANGE	BLACK	BLACK	5	30
								TOTALS	41	311

* FOR ALL TEMPORARY CONSTRUCTION SIGNS, SEE MUTCD DECEMBER 2023 11TH EDITION, 2024 STANDARD HIGHWAY SIGNS AND SECTION M4.30.0 TYPE III OF THE MASSDOT STANDARD SPECIFICATION FOR TEXT DIMENSIONS AND COLOR.

Tighe&Bond

COMMONWEALTH OF MASSACHUSETTS
CHRISTOPHER HAKER
CIVIL
No. 47184
REGISTERED PROFESSIONAL ENGINEER
05/05/2026

COMMONWEALTH OF MASSACHUSETTS
DANIEL R. BUTTRICK
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No. 48155
REGISTERED PROFESSIONAL ENGINEER
05/07/2026

Department of Conservation and Recreation

Damon Pond Dam Repairs And Area Improvements

Ashby, Massachusetts

MARK	DATE	DESCRIPTION

PROJECT NO:	M736/82A
DATE:	4/2026
FILE: M736-Task82A-TTCP.dwg	
DRAWN BY:	ARC
CHECKED:	CDH,DRB,PP
APPROVED:	CDH

TEMPORARY TRAFFIC CONTROL PLAN

SCALE: NO SCALE

C-601

SHEET 9 OF 18

Last Saved: 4/6/2026
By: achampagne
Plotted: Monday, April 06, 2026 - 3:31pm By: AChampagne
Tighe & Bond: J:\WM\M0736 MA DCR Engineering Services MSA\82 - Damon Pond Dam\82A - Design Permitting and Construction\Drawings-Figures\AutoCad\Sheets\M736-Task82A-TTCP.dwg

GENERAL NOTES

1. ALL EXISTING BRONZE DISCS REPRESENTING STATE BENCHMARKS OR SURVEY TRIANGULATION POINTS MUST NOT BE DISTURBED. WHEN THE WORK CALLED FOR INVOLVES DISTURBING A BRONZE DISC THE CONTRACTOR SHALL NOTIFY THE ENGINEER SUFFICIENTLY IN ADVANCE OF THE WORK TO PERMIT THE STATE TO TEMPORARILY RELOCATE THE AFFECTED MARKER.
2. ALL WORK SHALL COMPLY WITH OSHA'S LATEST STANDARDS. ALL REQUIREMENTS OF OSHA'S EXCAVATION STANDARDS SHALL BE PROVIDED BY THE CONTRACTOR INCLUDING, BUT NOT LIMITED TO, THE PROVISION FOR A COMPETENT PERSON ON SITE AND ANY REQUIRED DOCUMENTATION THAT MAY REQUIRE CERTIFICATION BY A PROFESSIONAL ENGINEER.
3. THE VERTICAL DATUM SHOWN HEREON REFERENCES THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
4. THE OWNER AND ENGINEER ASSUME NO RESPONSIBILITY FOR THE LOCATION OF EXISTING UTILITIES. THE ENGINEER AND OWNER MAKE NO GUARANTEE AS TO THE UNDERGROUND CONDITIONS THAT MAY BE ENCOUNTERED.
5. PER MASSACHUSETTS LAW, CONTRACTOR SHALL CALL 1-888-DIG-SAFE, (1-888-344-7233) AND THE TOWN OF ASHBY PRIOR TO ANY UNDERGROUND EXCAVATION ON SITE. THE DIG-SAFE SERVICE WILL FIELD LOCATE AND MARK UNDERGROUND UTILITIES IN THE FIELD. THE DIG-SAFE VERIFICATION NUMBER SHALL BE SUBMITTED TO THE TOWN OF ASHBY PRIOR TO ANY DEMOLITION AND REMOVAL OR CONSTRUCTION WORK.
6. ALL EXISTING CONDITIONS SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. IF FIELD CONDITIONS ARE OBSERVED THAT VARY SIGNIFICANTLY FROM THOSE SHOWN ON THESE PLANS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING FOR RESOLUTION OF THE CONFLICTING INFORMATION.
7. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN ALL UTILITIES FUNCTIONING PROPERLY IN THE AREAS UNDER CONSTRUCTION PRIOR TO COMPLETION OF THE PROJECT. ALL PIPES AND STRUCTURES WITHIN THE LIMITS OF THIS CONTRACT SHALL BE LEFT IN A CLEAN AND OPERABLE CONDITION AT THE COMPLETION OF THE WORK. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT SAND AND SILT FROM DISTURBED AREAS FROM ENTERING THE SYSTEM. CONTRACTOR IS RESPONSIBLE FOR DAMAGE SUSTAINED TO ANY EXISTING UTILITIES AND IT IS HIS RESPONSIBILITY TO MAKE REPAIRS TO THE REQUIREMENTS OF THE TOWN OR RESPECTIVE UTILITY COMPANY.
8. COORDINATE RELOCATION OR SUPPORTING OF UTILITY POLES WITH THE RESPECTIVE UTILITIES. NO UTILITY POLE RELOCATIONS ARE ANTICIPATED.
9. ANY AND ALL DEMOLISHED BUILDING MATERIALS, STRUCTURES, PIPES, PAVEMENT, CURBING, SURPLUS MATERIAL, AND SITE RUBBLE SHALL BE DISPOSED OF BY THE CONTRACTOR OFF-SITE AT HIS EXPENSE AND IN ACCORDANCE WITH ALL APPLICABLE STATE AND FEDERAL ENVIRONMENTAL REGULATIONS.
10. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO ENSURE THAT DEBRIS DOES NOT FALL ON ANY ROADWAY, RAILROAD, OR WATERWAY BELOW THE EXISTING STRUCTURE. ALL COSTS INCLUDING ERECTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURES OR OTHER SUCH APPROVED METHODS, SHALL BE SUBSIDIARY TO THE APPROPRIATE ITEMS OF WORK BEING PERFORMED.
11. ALL MATERIALS AND METHODS ARE TO COMPLY WITH THE MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, DATED 2026, AND ITS LATEST REVISIONS.
12. ALL DISTURBED AREAS SHALL BE LOAMED & SEEDED UNLESS OTHERWISE SPECIFIED. OVER EXCAVATE LOAM & SEED AREAS AS REQUIRED TO MEET GRADE.
13. IF LOCATIONS, SIZES, ETC. CHANGE FROM THESE PLANS, THE NEW CHANGES SHALL BE SUBMITTED TO THE OWNER/ENGINEER FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
14. ALL DIMENSIONS ARE HORIZONTAL AND VERTICAL, AND ARE GIVEN AT 68 DEGREES FAHRENHEIT.
15. ALL WORK PERFORMED BY THE CONTRACTOR SHALL COMPLY WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS AND REQUIREMENTS.
16. THE CONTRACTOR SHALL REVIEW AND UNDERSTAND ALL APPLICABLE ENVIRONMENTAL PERMITS AND ENSURE THAT ALL CONSTRUCTION CONDITIONS ARE MET.
17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTION SAFETY, AND MEANS AND METHODS TO PERFORM AND COMPLETE THE WORK.
18. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY DAMAGE TO PRIVATE OR PUBLIC PROPERTY OUTSIDE THE LIMITS OF CONSTRUCTION SHOWN ON THE PLANS CAUSED BY THE CONTRACTOR, AT THE SOLE COST TO THE CONTRACTOR.
19. THE CONTRACTOR SHALL SUBMIT LITERATURE (MANUFACTURER'S LITERATURE, CUT SHEETS, APPLICATION PROCEDURES, ETC.) FOR ALL PRODUCTS PROPOSED FOR USE ON THE PROJECT, FOR APPROVAL BY THE ENGINEER. APPROVAL OF MATERIALS SHALL BE IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF MASSDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, LATEST EDITION AS AMENDED, SUBSECTION 5.03 AND SECTION 6.00, CONTROL OF MATERIALS.
20. DETAIL OR SHOP DRAWINGS SHALL BE SUBMITTED AND APPROVED IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF MASSDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, LATEST EDITION AS AMENDED, SUBSECTION 5.02, PLANS AND DETAIL DRAWINGS.
21. TAKE ALL NECESSARY MEASURES AND PROVIDE ALL NECESSARY CONTINUOUS BARRIERS OF SUFFICIENT TYPE, SIZE AND STRENGTH TO PREVENT ACCESS TO ALL OPEN EXCAVATIONS AT THE COMPLETION OF EACH DAY'S WORK.
22. STORE FUEL, OIL, PAINT, OR OTHER HAZARDOUS MATERIALS IN A SECONDARY CONTAINER AND REMOVE FROM THE SITE TO A LOCKED INDOOR AREA WITH AN IMPERVIOUS FLOOR DURING NON-WORK HOURS.
23. IMMEDIATELY REPORT SPILLS OF OIL AND/OR HAZARDOUS MATERIALS (OHM) TO THE MASSDEP.
24. PROVIDE A SUFFICIENT SUPPLY OF ABSORBENT SPILL RESPONSE MATERIALS, SUCH AS BOOMS OR BLANKETS, AT THE CONSTRUCTION SITES AT ALL TIMES TO CLEAN UP POTENTIAL SPILLS OF HAZARDOUS MATERIALS.
25. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 3/4", UNLESS OTHERWISE NOTED.
26. SHEAR KEYS SHALL BE 3" HIGH BY ONE-THIRD THE WIDTH OF THE CONCRETE ELEMENT, CENTERED.
27. PEEL AND STICK BARRIER MEMBRANE SHALL BE 2' WIDE WITH PROTECTION BOARD (SUBSIDIARY) AND PLACED CENTERED OVER ALL HORIZONTAL AND VERTICAL EXPANSION AND CONSTRUCTION JOINTS.
28. APPLY PAVEMENT JOINT ADHESIVE ALONG ALL LONGITUDINAL JOINTS BETWEEN PAVEMENT PASSES AND ALONG BRIDGE CURB LINES AND EXPANSION JOINT ARMORING PRIOR TO PLACING ALL PAVEMENT COURSES.
29. CONTRACTOR SHALL EXAMINE DRAWINGS FOR ALL TRADES FOR THE VERIFICATION OF LOCATION AND DIMENSIONS OF ALL CHASES, INSERTS, OPENINGS, SLEEVES AND OTHER PROJECT REQUIREMENTS NOT SHOWN ON THE STRUCTURAL DRAWINGS.

SPECIFICATIONS

SPECIFICATIONS:	AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION MASSACHUSETTS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, 2026
1.REINFORCING STEEL:	AASTHO M31 (ASTM A 615) GRADE 60 EPOXY COATED BARS: DECK & CURBS
2.CONCRETE:	DECK & CURBS: POLYMER-MODIFIED, SELF CONSOLIDATING CONCRETE FOR CONCRETE REPAIRS (SEE SPECS)

REINFORCEMENT

1. DETAILING, FABRICATION, AND ERECTION OF REINFORCEMENT, UNLESS OTHERWISE NOTED, SHALL CONFORM TO AASHTO DESIGN SPECIFICATIONS, ACI "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318)" AND ACI "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES (ACI 315)", LATEST EDITION.
2. STEEL REINFORCEMENT UNLESS OTHERWISE SHOWN SHALL CONFORM TO ASTM A615 GRADE 60 MINIMUM (YIELD STRENGTH – 60,000 PSI).
3. WHERE CONTINUOUS BARS ARE CALLED FOR THEY SHALL BE RUN CONTINUOUSLY AROUND CORNERS AND LAPPED AT NECESSARY SPLICES OR HOOKED AT DISCONTINUOUS ENDS.
4. WHERE REINFORCEMENT IS CALLED FOR IN SECTION, REINFORCEMENT IS CONSIDERED TYPICAL WHEREVER THE SECTION APPLIES.
5. REINFORCEMENT SHALL BE CONTINUOUS THROUGH ALL CONSTRUCTION JOINTS UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
6. REINFORCEMENT COUPLER SPLICES SHALL BE MECHANICAL DEVICES CAPABLE OF TRANSMITTING THE ULTIMATE TENSILE AND COMPRESSIVE STRENGTH OF THE BAR.
7. REINFORCEMENT SHALL BE SET BEFORE PLACING CONCRETE OR MORTAR. SETTING ANY REINFORCEMENT INTO WET CONCRETE OR MORTAR IS PROHIBITED.

CONCRETE

1. CONCRETE WORK SHALL CONFORM TO THE LATEST EDITIONS OF THE MASSDOT STANDARD SPECIFICATIONS, THE AASHTO DESIGN SPECIFICATIONS, THE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318), AND SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDING (ACI 301).
2. CONCRETE SHALL BE CONTROLLED CONCRETE, PROPORTIONED, MIXED, AND PLACED UNDER THE SUPERVISION OF AN APPROVED CONCRETE TESTING AGENCY OR THE ENGINEER.
3. CONCRETE SHALL BE NORMAL WEIGHT CONCRETE AND SHALL HAVE A COMPRESSIVE STRENGTH OF 5000 PSI AT 28 DAYS, UNLESS OTHERWISE NOTED AND SHALL BE AIR ENTRAINED (SEE SPECS).
4. THE USE OF CONSTRUCTION JOINTS WHERE SHOWN ON THE DRAWINGS IS MANDATORY. OMISSIONS, ADDITIONS OR CHANGES SHALL NOT BE MADE EXCEPT WITH THE SUBMISSION OF A WRITTEN REQUEST TOGETHER WITH DRAWINGS OF THE PROPOSED JOINT LOCATIONS FOR APPROVAL OF THE STRUCTURAL ENGINEER.
5. WHERE CONSTRUCTION JOINTS ARE NOT SHOWN, DRAWINGS SHOWING LOCATION OF CONSTRUCTION JOINTS AND CONCRETE PLACING SEQUENCE SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO PREPARATION OF THE REINFORCEMENT SHOP DRAWINGS.
6. CONCRETE SLABS SHALL BE CAST SO THAT THE SLAB THICKNESS IS AT NO POINT LESS THAN THAT INDICATED ON THE DRAWINGS.
7. CONCRETE SLABS AND WALLS SHALL BE CAST ALTERNATELY OR IN A CHECKERBOARD FASHION SO THAT ADJACENT SECTIONS ARE PLACED NO SOONER THAN THREE DAYS APART. AT LEAST TWO DAYS MUST ELAPSE AFTER PLACING CONCRETE IN WALLS BEFORE PLACING FLOOR SYSTEM SUPPORTED THEREON.
8. CONCRETE SHALL BE PLACED WITHOUT HORIZONTAL CONSTRUCTION JOINTS EXCEPT WHERE SHOWN OR NOTED.
9. EXPOSED EDGES OF CONCRETE ELEMENTS SHALL HAVE CHAMFERED CORNERS
10. ONLY CRITICAL CONSTRUCTION JOINTS ARE SHOWN. SEE SPECIFICATIONS FOR REQUIRED MAXIMUM SPACING OF CONSTRUCTION JOINTS.

CONCRETE REPAIR NOTES

1. CONCRETE REPAIRS ARE TO BE IN CONFORMANCE WITH THE APPLICABLE REQUIREMENTS OF SPECIFICATION SECTIONS 03100, 03200, 03300 AND 03930.
2. SHIELDING WILL BE REQUIRED FOR THE CONCRETE REPAIR WORK AT THE BRIDGE TO PREVENT DEBRIS FROM FAILING BELOW (SEE SPECS). SHIELDING SHALL BE DESIGNED/DETAILED BY CONTRACTOR.

BRIDGE SUPERSTRUCTURE REHABILITATION NOTES

1. AFTER REMOVAL OF EXISTING PAVEMENT AND MEMBRANE, CONTRACTOR TO PROVIDE ENGINEER WITH 48 HOUR NOTICE TO SOUND EXISTING CONCRETE DECK AND TO DETERMINE AREAS REQUIRING PARTIAL AND FULL DEPTH DECK REPAIRS.
2. DETERIORATED AREAS OF DECK SHALL BE PATCHED IN ACCORDANCE WITH THE DETAILS PROVIDED IN THE DRAWINGS HEREIN. PRIOR TO PLACING NEW CONCRETE, THE PATCHED AREAS SHALL BE PREPARED TO A SATURATED, SURFACE-DRY CONDITION.
3. REFER TO CONCRETE REPAIR NOTES ABOVE FOR FURTHER REPAIR REQUIREMENTS.

DAM WALL CONCRETE REPAIR NOTES

1. ASSUMED REPAIR QUANTITIES ARE BASED ON LIMITED ACCESS TO DAM WALL DURING ENGINEER'S OBSERVATIONS. CONTRACTOR SHALL PERFORM THEIR OWN "SOUNDING" OF THE DAM WALL, IDENTIFYING HOLLOW SOUNDING AND SPALLED AREAS THAT NEED REPAIR ALONG THE ENTIRE LENGTH OF THE DAM WALL. FINDINGS ARE TO BE REPORTED TO ENGINEER PRIOR TO PERFORMING ANY REPAIRS.
2. REFER TO CONCRETE REPAIR NOTES ABOVE FOR FURTHER REPAIR REQUIREMENTS.

Tighe&Bond

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CHRISTOPHER HAKER
CIVIL
No. 47184
REGISTERED PROFESSIONAL ENGINEER
05/05/2026

COMMONWEALTH OF MASSACHUSETTS
BRIAN J. GARGAN
CIVIL
No. 50170
REGISTERED PROFESSIONAL ENGINEER
05/06/2026

Department of Conservation and Recreation

Damon Pond Dam Repairs And Area Improvements

Ashby, Massachusetts

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DRAWN BY:	JAK
CHECKED:	CDH,DRB
APPROVED:	CDH

STRUCTURAL NOTES

SCALE: NO SCALE

S-001
SHEET 9 OF 18

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CONCRETE APRON AND GEOCELLS, SEE SHEET C-103 AND DETAIL ON S-002

30'± LINEAR FEET OF STONE WALL IS ABSENT OF MORTAR; RECHINK GAPS GREATER THAN 1 INCH WITH STONES OF THE SAME PARENT MATERIAL, DO NOT USE MORTAR IN THIS AREA OF THE WALL, SEE REPAIR DETAIL ON C-103

PROVIDE PAVEMENT SAWCUT JOINT SEE DETAIL ON S-504

RAILINGS TO BE REPAINTED OR REPLACED AND PAINTED (TYP), SEE PHOTOS 2 AND 4 ON S-501 AND DETAIL ON SHEET S-504

REPAIR VISIBLE SPALLED CONCRETE AND DELAMINATED AREAS, SEE SHEET 504 SEE DAM WALL CONCRETE REPAIR NOTES ON S-001

ALL EFFLORESCENCE AND STAINING DUE TO WATER SEEPAGE IS TO BE REMOVED; INCLUDES BOTH UPSTREAM AND DOWNSTREAM WALLS AND BRIDGE CONCRETE AND MASONRY SURFACES, INCLUDING BRIDGE ABUTMENTS AND PILASTERS AT ROADWAY

REPOINT ALL MORTARED MASONRY WALL JOINTS; COLLECT AND DISPOSE OF DEBRIS; INCLUDES BOTH UPSTREAM AND DOWNSTREAM MASONRY FACES OF THE DAM AND BRIDGE AND BRIDGE ABUTMENTS (UNLESS OTHERWISE NOTED). ALL ORGANIC MATTER AND VEGETATION TO BE REMOVED FROM WALL SURFACES

REMOVE EXISTING MORTAR ON TOP OF PILASTERS IN ACCORDANCE WITH 02225 AND REPLACE IN ACCORDANCE WITH 04920 (TYP), SEE S-504

LIMIT OF SEDIMENT EXCAVATION

CRACK INJECTION REPAIR ON CONCRETE TRAINING WALL, SEE CRACK REPAIR DETAIL ON SHEET S-002

PROPOSED DECK WEEP EXTENSION, TOTAL OF 4 WEEPS SEE S-506

R&D SUSPENDED PIPE

NEW TRASH RACK AT INLET TO LOW-LEVEL OUTLET, SEE SHEET S-506 FOR DETAILS AND REQUIREMENTS

CRACK INJECTION REPAIR ON CONCRETE TRAINING WALL AND BETWEEN CONCRETE TRAINING WALL AND STONE ABUTMENT TO REPAIR LEAK, SEE CRACK REPAIR DETAIL ON SHEET S-002

BRIDGE DECK REPAIR

BRIDGE BEAM REPAIRS, SEE PHOTOS 5-8 ON S-501 AND DETAIL ON S-504

7&8 (UNDER BRIDGE)

5&6 (UNDER BRIDGE)

PROPOSED SUPERPAVE WEARING SURFACE WITH MEMBRANE WATERPROOFING SEE BRIDGE SECTION ON SHEET S-503

PROVIDE GROUT INJECTION PRIOR TO VISIBLE SPALLED CONCRETE REPAIR ON SOUTHWEST WINGWALL SEE PHOTO 6 ON S-501 AND DETAIL ON S-505

GATE

PHOTO LOCATION SYMBOL = #

N

NAD 83

SCALE IN FEET

0 10' 20'

GRAPHIC SCALE

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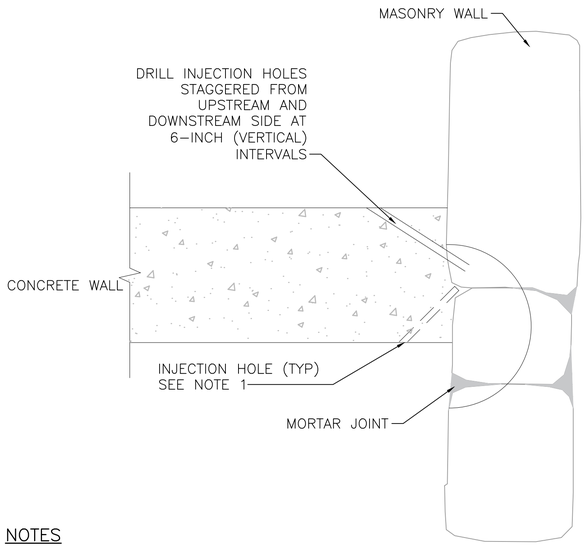
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REPAIR AND PHOTO LOCATION PLAN

SCALE: 1"=10'

S-101
SHEET10 OF 18

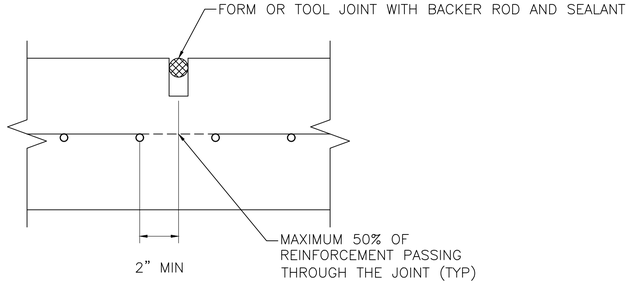
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NOTES

1. INSTALL INJECTION PACKERS IN DRILLED HOLES AND APPLY LIQUID CHEMICAL GROUT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. PROVIDE WATERTIGHT REPAIR. FOLLOWING INJECTION, REMOVE EXCESS GROUT UNTIL FLUSH WITH EXISTING SURFACE. RUB SMOOTH. SEE 03930 FOR FURTHER REQUIREMENTS.
2. LOCATION SHOWN ON S–101.
3. THE CONTRACTOR SHALL EXERCISE AN ABUNDANCE OF CAUTION TO PREVENT EXCESS LIQUID CHEMICAL GROUT FROM DROPPING INTO POND OR THE SPILLWAY CHANNEL.

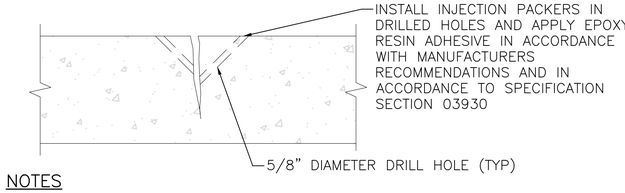
CONCRETE–MASONRY INTERFACE LEAK REPAIR



CRACK INDUCING JOINT DETAIL

NOTES

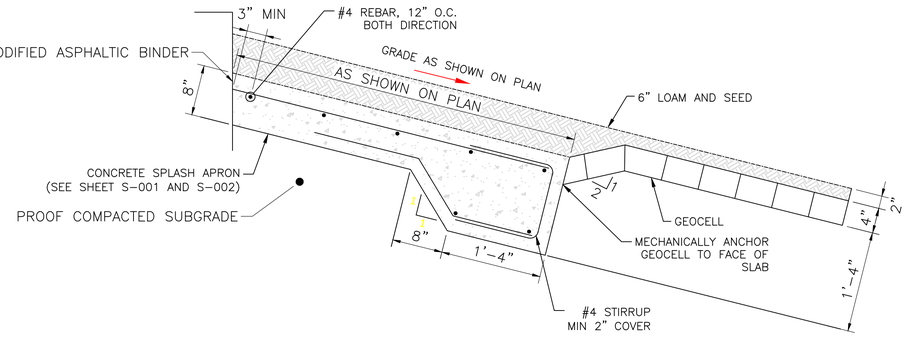
1. JOINT SHALL EXTEND DOWN ONE FOURTH THE DEPTH OF THE SLAB
2. JOINT SHALL NOT GO THROUGH REINFORCEMENT



NOTES

1. REMOVE ALL ORGANIC MATTER FROM CRACK PRIOR TO INJECTION.
2. CLEAN EXCESS EPOXY OFF CONCRETE SURFACE AND REMOVE PINS AFTER REPAIR IS COMPLETE.
3. LEAVE REPAIR SURFACES FLUSH WITH EXISTING CONCRETE.

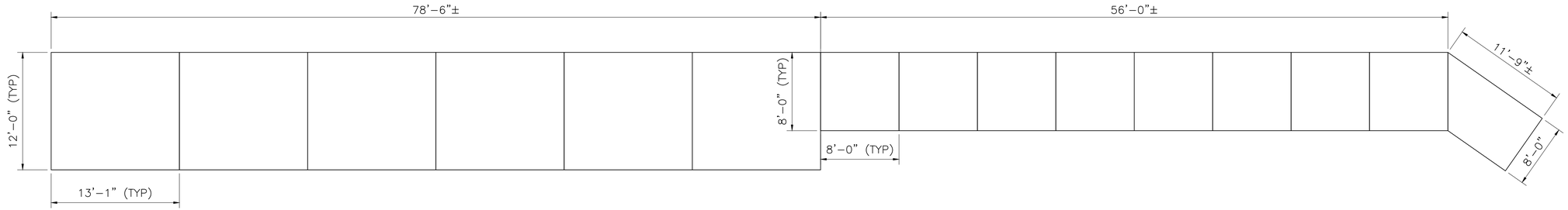
CRACK REPAIR DETAIL



CONCRETE SPLASH APRON

NOTES

1. PROVIDE A BROOM FINISH ON TOP SURFACE.



SPLASH APRON CONTROL JOINT PLAN

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CONSTRUCTION DETAILS

SCALE: NO SCALE

S-002
SHEET 11 OF 18

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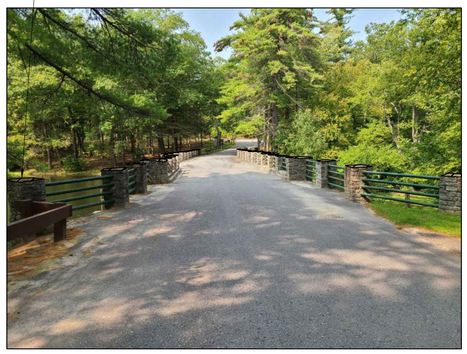


PHOTO 1
DAM AND BRIDGE LOOKING NORTHWEST ALONG HOSMER ROAD

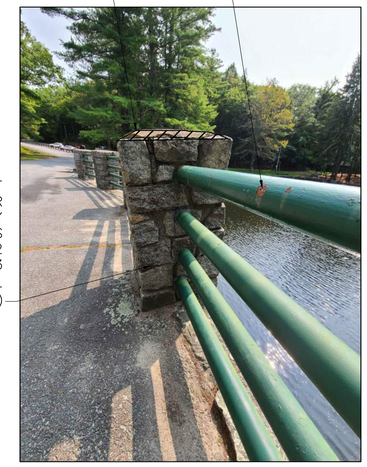


PHOTO 2
TYPICAL RAILING AND PILASTER 1

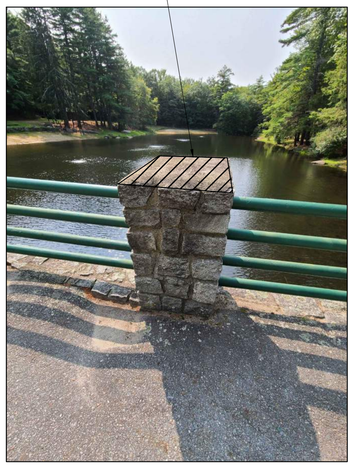


PHOTO 3
TYPICAL RAILINGS AND PILASTER 2



PHOTO 4
TYPICAL CORRODED RAILINGS

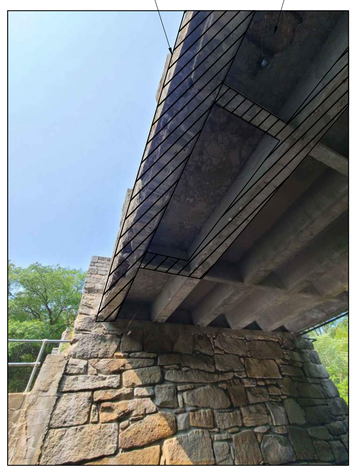


PHOTO 5
NORTHWEST BUTTRESS AND SOUTHERN SPANDREL BEAM

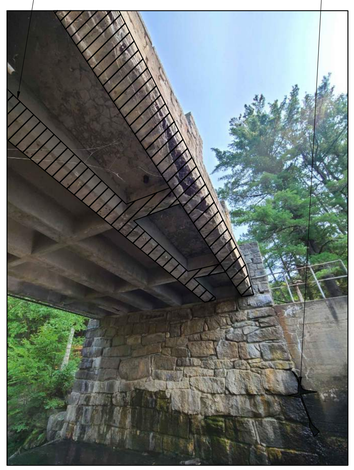


PHOTO 6
LOOKING SOUTHEAST: CONCRETE DETERIORATION ON SOUTHERN SPANDREL BEAM

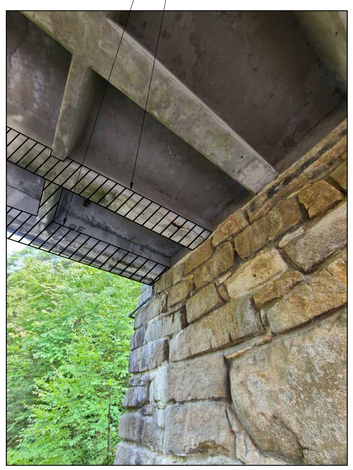


PHOTO 7
NORTHERN SPANDREL & INTERIOR BEAMS AT SOUTHEASTERN BUTTRESS

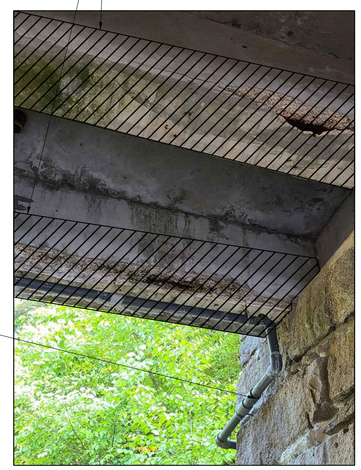


PHOTO 8
CLOSE UP: NORTHERN SPANDREL & INTERIOR BEAMS AT SOUTHEASTERN BUTTRESS

NOTES:

1. SEE GENERAL NOTES ON SHEET S–001 AND SPECIFICATION SECTION 03930 FOR CONCRETE REPAIR REQUIREMENTS.
2. SEE SPECIFICATION SECTION 04920 FOR MASONRY AND CAP MOCKUP AND MATERIAL REQUIREMENTS.
3. ONE PILASTER SHALL BE IDENTIFIED AND USED AS A MOCKUP FOR PILASTER REPOINTING AND CAP WORK. MOCKUP TO BE APPROVED BY DCR PRIOR TO BEGINNING REPOINTING WORK. SEE SPECIFICATION SECTION 04920 FOR MOCKUP REQUIREMENT.

Tighe&Bond

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DEMOLITION DETAILS (1 OF 2)

SCALE: NO SCALE

S-501
SHEET 12 OF 18

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ALL VEGETATION GROWING ON DAM/BRIDGE STRUCTURE IS TO BE REMOVED PRIOR TO PERFORMING REPAIRS, ORGANIC MATTER SHALL BE REMOVED FROM ALL JOINTS PRIOR TO REPAIRS/ REPOINTING, SEE NOTE 1 (TYP)



PHOTO 9
VEGETATION AND EFFLORESCENCE
ALONG UPSTREAM DAM WALL

ALL VEGETATION, ORGANIC MATTER AND EFFLORESCENCE TO BE REMOVED PRIOR TO CONCRETE REPAIRS



PHOTO 10
VISIBLE SPALL AND EFFLORESCE
ALONG UPSTREAM DAM WALL

LOOSE TOP COURSE STONES TO BE RESET AS REQUIRED. TOPWALL JOINTS SHALL ALSO BE REPOINTED. APPROX QUANTITY OF STONES TO BE RESET, 50 STONES.

VEGETATION AND ORGANIC MATTER TO BE REMOVED FOR REPAIR AND REPOINTING OF STONE MASONRY (TYP)

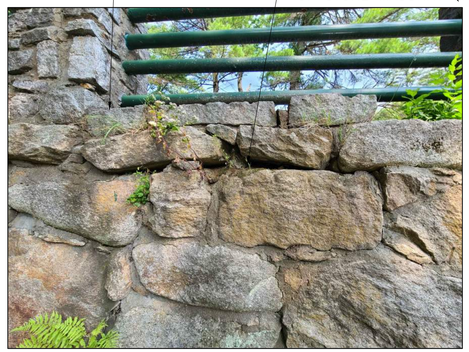


PHOTO 11
TYPICAL STONE MASONRY
SECTION TO BE REPOINTED

RECHINK VOIDS GREATER THAN 1 INCH, DO NOT USE MORTAR IN THIS AREA OF THE WALL.

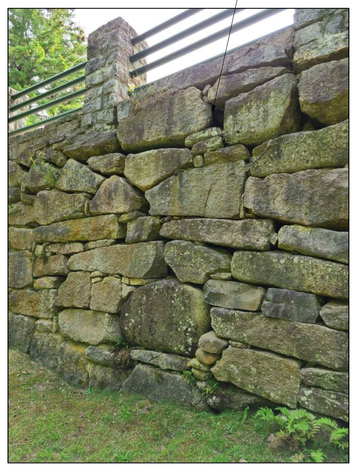
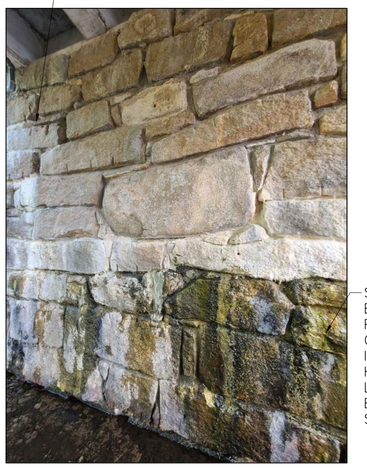


PHOTO 12
DOWNSTREAM FACE OF DAM
WALL TO BE LEFT DRY STACKED

MORTAR JOINTS TO BE REPAIRED/ REPOINTED (TYP)



STAINS SHALL BE REMOVED PRIOR TO GROUT INJECTION TO HELP VERIFY LEAKS HAVE BEEN STOPPED

PHOTO 13
STAINING ON BRIDGE
ABUTMENT TO BE CLEANED

REMOVE ALL ORGANIC MATTER FROM CRACKS PRIOR TO EPOXY INJECTION

CRACKS ALONG TRAINING WALL TO BE EPOXY INJECTION.



PHOTO 14
CRACKS IN TRAINING WALL

REMOVE TREE (TYP)

REPLACE MISSING STONES IN WALL

PLACE ROUNDED COBBLES AND BOULDERS



REBUILD WALL USING STONES AT FACE.

REMOVE LOOSE AND ORGANIC MATERIAL AND PLACE TYPE 2 RIPRAP.

PHOTO 15
IMPROVEMENTS TO WALL
DOWNSTREAM OF DAM

NOTES:

1. A 6FT X 6FT SECTION OF WALL SHALL BE IDENTIFIED AND USED AS A MOCKUP FOR REPOINTING WORK. MOCKUP TO BE APPROVED BY DCR PRIOR TO BEGINNING REPOINTING WORK. SEE SPECIFICATION SECTION 04920 FOR MOCKUP REQUIREMENTS.

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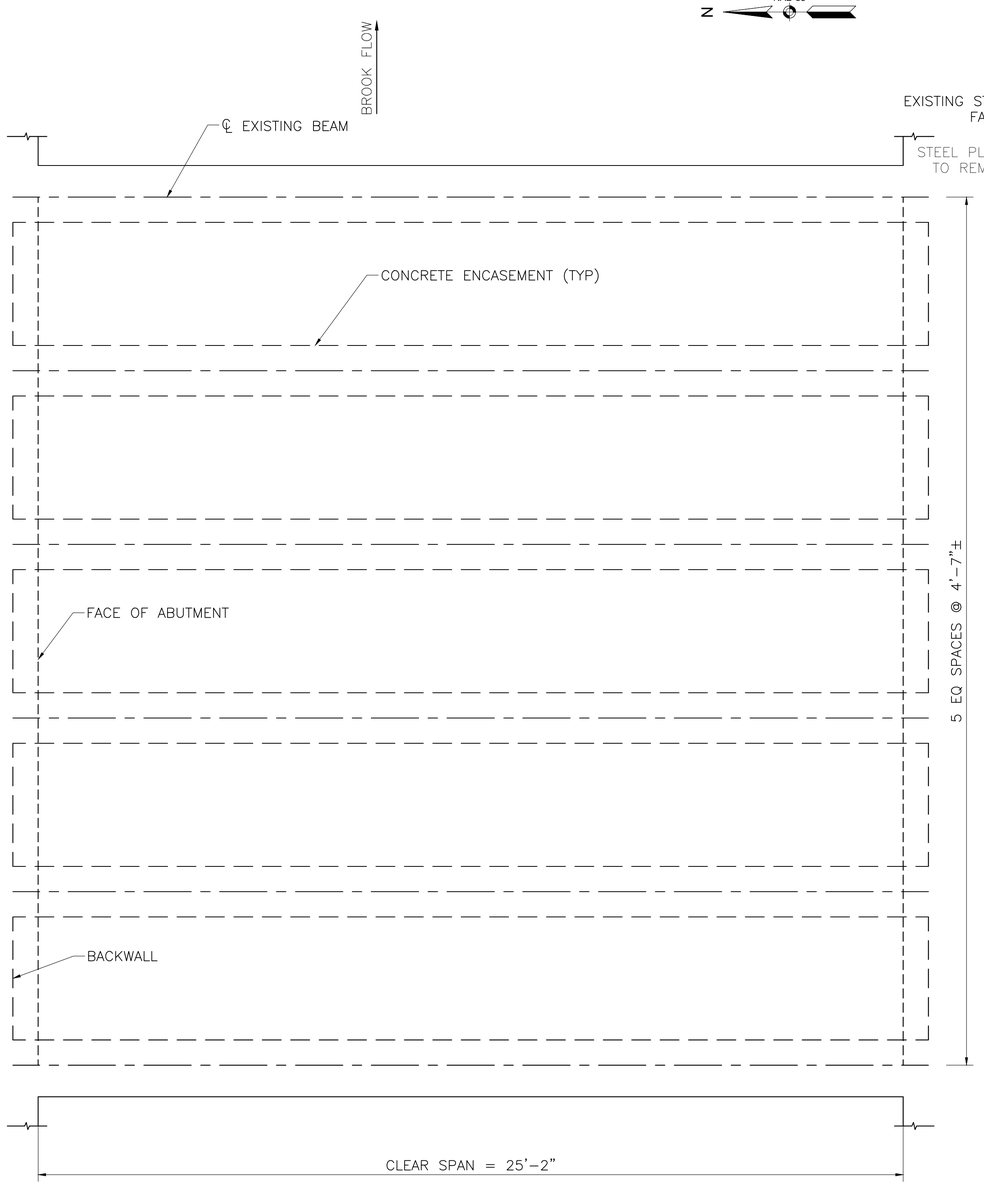
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DEMOLITION DETAILS
(2 OF 2)

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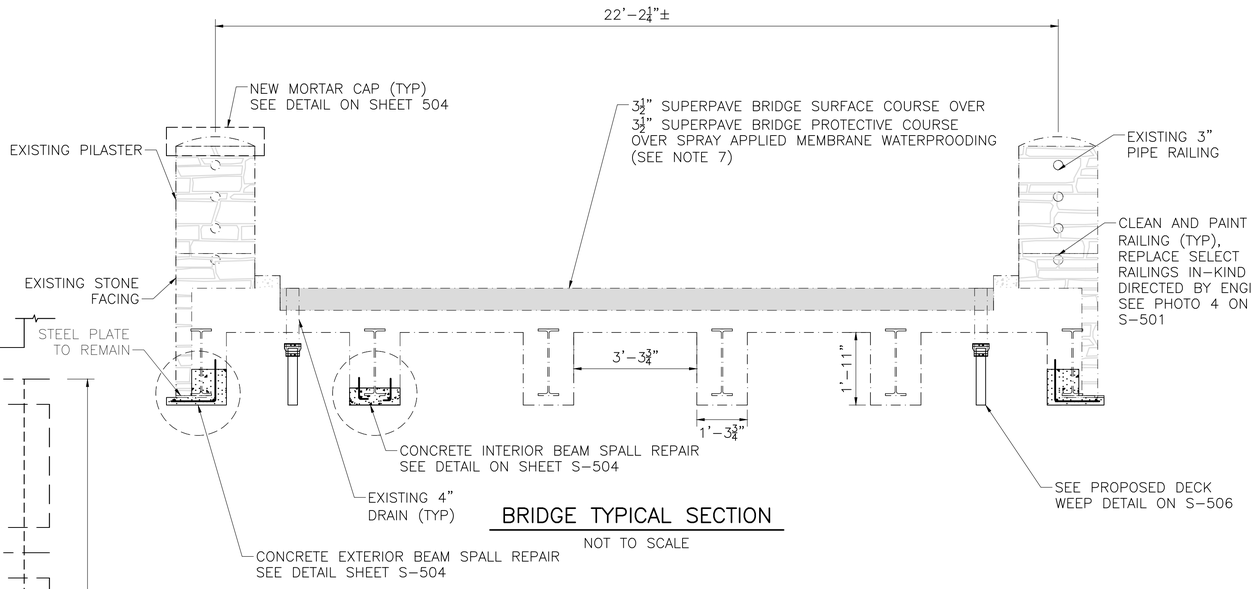
S-502
SHEET 13 OF 18

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HOMER ROAD BRIDGE FRAMING PLAN

SCALE: 1" = 2'

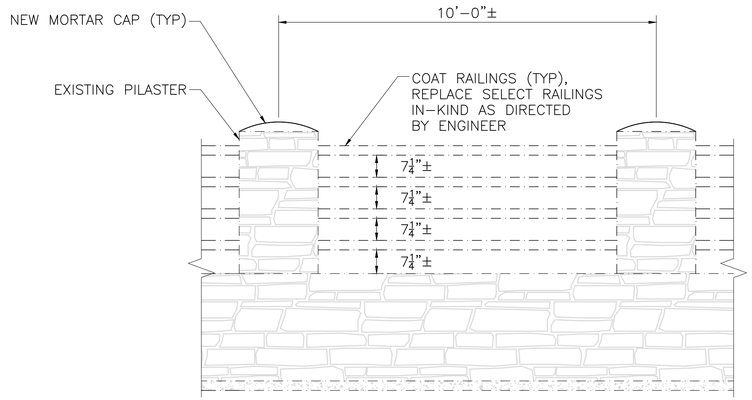


BRIDGE TYPICAL SECTION

NOT TO SCALE

NOTES:

1. FRAMING PLAN AND EXISTING SECTION BASED ON SKETCHES FROM PREVIOUS BRIDGE RATING REPORT (1982) NOTED AS BRIDGE NO. A-12-10 WILLARD BROOK SECTION DATED JUNE 27TH, 2001 AND ARE APPROXIMATE, CONTRACTOR TO FIELD VERIFY PRIOR TO FABRICATION.
2. FIELD OBSERVATIONS RECORDED JANUARY 16TH, 2019.
3. ALL CONCRETE REPAIR TO BE IN CONFORMANCE WITH SPECIFICATION SECTION 03300 & 03930.
4. RAILING MATERIALS SHALL BE IN CONFORMANCE WITH SPECIFICATION SECTION 05500.
5. SEE GENERAL NOTES FOR ADDITIONAL REQUIREMENTS.
6. MAINTAIN EXISTING DECK SCUPPERS.
7. PROPOSED PAVEMENT THICKNESS TO MATCH EXISTING. CONTRACTOR TO FIELD VERIFY EXISTING THICKNESS AT BRIDGE.



TYPICAL BRIDGE RAIL ELEVATION

NOT TO SCALE

Tighe&Bond

COMMONWEALTH OF MASSACHUSETTS
CHRISTOPHER HAKER
CIVIL
No. 47184
REGISTERED PROFESSIONAL ENGINEER
05/05/2026

COMMONWEALTH OF MASSACHUSETTS
BRIAN J. GARGAN
CIVIL
No. 50170
REGISTERED PROFESSIONAL ENGINEER
05/06/2026

Department of Conservation and Recreation

Damon Pond Dam Repairs And Area Improvements

Ashby, Massachusetts

MARK	DATE	DESCRIPTION

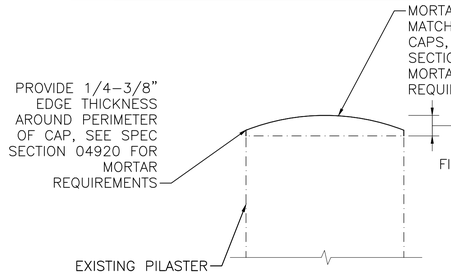
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DATE:	4/2026
FILE: M0736-Task82A-Structural.dwg	
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CHECKED:	CDH,DRB
APPROVED:	CDH

REPAIR DETAILS
(1 OF 3)

SCALE: AS SHOWN

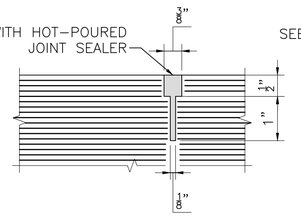
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SHEET 14 OF 18

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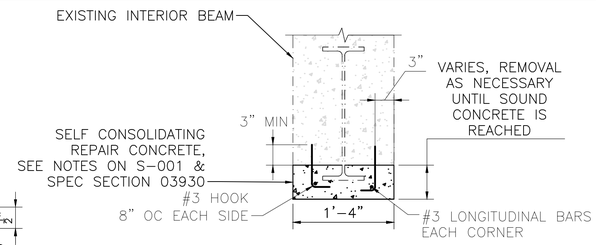
MORTAR CAP REPAIR

SCALE: 1" = 1'–0"



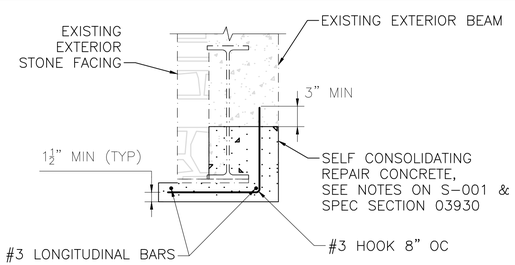
PAVEMENT SAWCUT DETAIL

NOT TO SCALE



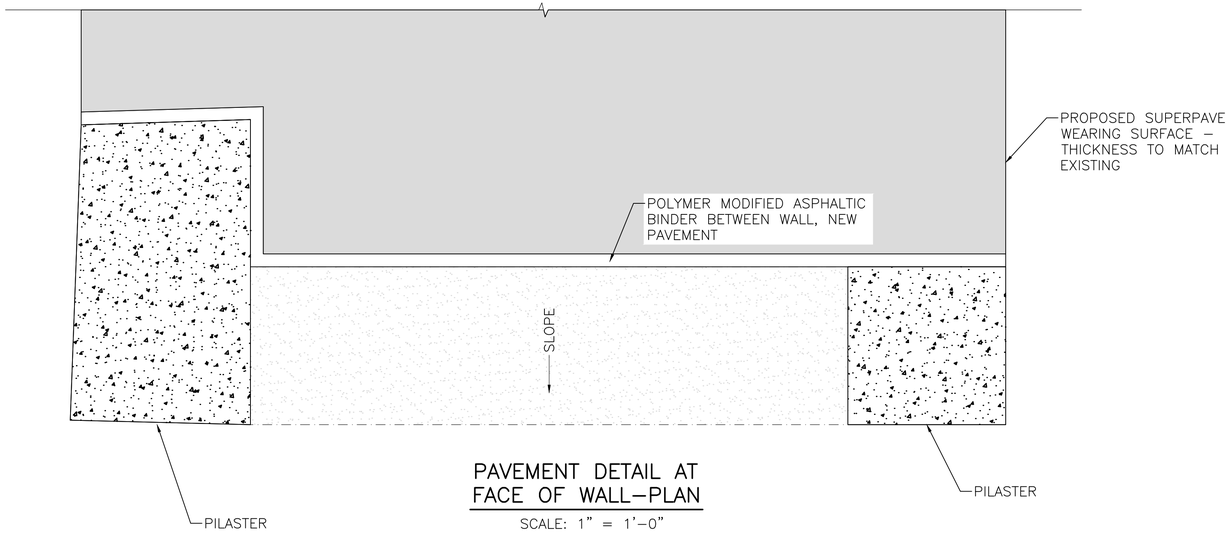
INTERIOR BEAM SPALL REPAIR DETAIL

SCALE: 1" = 1'–0"



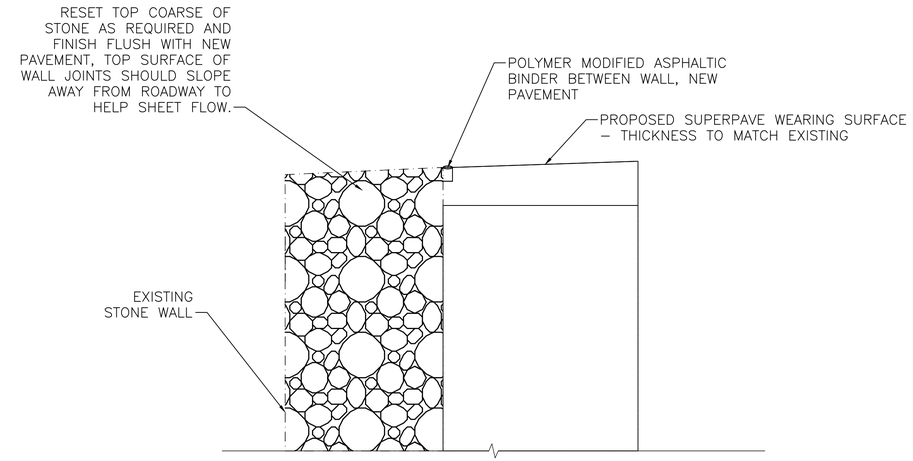
EXTERIOR BEAM SPALL REPAIR DETAIL

SCALE: 1" = 1'–0"



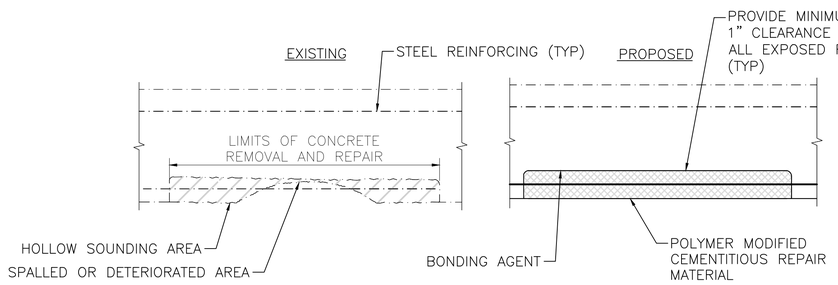
PAVEMENT DETAIL AT FACE OF WALL–PLAN

SCALE: 1" = 1'–0"



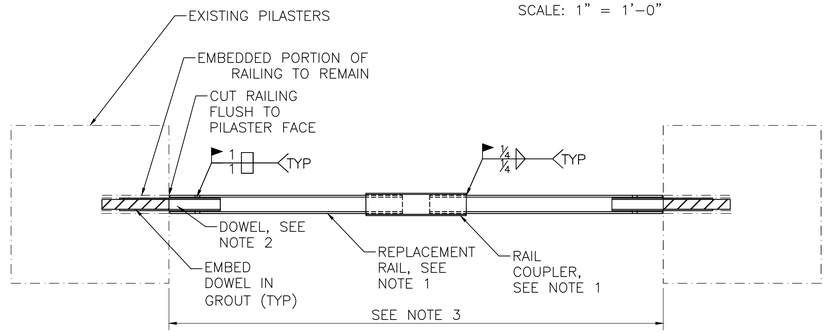
PAVEMENT DETAIL AT FACE OF WALL – ELEVATION

SCALE: 1" = 1'–0"



SPALLED OR HOLLOW AREA CONCRETE REPAIR AT DAM WALL

NOT TO SCALE



RAILING REPLACEMENT

NOT TO SCALE

NOTES

1. SEE NOTES ON S–001 AND SPEC SECTION 03930.

NOTES

1. REPLACEMENT RAIL AND COUPLING TO BE A53 GRADE B PIPE, EXTRA STRONG (SCH80). RAILING OD TO MATCH EXISTING, COUPLER ID TO SNUG FIT RAILING OD.
2. DOWEL TO BE A53 GRADE B PIPE, EXTRA STRONG (SCH80), GROUT DOWEL INTO EXISTING RAILING/PILASTER OPENING, OD TO SNUG FIT ID OF REPLACEMENT RAIL, 8" EMBED EACH WAY.
3. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS AND RAILING CONNECTION TO PILASTER AND REVIEW FINDINGS WITH ENGINEER PRIOR TO THE ORDERING AND FABRICATION OF RAIL REPLACEMENT ELEMENTS.
4. PREPARE AND PAINT FOLLOWING INSTRUCTION PER SECTION 09900.

Tighe&Bond

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Damon Pond Dam Repairs And Area Improvements

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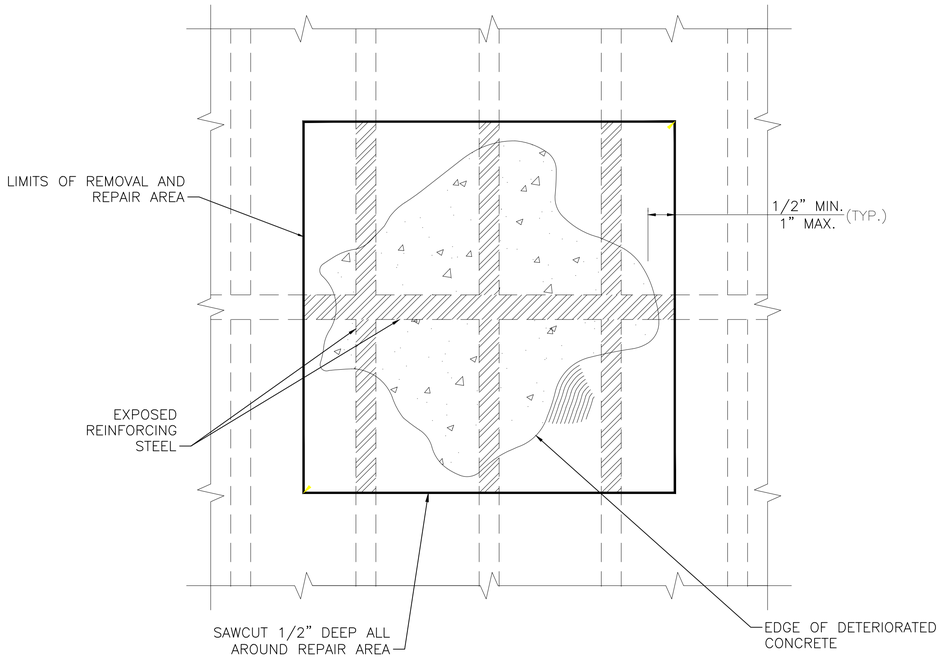
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REPAIR DETAILS (2 OF 3)

SCALE: AS SHOWN

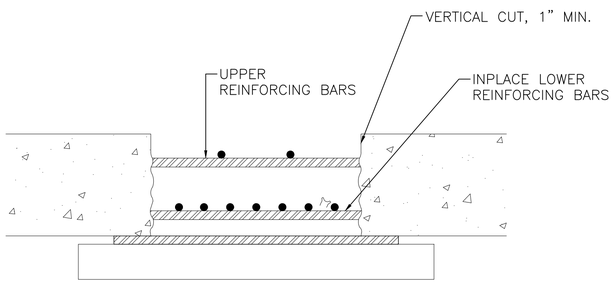
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SHEET 15 OF 18

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PLAN VIEW: TYPICAL LIMITS OF BRIDGE DECK REPAIR AREA

NOT TO SCALE

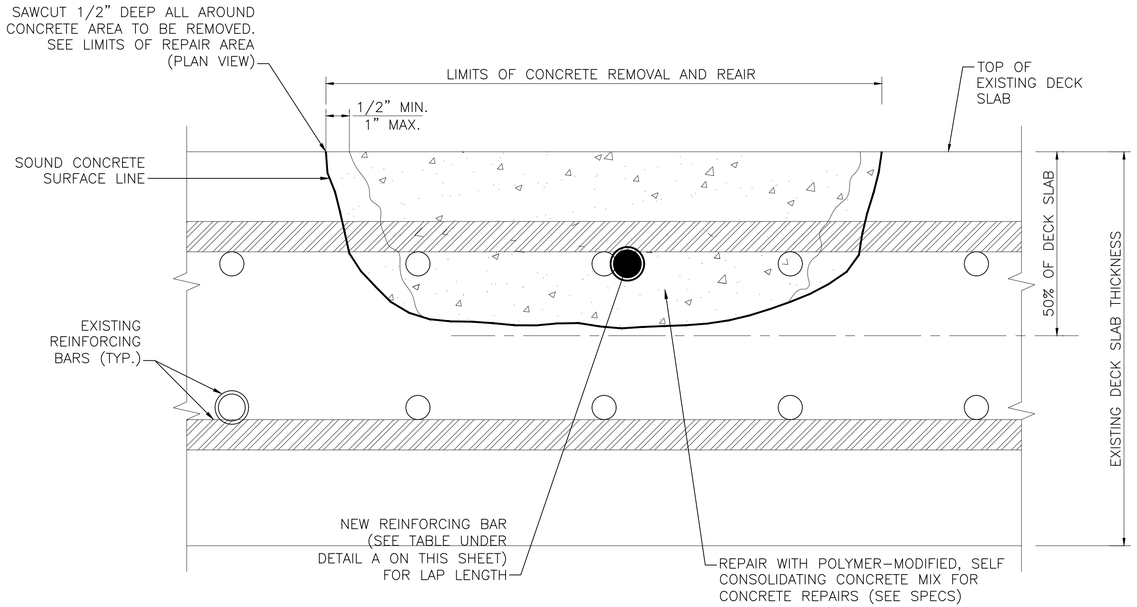


FORMWORK SUPPORT FOR FULL DEPTH BRIDGE DECK REPAIR

NOT TO SCALE

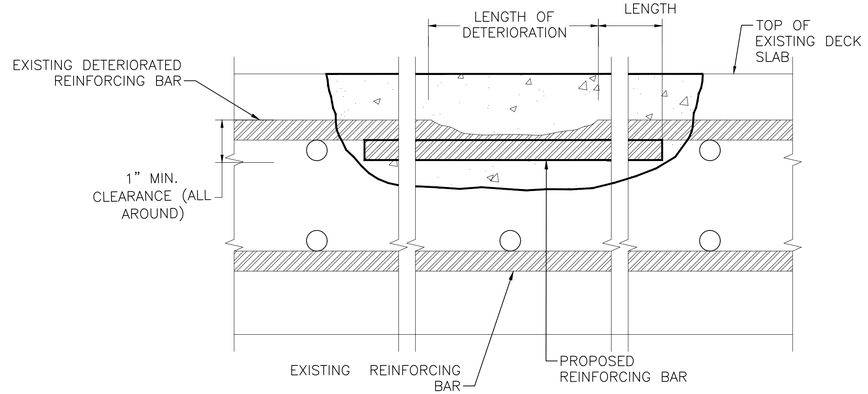
NOTES

1. FORM WORK TO BE DESIGNED BY CONTRACTOR.
2. DECK FORMS SHALL BE FLUSH WITH EXISTING DECK UNDERSIDE AND SHALL BE REMOVED AFTER CURING IS COMPLETE.
3. REFER TO BRIDGE SUPERSTRUCTURE REHABILITATION NOTES ON S-001 FOR CONCRETE DECK REPAIR REQUIREMENTS.



PARTIAL DEPTH BRIDGE DECK REPAIR

NOT TO SCALE



STEEL REINFORCEMENT LAP LENGTH				
MODIFICATION	#4 BARS	#5 BARS	#6 BARS	#7 BARS
COATED, CENTER TO CENTER SPACING < 6" COVER < 3DB	31"	39"	46"	53"
COATED, CENTER TO CENTER SPACING < 6" COVER ≥ 3DB	18"	22"	27"	49"
COATED, CENTER TO CENTER SPACING ≥ 6" COVER < 3DB	22"	28"	33"	49"
COATED, CENTER TO CENTER SPACING ≥ 6" COVER ≥ 3DB	18"	22"	27"	39"

TYPICAL DETERIORATIED REINFORCING BAR REPAIR DETAIL FOR BRIDGE DECK REPAIRS

NOTES

1. LIMITS OF CONCRETE REMOVAL SHALL BE ADJUSTED, AS REQUIRED, TO FACILITATE REPAIRS OF DETERIORATED REINFORCING BARS INCLUDING THE REQUIRED LAP LENGTH.

DETAIL A

Tighe&Bond

COMMONWEALTH OF MASSACHUSETTS
CHRISTOPHER HAKER
CIVIL
No. 47184
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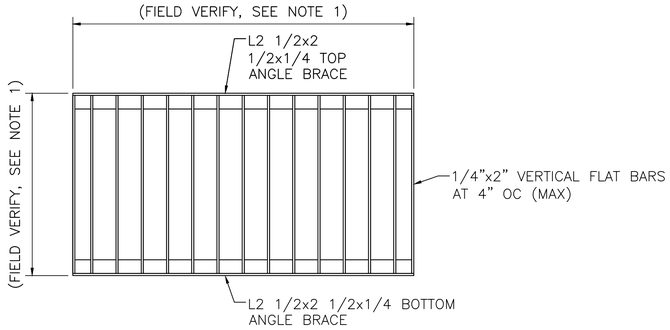
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REPAIR DETAILS (3 OF 3)

SCALE: NO SCALE

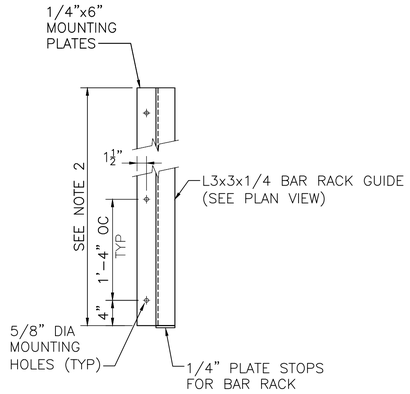
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SHEET 16 OF 18

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TRASH RACK ELEVATION VIEW

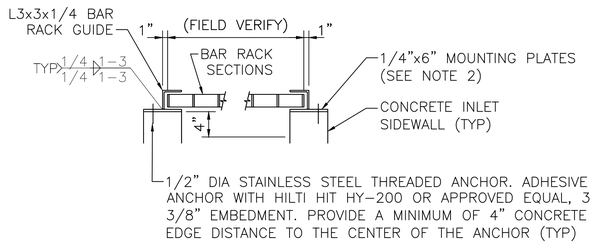
SCALE: 1" = 1'-0"



TRASH RACK GUIDE FRAMES ELEVATION VIEW

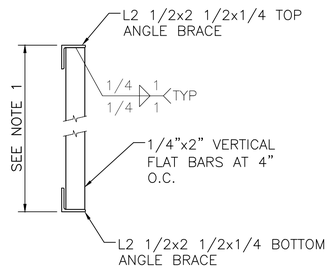
SCALE: 1" = 1'-0"

(ONE REQUIRED AS SHOWN AND ONE REQUIRED OPPOSITE HAND.)



TRASH RACK GUIDE FRAMES PLAN VIEW

SCALE: 1" = 1'-0"

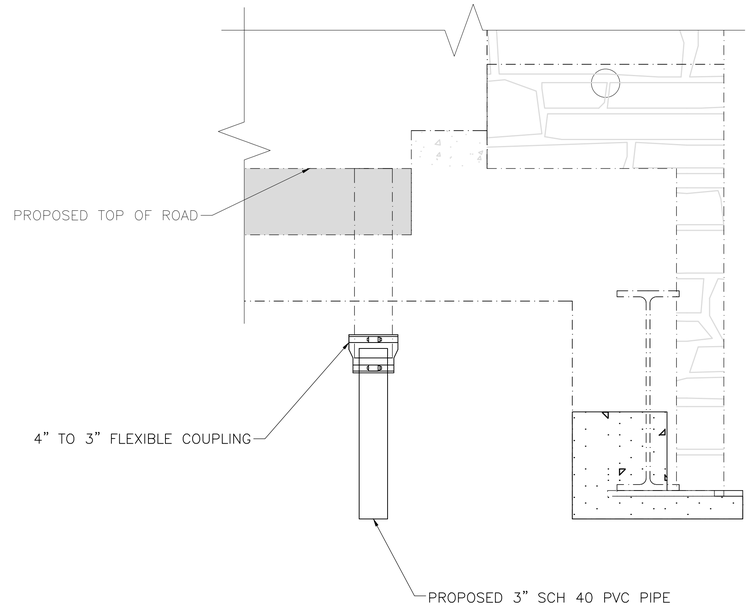


BAR RACK SECTION VIEW

SCALE: 1½" = 1'-0"

NOTES

1. CONTRACTOR TO FIELD VERIFY INLET STRUCTURE MEASUREMENTS PRIOR TO FABRICATION OF BAR RACK AND FRAMES. APPROXIMATE DIMENSIONS ARE 3'-0"X 3'-0". RACK WIDTH TO FIT BETWEEN GUIDE FRAMES WITH 1" CLEAR ON EACH END AS DETAILED. CONFIGURATION AND RACK HEIGHT TO BE FROM INLET BASE TO TOP OF CONCRETE CURB.
2. COORDINATE LENGTH OF GUIDE FRAMES TO EQUAL PROVIDED RACK HEIGHT.
3. ALL STEEL FOR BAR RACK SHALL BE GRADE 50.



DECK WEEP DETAIL

SCALE: 1½" = 1'-0"

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BAR RACK & DECK WEEP DETAILS

SCALE: AS SHOWN

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