

COMMONWEALTH OF MASSACHUSETTS



CONTRACT DOCUMENTS AND SPECIAL PROVISIONS

PROPOSAL NO.	608851-126586
P.V. =	\$3,672,000.00
PLANS	YES

FOR

**Federal Aid Project No. BFS(BR-OFF)-003S(750)X
Bridge Replacement, H-08-003=N-07-002, Creamery Road over Ware River**

in the Towns of

HARDWICK-NEW BRAintree

In accordance with the STANDARD SPECIFICATIONS
for HIGHWAYS and BRIDGES dated 2024

This Proposal to be opened and read:

TUESDAY, AUGUST 13, 2024 at 2:00 P.M.

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DOCUMENT 00010

TABLE OF CONTENTS

DOCUMENT 00010	
TABLE OF CONTENTS	00010-1 through 4
DOCUMENT 00104	
NOTICE TO CONTRACTORS	00104- 1 through 4
DOCUMENT 00210	
REQUIREMENTS OF MASSACHUSETTS GENERAL LAWS CHAPTER 30 SECTION 39R; CHAPTER 30, SECTION 39O	00210-1 through 4
DOCUMENT 00331	
LOCUS MAP	00331-1 through 2
DOCUMENT 00439	
CONTRACTOR PROJECT EVALUATION FORM	00439-1 through 2
DOCUMENT 00440	
SUBCONTRACTOR PROJECT EVALUATION FORM	00440-1 through 2
DOCUMENT 00710	
GENERAL CONTRACT PROVISIONS.....	00710-1 through 2
DOCUMENT 00715	
SUPPLEMENTAL SPECIFICATIONS	00715-1 through 12
DOCUMENT 00719	
SPECIAL PROVISIONS FOR PARTICIPATION BY DISADVANTAGED BUSINESS ENTERPRISES	00719-1 through 18
DOCUMENT 00760	
REQUIRED CONTRACT PROVISIONS FOR FEDERAL-AID CONSTRUCTION CONTRACTS.....	00760-1 through 14
DOCUMENT 00811	
MONTHLY PRICE ADJUSTMENT FOR HOT MIX ASPHALT (HMA) MIXTURES.....	00811-1 through 2
DOCUMENT 00812	
MONTHLY PRICE ADJUSTMENT FOR DIESEL FUEL AND GASOLINE	00812-1 through 2
DOCUMENT 00813	
PRICE ADJUSTMENT FOR STRUCTURAL STEEL AND REINFORCING STEEL	00813-1 through 4
DOCUMENT 00814	
PRICE ADJUSTMENT FOR PORTLAND CEMENT CONCRETE MIXES	00814-1 through 2
DOCUMENT 00820	
THE COMMONWEALTH OF MASSACHUSETTS SUPPLEMENTAL EQUAL EMPLOYMENT OPPORTUNITY, NON-DISCRIMINATION AND AFFIRMATIVE ACTION PROGRAM	00820-1 through 6
DOCUMENT 00821	
ELECTRONIC REPORTING REQUIREMENTS CIVIL RIGHTS PROGRAM AND CERTIFIED PAYROLL	00821-1 through 2
DOCUMENT 00859	
CONTRACTOR/SUBCONTRACTOR CERTIFICATION FORM	00859-1 through 2

TABLE OF CONTENTS (Continued)

DOCUMENT 00860	
COMMONWEALTH OF MASSACHUSETTS PUBLIC EMPLOYMENT LAWS	00860-1 through 2
DOCUMENT 00861	
STATE PREVAILING WAGE RATES	00861-1 through 74
DOCUMENT 00870	
STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY	
CONSTRUCTION CONTRACT SPECIFICATIONS	00870-1 through 8
DOCUMENT 00880	
MINIMUM WAGES FOR FEDERAL AND FEDERALLY	
ASSISTED CONTRACTS.....	00880-1 through 36
DOCUMENT A00801	
SPECIAL PROVISIONS	A00801-1 through 178
DOCUMENT A00802	
DETAIL SHEETS.....	A00802-1 through 16
DOCUMENT A00808	
PROJECT UTILITY COORDINATION FORM.....	A00808-1 through 4
DOCUMENT A00810	
MASSDOT HERBICIDE USE REPORT	A00810-1 through 2
DOCUMENT A00815	
WORK ZONE SAFETY	
TEMPORARY TRAFFIC CONTROL	A00815-1 through 86
DOCUMENT A00820	
REQUEST FOR RELEASE OF MASSDOT AUTOCAD FILES FORM.....	A00820-1 through 2
DOCUMENT A00830	
COMBINED PERMIT APPLICATION	
ARMY CORPS OF ENGINEERS PERMIT APPLICATION AND	
MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	
WATER QUALITY CERTIFICATE APPLICATION.....	A00830-1 through 210
DOCUMENT A00831	
ARMY CORPS OF ENGINEERS	
GENERAL PERMIT AND NAE VERIFICATION LETTER	A00831-1 through 128
DOCUMENT A00833	
MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	
401 – 404 ADMINISTRATIVE COMPLETENESS AND TECHNICAL	
DEFICIENCY REVIEW	A00833-1 through 4
DOCUMENT A00834	
MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	
401 – 404 ADMINISTRATIVE COMPLETENESS AND TECHNICAL DEFICIENCY REVIEW	
RESPONSE LETTER	A00834-1 through 6
DOCUMENT A00841	
MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	
WATER QUALITY CERTIFICATE.....	A00841-1 through 18

TABLE OF CONTENTS (Continued)

DOCUMENT A00842	
NORTHERN LONG-EARED BAT ACOUSTIC SURVEY REPORT	A00842-1 through 72
DOCUMENT A00844	
U.S. FISH AND WILDLIFE SERVICE	
NLAA CONCURRENCE VERIFICATION LETTER.....	A00844-1 through 16
DOCUMENT A00845	
FRESHWATER MUSSEL SURVEY	
NORMANDEAU ASSOCIATES	A00845-1 through 76
DOCUMENT A00846	
MASSACHUSETTS DIVISION OF FISHERIES & WILDLIFE	
NATURAL HERITAGE AND ENDANGERED SPECIES PROGRAM (NHESP)	
NHESP DETERMINATION LETTER.....	A00846-1 through 6
DOCUMENT A00847	
MASSACHUSETTS DIVISION OF FISHERIES & WILDLIFE	
NATURAL HERITAGE AND ENDANGERED SPECIES PROGRAM (NHESP)	
TURTLE PROTECTION SKETCH	A00847-1 through 4
DOCUMENT A00875	
POLICY DIRECTIVE P-22-001 AND POLICY DIRECTIVE P-22-002	A00875-1 through 8
DOCUMENT B00420	
PROPOSAL.....	B00420-1 through 12
DOCUMENT B00853	
SCHEDULE OF PARTICIPATION BY DISADVANTAGED	
BUSINESS ENTERPRISES (DBEs)	B00853-1 through 2
DOCUMENT B00854	
DISADVANTAGED BUSINESS ENTERPRISES (DBE) PARTICIPATION	
LETTER OF INTENT.....	B00854-1 through 2
DOCUMENT B00855	
DBE JOINT CHECK ARRANGEMENT APPROVAL FORM.....	B00855-1 through 2
DOCUMENT B00856	
JOINT VENTURE AFFIDAVIT	B00856-1 through 4

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DOCUMENT 00102

**NOTICE TO CONTRACTORS**

Electronic proposals for the following project will be received through the internet using Bid Express until the date and time stated below and will be posted on www.bidx.com forthwith after the bid submission deadline. No paper copies of bids will be accepted. All Bidders must have a valid vendor code issued by MassDOT in order to bid on projects. Bidders need to apply for a Digital ID at least 14 days prior to a scheduled bid opening date with Bid Express.

TUESDAY, AUGUST 13, 2024 at 2:00 P.M. ****HARDWICK-NEW BRAINTREE****Federal Aid Project No. BFS(BR-OFF)-003S(750)X****Bridge Replacement, H-08-003=N-07-002, Creamery Road over Ware River******Date Subject to Change**PROJECT VALUE = \$3,672,000.00

Bidders must be pre-qualified by the Department in the BRIDGE - CONSTRUCTION category to bid on the above project. An award will not be made to a Contractor who is not pre-qualified by the Department prior to the opening of Proposals.

All prospective Bidders who intend to bid on this project must obtain "Request Proposal Form (R109)". The blank "Request Proposal Form (R109)" can be obtained at:
<https://www.mass.gov/prequalification-of-horizontal-construction-firms>.

All prospective Bidders must complete and e-mail an electronic copy of "Request Proposal Form (R109)" to the MassDOT Director of Prequalification for approval:
prequal.r109@dot.state.ma.us.

Proposal documents for official bidders are posted on www.bidx.com. Other interested parties may receive informational Contract Documents containing the Plans and Special Provisions, free of charge.

Bids will be considered, and the contract awarded in accordance with statutes governing such contracts in accordance with Massachusetts General Laws Chapter 30 § 39M.

The Project Bids File Attachments folder for proposals at www.bidx.com shall be used for submitting at the time of bid required information such as the Bid Bond required document, and other documents that may be requested in the proposal.

NOTICE TO CONTRACTORS (Continued)

All parties who wish to have access to information plans and specification must send a "Request for Informational Documents" to MassDOTBidDocuments@dot.state.ma.us.

A Proposal Guaranty in the amount of 5% of the value of the bid is required.

This project is subject to the schedule of prevailing wage rates as determined by the Commissioner of the Massachusetts Department of Labor and Workforce Development, and the Division of Occupational Safety, and the United States Department of Labor.

Plans will be on display and information will be available at the MassDOT Boston Office and at the District Office in NORTHAMPTON.

The Massachusetts Department of Transportation, in accordance with Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. §§ 2000d to 2000d-4) and the Regulations, hereby affirmatively ensures that for any contract entered into pursuant to this advertisement, all bidders, including disadvantaged business enterprises, will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, national origin in consideration for an Award.

This Proposal contains the "STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONTRACT SPECIFICATIONS (EXECUTIVE ORDER 11246)". The goals and timetables applicable to this proposal for minority and female participation, expressed in percentage terms for the Contractor's aggregate work force in each trade on all work, are contained in Appendices A and B-80 of the above specifications.

The Contractor (hereinafter includes consultants) will comply with the Acts and Regulations relative to Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, Federal Highway Administration (FHWA), as they may be amended from time to time, which are herein incorporated by reference and made a part of this Contract as contained in Appendices C and D of the above specifications.

NOTICE TO CONTRACTORS (Continued)**PRICE ADJUSTMENTS**

This Contract contains price adjustments for hot mix asphalt and Portland cement mixtures, diesel fuel, and gasoline. For reference the base prices are as follows: liquid asphalt \$585.00 per ton, Portland cement \$425.53 per ton, diesel fuel \$2.865 per gallon, and gasoline \$2.764 per gallon, and Steel Base Price Index 425.7. MassDOT posts the **Price Adjustments** on their Highway Division's website at <https://www.mass.gov/massdot-contract-price-adjustments>

This Contract contains Price Adjustments for steel. See Document 00813 - PRICE ADJUSTMENT FOR STRUCTURAL STEEL AND REINFORCING STEEL for their application and base prices.

MassDOT projects are subject to the rules and regulations of the Architectural Access Board (521 CMR 1.00 et seq.)

Prospective bidders and interested parties can access this information and more via the internet at WWW.COMMBUYS.COM.

BY: Monica G. Tibbits-Nutt, Secretary and CEO, MassDOT
Jonathan L. Gulliver, Administrator, MassDOT Highway Division
SATURDAY, JUNE 29, 2024

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DOCUMENT 00210

REQUIREMENTS OF MASSACHUSETTS GENERAL LAWS
CHAPTER 30, SECTION 39R;
CHAPTER 30, SECTION 39O

July 1, 1981, updated October 2016

M.G.L. c. 30, § 39R. Award of Contracts; Accounting Statements; Annual Financial Statements; Definitions.

(a) The words defined herein shall have the meaning stated below whenever they appear in this section:

- (1) "Contractor" means any person, corporation, partnership, joint venture, sole proprietorship, or other entity awarded a contract pursuant to sections thirty-eight A1/2 to thirty-eight O, inclusive, of chapter seven and any contract awarded or executed pursuant to section eleven C of chapter twenty-five A, section thirty-nine M of chapter thirty, or sections forty-four A to forty-four H, inclusive, of chapter one hundred and forty-nine, which is for an amount or estimated amount greater than one hundred thousand dollars.
- (2) "Contract" means any contract awarded or executed pursuant to sections thirty-eight A1/2 to thirty-eight O, inclusive, of chapter seven and any contract awarded or executed pursuant to section eleven C of chapter twenty-five A, section thirty-nine M of chapter thirty, or sections forty-four A through forty-four H, inclusive, of chapter one hundred and forty-nine, which is for amount or estimated amount greater than one hundred thousand dollars.
- (3) "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.
- (4) "Independent Certified Public Accountant" 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 residence or principal office and who is in fact independent. In determining whether an accountant is independent with respect to a particular person, appropriate consideration should be given to all relationships between the accountant and that person or any affiliate thereof. Determination of an accountant's independence shall not be confined to the relationships existing in connection with the filing of reports with the awarding authority.
- (5) "Audit", when used in regard to 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.
- (6) "Accountant's Report", when used in regard to financial statements, means a document in which an independent certified public accountant indicates the scope of the audit which he has made and sets forth his opinion regarding the financial statements taken as a whole with a listing of noted exceptions and qualifications, or an assertion to the effect that an overall opinion cannot be expressed. When an overall opinion cannot be expressed the reason therefor shall be stated. An accountant's report shall include as a part thereof a signed statement by the responsible corporate officer attesting that management has fully disclosed all material facts to the independent certified public accountant, and that the audited financial statement is a true and complete statement of the financial condition of the contractor.
- (7) "Management", when used herein, means the chief executive officers, partners, principals or other person or persons primarily responsible for the financial and operational policies and practices of the contractor.
- (8) Accounting terms, unless otherwise defined herein, shall have a meaning in accordance with generally accepted accounting principles and auditing standards.

(b) Subsection (a)(2) hereof notwithstanding, every agreement or contract awarded or executed pursuant to sections thirty-eight A 1/2 to thirty-eight O, inclusive, of chapter seven, or eleven C of chapter twenty-five A, and pursuant to section thirty-nine M of chapter thirty or to section forty-four A through H, inclusive, of chapter one hundred and forty-nine, shall provide that:

- (1) The contractor shall make, and keep for at least six years after final payment, books, records, and accounts which in reasonable detail accurately and fairly reflect the transactions and dispositions of the contractor, and
- (2) Until the expiration of six years after final payment, the office of inspector general, and the commissioner of capital asset management and maintenance shall have the right to examine any books, documents, papers or records of the contractor or of his subcontractors that directly pertain to, and involve transactions relating to, the contractor or his subcontractors, and
- (3) If the agreement is a contract as defined herein, the contractor shall describe any change in the method of maintaining records or recording transactions which materially affect any statements filed with the awarding authority, including in his description 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, and
- (4) If the agreement is a contract as defined herein, the contractor has filed a statement of management on internal accounting controls as set forth in paragraph (c) below prior to the execution of the contract, and
- (5) If the agreement is a contract as defined herein, the contractor has filed prior to the execution of the contracts and will continue to file annually, an audited financial statement for the most recent completed fiscal year as set forth in paragraph (d) below.

(c) Every contractor awarded a contract shall file with the awarding authority a statement of management as to whether the system of internal accounting controls of the contractor and its subsidiaries reasonably assures that:

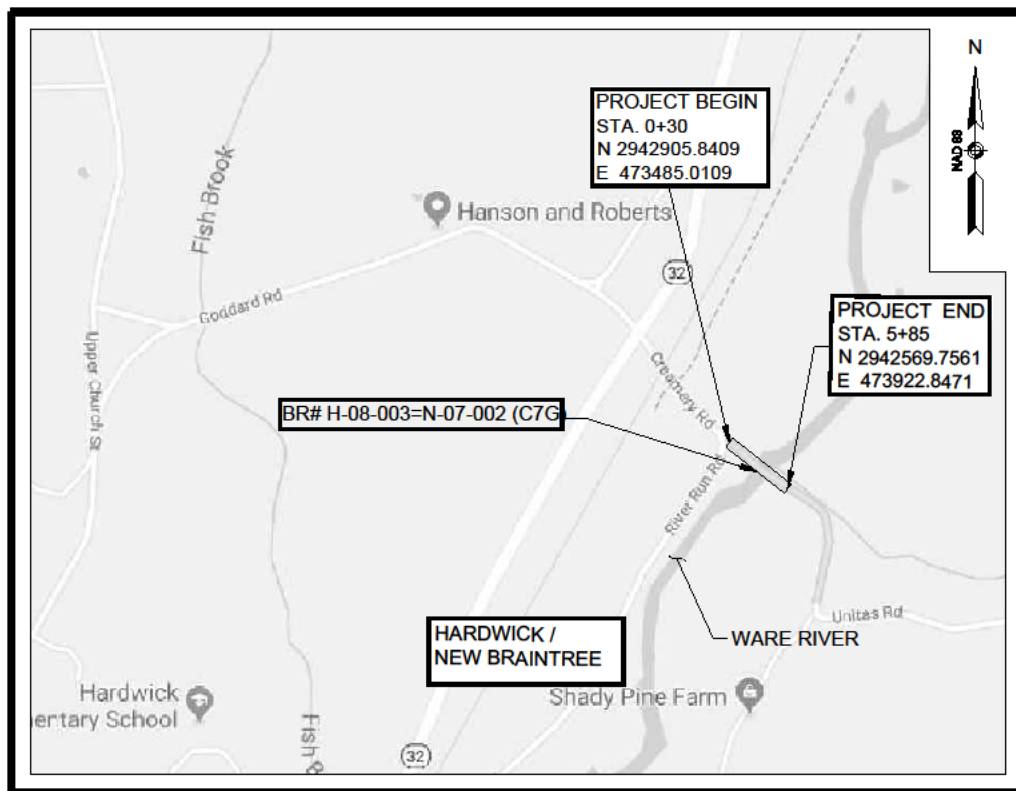
- (1) transactions are executed in accordance with management's general and specific authorization;
- (2) transactions are recorded as necessary
 - i. to permit preparation of financial statements in conformity with generally accepted accounting principles, and
 - ii. to maintain accountability for assets;
- (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.

Every contractor awarded a contract shall also file with the awarding authority a statement prepared and signed by an independent certified public accountant, stating that he 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 this paragraph and paragraph (b) above are consistent with the result of management's evaluation of the system of internal accounting controls; and
- (2) whether such representations of management are, in addition, reasonable with respect to transactions and assets in amounts which would be material when measured in relation to the applicant's financial statements.

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DOCUMENT 00331

LOCUS MAP**HARDWICK-NEW BRAintree****Federal Aid Project No. BFS(BR-OFF)-003S(750)X****Bridge Replacement, H-08-003=N-07-002, Creamery Road over Ware River**

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Final Report ☐Interim Report ☐**CONTRACTOR PROJECT EVALUATION FORM***For instructions on using this form, see Engineering Directive E-10-002, Dated 4/20/2010*

Date: _____

City/Town: _____

Contractor: _____

Project: _____

Address: _____

F.A. No. _____

Contract Number: _____

Bid Price: _____

Notice to Proceed: _____

Funds: State: _____ Fed Aid: _____

Current Contract Completion Date: _____

Date Work Started: _____

Date Work Completed*: _____

Contractor's Superintendent: _____

Division: (indicates class of work) Highway: _____ Bridge: _____ Maintenance: _____

*If work was NOT completed within specified time (including extensions) give reasons on following page.

	Excellent 10	Very Good 9	Average 8	7	Fair 6	5	Poor 4	% Rating
1. Workmanship								x 2=
2. Safety								x 2=
3. Schedule								x 1.5=
4. Home Office Support								x 1=
5. Subcontractors Performance								x 1=
6. Field Supervision/ Superintendent								x 1=
7. Contract Compliance								x 0.5=
8. Equipment								x 0.5=
9. Payment of Accounts								x 0.5=
(use back for additional comments)								
							Overall Rating:	

*(Give explanation of items 1 through 9 on the following page in numerical order if overall rating is below 80%. Use additional sheets if necessary.)*_____
District Construction Engineer's Signature/Date_____
Resident Engineer's Signature/Date_____
Contractor's Signature Acknowledging Report/DateContractor Requests Meeting with the District: No ☐Yes ☐

Date Meeting Held: _____

Contractor's Comments/Meeting Notes (extra sheets may be added to this form and noted here if needed): __________



DOCUMENT 00440

Final Report ☐Interim Report ☐**SUBCONTRACTOR PROJECT EVALUATION FORM***For instructions on using this form, see Engineering Directive E-10-002, Dated 4/20/2010*

Date: _____

City/Town: _____

Subcontractor: _____

Project: _____

Address: _____

F.A. No.: _____

Contract Number: _____

Prime Contractor _____

Current Contract Completion Date: _____

Date Work Started: _____

Date Work Completed*: _____

Subcontractor's Superintendent: _____

Type of Work Performed by Subcontractor: _____

*If work was NOT completed within specified time (including extensions) give reasons on following page.

	Excellent 10	Very Good 9	Average 8	7	Fair 6	5	Poor 4	% Rating
1. Workmanship								x 2=
2. Safety								x 2=
3. Schedule								x 1.5=
4. Home Office Support								x 1.5=
5. Field Supervision/ Superintendent								x 1=
6. Contract Compliance								x 1=
7. Equipment								x 0.5=
8. Payment of Accounts								x 0.5=
(use back for additional comments)							Overall Rating:	

(Give explanation of items 1 through 8 on the following page in numerical order if overall rating is below 80%. Use additional sheets if necessary.)

District Construction Engineer's Signature/Date _____

Resident Engineer's Signature/Date _____

Contractor Signature Acknowledging Report/Date _____

Subcontractor Signature Acknowledging Report/Date _____

Subcontractor Requests Meeting with the District: No ☐ Yes ☐ Date Meeting Held: _____

Subcontractor's Comments / Meeting Notes (extra sheets may be added to this form and noted here if needed): _____

Contractor's Comments: _____

SUBCONTRACTOR PROJECT EVALUATION FORM (Continued)

Date: _____ Contract Number: _____

INFORMATION FOR DISTRICT HIGHWAY DIRECTORS RELATING TO PREQUALIFICATION

A deduction shall be recommended for unsatisfactory performance if computed overall rating is under 80%.

A deduction may be recommended for this project being completed late due to the Contractor's fault.

RECOMMENDATIONS FOR DEDUCTIONS FROM CONTRACTORS' ASSIGNED FACTOR

(Write Yes or No in space provided)

I recommend a deduction for Contractor's unsatisfactory performance: _____

I recommend a deduction for project completed late: _____

Signed: _____
District Highway Director

EXPLANATION OF RATINGS 1 – 8: _____

[illegible]

WORK NOT COMPLETED WITHIN SPECIFIED TIME:

DOCUMENT 00710
GENERAL CONTRACT PROVISIONS
Revised: 05/06/24

NOTICE OF AVAILABILITY

The STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES dated 2024, the SUPPLEMENTAL SPECIFICATIONS, the 1996 METRIC CONSTRUCTION AND TRAFFIC STANDARD DETAILS, the 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS; the 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING and the 2017 CONSTRUCTION STANDARD DETAILS are available online at <https://www.mass.gov/massdot-highway-division-manuals-and-publications>

SPECIAL PROVISIONS FOR RIGHT-TO-KNOW ACT REQUIREMENTS

The Contractor's attention is directed to Massachusetts General Laws, Chapter 111F, commonly known as the Right-To-Know Act, and to the regulations promulgated pursuant thereto. Among the provisions of the Right-To-Know Act is a requirement that employers make available to employees Materials Safety Data Sheets (MSDS) for any substance on the Massachusetts Substance List (MSL) to which employees are, have been, or may be exposed.

To ensure prompt compliance with these regulations and legislation, the Contractor shall:

1. Deliver to the Department, prior to the start of any work under this contract, copies of MSDS for all MSL substances to be used, stored, processed or manufactured at the worksite by the Contractor.
2. Train employees of the Department, who may be exposed to MSL substances as a result of the Contractor's work under this contract, with regard to those specific substances in accordance with requirements of the Right-To-Know Act.
3. Observe all safety precautions recommended on the MSDS for any MSL substance to be used, stored, processed, or manufactured at the worksite by the Contractor.
4. Inform the Department in writing regarding specific protective equipment recommended in the MSDS for MSL substances to which employees of the Department may be exposed as a result of the Contractor's work under this contract.

The Department shall not be liable for any delay or suspension of work caused by the refusal of its employees to perform any work due to the Contractor's failure to comply with the Right-To-Know Act. The Contractor agrees to hold the Department or the Commissioner of the Department harmless and fully indemnified for any and all claims, demands, fines, actions, complaints, and causes of action resulting from or arising out of the Contractor's failure to comply with the requirements of the Right-To-Know Act.

ALTERNATIVE DISPUTE RESOLUTION

Forum, Choice of Law and Mediations:

Any actions arising out of a contract shall be governed by the laws of Massachusetts and shall be brought and maintained in a State or federal court in Massachusetts which shall have exclusive jurisdiction thereof. MassDOT and the Contractor may both agree to mediation of any claim and will share the costs of such mediation pro rata based on the number of parties involved.

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DOCUMENT 00715



SUPPLEMENTAL SPECIFICATIONS

MARCH 31, 2024

The 2024 *Standard Specifications for Highways and Bridges* are amended by the following modifications, additions and deletions. These Supplemental Specifications prevail over those published in the Standard Specifications.

The Specifications Committee has issued these Supplemental Specifications for inclusion into each proposal until such time as they are updated or incorporated into the next Standard Specifications.

Contractors are cautioned that these Supplemental Specifications are dated and will change as they are updated.

DIVISION I

GENERAL REQUIREMENTS AND COVENANTS

SECTION 4: SCOPE OF WORK

Subsection 4.06: Increased or Decreased Contract Quantities

Replace the second paragraph with the following:

Where the actual quantity of a pay item varies by more than 25% above or below the estimated quantity stated in the Contract, an equitable adjustment in the Contract Price for that pay item shall be negotiated upon demand of either party regardless of the cause of the variation in quantity. A demand for an equitable adjustment must be submitted to the other party within 30 days after beginning the work of the affected item that is greater than 25% above the bid quantity or within 30 days after completing the work when the actual quantity is 25% less than the bid quantity.

DIVISION II

CONSTRUCTION DETAILS

DIVISION II: Construction Details

Replace M4.02.15 Cement Mortar with M4.04.0 Grout, Mortar, and Concrete Products where encountered, including in sections 230.40, 485.40, 501.40, 685.40, 940.40A and 983.40.

SECTION 100: EARTHWORK, GRADING, DEMOLITION, RODENT CONTROL AND BORINGS

SECTION 160: CONTROLLED LOW-STRENGTH MATERIAL

Section 160: Controlled Low-Strength Material

Add this new Section:

DESCRIPTION

160.20: General

Controlled Low-Strength Material shall be installed in accordance with the relevant provisions of Subsection 150: Embankment, Section 901: Cement Concrete and in accordance with the procedures described herein.

Controlled Low Strength Materials (CLSM) shall be a self-compacting, self-leveling, flowable, excavatable or non-excavatable, low strength, rigid setting, and unshrinkable material, used as an alternative to compacted granular fills, including backfill, structural fill, utility fill, pavement base, subgrade, subbase, base course, conduit bedding, erosion control, and void filling.

MATERIALS

160.40: General

Material for controlled low-strength material shall meet the requirement specified of M4.08.0 Controlled Low-Strength Material. The material shall be specified by the Engineer as one of the following types;

- CLSM – Manual Excavatable (≤ 100 psi)
- CLSM – Mechanical Excavatable (101-300 psi)
- CLSM – Structural Non Excavatable (> 300 psi)

Permeability testing as specified in Table M4.08.0-2 shall be required when the material is placed outside of roadway areas or footings for concrete structures, or as directed by the Engineer.

CONSTRUCTION METHODS

160.60: General

The Contractor shall submit a placement plan for Controlled Low-Strength Material (CLSM). The plan shall include the type of CLSM, detailed descriptions of methods used for placing and containing the controlled density fill and the set time to strength.

The Contractor shall remove all debris prior to placing the fill. Fill shall not be placed against any structural elements or utilities unless approved by the Engineer.

CLSM shall be poured in lifts not exceeding 4 feet to insure stability under the fluid effects of the pour. Care shall be taken to ensure the integrity of the forms or other means of supporting the material until the material sets up.

COMPENSATION

160.80: Method of Measurement

Controlled Low-Strength Material shall be measured by the cubic yard in place to the neat lines established on the plans or specified by the Engineer. When backfilling pipes the horizontal neat lines shall be not greater than 3.0 ft. greater than the rated inside diameter of the pipe and vertically from the top of the crushed stone foundation material, if any, or 6 in. below the pipe invert whichever is less to the specified top elevation. A deduction shall be made for the volume of the pipe or conduit encased.

160.81: Basis of Payment

Payment under this item shall constitute full compensation for the placement, testing, and all material, equipment and labor to complete the work.

160.82: Payment Items

160.1	Controlled Low-Strength Material -	Cubic Yard
	Manual Excavatable (≤ 100 PSI)	
160.2	Controlled Low-Strength Material -	Cubic Yard
	Mechanical Excavatable (101-300 PSI)	
160.3	Controlled Low-Strength Material (>300 PSI)	Cubic Yard

SECTION 200: DRAINAGE

SECTION 201: BASINS, MANHOLES AND INLETS

Section 201.40: General

Replace "Cement Mortar M4.02.15" with "Mortar M4.04.0".

SECTION 690: HIGHWAY GUARD, FENCES AND WALLS

SECTION 690: WALLS REMOVED AND RESET

Section 690.40: General

Replace the last sentence with the following:

Mortar shall meet the requirement of M4.04.0: Grout, Mortar, and Concrete Products.

SECTION 800: TRAFFIC CONTROL DEVICES

SECTION 825: RECTANGULAR RAPID FLASHING BEACONS

Section 825: Rectangular Rapid Flashing Beacons

Add this new Section:

DESCRIPTION

825.20: General

This work shall consist of furnishing and installing a solar-powered, actuated, Rectangular Rapid Flashing Beacon (RRFB) system at the location(s) shown in the Plans.

MATERIALS

825.40: General

Rectangular Rapid-Flashing Beacons shall meet the requirements specified in the following Subsections of Division III, Materials:

Cement Concrete.....	M4.02.00
Signal Posts and Bases	M10.05.1
APS Pushbuttons.....	M10.09.1
RRFB Assemblies.....	M10.11.0

An RRFB system shall include the following items (quantities shown in the Major Items List found in the Plans):

- Cement Concrete Foundation
- Signal Post and Pedestal Base
- APS Pushbutton
- Light Bar
- Signage
- Enclosure for Controller, Activation Unit, and Battery System
- Solar Panel
- All mounting and supporting hardware and wiring necessary to complete a working system

The Contractor shall supply cement concrete foundations per the Plans.

The Contractor shall supply Schedule 80 aluminum signal posts with a brushed or spun finish and square, pedestal aluminum bases with a natural finish unless otherwise shown in the Plans or Special Provisions.

Each Light Bar shall have a pair of yellow beacons facing one or both directions of traffic, as shown in the Plans.

All sign designs shall conform to the MUTCD. Sign panel information, including dimensions, shall be per the Plans.

The warning signs (MUTCD code W11-2, W11-15, or S1-1 signs – see Plans for sign type), and the diagonal downward arrow sign (W16-7P) signs shall be on Type A substrate, conforming to 828.42: Panels. The sign sheeting shall be fluorescent yellow-green, conforming to ASTM D4956 Type IX.

An R10-25 sign, conforming to the MUTCD, shall be mounted above the APS Pushbutton on a Type A substrate or may be integral to the button assembly.

The solar panel and battery system may be integrated into a single unit or housed separately, per the manufacturer's design. These may also be co-housed with the Light Bar and/or the Controller and Activation Unit.

The solar panel and battery system shall be sized appropriately to accommodate 300 actuations per day, 365 days a year, for the duration of the repeating flashing sequence shown in the Plans. The sizing calculations shall be based upon solar and temperature conditions for a typical December-January in Massachusetts. The system shall have a minimum autonomy of 5 days.

Each assembly shall be rated for wind speeds of up to 90 mph.

Any proprietary software required for the programming and/or operation of the system during its lifetime shall be included at no additional cost.

825.41: Shop Drawings

Within 30 days from the Notice to Proceed the Contractor shall submit shop drawings for the RRFB system, including cutsheets for all components to show conformance with M10.05, M10.09.1, and M10.11.0 and these specifications.

Shop drawings shall include all solar and battery sizing calculations. These calculations shall have Contractor- or manufacturer-supplied, site-specific shading factors applied.

825.42: Material Warranties

All RRFB components shall include a minimum 1-year manufacturer's replacement warranty for manufacturing or installation defects starting at the date of acceptance by the Engineer. A battery shall be considered defective should it not retain 80% of its original capacity within the warranty period.

CONSTRUCTION METHODS**825.60: General**

RRFBs shall be installed on new foundations at the locations as shown in the Plans. Bases shall be secured to the foundation in accordance with the manufacturer's specifications.

All systems shall be installed per the manufacturer's instructions.

The location and orientation of the system shall be per the Plans.

The arrow on each APS pushbutton shall be aligned parallel to the direction of travel of the crosswalk.

The Light Bar(s) shall be oriented towards the incoming lane(s).

Solar panels shall be oriented to maximize sunlight gain.

SYSTEM OPERATION**825.70: APS Pushbuttons**

APS Pushbuttons shall actuate the RRFB system. Upon actuation, an audible speech message shall be broadcast from each pushbutton in the system that says, "Warning lights are flashing," shall be stated twice. This message shall be repeated upon each actuation. No other messages shall be allowed.

While the system is in dark mode, the APS Pushbuttons shall broadcast a locator tone. The locator tone shall have a duration of 0.15 seconds or less and shall repeat at 1-second intervals at all times that the system is in dark mode. The locator tone shall be set 2 to 5 dBA above ambient sound, shall automatically adjust intensity, but cap at a maximum volume of 100 dBA.

APS Pushbuttons shall have all other vibrotactile and percussive indications disabled.

825.71: Light Bar

The Light Bar shall remain dark until actuated.

Upon actuation, all Light Bars in the system shall be activated simultaneously for a predetermined repeating flash sequence. The flashing rate shall be 75 flashing sequences per minute.

The left and right yellow beacons shall operate using the following sequence:

- A. The yellow beacon on the left-hand side shall be illuminated for approximately 50 milliseconds.
- B. Both yellow beacons shall be dark for approximately 50 milliseconds.
- C. The yellow beacon on the right-hand side shall be illuminated for approximately 50 milliseconds.
- D. Both yellow beacons shall be dark for approximately 50 milliseconds.
- E. The yellow beacon on the left-hand side shall be illuminated for approximately 50 milliseconds.
- F. Both yellow beacons shall be dark for approximately 50 milliseconds.
- G. The yellow beacon on the right-hand side shall be illuminated for approximately 50 milliseconds.
- H. Both yellow beacons shall be dark for approximately 50 milliseconds.
- I. Both yellow beacons shall be illuminated for approximately 50 milliseconds.
- J. Both yellow beacons shall be dark for approximately 50 milliseconds.

K. Both yellow beacons shall be illuminated for approximately 50 milliseconds.

L. Both yellow beacons shall be dark for approximately 250 milliseconds.

The flash rate of each individual RRFB indication, as applied over the full flashing sequence, shall not be more than 5 flashes per second, to avoid frequencies that might cause seizures.

The sequence shall then be repeated until the duration time has been met and then all yellow beacons shall return to dark mode simultaneously. The duration time shall be per the Plans.

The predetermined repeating flash sequence shall be immediately initiated every time a pushbutton detector is actuated. If the RRFBs are already flashing and an actuation is received, it shall restart the duration time. There shall be no delay time programmed between actuations.

COMPENSATION

825.80: Method of Measurement

RRFBs will be measured as a single system, 2-Post Assembly or 3-Post Assembly, furnished and installed.

825.81: Basis of Payment

The work will be paid for at the contract price each under the respective item for a 2-Post Assembly System or 3-Post Assembly System. Any additional wiring, mounting equipment, or other materials or labor required to for an operating system per the Plans and Specifications shall be considered as incidental to the construction and be included in the contract price.

825.82: Payment Item

825.2	RRFB (2-Post Assembly System)	Each
825.3	RRFB (3-Post Assembly System)	Each

SECTION 900: STRUCTURES

SECTION 970: DAMP-PROOFING

Subsection 970.30: General

Add the following material to this subsection:

Mortar..... M4.04.0

Subsection 970.40: General

Replace the second sentence in the second paragraph with the following;

All holes in concrete surfaces shall be satisfactorily filled with mortar before damp-proofing is applied.

SECTION 983: REVETMENT

Subsection 983.64 Special Slope Paving Under Bridges

Replace the last sentence under B. Quarry Stone or Precast Concrete Blocks. with the following:

Mortar shall then be placed in the joints to the top of the paved surface.

Subsection 983.65 Channel Paving and Grouted Channel Paving

Replace the last sentence with the following:

The grout shall conform to M4.04.0: Grout, Mortar, and Concrete Products.

DIVISION III

MATERIALS SPECIFICATIONS

SECTION M4: CEMENT AND CEMENT CONCRETE MATERIALS

Section M4.02.00 Cement Concrete

Add the following to the end of this section.

Alkali Silica Reactivity - Resistant Portland Cement Concrete

All cement concrete and precast/prestressed concrete products shall be alkali silica reactivity-resistant. Proportion Portland cement concrete mixes to include materials that meet either the aggregate requirement or Alkali-Silica Reactivity (ASR) mitigation criteria listed below. Provide cement mill test reports from certified laboratories that show the materials' source, composition and the cement alkali content expressed as sodium oxide equivalent(s) not to exceed 1.4%. Certified test reports according to test procedures as specified in Table A will be required to be submitted with the trial batch submission to RMS for approval every year or whenever the source of material is changed.

Select non-reactive aggregates that meet all the criteria of Table M4.02.00-2. Mitigate the mix as described below when nonreactive aggregates are unavailable. If non-reactive aggregates are used for portland cement concrete mix, 15% by weight of the cementitious content shall be fly ash meeting AASHTO M 295, Type F.

Select a material or a combination of materials that meet the criteria shown in Table M4.02.00-3 to mitigate ASR when concrete mixes must be proportioned with reactive aggregates. Perform verification test according to AASHTO T 303 and ASTM C295 to determine the effectiveness of the resulting mix design against ASR. Use the same proportion of cement and pozzolan for each test mixture as that proposed for the actual mix design. Provide the Department with certified documentation of the mixtures' effectiveness to control ASR.

Table M4.02.00-2: Tests and Criteria for Proposed Aggregates

Procedure	Description	Limits
AASHTO T 303: Accelerated Detection of Potentially Deleterious Expansion of Mortar Bars Due to Alkali-Silica Reaction	Mean mortar bar expansion at 14 days. Perform a polynomial fit ⁽¹⁾ of 4, 7, 11, and 14 days to determine reliability of results	0.08% maximum metamorphic aggregate; 0.10% maximum all other aggregates. Repeat AASHTO T 303 if r ² is less than 0.95.
ASTM C295: Petrographic Examination of Aggregates for Concrete	Optically strained, microfractured, or microcrystalline quartz	5.0% maximum ⁽²⁾
	Chert or chalcedony	3.0% maximum ⁽²⁾
	Tridymite or cristobolite	1.0% maximum ⁽²⁾
	Opal	0.5% maximum ⁽²⁾
	Natural volcanic glass	3.0% maximum ⁽²⁾
⁽¹⁾ Use a second order polynomial of %Exp = A ⁰ + A ¹ SQRT(t) + A ² t. See publication SD92-04-F. ⁽²⁾ Based on the total aggregate sample.		

Table M4.02.00-3: Mitigation Methods for ASR in Portland Cement Concrete

Material	Specification	Cementitious Material Percentage ⁽¹⁾
Low alkali cement ⁽²⁾	AASHTO M 85	100%
Fly ash - Class F	AASHTO M 295	15% minimum to 30% ⁽⁴⁾ maximum
Silica Fume ⁽⁵⁾	AASHTO M 307	6% ± 1% ⁽⁶⁾
Slag Grade 100 and 120	AASHTO M 302	25% minimum to 50% maximum
⁽¹⁾ Measure this minimum content of cementitious material as percent by weight of cement plus pozzolan. ⁽²⁾ This single criterion is not effective in all cases in remediating ASR. Low alkali cement (0.60% maximum ⁽³⁾) must be used in combination with other pozzolanic materials in Table B. ⁽³⁾ Na ₂ O equivalent = %Na ₂ O + 0.658 (%K ₂ O) ⁽⁴⁾ Fly ash, Type F, shall replace 15% by weight of the design cement content, and any additional fly ash will be considered as fine aggregate. ⁽⁵⁾ Silica fume shall only be used in silica fume cement concrete. ⁽⁶⁾ The total amount of Type F fly ash and silica fume shall constitute 20% by weight of the design cement content, and any additional fly ash shall be considered as fine aggregate.		

Section M4.02.15 Cement Mortar*Delete this section.***Section M4.04.0: Grout, Mortar and Concrete Products***Replace this section with the following.***M4.04.0: Grout, Mortar, and Concrete Products**

Grout, cementitious mortar, and concrete products shall be packaged, dry, and preblended with preformulated constituent materials (excluding mixing water) to produce a material with acceptable quality characteristics and material properties, including time of set, compressive strength, flexural strength, slant shear bond strength, resistance to alkali silica reaction, freezing/thawing, and de-icing cycles, shrinkage, expansion, and sulfate reaction.

Mortar products shall be defined as products containing aggregate of which less than 5% by mass of the total mixture is retained on the 3/8 in. sieve. Mortar products for concrete repairs shall be used only on repair depths of 2 in. or less. Concrete products shall be defined as products containing aggregate of which 5% or more by mass of the total mixture is retained on the 3/8 in. sieve. Concrete products for concrete repairs shall be used only on repair depths greater than 2 in.

The aggregate sources included in the prepackaged product or extended into the product shall meet Section M4.02.02: Aggregates. Grout, cementitious mortar, and concrete products shall only be applied per the requirements provided on the product's technical data sheet. Grout, cementitious mortar, and concrete products shall maintain valid listing on the MassDOT Qualified Construction Materials List (QCML). Grout, cementitious mortar, and concrete products shall meet requirements specified herein.

A. Technical Data Sheet.

The Manufacturer shall submit the product's technical data sheet to the Department for review. At a minimum, the product's technical data sheets shall include:

- (a) Product Name
- (b) Manufacturer, including address and contact information
- (c) Packaging
- (d) Yield
- (e) Product Description, including an overview of the product and its intended application(s) and use(s).
- (f) Technical Data, including quality characteristics and corresponding performance criteria with the AASHTO and/or ASTM standard test methods identified.

- (g) Recommended Equipment
- (h) Instructions, including surface preparation, mixing, forming, placing, finishing, curing, and protection from adverse conditions, such as precipitation, cold conditions, and hot conditions.
- (i) Limitations
- (j) Storage and Shelf Life
- (k) Safety

B. Mix Design Formulation.

Products that are extended with aggregate not included in the original product packaging shall be formulated per the product's technical data sheet and evaluated through Department mix design evaluation and verification testing. Producers shall report and submit proposed mix design formulations onto the Department issued mix design sheet. The Producer shall select an AASHTO accredited independent laboratory to conduct verification testing. The sampling and testing conducted by the independent laboratory shall be witnessed by the Department.

C. Product Verification Testing.

Verification test results shall be within the limits specified herein.

M4.04.1: Conventional Grout, Cementitious Mortar, and Concrete Products

Conventional grout, cementitious mortar, and concrete products shall meet the requirements of Section M4: Cement and Concrete Materials, performance criteria of the product's technical data sheet, and the requirements specified herein.

M4.04.2: Rapid Hardening Cementitious Mortar and Concrete Products

Rapid hardening cementitious mortar and concrete products shall meet the requirements and performance criteria of the product's technical data sheet, ASTM C928 Standard Specification for Packaged, Dry, Rapid-Hardening Cementitious Materials for Concrete Repairs, and Table M4.04.2-2.

Table M4.04.2-1: Types of Rapid Hardening Cementitious Products for Concrete Repairs

Type	Description	Application
R1	General Rapid Hardening	Vertical and Overhead Repairs
R2	Medium Rapid Hardening	Vertical and Overhead Repairs
R3	Very Rapid Hardening	Horizontal, Vertical, and Overhead Repairs

Table M4.04.2-2: Verification Testing Requirements

Property	Method	Quality Characteristic		Limits					
				R1		R2		R3	
				Min.	Max.	Min.	Max.	Min.	Max.
Setting	T 197	Initial Set (min.)		Technical Data Sheet					
		Final Set (min.)		Technical Data Sheet					
Strength	T 97 ^[1]	Flexural Strength (psi)	24 Hours	–	–	–	–	650	–
			7 Days	–	–	–	–	–	–
Durability	T 358	Surface Chloride Ion Penetration Resistance (kΩ-cm)	28 Days	21	–	21	–	21	–
	T 161 (A)	Relative Durability Factor		90	–	90	–	90	–
Mass Loss (%)		–	6.0	–	6.0	–	6.0		

[1] Not applicable to vertical and overhead repair applications.

M4.04.3: Mortar Products for Unit Masonry

Mortar products for unit masonry shall meet the requirements and performance criteria of the product's technical data sheet and Type M specified in ASTM C270 Standard Specification for Mortar for Unit Masonry. Field proportioned cement mortar for laying brick and block shall be composed of 1 part Portland cement and 2 parts of fine aggregate by volume with a sufficient amount of water to form a workable mixture, while still achieving the properties specified herein.

M4.04.4: Grout Products for Unit Masonry

Grout products for unit masonry shall meet the requirements and performance criteria of the product's technical data sheet and ASTM C476 Standard Specification for Grout for Masonry.

M4.04.5: Non-Shrink Grout Products

Non-shrink grout products are intended for use under applied load, including supporting a structure, transfer medium between load-bearing members, shear keys, and other non-shrink applications, where a change in height below initial placement height is to be avoided. Non-shrink grout products shall meet the requirements and performance criteria of the product's technical data sheet and ASTM C1107 Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).

SECTION M5: PIPE, CULVERT SECTIONS AND CONDUITSection M5.01.0: Joint Material for Pipe

Replace M4.02.15 Cement Mortar with M4.04.0 Grout, Mortar, and Concrete Products in paragraph B.

SECTION M8: METALS AND RELATED MATERIALSSection M8.18.1: Traffic Signal Supports

Delete the heading Posts and the two paragraphs under it. Delete the heading Bases and the three paragraphs under it.

SECTION M10: TRAFFIC CONTROL DEVICES

Section M10.05.0: Traffic Signal Structures (General)

Add this new Section:

M10.05.0: Traffic Signal Structures (General)

The bases of all Traffic Signal Structures shall be supplied with a bonding lug.

Section M10.05.1: Signal Posts and Bases

Add this new Section:

M10.05.1: Signal Posts and Bases

All Signal Posts shall be one-piece 4-in. diameter, Schedule 40 or Schedule 80, and machine-threaded.

Signal Posts may be fabricated from aluminum with a brushed or spun finish or from steel with a galvanized finish.

The interior of Signal Posts shall be coated as specified in Underwriters Laboratories UL-6 for enameled conduit, or aluminum conduit conforming to M5.07.1: Electrical Conduit-Rigid Metallic (Type RM), Paragraph C.

Signal Posts Bases shall be fabricated to accept the threads from the Signal Post and locked into place with set screws.

Signal Post Bases shall be fabricated from aluminum with a natural or anodized finish or galvanized cast iron.

Signal Post Bases shall be square or octagonal.

Signal Posts and Bases conform to Table M10.05.1-1.

Table M10.05.1-1: Signal Post and Base Material Requirements

Component	Material	Specification
Signal Post	Aluminum	6063-T6 (ASTM B221, B429 or B241)
Signal Post	Steel	ASTM A53, Grade A or B
Signal Post Base	Aluminum	356.0-T6 (ASTM B26, B108)
Signal Post Base	Cast Iron	AASHTO M 105

Section M10.11.0: RRFB Assemblies

Add this new Section:

M10.11.0: RRFB Assemblies

Rectangular Rapid Flashing Beacon (RRFB) Assemblies shall consist of a Light Bar and an enclosure for the Controller and Activation Unit.

Light Bar

The Light Bar shall consist of two rapidly-flashed rectangular-shaped yellow indications, each with an LED-array based pulsing light source. The size of each RRFB indication shall conform to the Construction Standard Details.

The light intensity of the yellow indications during daytime conditions shall meet the minimum specifications for Class 1 yellow peak luminous intensity in the publication "Directional Flashing Optical Warning Devices for Authorized Emergency, Maintenance, and Service Vehicles J595," 2005, Society of Automotive Engineers (SAE). A photocell or equivalent device shall be included to reduce the brilliance of the LED beacons during nighttime conditions.

DOCUMENT 00719

(Revised September 14, 2023 – for all Federally Aided Projects)

**SPECIAL PROVISIONS FOR PARTICIPATION BY
DISADVANTAGED BUSINESS ENTERPRISES**
(IMPLEMENTING TITLE 49 OF THE CODE OF FEDERAL REGULATIONS, PART 26)

Section:

Page 00719-

POLICY	2
1. DEFINITIONS.....	3
2. DBE PARTICIPATION	5
a. Goal	5
b. Bidders List.....	5
3. CONTRACTOR ASSURANCES	6
4. REQUIRED SUBCONTRACT PROVISIONS	6
5. ELIGIBILITY OF DBES	6
a. Massachusetts DBE Directory	6
b. DBE Certification	6
c. Joint Venture Approval	7
6. COUNTING DBE PARTICIPATION TOWARDS DBE PARTICIPATION GOALS.....	7
a. Commercially Useful Function	7
b. Counting Participation Toward The Contract Participation Goal.....	7
c. Joint Check Policy.....	9
d. Joint Check Procedure(s)	10
7. AWARD DOCUMENTATION AND PROCEDURES	11
8. COMPLIANCE	13
9. SANCTIONS.....	16
10. FURTHER INFORMATION; ENFORCEMENT, COOPERATION AND CONFIDENTIALITY	16
11. LIST OF ADDITIONAL DOCUMENTS	18

POLICY

The Massachusetts Department of Transportation (MassDOT) receives Federal financial assistance from the Federal Highway Administration (FHWA), United States Department of Transportation (U.S. DOT), and as a condition of receiving this assistance, has signed an assurance that it will comply with 49 CFR Part 26 (Participation By Disadvantaged Business Enterprises In Department Of Transportation Financial Assistance Programs). The U.S. DOT Disadvantaged Business Enterprise Program is authorized by the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (“SAFETEA-LU”), as amended, at Title 23, United States Code, § 1101.

Accordingly, MassDOT has established a Disadvantaged Business Enterprise (DBE) Program in accordance with 49 CFR Part 26. It is the policy of MassDOT to ensure that DBEs have an equal opportunity to receive and participate in U.S. DOT assisted Contracts, without regard to race, color, national origin, or sex. To this end, MassDOT shall not directly, or through contractual or other arrangements, use criteria or methods of administration that have the effect of defeating or substantially impairing accomplishment of the program objectives stated below:

- ◆ To ensure nondiscrimination in the award and administration of U.S. DOT assisted Contracts;
- ◆ To create a level playing field on which DBEs can compete fairly for U.S. DOT assisted Contracts;
- ◆ To ensure that the DBE Program is narrowly tailored in accordance with applicable law;
- ◆ To ensure that only firms that fully meet 49 CFR Part 26 eligibility standards are permitted to participate as DBEs;
- ◆ To help remove barriers to the participation of DBEs in U.S. DOT assisted Contracts; and
- ◆ To assist the development of firms that can compete successfully in the market place outside the DBE Program.

The Director of Civil Rights of MassDOT has been designated as the DBE Liaison Officer. The DBE Liaison Officer is responsible for implementing all aspects of the DBE Program. Other MassDOT employees are responsible for assisting the Office of Civil Rights in carrying out this obligation. Implementation of the DBE Program is accorded the same priority as compliance with all other legal obligations incurred by MassDOT in its financial assistance agreements with each operating administration of the U.S. DOT. Information on the Federal requirements and MassDOT’s policies and information can be found at:

<i>Type of Info</i>	<i>Website</i>	<i>Description</i>
MassDOT Highway Division Policies and Info	https://www.mass.gov/disadvantaged-business-enterprise-goals-2019-2022	MassDOT– Highway Div’n Page
For copies of the Code of Federal Regulations	http://www.gpo.gov/fdsys/browse/collectionCfr.action?collectionCode=CFR	FDsys – US Gov’t Printing Office
For information about the U.S.DOT DBE Program	https://www.transportation.gov/civil-rights/disadvantaged-business-enterprise	U.S. DOT/ FHWA page

1. DEFINITIONS

As used in these provisions, the terms set out below are defined as follows:

“Broker”, for purposes of these provisions, shall mean a DBE Entity that has entered into a legally binding relationship to provide goods or services delivered or performed by a third party. A broker may be a DBE Entity that arranges or expedites transactions but performs no work or installation services.

“Contractor”, “General” or “Prime” Contractor, “Bidder,” and “DB Entity” shall mean a person, firm, or other entity that has contracted directly with MassDOT to provide contracted work or services.

“Contract” shall mean the Contract for work between the Contractor and MassDOT.

“DBB” or “Design-Bid-Build” shall mean the traditional design, bid and project delivery method consisting of separate contracts between awarding authority and a designer resulting in a fully designed project; and a separate bidding process and Contract with a construction Contractor or Bidder.

“DB” or “Design-Build” shall mean an accelerated design, bid and project delivery method consisting of a single contract between the awarding authority and a DB Entity, consisting of design and construction companies that will bring a project to full design and construction.

“Disadvantaged Business Enterprise” or “DBE” shall mean a for-profit, small business concern:

- (a) that is at least fifty-one (51%) percent owned by one or more individuals who are both socially and economically disadvantaged, or, in the case of any corporation, in which at least fifty-one (51%) percent of the stock is owned by one or more such individuals; and
- (b) where the management and daily business operations are controlled by one or more of the socially and economically disadvantaged individuals who own it.

“FHWA” shall mean the Federal Highway Administration,” an agency within U.S. DOT that supports State and local governments in the design, and maintenance of the Nation’s highway system (Federal Aid Highway Program).

“Good faith efforts” shall mean efforts to achieve a DBE participation goal or other requirement of these Special Provisions that, by their scope, intensity, and appropriateness to the objective, can reasonably be expected to fulfill the program requirement. Such efforts must be deemed acceptable by MassDOT.

“Joint Venture” shall mean an association of a DBE firm and one or more other firms to carry out a single, for-profit business enterprise, for which the parties combine their property, capital, efforts, skills and knowledge, and in which the DBE is responsible for a distinct, clearly defined portion of the work of the Contract and whose share in the capital contribution, control, management, risks, and profits of the joint venture are commensurate with its ownership interest.

“Approved Joint Venture” shall mean a joint venture, as defined above, which has been approved by MassDOT’s Prequalification Office and Office of Civil Rights for DBE participation on a particular Contract.

"Manufacturer" shall mean a firm that operates or maintains a factory or establishment that produces, on the premises, the materials, supplies, articles or equipment required under the contract and of the general character described by the specifications.

"Regular Dealer" shall mean a DBE firm that owns, operates, or maintains a store, warehouse, or other establishment in which materials, supplies, articles or equipment of the general character described by the specifications and required under the Contract are bought, kept in stock, and regularly sold or leased to the public in the usual course of business.

- (a) To be a regular dealer, the firm must be an established, regular business that engages, as its principal business, and under its own name, in the purchase and sale of the products in question.
- (b) A person may be a regular dealer in such bulk items as petroleum products, steel, cement, gravel, stone, or asphalt without owning, operating, or maintaining a place of business as provided above if the person both owns and operates distribution equipment for the products. Any supplementing of regular dealers' own distribution equipment shall be by long term lease agreement and not on an ad hoc or contract by contract basis.
- (c) Packagers, brokers, manufacturers' representatives, or other persons who arrange or expedite transactions are not regular dealers within the meaning of this definition.

"Responsive" and "Responsible" refers to the bidder's submittal meeting all of the requirements of the advertised request for proposal. The term responsible refers to the ability of the Contractor to perform the work. This ability can be determined prior to bid invitations.

"Small Business or Small Business Concern" shall mean a small business concern or company as defined in Section 3 of the Small Business Act and SBA regulations implementing it (13 CFR Part 121); and is a business that does not exceed the cap on annual average gross receipts established by the U.S. Secretary of Transportation pursuant to 49 CFR Part 26.65; see also 49 CFR Part 26.39.

"SDO" shall mean the Massachusetts Supplier Diversity Office, formerly known as the State Office of Minority and Women Business Assistance (SOMWBA). In 2010, SOMWBA was abolished and the SDO was established. See St. 2010, c. 56. The SDO has assumed all the functions of SOWMBA. SDO is an agency within the Commonwealth of Massachusetts Executive office of Administration and Finance (ANF) Operational Services Division (OSD). The SDO mandate is to help promote the development of business enterprises and non-profit organizations owned and operated by minorities and women.

"Socially and economically disadvantaged individuals" shall mean individuals who are citizens of the United States (or lawfully admitted permanent residents) and who are:

- (a) Individuals found by SDO to be socially and economically disadvantaged individuals on a case by case basis.
- (b) Individuals in the following groups, members of which are rebuttably presumed to be socially and economically disadvantaged:

- (1) "Black Americans" which includes persons having origin in any of the Black racial groups of Africa; (2) "Hispanic Americans" which include persons of Mexican, Puerto Rican, Cuban, Dominican, Central or South American, or other Spanish or Portuguese culture or origin, regardless of race; (3) "Native Americans" which include persons who are American Indians, Eskimos, Aleuts, or Native Hawaiians; (4) "Asian Pacific Americans" which includes persons whose origins are from Japan, China, Taiwan, Korea, Burma (Myanmar), Vietnam, Laos, Cambodia (Kampuchea), Thailand, Malaysia, Indonesia, the Philippines, Brunei, Samoa, Guam, the U.S. Trust Territories of the Pacific Islands (Republic of Palau), the Commonwealth of the Northern Marianas Islands, Macao, Fiji, Tonga, Kiribati, Tuvalu, Nauru, Federated States of Micronesia, or Hong Kong; (5) "Subcontinent Asian Americans" which includes persons whose origins are from India, Pakistan, Bangladesh, Bhutan, the Maldives Islands, Nepal or Sri Lanka; (6) Women; or (7) Any additional groups whose members are designated as socially and economically disadvantaged by the Small Business Administration (SBA), at such time as the SBA designation becomes effective.

Other terms and definitions applicable to the U.S. DOT DBE Program may be found at 49 CFR Part 26 and related appendices and guidance pages.

2. DBE PARTICIPATION

a. Goal

On this Contract, MassDOT has established the following goal(s) for participation by firms owned and controlled by socially and economically disadvantaged persons. At least half of the goal must be met in the form of DBE Subcontractor construction activity as opposed to material supplies or other services. The applicable goal remains in effect throughout the life of the contract regardless of whether pre-identified DBE Subcontractors remain on the Project or under Contract.

☒ Design-Bid-Build Projects: DBE Participation Goal 6 %
(One half of this goal shall be met in the form of Subcontractor construction activity)

☐ Design-Build Projects: DBE Design Participation Goal ____ % and DBE Construction Participation Goal ____ %
(One half of the Construction Goal shall be met in the form of Subcontractor construction activity)

b. Bidders List

Pursuant to the provisions of 49 CFR Part 26.11(c), Recipients such as MassDOT, must collect from all Bidders who seek work on Federally assisted Contracts the firm full company name(s), addresses and telephone numbers of all firms that have submitted bids or quotes to the Bidders in connection with this Project. All bidders should refer to the Special Provision Document "A00801" of the Project proposal for this requirement.

In addition, MassDOT must provide to U.S. DOT, information concerning contractors firm status as a DBE or non-DBE, the age of the firm, and the annual gross receipts of the firm within a series of brackets (e.g., less than \$500,000; \$500,000–\$1 million; \$1–2 million; \$2–5 million, etc.). The status, firm age, and annual gross receipt information will be sought by MassDOT regularly prior to setting its DBE participation goal for submission to U.S. DOT. MassDOT will survey each individual firm for this information directly.

Failure to comply with a written request for this information within fifteen (15) business days may result in the suspension of bidding privileges or other such sanctions, as provided for in Section 9 of this provision, until the information is received.

3. CONTRACTOR ASSURANCES

No Contractor or any Subcontractor shall discriminate on the basis of race color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in all respects and as applicable prior to, or subsequent to, award of U.S. DOT assisted Contracts. The Contractor agrees to affirmatively seek out and consider DBE firms as Contractors, Subcontractors, and/or suppliers of materials and services for this Contract. No Contract will be approved until MassDOT has reviewed Bidders'/Contractors' affirmative actions concerning DBEs. Failure to carry out these requirements is a material breach of this Contract which may result in the termination of the Contract or such other remedy as MassDOT or FHWA deem appropriate.

4. REQUIRED SUBCONTRACT PROVISIONS

The Prime Contractor shall include the provisions of Section 3 above in every subcontract, making those provisions binding on each Subcontractor; in addition, the Prime Contractor shall include a copy of this Special Provision, in its entirety, in every subcontract with a DBE firm which is, or may be, submitted for credit toward the Contract participation goal.

5. ELIGIBILITY OF DBES

Only firms that have been certified by SDO and confirmed by MassDOT as eligible in accordance with 49 CFR Part 26 to participate as DBEs on federally aided MassDOT Contracts may be used on this Contract for credit toward the DBE participation goal.

a. Massachusetts DBE Directory

MassDOT makes available to all bidders the most current Massachusetts Disadvantaged Business Enterprise Directory. This directory is made available for Contractors' convenience and is informational only. The Directory lists those firms that have been certified as eligible in accordance with the criteria of 49 CFR Part 26 to participate as DBEs on federally aided MassDOT contracts. The Directory also lists the kinds of work each firm is certified to perform but does not constitute an endorsement of the quality of performance of any business and does not represent MassDOT Subcontractor approval.

Contractors are encouraged to make use of the DBE Directory maintained by SDO on the Internet. This listing is updated daily and may be accessed at the SDO's website at:

<https://www.diversitycertification.mass.gov/BusinessDirectory/BusinessDirectorySearch.aspx>

b. DBE Certification

A firm must apply to SDO, currently acting as certification agent for MassDOT, for DBE certification to participate on federally aided MassDOT Contracts. A DBE application may be made in conjunction with a firm's application to SDO for certification to participate in state-funded minority and women business enterprise programs or may be for DBE certification only. An applicant for DBE certification must identify the area(s) of work it seeks to perform on U.S. DOT funded projects.

c. Joint Venture Approval

To obtain recognition as an approved DBE Joint Venture, the parties to the joint venture must provide to MassDOT's Office of Civil Rights and Prequalification Office, at least fourteen (14) business days before the bid opening date, an Affidavit of DBE/Non-DBE Joint Venture in the form attached hereto, and including, but not limited to the following:

1. a copy of the Joint Venture Agreement;
2. a description of the distinct, clearly defined portion of the contract work that the DBE will perform with its own forces; and,
3. all such additional information as may be requested by MassDOT for the purpose of determining whether the joint venture is eligible.

6. COUNTING DBE PARTICIPATION TOWARDS DBE PARTICIPATION GOALS

In order for DBE participation to count toward the Contract participation goal, the DBE(s) must have served a commercially useful function in the performance of the Contract and must have been paid in full for acceptable performance.

a. Commercially Useful Function

- (1) In general, a DBE performs a commercially useful function when it is responsible for execution of the work of the contract and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. With respect to materials and supplies used on the Contract, the DBE must be responsible for negotiating price, determining quality and quantity, ordering the material, installing (where applicable) and paying for the material itself.
- (2) To determine whether a DBE is performing a commercially useful function, MassDOT will evaluate the amount of work subcontracted, industry practices, whether the amount the firm is to be paid under the Contract is commensurate with the work it is actually performing and the DBE credit claimed for its performance of the work, and other relevant factors.
- (3) A DBE does not perform a commercially useful function if its role is limited to that of an extra participant in a transaction, contract, or project through which funds are passed in order to obtain the appearance of DBE participation. In determining whether a DBE is such an extra participant, MassDOT will examine similar transactions, particularly those in which DBEs do not participate.

b. Counting Participation Toward The Contract Participation Goal

DBE participation which serves a commercially useful function shall be counted toward the DBE participation goal in accordance with the Provisions of 49 CFR Part 26.55(a) to (h), as follows:

- (1) When a DBE participates in a construction Contract, MassDOT will count the value of the work performed by the DBE's own forces. MassDOT will count the cost of supplies and materials obtained by the DBE for the work of its contract, including supplies purchased or equipment leased by the DBE. Supplies, labor, or equipment the DBE Subcontractor uses, purchases, or leases from the Prime Contractor or any affiliate of the Prime Contractor will not be counted.

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- (2) MassDOT will count the entire amount of fees or commissions charged by a DBE firm for providing bona fide services, such as professional, technical, consultant, or managerial services, or for providing bonds or insurance specifically required for the performance of a U.S. DOT assisted Contract, toward DBE participation goals, provided it is determined that the fee is reasonable and not excessive as compared with fees customarily allowed for similar services.
 - (3) When a DBE performs as a participant in a joint venture, MassDOT will count toward DBE participation goals a portion of the total dollar value of the contract that is equal to the distinct, clearly defined portion of the work of the Contract that the DBE performs with its own forces.
 - (4) MassDOT will use the following factors in determining whether a DBE trucking company is performing a commercially useful function:
 - (i) the DBE must be responsible for the management and supervision of the entire trucking operation for which it is responsible on a particular contract; there cannot be a contrived arrangement for the purpose of meeting DBE participation goals.
 - (ii) the DBE must itself own and operate at least one fully licensed, insured, and operational truck used on the Contract.
 - (iii) the Contractor will receive DBE credit for the total value of the transportation services the DBE provides on the Contract using trucks owned, insured, and operated by the DBE itself and using drivers the DBE employs alone.
 - (iv) the DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The Contractor who has a contract with a DBE who leases trucks from another DBE will receive credit for the total value of the transportation services of the lease.
 - (v) the DBE may also lease trucks from a non-DBE firm, including an owner-operator. The Contractor who has a Contract with a DBE who leases trucks from a non-DBE is entitled to credit for the total value of the transportation services provided by non-DBE lessees not to exceed the value of transportation services provided by DBE-owned trucks on the Contract. Additional participation by non-DBE lessees receives credit only for the fee or commission it receives as a result of the lease arrangement, fee or commission it receives as a result of the lease arrangement. The DBE does not receive credit for the total value of the transportation services provided by the lessee, since these services are not provided by a DBE.
 - (vi) the lease must indicate that the DBE has exclusive use of, and control over, the truck. This does not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, so long as the lease gives the DBE absolute priority for use of the leased truck. Leased trucks must display the name and identification number of the DBE.
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- (5) MassDOT will count the Prime Contractor's expenditures with DBEs for materials or supplies toward DBE participation goals as follows:
- (i) if the materials or supplies are obtained from a DBE manufacturer, as defined in Section 1 above, MassDOT will count one hundred (100%) percent of the cost of the materials or supplies toward DBE participation goals, provided the DBE meets the other requirements of the regulations.
 - (ii) if the materials or supplies are purchased from a DBE regular dealer, as defined in Section 1 above, MassDOT will count sixty (60%) percent of the cost of the materials or supplies toward the Contract participation goal, provided the DBE meets the other requirements of the regulations.
 - (iii) for materials or supplies purchased from a DBE which is neither a manufacturer nor a regular dealer, MassDOT will count the entire amount of fees or commissions charged for assistance in the procurement of the materials and supplies, or fees or transportation charges for the delivery of materials or supplies required on a job site toward the Contract participation goal, provided that MassDOT determines the fees to be reasonable and not excessive as compared with fees customarily allowed for similar services; the cost of the materials and supplies themselves will not be counted; and provided the DBE meets the other requirements of the regulations.

c. Joint Check Policy

MassDOT recognizes that the use of joint checks may be a business practice required by material suppliers and vendors in the construction industry. A joint check is a two-party check issued by a/the Prime Contractor to a DBE third party such as a regular dealer of material or supplies. The Prime Contractor issues the check as payor to the DBE and the third party jointly as payees to guarantee payment to the third party for materials or supplies obtained or to be used by the DBE. FHWA has established criteria to ensure that DBEs are in fact performing a commercially useful function ("CUF") while using a joint check arrangement. Contractors and DBEs must meet and conform to these conditions and criteria governing the use of joint checks.

In the event that a Contractor or DBE Subcontractor desires to use a joint check, MassDOT will require prior notice and will closely monitor the arrangement for compliance with FHWA regulations and guidance. MassDOT may allow a joint check arrangement and give credit to a Contractor for use of the DBE where one or more of the following conditions exist:

- The use of a joint check is in fact required by this type of vendor or supplier as a standard industry practice that applies to all Contractors (DBEs and non-DBEs); or is required by a specific vendor or supplier;
- Payment for supplies or materials would be delayed for an unreasonably extended period without the joint check arrangement;
- The DBE (or any of its Subcontractors) has a pattern or history of not paying a vendor or supplier within a reasonable time or has not established enough of a credit history with the supplier or vendor; and/or
- The presence of severe adverse economic conditions, where credit resources may be limited and such practices may be necessary or required to effect timely payments.

Other factors MassDOT may consider:

- Whether there is a requirement by the Prime Contractor that a DBE should use a specific vendor or supplier to meet their Subcontractor specifications;
- Whether there is a requirement that a DBE use the Prime Contractor's negotiated price;
- The independence of the DBE;
- Whether approval has been sought prior to use of a joint check arrangement; and
- Whether any approved joint check arrangement has exceeded a reasonable period of use;
- The operation of the joint check arrangement; and
- Whether the DBE has made an effort to establish alternate arrangements for following periods (i.e., the DBE must show it can, or has, or why it has not, established or increased a credit line with the vendor or supplier).

Even with the use of a Joint Check, both the Contractor and DBE remain responsible for compliance with all other elements under 49 CFR § 26.55 (c) (1), and must still be able to prove that a commercially useful function is being performed for the Contractor.

d. Joint Check Procedure(s)

- The DBE advises its General or Prime Contractor that it will have to use a Joint Check and provide proof of such requirement.
- The General or the Prime Contractor submits a request for approval to MassDOT, using MassDOT's approved Joint Check Request form (Document B00855) and by notification on the DBE Letter of Intent (Document B00854), and any other relevant documents. Requests that are not initiated during the bid process should be made in writing and comply with the procedure.
- The MassDOT Office of Civil Rights will review the request and render a decision as part of the approval process for DBE Schedules and Letters of Intent.
- Review and Approval will be project specific and relevant documents will be made part of the project Contract file.
- Payments should be made in the name of both the DBE and vendor or supplier. Payments should be issued and signed by the Contractor as only the guarantor for prompt payment of purchases to the vendor or supplier. The payment to the vendor or supplier should be handled by the DBE (i.e. if possible, funds or the joint check should be processed by the DBE and sent by the DBE to the vendor or supplier).
- MassDOT may request copies of cancelled checks (front and back) and transmittal information to verify any payments made to the DBE and vendor or supplier.
- MassDOT may request other information and documents, and may ask questions of the Contractor, Subcontractor and vendor or supplier prior to, during, and after the project performance to ascertain whether the Subcontractor is performing a commercially useful function and all parties are complying with DBE Program policies and procedures as part of the Subcontractor approval process.

7. AWARD DOCUMENTATION AND PROCEDURES

- a. The two lowest bidders/the two bidders with the lowest price per quality score point, shall submit, by the close of business on the third (3rd) business day after the bid opening, a completed Schedule of Participation by DBEs (Document B00853) which shall list:
- (1) The full company name, address and telephone number of each DBE with whom the bidder intends to make a commitment.
 - (2) The contract item(s), by number(s) and quantity(ies), if applicable, or specific description of other business activity to be performed by each DBE as set forth in the Letters of Intent. The Bidder shall list only firms which have the capacity to perform, manage and supervise the work proposed in accordance with the requirements of 49 CFR Part 26 and Section **6.b** of these Special Provisions.
 - (3) The total dollar amount to be paid to each DBE. (Bidders are cautioned that at least one half of the participation goal must be met with construction activity work.)
 - (4) The total dollar amount to be paid to each DBE that is eligible for credit toward the DBE participation goal under the counting rules set out in Section **6.b**.
 - (5) The total creditable DBE participation as a percentage of the total bid price.
- b. All firms listed on the Schedule must be currently certified.
- c. The two lowest bidders/the two bidders with the lowest price per quality score point, shall each submit, with their Schedules of Participation, fully completed, signed Letters of Intent (Document B00854) from each of the DBEs listed on the Schedule. The Letters of Intent shall be in the form attached and shall identify specifically the contract activity the DBE proposes to perform, expressed as contract item number, if applicable, description of the activity, NAICS code, quantity, unit price and total price. In the event of discrepancy between the Schedule and the Letter of Intent, the Letter of Intent shall govern.
- d. Evidence of good faith efforts will be evaluated by MassDOT in the selection of the lowest responsible bidder.

All information requested by MassDOT for the purpose of evaluating the Contractor's efforts to achieve the participation goal must be provided within three (3) calendar days and must be accurate and complete in every detail. The apparent low bidder's attainment of the DBE participation goal or a satisfactory demonstration of good faith efforts is a prerequisite for award of the Contract.

- e. Failure to meet, or to demonstrate good faith efforts to meet, the requirements of these Special Provisions shall render a bid non-responsive. Therefore, in order to be eligible for award, the bidder (1) must list all DBE's it plans to employ on the Schedule of Participation; and provide the required Letters of Intent for, DBE participation which meets or exceeds the Contract goal in accordance with the terms of these Special Provisions or (2) must demonstrate, to the satisfaction of MassDOT, that good faith efforts were made to achieve the participation goal. MassDOT will adhere to the guidance provided in Appendix A to 49 CFR Part 26 on the determination of a Contractor's good faith efforts to meet the DBE participation goal(s) set forth in Section 2 herein.

- f. If MassDOT finds that the percentage of DBE participation submitted by the bidder on its Schedule does not meet the Contract participation goal, or that Schedule and Letters of Intent were not timely filed, and that the bidder has not demonstrated good faith efforts to comply with these requirements, it shall propose that the bidder be declared ineligible for award. In that case, the bidder may request administrative reconsideration. Such requests must be sent in writing within three (3) calendar days of receiving notice of proposed ineligibility to: The Office of the General Counsel, Massachusetts Department of Transportation, 10 Park Plaza, Boston, MA, 02116.
- g. If, after administrative reconsideration, MassDOT finds that the bidder has not shown that sufficient good faith efforts were made to comply with the requirements of these Special Provisions, it shall reject the bidder's proposal and may retain the proposal guaranty.
- h. Actions which constitute evidence of good faith efforts to meet a DBE participation goal include, but are not limited to, the following examples, which are set forth in 49 CFR Part 26, Appendix A:
- (1) Soliciting through all reasonable and available means (e.g., attendance at pre-bid meetings, advertising and/or written notices) the interest of all certified DBEs who have the capability to perform the work of the Contract. The bidder must solicit this interest within sufficient time to allow the DBEs to respond to the solicitation. The bidder must determine with certainty if the DBEs are interested by taking appropriate steps to follow up initial solicitations.
 - (2) Selecting portions of the work to be performed by DBEs in order to increase the likelihood that the DBE participation goal will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the Prime Contractor might otherwise prefer to perform these work items with its own forces.
 - (3) Providing interested DBEs with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist them in responding to a solicitation.
 - (4) Negotiating in good faith with interested DBEs. It is the bidder's responsibility to make a portion of the work available to DBE Subcontractors and suppliers and to select those portions of the work or material needs consistent with the available DBE Subcontractors and suppliers, so as to facilitate DBE participation. Evidence of such negotiation includes the names, addresses, and telephone number of DBEs that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for DBEs to perform the work.

A bidder using good business judgment would consider a number of factors in negotiating with Subcontractors, including DBE Subcontractors, and would take a firm's price and capabilities as well as Contract participation goals into consideration. However, the fact that there may be some additional costs involved in finding and using DBEs is not in itself sufficient reason for a bidder's failure to meet the Contract DBE participation goal, as long as such costs are reasonable. Also, the ability or desire of a Prime Contractor to perform the work of a Contract with its own organization does not relieve the bidder of the responsibility to make good faith efforts. Prime Contractors are not, however, required to accept higher quotes from DBEs if the price difference is excessive or unreasonable.

- (5) Not rejecting DBEs as being unqualified without sound reasons based on a thorough investigation of their capabilities. Contractors should be careful of adding additional requirements of performance that would in effect limit participation by DBEs or any small business. The Contractor's standing within its industry, membership in specific groups, organizations, or associations and political or social affiliations (for example union vs. nonunion employee status) are not legitimate causes for the rejection or non-solicitation of bids in the Contractor's efforts to meet the Contract participation goal.
- (6) Making efforts to assist interested DBEs in obtaining bonding, lines of credit, or insurance as required by the recipient or contractor.
- (7) Making efforts to assist interested DBEs in obtaining necessary equipment, supplies, materials, or related assistance or services.
- (8) Effectively using the services of available minority/women community organizations; minority/women contractors' groups; local, state, and federal minority/women business assistance offices; and other organizations as allowed on a case by case basis to provide assistance in the recruitment and placement of DBEs.

8. COMPLIANCE

- a. All activity performed by a DBE for credit toward the Contract participation goal must be performed, managed and supervised by the DBE in accordance with all commercially useful function requirements of 49 CFR Part 26. The Prime Contractor shall not enter into, or condone, any other arrangement.
- b. The Prime Contractor shall not perform with its own organization, or assign to any other business, an activity designated for the DBE(s) named on the Schedule(s) submitted by the Prime Contractor under Section 7 or under paragraph 8.f of this section, without the approval of MassDOT in accordance with the requirements of paragraphs 8.f and 8.j of this section.
- c. MassDOT may suspend payment for any activity that was not performed by the DBE to whom the activity was committed on the approved Schedule of Participation, or that was not performed in accordance with the requirements of Section 6.
- d. MassDOT retains the right to approve or disapprove of any or all Subcontractors. Requests by the Prime Contractor for approval of participation by a DBE Subcontractor for credit toward the Contract participation goal must include, in addition to any other requirements for Subcontractor approval, the following:
 - (1) A copy of the proposed subcontract. The subcontract must be for at least the dollar amount, and for the work described, in the Bidder's Schedule of Participation.
 - (2) A resume stating the qualifications and experience of the DBE Superintendent and/or foreperson who will supervise the on-site work. A new resume will be required for any change in supervisory personnel during the progress of the work.
 - (3) A Schedule of Operations indicating when the DBE is expected to perform the work.
 - (4) A list of (1) equipment owned by the DBE to be used on the Project, and (2) equipment to be leased by the DBE for use on the Project.

- (5) A list of: (1) all projects (public and private) which the DBE is currently performing; (2) all projects (public and private) to which the DBE is committed; and (3) all projects (public and private) to which the DBE intends to make a commitment. For each Contract, list the contracting organization, the name and telephone number of a contact person for the contracting organization, the dollar value of the work, a description of the work, and the DBE's work schedule for each project.
- e. If, pursuant to the Subcontractor approval process, MassDOT finds that a DBE Subcontractor does not have sufficient experience or resources to perform, manage and supervise work of the kind proposed in accordance with the requirements of 49 CFR Part 26, approval of the DBE Subcontractor may be denied. In the event of such denial, the Prime Contractor shall proceed in accordance with the requirements paragraphs **8.f** and **8.j** of this section.
- f. If, for reasons beyond its control, the Prime Contractor cannot comply with its DBE participation commitment in accordance with the Schedule of Participation submitted under Section 7, the Prime Contractor shall submit to MassDOT the reasons for its inability to comply with its obligations and shall submit, and request approval for, a revised Schedule of Participation. If approved by MassDOT, the revised Schedule shall govern the Prime Contractor's performance in meeting its obligations under these Special Provisions.
- g. A Prime Contractor's compliance with the participation goal in Section 2 shall be determined by reference to the established percentage of the total contract price, provided, however, that no decrease in the dollar amount of a bidder's commitment to any DBE shall be allowed without the approval of MassDOT.
- h. If the contract amount is increased, the Prime Contractor may be required to submit a revised Schedule of Participation in accordance with paragraphs **8.f** and **8.j** of this section.
- i. In the event of the decertification of a DBE scheduled to participate on the Contract for credit toward the participation goal, but not under subcontract, the Contractor shall proceed in accordance with paragraphs **8.f** and **8.j** of this section.
- j. The Prime Contractor shall notify MassDOT immediately of any facts that come to its attention indicating that it may or will be unable to comply with any aspect of its DBE obligation under this Contract.
- k. Any notice required by these Special Provisions shall be given in writing to: (1) the Resident Engineer; (2) the District designated Compliance Officer; and (3) the DBE Liaison Officer, MassDOT Office of Civil Rights, 10 Park Plaza, – 3rd Floor - West, Boston, MA, 02116 and cc'd to the Deputy Chief of External Programs.
- l. The Prime Contractor and its Subcontractors shall comply with MassDOT's Electronic Reporting System Requirements (MassDOT Document 00821) and submit all information required by MassDOT related to the DBE Special Provisions through the Equitable Business Opportunity Solution ("EBO"). MassDOT reserves the right to request reports in the format it deems necessary anytime during the performance of the Contract.
- m. Termination of DBE by Prime Contractor
- (1) A Prime Contractor shall not terminate a DBE Subcontractor or an approved substitute DBE firm without the prior written consent of MassDOT. This includes, but is not limited to, instances in which a Prime Contractor seeks to perform work originally designated for a DBE Subcontractor with its own forces or those of an affiliate, a non-DBE firm, or with another DBE firm.

- (2) MassDOT may provide such written consent only if MassDOT agrees, for reasons stated in its concurrence document, that the Prime Contractor has good cause to terminate the DBE firm.
- (3) For purposes of this paragraph, good cause includes the following circumstances:
 - (i) The DBE Subcontractor fails or refuses to execute a written contract;
 - (ii) The DBE Subcontractor fails or refuses to perform the work of its subcontract in a way consistent with normal industry standards. Good cause, however, does not exist if the failure or refusal of the DBE Subcontractor to perform its work on the subcontract results from the bad faith or discriminatory action of the Prime Contractor;
 - (iii) The DBE Subcontractor fails or refuses to meet the Prime Contractor's reasonable, nondiscriminatory bond requirements.
 - (iv) The DBE Subcontractor becomes bankrupt, insolvent, or exhibits credit unworthiness;
 - (v) The DBE Subcontractor is ineligible to work on public works projects because of suspension and debarment proceedings pursuant 2 CFR Parts 180, 215 and 1,200 or applicable State law;
 - (vi) (vii) MassDOT has determined that the listed DBE Subcontractor is not a responsible contractor;
 - (vii) The listed DBE Subcontractor voluntarily withdraws from the Project and provides written notice of its withdrawal;
 - (viii) The listed DBE is ineligible to receive DBE credit for the type of work required;
 - (ix) A DBE owner dies or becomes disabled with the result that the listed DBE Contractor is unable to complete its work on the Contract;
 - (x) Other documented good cause that MassDOT determines compels the termination of the DBE Subcontractor. Good cause, however, does not exist if the Prime Contractor seeks to terminate a DBE it relied upon to obtain the Contract so that the Prime Contractor can self-perform the DBE work or substitute another DBE or non-DBE Contractor after Contract Award.
- (4) Before transmitting to MassDOT a request to terminate and/or substitute a DBE Subcontractor, the Prime Contractor must give notice in writing to the DBE Subcontractor, with a copy to MassDOT, of its intent to request to terminate and/or substitute, and the reason for the request.
- (5) The Prime Contractor must give the DBE five (5) business days to respond to the Prime Contractor's notice. The DBE must advise MassDOT and the Contractor of the reasons, if any, why it objects to the proposed termination of its subcontract and why MassDOT should not approve the Prime Contractor's action. If required in a particular case as a matter of public necessity (e.g., safety), MassDOT may provide a response period shorter than five (5) business days.
- (6) In addition to post-award terminations, the provisions of this section apply to pre-award deletions of or substitutions for DBE firms.

n. Prompt Payment.

Contractors are required to promptly pay Subcontractors under this Prime Contract within ten (10) business days from the receipt of each payment the Prime Contractor receives from MassDOT. Failure to comply with this requirement may result in the withholding of payment to the Prime Contractor until such time as all payments due under this provision have been received by the Subcontractor(s) and/or referral to the Prequalification Committee for action which may affect the Contractor's prequalification status.

9. SANCTIONS

If the Prime Contractor does not comply with the terms of these Special Provisions and cannot demonstrate to the satisfaction of MassDOT that good faith efforts were made to achieve such compliance, MassDOT may, in addition to any other remedy provided for in the Contract, and notwithstanding any other provision in the Contract:

- a.** Retain, in connection with final acceptance and final payment processing, an amount determined by multiplying the total contract amount by the percentage in Section 2, less the amount paid to approved DBE(s) for work performed under the Contract in accordance with the provisions of Section 8.
- b.** Suspend, terminate or cancel this Contract, in whole or in part, and call upon the Prime Contractor's surety to perform all terms and conditions in the Contract.
- c.** In accordance with 720 CMR 5.05(1)(f), modify or revoke the Prime Contractor's Prequalification status or recommend that the Prime Contractor not receive award of a pending Contract. The Prime Contractor may appeal the determination of the Prequalification Committee in accordance with the provisions of 720 CMR 5.06.
- d.** Initiate debarment proceedings pursuant to M.G.L. c. 29 §29F and, as applicable, 2 CFR Parts 180, 215 and 1,200.
- e.** Refer the matter to the Massachusetts Attorney General for review and prosecution, if appropriate, of any false claim or pursuant to M.G.L. c. 12, §§ 5A to 5O (the Massachusetts False Claim Act).
- f.** Refer the matter to the U.S. DOT's Office of the Inspector General or other agencies for prosecution under Title 18, U.S.C. § 1001, 49 CFR Parts 29 and 31, and other applicable laws and regulations.

10. FURTHER INFORMATION; ENFORCEMENT, COOPERATION AND CONFIDENTIALITY.

- a.** Any proposed DBE, bidder, or Contractor shall provide such information as is necessary in the judgment of MassDOT to ascertain its compliance with the terms of this Special Provision. Further, pursuant to 49 CFR, Part 26.107:

- (1) If you are a firm that does not meet the eligibility criteria of 49 CFR, Parts 26.61 to 26.73 (“subpart D”), that attempts to participate in a DOT- assisted program as a DBE on the basis of false, fraudulent, or deceitful statements or representations or under circumstances indicating a serious lack of business integrity or honesty, MassDOT or FHWA may initiate suspension or debarment proceedings against you under 49 CFR Part 29.
 - (2) If you are a firm that, in order to meet DBE Contract participation goals or other DBE Program requirements, uses or attempts to use, on the basis of false, fraudulent or deceitful statements or representations or under circumstances indicating a serious lack of business integrity or honesty, another firm that does not meet the eligibility criteria of subpart D, FHWA may initiate suspension or debarment proceedings against you under 49 CFR Part 29.
 - (3) In a suspension or debarment proceeding brought either under subparagraph a.(1) or b.(2) of this section, the concerned operating administration may consider the fact that a purported DBE has been certified by a recipient. Such certification does not preclude FHWA from determining that the purported DBE, or another firm that has used or attempted to use it to meet DBE participation goals, should be suspended or debarred.
 - (4) FHWA may take enforcement action under 49 CFR Part 31, Program Fraud and Civil Remedies, against any participant in the DBE Program whose conduct is subject to such action under 49 CFR Part 31.
 - (5) FHWA may refer to the Department of Justice, for prosecution under 18 U.S.C. 1001 or other applicable provisions of law, any person who makes a false or fraudulent statement in connection with participation of a DBE in any DOT-assisted program or otherwise violates applicable Federal statutes.
- b. Pursuant to 49 CFR Part 26.109, the rules governing information, confidentiality, cooperation, and intimidation or retaliation are as follows:
- (1) Availability of records.
 - (i) In responding to requests for information concerning any aspect of the DBE Program, FHWA complies with provisions of the Federal Freedom of Information and Privacy Acts (5 U.S.C. 552 and 552a). FHWA may make available to the public any information concerning the DBE Program release of which is not prohibited by Federal law.
 - (ii) MassDOT shall safeguard from disclosure to unauthorized persons information that may reasonably be considered as confidential business information, consistent with Federal and Massachusetts General Law (M.G.L. c. 66, § 10, M.G.L. c. 4, §7 (26), 950 CMR 32.00).
 - (2) Confidentiality of information on complainants. Notwithstanding the provisions of subparagraph b.(1) of this section, the identity of complainants shall be kept confidential, at their election. If such confidentiality will hinder the investigation, proceeding or hearing, or result in a denial of appropriate administrative due process to other parties, the complainant must be advised for the purpose of waiving the privilege. Complainants are advised that, in some circumstances, failure to waive the privilege may result in the closure of the investigation or dismissal of the proceeding or hearing.

- (3) Cooperation. All participants in FHWA's DBE Program (including, but not limited to, recipients, DBE firms and applicants for DBE certification, complainants and appellants, and Contractors using DBE firms to meet Contract participation goals) are required to cooperate fully and promptly with U.S. DOT and recipient compliance reviews, certification reviews, investigations, and other requests for information. Failure to do so shall be a ground for appropriate action against the party involved (e.g., with respect to recipients, a finding of noncompliance; with respect to DBE firms, denial of certification or removal of eligibility and/or suspension and debarment; with respect to a complainant or appellant, dismissal of the complaint or appeal; with respect to a Contractor which uses DBE firms to meet participation goals, findings of non-responsibility for future Contracts and/or suspension and debarment).
- (4) Intimidation and retaliation. No recipient, Contractor, or any other participant in the program, may intimidate, threaten, coerce, or discriminate against any individual or firm for the purpose of interfering with any right or privilege secured by this part or because the individual or firm has made a complaint, testified, assisted, or participated in any manner in an investigation, proceeding, or hearing under this part. If any recipient or contractor violates this prohibition, that entity is in noncompliance with this 49 CFR Part 26.

11. LIST OF ADDITIONAL DOCUMENTS.

- a. The following documents shall be completed and signed by the bidder and designated DBEs in accordance with Section 7 - Award Documentation and Procedures. These documents must be returned by the bidder to MassDOT's Bid Document Distribution Center:
- ☐ Schedule of DBE Participation (Document B00853)
 - ☐ Letter of Intent (Document B00854)
 - ☐ DBE Joint Check Arrangement Approval Form (Document B00855), if Contractor and DBE plan, or if DBE is required to use a Joint Check
- b. The following document shall be signed and returned by Contractor and Subcontractors/DBEs to the MassDOT District Office overseeing the Project, as applicable:
- ☐ Contractor/Subcontractor Certification Form (Document No. 00859) (a checklist of other documents to be included with every subcontract (DBEs and non-DBEs alike)).
- c. The following document shall be provided to MassDOT's Office of Civil Rights and Prequalification Office at least fourteen (14) business days before the bid opening date, if applicable:
- ☐ Affidavit of DBE/Non-DBE Joint Venture (Document B00856)
- d. The following document shall be provided to MassDOT's District Office of Civil Rights within 30 calendar days after the work of the DBE is completed, or no later than 30 calendar days after the work of the DBE is on a completed and processed CQE. This document shall be completed and submitted by the Prime Contractor:
- ☐ Certificate of Completion by a Minority/Women or Disadvantaged Business Enterprise (M/W/DBE) (Form No. CSD-100)

REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS

- I. General
- II. Nondiscrimination
- III. Non-segregated Facilities
- IV. Davis-Bacon and Related Act Provisions
- V. Contract Work Hours and Safety Standards Act Provisions
- VI. Subletting or Assigning the Contract
- VII. Safety: Accident Prevention
- VIII. False Statements Concerning Highway Projects
- IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
- X. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion
- XI. Certification Regarding Use of Contract Funds for Lobbying
- XII. Use of United States-Flag Vessels:

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under title 23, United States Code, as required in 23 CFR 633.102(b) (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services). 23 CFR 633.102(e).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider. 23 CFR 633.102(e).

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services) in accordance with 23 CFR 633.102. The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in solicitation-for-bids or request-for-proposals documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract). 23 CFR 633.102(b).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work

performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract. 23 CFR 633.102(d).

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. 23 U.S.C. 114(b). The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors. 23 U.S.C. 101(a).

II. NONDISCRIMINATION (23 CFR 230.107(a); 23 CFR Part 230, Subpart A, Appendix A; EO 11246)

The provisions of this section related to 23 CFR Part 230, Subpart A, Appendix A are applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR Part 60, 29 CFR Parts 1625-1627, 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), and related regulations including 49 CFR Parts 21, 26, and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding \$10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR Part 60, and 29 CFR Parts 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), and Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), and related regulations including 49 CFR Parts 21, 26, and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR Part 230, Subpart A, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal Employment Opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (see 28 CFR Part 35, 29 CFR Part 1630, 29 CFR Parts 1625-1627, 41 CFR Part 60 and 49 CFR Part 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140, shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR Part 35 and 29 CFR Part 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract. 23 CFR 230.409 (g)(4) & (5).

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, sexual orientation, gender identity, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action or are substantially involved in such action, will be made fully cognizant of and will implement the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer or other knowledgeable company official.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to ensure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action

within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs (i.e., apprenticeship and on-the-job training programs for the geographical area of contract performance). In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. 23 CFR 230.409. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide

sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established thereunder. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors, suppliers, and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurances Required:

a. The requirements of 49 CFR Part 26 and the State DOT's FHWA-approved Disadvantaged Business Enterprise (DBE) program are incorporated by reference.

b. The contractor, subrecipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate, which may include, but is not limited to:

- (1) Withholding monthly progress payments;
- (2) Assessing sanctions;
- (3) Liquidated damages; and/or
- (4) Disqualifying the contractor from future bidding as non-responsible.

c. The Title VI and nondiscrimination provisions of U.S. DOT Order 1050.2A at Appendixes A and E are incorporated by reference. 49 CFR Part 21.

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women.

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on [Form FHWA-1391](#). The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of more than \$10,000. 41 CFR 60-1.5.

As prescribed by 41 CFR 60-1.8, the contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, sexual orientation, gender identity, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location under the contractor's control where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding \$2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size), in accordance with 29 CFR 5.5. The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. 23 U.S.C. 113. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. 23 U.S.C. 101. Where applicable law requires that projects be treated as a project on a Federal-aid highway, the provisions of this subpart will apply regardless of the location of the project. Examples include: Surface Transportation Block Grant Program projects funded under 23 U.S.C. 133 [excluding recreational trails projects], the Nationally Significant Freight and Highway

Projects funded under 23 U.S.C. 117, and National Highway Freight Program projects funded under 23 U.S.C. 167.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages (29 CFR 5.5)

a. *Wage rates and fringe benefits.* All laborers and mechanics employed or working upon the site of the work (or otherwise working in construction or development of the project under a development statute), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act ([29 CFR part 3](#))), the full amount of basic hourly wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. As provided in paragraphs (d) and (e) of 29 CFR 5.5, the appropriate wage determinations are effective by operation of law even if they have not been attached to the contract. Contributions made or costs reasonably anticipated for bona fide fringe benefits under the Davis-Bacon Act ([40 U.S.C. 3141\(2\)\(B\)](#)) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.e. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics must be paid the appropriate wage rate and fringe benefits on the wage determination for the classification(s) of work actually performed, without regard to skill, except as provided in paragraph 4. of this section. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: *Provided*, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classifications and wage rates conformed under paragraph 1.c. of this section) and the Davis-Bacon poster (WH-1321) must be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b. *Frequently recurring classifications.* (1) In addition to wage and fringe benefit rates that have been determined to be prevailing under the procedures set forth in [29 CFR part 1](#), a wage determination may contain, pursuant to § 1.3(f), wage and fringe benefit rates for classifications of laborers and mechanics for which conformance requests are regularly submitted pursuant to paragraph 1.c. of this section, provided that:

(i) The work performed by the classification is not performed by a classification in the wage determination for which a prevailing wage rate has been determined;

(ii) The classification is used in the area by the construction industry; and

(iii) The wage rate for the classification bears a reasonable relationship to the prevailing wage rates contained in the wage determination.

(2) The Administrator will establish wage rates for such classifications in accordance with paragraph 1.c.(1)(iii) of this section. Work performed in such a classification must be paid at no less than the wage and fringe benefit rate listed on the wage determination for such classification.

c. *Conformance.* (1) The contracting officer must require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract be classified in conformance with the wage determination. Conformance of an additional classification and wage rate and fringe benefits is appropriate only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is used in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) The conformance process may not be used to split, subdivide, or otherwise avoid application of classifications listed in the wage determination.

(3) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken will be sent by the contracting officer by email to DBAconformance@dol.gov. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(4) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer will, by email to DBAconformance@dol.gov, refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(5) The contracting officer must promptly notify the contractor of the action taken by the Wage and Hour Division

under paragraphs 1.c.(3) and (4) of this section. The contractor must furnish a written copy of such determination to each affected worker or it must be posted as a part of the wage determination. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 1.c.(3) or (4) of this section must be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

d. *Fringe benefits not expressed as an hourly rate.* Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor may either pay the benefit as stated in the wage determination or may pay another bona fide fringe benefit or an hourly cash equivalent thereof.

e. *Unfunded plans.* If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, *Provided*, That the Secretary of Labor has found, upon the written request of the contractor, in accordance with the criteria set forth in § 5.28, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

f. *Interest.* In the event of a failure to pay all or part of the wages required by the contract, the contractor will be required to pay interest on any underpayment of wages.

2. Withholding (29 CFR 5.5)

a. *Withholding requirements.* The contracting agency may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for the full amount of wages and monetary relief, including interest, required by the clauses set forth in this section for violations of this contract, or to satisfy any such liabilities required by any other Federal contract, or federally assisted contract subject to Davis-Bacon labor standards, that is held by the same prime contractor (as defined in § 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to Davis-Bacon labor standards requirements and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld. In the event of a contractor's failure to pay any laborer or mechanic, including any apprentice or helper working on the site of the work all or part of the wages required by the contract, or upon the contractor's failure to submit the required records as discussed in paragraph 3.d. of this section, the contracting agency may on its own initiative and after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

b. *Priority to withheld funds.* The Department has priority to funds withheld or to be withheld in accordance with paragraph

2.a. of this section or Section V, paragraph 3.a., or both, over claims to those funds by:

- (1) A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;
- (2) A contracting agency for its procurement costs;
- (3) A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;
- (4) A contractor's assignee(s);
- (5) A contractor's successor(s); or
- (6) A claim asserted under the Prompt Payment Act, [31 U.S.C. 3901](#)–3907.

3. Records and certified payrolls (29 CFR 5.5)

a. Basic record requirements (1) Length of record retention. All regular payrolls and other basic records must be maintained by the contractor and any subcontractor during the course of the work and preserved for all laborers and mechanics working at the site of the work (or otherwise working in construction or development of the project under a development statute) for a period of at least 3 years after all the work on the prime contract is completed.

(2) Information required. Such records must contain the name; Social Security number; last known address, telephone number, and email address of each such worker; each worker's correct classification(s) of work actually performed; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in [40 U.S.C. 3141\(2\)\(B\)](#) of the Davis-Bacon Act); daily and weekly number of hours actually worked in total and on each covered contract; deductions made; and actual wages paid.

(3) Additional records relating to fringe benefits. Whenever the Secretary of Labor has found under paragraph 1.e. of this section that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in [40 U.S.C. 3141\(2\)\(B\)](#) of the Davis-Bacon Act, the contractor must maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits.

(4) Additional records relating to apprenticeship. Contractors with apprentices working under approved programs must maintain written evidence of the registration of apprenticeship programs, the registration of the apprentices, and the ratios and wage rates prescribed in the applicable programs.

b. Certified payroll requirements (1) Frequency and method of submission. The contractor or subcontractor must submit weekly, for each week in which any DBA- or Related Acts-covered work is performed, certified payrolls to the contracting

agency. The prime contractor is responsible for the submission of all certified payrolls by all subcontractors. A contracting agency or prime contractor may permit or require contractors to submit certified payrolls through an electronic system, as long as the electronic system requires a legally valid electronic signature; the system allows the contractor, the contracting agency, and the Department of Labor to access the certified payrolls upon request for at least 3 years after the work on the prime contract has been completed; and the contracting agency or prime contractor permits other methods of submission in situations where the contractor is unable or limited in its ability to use or access the electronic system.

(2) Information required. The certified payrolls submitted must set out accurately and completely all of the information required to be maintained under paragraph 3.a.(2) of this section, except that full Social Security numbers and last known addresses, telephone numbers, and email addresses must not be included on weekly transmittals. Instead, the certified payrolls need only include an individually identifying number for each worker (e.g., the last four digits of the worker's Social Security number). The required weekly certified payroll information may be submitted using Optional Form WH-347 or in any other format desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division website at <https://www.dol.gov/sites/dolgov/files/WHDL/legacy/files/wh347.pdf> or its successor website. It is not a violation of this section for a prime contractor to require a subcontractor to provide full Social Security numbers and last known addresses, telephone numbers, and email addresses to the prime contractor for its own records, without weekly submission by the subcontractor to the contracting agency.

(3) Statement of Compliance. Each certified payroll submitted must be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor, or the contractor's or subcontractor's agent who pays or supervises the payment of the persons working on the contract, and must certify the following:

(i) That the certified payroll for the payroll period contains the information required to be provided under paragraph 3.b. of this section, the appropriate information and basic records are being maintained under paragraph 3.a. of this section, and such information and records are correct and complete;

(ii) That each laborer or mechanic (including each helper and apprentice) working on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in [29 CFR part 3](#); and

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification(s) of work actually performed, as specified in the applicable wage determination incorporated into the contract.

(4) Use of Optional Form WH-347. The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 will satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(3) of this section.

(5) *Signature.* The signature by the contractor, subcontractor, or the contractor's or subcontractor's agent must be an original handwritten signature or a legally valid electronic signature.

(6) *Falsification.* The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under [18 U.S.C. 1001](#) and [31 U.S.C. 3729](#).

(7) *Length of certified payroll retention.* The contractor or subcontractor must preserve all certified payrolls during the course of the work and for a period of 3 years after all the work on the prime contract is completed.

c. *Contracts, subcontracts, and related documents.* The contractor or subcontractor must maintain this contract or subcontract and related documents including, without limitation, bids, proposals, amendments, modifications, and extensions. The contractor or subcontractor must preserve these contracts, subcontracts, and related documents during the course of the work and for a period of 3 years after all the work on the prime contract is completed.

d. *Required disclosures and access* (1) *Required record disclosures and access to workers.* The contractor or subcontractor must make the records required under paragraphs 3.a. through 3.c. of this section, and any other documents that the contracting agency, the State DOT, the FHWA, or the Department of Labor deems necessary to determine compliance with the labor standards provisions of any of the applicable statutes referenced by § 5.1, available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and must permit such representatives to interview workers during working hours on the job.

(2) *Sanctions for non-compliance with records and worker access requirements.* If the contractor or subcontractor fails to submit the required records or to make them available, or refuses to permit worker interviews during working hours on the job, the Federal agency may, after written notice to the contractor, sponsor, applicant, owner, or other entity, as the case may be, that maintains such records or that employs such workers, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available, or to permit worker interviews during working hours on the job, may be grounds for debarment action pursuant to § 5.12. In addition, any contractor or other person that fails to submit the required records or make those records available to WHD within the time WHD requests that the records be produced will be precluded from introducing as evidence in an administrative proceeding under [29 CFR part 6](#) any of the required records that were not provided or made available to WHD. WHD will take into consideration a reasonable request from the contractor or person for an extension of the time for submission of records. WHD will determine the reasonableness of the request and may consider, among other things, the location of the records and the volume of production.

(3) *Required information disclosures.* Contractors and subcontractors must maintain the full Social Security number and last known address, telephone number, and email address

of each covered worker, and must provide them upon request to the contracting agency, the State DOT, the FHWA, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or other compliance action.

4. Apprentices and equal employment opportunity (29 CFR 5.5)

a. *Apprentices* (1) *Rate of pay.* Apprentices will be permitted to work at less than the predetermined rate for the work they perform when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship (OA), or with a State Apprenticeship Agency recognized by the OA. A person who is not individually registered in the program, but who has been certified by the OA or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice, will be permitted to work at less than the predetermined rate for the work they perform in the first 90 days of probationary employment as an apprentice in such a program. In the event the OA or a State Apprenticeship Agency recognized by the OA withdraws approval of an apprenticeship program, the contractor will no longer be permitted to use apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(2) *Fringe benefits.* Apprentices must be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringe benefits must be paid in accordance with that determination.

(3) *Apprenticeship ratio.* The allowable ratio of apprentices to journeyworkers on the job site in any craft classification must not be greater than the ratio permitted to the contractor as to the entire work force under the registered program or the ratio applicable to the locality of the project pursuant to paragraph 4.a.(4) of this section. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated in paragraph 4.a.(1) of this section, must be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under this section must be paid not less than the applicable wage rate on the wage determination for the work actually performed.

(4) *Reciprocity of ratios and wage rates.* Where a contractor is performing construction on a project in a locality other than the locality in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyworker's hourly rate) applicable within the locality in which the construction is being performed must be observed. If there is no applicable ratio or wage rate for the locality of the project, the ratio and wage rate specified in the contractor's registered program must be observed.

b. *Equal employment opportunity.* The use of apprentices and journeyworkers under this part must be in conformity with

the equal employment opportunity requirements of Executive Order 11246, as amended, and [29 CFR part 30](#).

c. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. 23 CFR 230.111(e)(2). The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeyworkers shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract as provided in 29 CFR 5.5.

6. Subcontracts. The contractor or subcontractor must insert FHWA-1273 in any subcontracts, along with the applicable wage determination(s) and such other clauses or contract modifications as the contracting agency may by appropriate instructions require, and a clause requiring the subcontractors to include these clauses and wage determination(s) in any lower tier subcontracts. The prime contractor is responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in this section. In the event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower-tier subcontractors, and may be subject to debarment, as appropriate. 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract as provided in 29 CFR 5.5.

9. Disputes concerning labor standards. As provided in 29 CFR 5.5, disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility. a. By entering into this contract, the contractor certifies that neither it nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of [40 U.S.C. 3144\(b\)](#) or § 5.12(a).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of [40 U.S.C. 3144\(b\)](#) or § 5.12(a).

c. The penalty for making false statements is prescribed in the U.S. Code, Title 18 Crimes and Criminal Procedure, [18 U.S.C. 1001](#).

11. Anti-retaliation. It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

a. Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the DBA, Related Acts, this part, or [29 CFR part 1](#) or [3](#);

b. Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under the DBA, Related Acts, this part, or [29 CFR part 1](#) or [3](#);

c. Cooperating in any investigation or other compliance action, or testifying in any proceeding under the DBA, Related Acts, this part, or [29 CFR part 1](#) or [3](#); or

d. Informing any other person about their rights under the DBA, Related Acts, this part, or [29 CFR part 1](#) or [3](#).

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

Pursuant to 29 CFR 5.5(b), the following clauses apply to any Federal-aid construction contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchpersons and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek. 29 CFR 5.5.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph 1. of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages and interest from the date of the underpayment. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or

mechanic, including watchpersons and guards, employed in violation of the clause set forth in paragraph 1. of this section, in the sum currently provided in 29 CFR 5.5(b)(2)* for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph 1. of this section.

* \$31 as of January 15, 2023 (See 88 FR 88 FR 2210) as may be adjusted annually by the Department of Labor, pursuant to the Federal Civil Penalties Inflation Adjustment Act of 1990.

3. Withholding for unpaid wages and liquidated damages

a. *Withholding process.* The FHWA or the contracting agency may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for any unpaid wages; monetary relief, including interest; and liquidated damages required by the clauses set forth in this section on this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract subject to the Contract Work Hours and Safety Standards Act that is held by the same prime contractor (as defined in § 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to the Contract Work Hours and Safety Standards Act and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld.

b. *Priority to withheld funds.* The Department has priority to funds withheld or to be withheld in accordance with Section IV paragraph 2.a. or paragraph 3.a. of this section, or both, over claims to those funds by:

- (1) A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;
- (2) A contracting agency for its procurement costs;
- (3) A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;
- (4) A contractor's assignee(s);
- (5) A contractor's successor(s); or
- (6) A claim asserted under the Prompt Payment Act, [31 U.S.C. 3901](#)–3907.

4. **Subcontracts.** The contractor or subcontractor must insert in any subcontracts the clauses set forth in paragraphs 1. through 5. of this section and a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor is responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs 1. through 5. In the

event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower-tier subcontractors, and associated liquidated damages and may be subject to debarment, as appropriate.

5. **Anti-retaliation.** It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

- a. Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the Contract Work Hours and Safety Standards Act (CWHSSA) or its implementing regulations in this part;
- b. Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under CWHSSA or this part;
- c. Cooperating in any investigation or other compliance action, or testifying in any proceeding under CWHSSA or this part; or
- d. Informing any other person about their rights under CWHSSA or this part.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System pursuant to 23 CFR 635.116.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term "perform work with its own organization" in paragraph 1 of Section VI refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions: (based on longstanding interpretation)

- (1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
- (2) the prime contractor remains responsible for the quality of the work of the leased employees;

(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and
 (4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract. 23 CFR 635.102.

2. Pursuant to 23 CFR 635.116(a), the contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. Pursuant to 23 CFR 635.116(c), the contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract. (based on long-standing interpretation of 23 CFR 635.116).

5. The 30-percent self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements. 23 CFR 635.116(d).

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR Part 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract. 23 CFR 635.108.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and

health standards (29 CFR Part 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704). 29 CFR 1926.10.

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR Part 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 11, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT (42 U.S.C. 7606; 2 CFR 200.88; EO 11738)

This provision is applicable to all Federal-aid construction contracts in excess of \$150,000 and to all related subcontracts. 48 CFR 2.101; 2 CFR 200.327.

By submission of this bid/proposal or the execution of this contract or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, subcontractor, supplier, or vendor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal Highway Administration and the Regional Office of the Environmental Protection Agency. 2 CFR Part 200, Appendix II.

The contractor agrees to include or cause to be included the requirements of this Section in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements. 2 CFR 200.327.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost \$25,000 or more – as defined in 2 CFR Parts 180 and 1200. 2 CFR 180.220 and 1200.220.

1. Instructions for Certification – First Tier Participants:

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction. 2 CFR 180.320.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default. 2 CFR 180.325.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances. 2 CFR 180.345 and 180.350.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180, Subpart I, 180.900-180.1020, and 1200. "First Tier Covered Transactions" refers to any covered transaction between a recipient or subrecipient of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a recipient or subrecipient of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction. 2 CFR 180.330.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold. 2 CFR 180.220 and 180.300.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. 2 CFR 180.300; 180.320, and 180.325. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. 2 CFR 180.335. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (<https://www.sam.gov/>). 2 CFR 180.300, 180.320, and 180.325.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default. 2 CFR 180.325.

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency, 2 CFR 180.335;

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property, 2 CFR 180.800;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification, 2 CFR 180.700 and 180.800; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default. 2 CFR 180.335(d).

(5) Are not a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(6) Are not a corporation with any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability (USDOT Order 4200.6 implementing appropriations act requirements).

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal. 2 CFR 180.335 and 180.340.

3. Instructions for Certification - Lower Tier Participants:

(Applicable to all subcontracts, purchase orders, and other lower tier transactions requiring prior FHWA approval or estimated to cost \$25,000 or more - 2 CFR Parts 180 and 1200). 2 CFR 180.220 and 1200.220.

a. By signing and submitting this proposal, the prospective lower tier participant is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which

this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances. 2 CFR 180.365.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180, Subpart I, 180.900 – 180.1020, and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a recipient or subrecipient of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a recipient or subrecipient of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated. 2 CFR 1200.220 and 1200.332.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold. 2 CFR 180.220 and 1200.220.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (<https://www.sam.gov/>), which is compiled by the General Services Administration. 2 CFR 180.300, 180.320, 180.330, and 180.335.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily

excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment. 2 CFR 180.325.

4. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

a. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals:

(1) is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency, 2 CFR 180.355;

(2) is a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(3) is a corporation with any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability. (USDOT Order 4200.6 implementing appropriations act requirements)

b. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal.

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000. 49 CFR Part 20, App. A.

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

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

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or

cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

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

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

XII. USE OF UNITED STATES-FLAG VESSELS:

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, or any other covered transaction. 46 CFR Part 381.

This requirement applies to material or equipment that is acquired for a specific Federal-aid highway project. 46 CFR 381.7. It is not applicable to goods or materials that come into inventories independent of an FHWA funded-contract.

When oceanic shipments (or shipments across the Great Lakes) are necessary for materials or equipment acquired for a specific Federal-aid construction project, the bidder, proposer, contractor, subcontractor, or vendor agrees:

1. To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels. 46 CFR 381.7.

2. To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, 'on-board' commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (b)(1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Office of Cargo and Commercial Sealift (MAR-620), Maritime Administration, Washington, DC 20590. (MARAD requires copies of the ocean carrier's (master) bills of lading, certified onboard, dated, with rates and charges. These bills of lading may contain business sensitive information and therefore may be submitted directly to MARAD by the Ocean Transportation Intermediary on behalf of the contractor). 46 CFR 381.7.

**ATTACHMENT A - EMPLOYMENT AND MATERIALS
PREFERENCE FOR APPALACHIAN DEVELOPMENT
HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS
ROAD CONTRACTS (23 CFR 633, Subpart B, Appendix B)**

This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

DOCUMENT 00811

SPECIAL PROVISIONS
MONTHLY PRICE ADJUSTMENT FOR HOT MIX ASPHALT (HMA) MIXTURES
Revised: 02/03/2023

This provision applies to all projects using greater than 100 tons of hot mix asphalt (HMA) mixtures containing liquid asphalt cement as stipulated in the Notice to Contractors section of the bid documents.

Price Adjustments will be based on the variance in price, for the liquid asphalt component only, between the Base Price and the Period Price. They shall not include transportation or other charges. Price Adjustments will occur on a monthly basis.

Base Price

The Base Price of liquid asphalt on a project as listed in the Notice to Contractors section of the bid documents is a fixed price determined by the Department at the time of the bid using the same method as the determination of the Period Price detailed below. The Base Price shall be used in all bids.

Period Price

The Period Price is the price of liquid asphalt for each monthly period as determined by the Department using the average selling price per standard ton of PG64-28 paving grade (primary binder classification) asphalt, FOB manufacturer's terminal, as listed under the "East Coast Market - New England, Boston, Massachusetts area" section of the Poten & Partners, Inc. "Asphalt Weekly Monitor". This average selling price is listed in the issue having a publication date of the second Friday of the month and will be posted as the Period Price for that month. The Department will post this Period Price on its website at <https://www.mass.gov/service-details/massdot-current-contract-price-adjustments> following its receipt of the relevant issue of the "Asphalt Weekly Monitor". Poten and Partners has granted the Department the right to publish this specific asphalt price information sourced from the Asphalt Weekly Monitor.

Price Adjustment Determination, Calculation and Payment

The Contract Price of the HMA mixture will be paid under the respective item in the Contract. Price Adjustments, as herein provided, either upwards or downwards, will be made after the work has been performed using the monthly period price for the month during which the work was performed.

Price Adjustments will be paid only if the variance from the Base Price is 5% or more for a monthly period. The complete adjustment will be paid in all cases with no deduction of the 5% from either upward or downward adjustments.

The Price Adjustment applies only to the actual virgin liquid asphalt content in the mixture placed on the job in accordance with the approved Job Mix Formula.

Price Adjustments will be separate payment items. The pay item numbers are 999.401 for a positive price adjustment (a payment) and 999.402 for a negative price adjustment (a deduction). Price Adjustments will be calculated using the following equation:

Price Adjustment = Tons of HMA Placed X Liquid Asphalt Content % X RAP Factor X (Period Price - Base Price)

No Price Adjustment will be allowed beyond the Completion Date of this Contract, unless there is a Department-approved extension of time.

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DOCUMENT 00812

SPECIAL PROVISIONS
MONTHLY PRICE ADJUSTMENT FOR DIESEL FUEL AND GASOLINE –
ENGLISH UNITS
Revised: 02/01/2021

This monthly fuel price adjustment is inserted in this contract because the national and worldwide energy situation has made the future cost of fuel unpredictable. This adjustment will provide for either additional compensation to the Contractor or repayment to the Commonwealth, depending on an increase or decrease in the average price of diesel fuel or gasoline.

This adjustment will be based on fuel usage factors for various items of work developed by the Highway Research Board in Circular 158, dated July 1974. These factors will be multiplied by the quantities of work done in each item during each monthly period and further multiplied by the variance in price from the Base Price to the Period Price.

The Base Price of Diesel Fuel and Gasoline will be the price as indicated in the Department's web site <https://www.mass.gov/service-details/massdot-current-contract-price-adjustments> for the month in which the contract was bid, which includes State Tax.

The Period Price will be the average of prices charged to the State, including State Tax for the bulk purchases made during each month.

This adjustment will be effected only if the variance from the Base Price is 5% or more for a monthly period. The complete adjustment will be paid in all cases with no deduction of the 5% from either upward or downward adjustments.

No adjustment will be paid for work done beyond the extended completion date of any contract.

Any adjustment (increase or decrease) to estimated quantities made to each item at the time of final payment will have the fuel price adjustment figured at the average period price for the entire term of the project for the difference of quantity.

The fuel price adjustment will apply only to the following items of work at the fuel factors shown:

ITEMS COVERED	FUEL FACTORS	
	Diesel	Gasoline
Excavation: and Borrow Work: Items 120, 120.1, 121, 123, 124, 125, 127, 129.3, 140, 140.1, 141, 142, 143, 144, 150, 150.1, 151 and 151.1 (Both Factors used)	0.29 Gallons / CY.	0.15 Gallons / CY
Surfacing Work: All Items containing Hot Mix Asphalt	2.90 Gallons / Ton	Does Not Apply

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DOCUMENT 00813

SPECIAL PROVISIONS

PRICE ADJUSTMENTS FOR STRUCTURAL STEEL AND REINFORCING STEEL

July 18, 2024

This special provision applies to all projects containing the use of structural steel and/or reinforcing steel as specified elsewhere in the Contract work. It applies to all structural steel and all reinforcing steel, as defined below, on the project. Compliance with this provision is mandatory, i.e., there are no “opt-in” or “opt-out” clauses. Price adjustments will be handled as described below and shall only apply to unfabricated reinforcing steel bars and unfabricated structural steel material, consisting of rolled shapes, plate steel, sheet piling, pipe piles, steel castings and steel forgings.

Price adjustments will be variances between Base Prices and Period Prices. Base Prices and Period Prices are defined below.

Price adjustments will only be made if the variances between Base Prices and Period Prices are 5% or more. A variance can result in the Period Price being either higher or lower than the Base Price. Once the 5% threshold has been achieved, the adjustment will apply to the full variance between the Base Price and the Period Price.

Price adjustments will be calculated by multiplying the number of pounds of unfabricated structural steel material or unfabricated reinforcing steel bars on a project by the index factor calculated as shown below under Example of a Period Price Calculation.

Price adjustments will not include guardrail panels or 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.

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

Base Prices and Period Prices are defined as follows:

Base Prices of unfabricated structural steel and unfabricated reinforcing steel on a project are fixed prices determined by the Department and found in the table below. While it is the intention of the Department to make this table comprehensive, some of a project’s unfabricated structural steel and/or unfabricated reinforcing steel may be inadvertently omitted. Should this occur, the Contractor shall bring the omission to the Department’s attention so that a contract alteration may be processed that adds the missing steel to the table and its price adjustments to the Contract.

The Base Price Date is the month and year of the most recent finalized period price index at the time that MassDOT opened bids for the project. The Base Price Index for this contract is the Steel PPI listed in the Notice to Contractors.

Period Prices of unfabricated structural steel and unfabricated reinforcing steel on a project are variable prices that have been calculated using the Period Price Date and an index of steel prices to adjust the Base Price.

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.

The index used for the calculation of Period Prices is the U.S. Department of Labor Bureau of Labor Statistics 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 (4) 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)”.

Period Prices are determined as follows:

Period Price = Base Price X Index Factor

Index Factor = Period Price Index / Base Price Index

Example of a Period Price Calculation:

Calculate the Period Price for December 2009 using a Base Price from March 2009 of \$0.82/Pound for 1,000 Pounds of ASTM A709 (AASHTO M270) Grade A36 Structural Steel Plate.

The Period Price Date is December 2009. From the PPI website*, the Period Price Index = 218.0.

The Base Price Date is March 2009. From the PPI website*, the Base Price Index = 229.4.

Index Factor = Period Price Index / Base Price Index = $218.0 / 229.4 = 0.950$

Period Price = Base Price X Index Factor = $\$0.82/\text{Pound} \times 0.950 = \$0.78/\text{Pound}$

Since $\$0.82 - \$0.78 = \$0.04$ is less than 5% of \$0.82, no price adjustment is required.

If the \$0.04 difference shown above was greater than 5% of the Base Price, then the price adjustment would be 1,000 Pounds X \$0.04/Pound = \$40.00. Since the Period Price of \$0.78/Pound is less than the Base Price of \$0.82/Pound, indicating a drop in the price of steel between the bid and the delivery of material, a credit of \$40.00 would be owed to MassDOT. When the Period Price is higher than the Base Price, the price adjustment is owed to the Contractor.

* To access the PPI website and obtain a Base Price Index or a Period Price Index, go to

<http://data.bls.gov/cgi-bin/srgate>

End of example.

The Contractor will be paid for unfabricated structural steel and unfabricated reinforcing steel under the respective contract pay items for all components constructed of either structural steel or reinforced Portland cement concrete under their respective Contract Pay Items.

Price adjustments, as herein provided for, will be paid separately as follows:

Structural Steel

Pay Item Number 999.449 for positive (+) pay adjustments (payments to the Contractor)

Pay Item Number 999.457 for negative (-) pay adjustments (credits to MassDOT Highway Division)

Reinforcing Steel

Pay Item Number 999.466 for positive (+) pay adjustments (payments to the Contractor)

Pay Item Number 999.467 for negative (-) pay adjustments (credits to MassDOT Highway Division)

No price adjustment will be made for price changes after the Contract Completion Date, unless the MassDOT Highway Division has approved an extension of Contract Time for the Contract.

TABLE

Steel Type		Price per Pound
1	ASTM A615/A615M Grade 60 (AASHTO M31 Grade 60 or 420) Reinforcing Steel	\$0.66
2	ASTM A27 (AASHTO M103) Steel Castings, H-Pile Points & Pipe Pile Shoes (See Note below.)	\$0.90
3	ASTM A668 / A668M (AASHTO M102) Steel Forgings	\$0.90
4	ASTM A108 (AASHTO M169) Steel Forgings for Shear Studs	\$0.93
5	ASTM A709/A709M Grade 36 / AASHTO M270M/M270 Grade 36 or 250 Structural Steel Plate	\$1.00
6	ASTM A709/A709M Grade 36 / AASHTO M270M/M270 Grade 36 or 250 Structural Steel Shapes	\$0.92
7	ASTM A709/A709M Grade 50 / AASHTO M270M/M270 Grade 50 or 345 Structural Steel Plate	\$1.00
8	ASTM A709/A709M Grade 50 / AASHTO M270M/M270 Grade 50 or 345 Structural Steel Shapes	\$0.92
9	ASTM A709/A709M Grade 50WT / AASHTO M270M/M270 Grade 50WT or 345WT Structural Steel Plate	\$1.04
10	ASTM A709/A709M Grade 50WT / AASHTO M270M/M270 Grade 50WT or 345WT Structural Steel Shapes	\$0.93
11	ASTM A709/A709M Grade 50W / AASHTO M270M/M270 Grade 50W 345W Structural Steel Plate	\$1.04
12	ASTM A709/A709M Grade 50W / AASHTO M270M/M270 Grade 50W or 345W Structural Steel Shapes	\$0.93
13	ASTM A709/A709M Grade HPS 50W / AASHTO M270M/M270 Grade HPS 50W or 345W Structural Steel Plate	\$1.09
14	ASTM A709/A709M Grade HPS 70W / AASHTO M270M/M270 Grade HPS 70W or 485W Structural Steel Plate	\$1.16
15	ASTM A514/A514M-05 Grade HPS 100W / AASHTO M270M/M270 Grade HPS 100W or 690W Structural Steel Plate	\$1.78
16	ASTM A992/A992M Grade 50S / AASHTO M270M/M270 Grade 50S or 345S Structural Steel Plate	\$1.04
17	ASTM A992/A992M Grade 50S / AASHTO M270M/M270 Grade 50S or 345S Structural Steel Shapes	\$0.93
18	ASTM A276 Type 316 Stainless Steel	\$5.30
19	ASTM A240 Type 316 Stainless Steel	\$5.30
20	ASTM A148 Grade 80/50 Steel Castings (See Note below.)	\$1.83
21	ASTM A53 Grade B Structural Steel Pipe	\$1.16
22	ASTM A500 Grades A, B, 36 & 50 Structural Steel Pipe	\$1.16
23	ASTM A252, Grades 240 (36 KSI) & 414 (60 KSI) Pipe Pile	\$0.91
24	ASTM 252, Grade 2 Permanent Steel Casing	\$0.91
25	ASTM A36 (AASHTO M183) for H-piles, steel supports and sign supports	\$0.98
26	ASTM A328 / A328M, Grade 50 (AASHTO M202) Steel Sheetpiling	\$1.75
27	ASTM A572 / A572M, Grade 50 Sheetpiling	\$1.75
28	ASTM A36/36M, Grade 50	\$1.00
29	ASTM A570, Grade 50	\$0.98
30	ASTM A572 (AASHTO M223), Grade 50 H-Piles	\$1.00
31	ASTM A1085 Grade A (50 KSI) Steel Hollow Structural Sections (HSS), heat-treated per ASTM A1085 Supplement S1	\$1.16
32	AREA 140 LB Rail and Track Accessories	\$0.60

NOTE: Steel Castings are generally used only on moveable bridges. Cast iron frames, grates and pipe are not “steel” castings and will not be considered for price adjustments.

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DOCUMENT 00814

SPECIAL PROVISIONS
PRICE ADJUSTMENT FOR PORTLAND CEMENT CONCRETE MIXES

January 12, 2009

This provision applies to all projects using greater than 100 Cubic Yards (76 Cubic Meters) of Portland cement concrete containing Portland cement as stipulated in the Notice to Contractors section of the Bid Documents. This Price Adjustment will occur on a monthly basis.

The Price Adjustment will be based on the variance in price for the Portland cement component only from the Base Price to the Period Price. It shall not include transportation or other charges.

The Base Price of Portland cement on a project is a fixed price determined at the time of bid by the Department by using the same method as for the determination of the Period Price (see below) and found in the Notice to Contractors.

The Period Price of Portland cement will be determined by using the latest published price, in dollars per ton (U.S.), for Portland cement (Type I) quoted for Boston, U.S.A. in the **Construction Economics** section of *ENR Engineering News-Record* magazine or at the ENR website <http://www.enr.com> under **Construction Economics**. The Period Price will be posted on the MassDOT website the Wednesday immediately following the publishing of the monthly price in ENR, which is normally the first week of the month.

The Contract Price of the Portland cement concrete mix will be paid under the respective item in the Contract. The price adjustment, as herein provided, upwards or downwards, will be made after the work has been performed, using the monthly period price for the month during which the work was performed.

The price adjustment applies only to the actual Portland cement content in the mix placed on the job in accordance with the Standard Specifications for Highways and Bridges, Division III, Section M4.02.01. No adjustments will be made for any cement replacement materials such as fly ash or ground granulated blast furnace slag.

The Price Adjustment will be a separate payment item. It will be determined by multiplying the number of cubic yards of Portland cement concrete placed during each monthly period times the Portland cement content percentage times the variance in price between the Base Price and Period Price of Portland cement.

This Price Adjustment will be paid only if the variance from the Base Price is 5% or more for a monthly period. The complete adjustment will be paid in all cases with no deduction of the 5% from either upward or downward adjustments.

No Price Adjustment will be allowed beyond the Completion Date of this Contract, unless there is a Department-approved extension of time.

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DOCUMENT 00820

**THE COMMONWEALTH OF MASSACHUSETTS
SUPPLEMENTAL EQUAL EMPLOYMENT OPPORTUNITY,
NON-DISCRIMINATION AND AFFIRMATIVE ACTION PROGRAM**

I. Definitions

For purposes of this contract,

"Minority" means a person who meets one or more of the following definitions:

- (a) American Indian or Native American means: all persons having origins in any of the original peoples of North America and who are recognized as an Indian by a tribe or tribal organization.
- (b) Asian means: All persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian sub-continent, or the Pacific Islands, including, but Not limited to China, Japan, Korea, Samoa, India, and the Philippine Islands.
- (c) Black means: All persons having origins in any of the Black racial groups of Africa, including, but not limited to, African-Americans, and all persons having origins in any of the original peoples of the Cape Verdean Islands.
- (d) Eskimo or Aleut means: All persons having origins in any of the peoples of Northern Canada, Greenland, Alaska, and Eastern Siberia.
- (e) Hispanic means: All persons having their origins in any of the Spanish-speaking peoples of Mexico, Puerto Rico, Cuba, Central or South America, or the Caribbean Islands.

"State construction contract" means a contract for the construction, reconstruction, installation, demolition, maintenance or repair of a building or capital facility, or a contract for the construction, reconstruction, alteration, remodeling or repair of a public work undertaken by a department, agency, board, or commission of the commonwealth.

"State assisted construction contract" means a contract for the construction, reconstruction, installation, demolition, maintenance or repair of a building or capital facility undertaken by a political subdivision of the commonwealth, or two or more political subdivisions thereof, an authority, or other instrumentality and whose costs of the contract are paid for, reimbursed, grant funded, or otherwise supported, in whole or in part, by the commonwealth.

II. Equal Opportunity, Non-Discrimination and Affirmative Action

During the performance of this Contract, the Contractor and all subcontractors (hereinafter collectively referred to as "the Contractor") for a state construction contract or a state assisted construction contract, for him/herself, his/her assignees and successors in interest, agree to comply with all applicable equal employment opportunity, non-discrimination and affirmative action requirements, including but not limited to the following:

In connection with the performance of work under this contract, the Contractor shall not discriminate against any employee or applicant for employment because of race, color, religious creed, national origin, sex, sexual orientation, genetic information, military service, age, ancestry or disability, shall not discriminate in the selection or retention of subcontractors, and shall not discriminate in the procurement of materials and rentals of equipment.

The aforesaid provision shall include, but not be limited to, the following: employment upgrading, demotion, or transfer; recruitment advertising, layoff or termination; rates of pay or other forms of compensation; conditions or privileges of employment; and selection for apprenticeship or on-the-job training opportunity. The Contractor shall comply with the provisions of chapter 151B of the Massachusetts General Laws, as amended, and all other applicable anti-discrimination and equal opportunity laws, all of which are herein incorporated by reference and made a part of this Contract.

The Contractor shall post hereafter in conspicuous places, available for employees and applicants for employment, notices to be provided by the Massachusetts Commission Against Discrimination setting forth the provisions of the Fair Employment Practices Law of the Commonwealth (Massachusetts General Laws Chapter 151 B).

In connection with the performance of work under this contract, the Contractor shall undertake, in good faith, affirmative action measures to eliminate any discriminatory barriers in the terms and conditions of employment on the grounds of race, color, religious creed, national origin, sex, sexual orientation, genetic information, military service, age, ancestry or disability. Such affirmative action measures shall entail positive and aggressive measures to ensure nondiscrimination and to promote equal opportunity in the areas of hiring, upgrading, demotion or transfer, recruitment, layoff or termination, rate of compensation, apprenticeship and on-the-job training programs. A list of positive and aggressive measures shall include, but not be limited to, advertising employment opportunities in minority and other community news media; notifying minority, women and other community-based organizations of employment opportunities; validating all job specifications, selection requirements, and tests; maintaining a file of names and addresses of each worker referred to the Contractor and what action was taken concerning such worker; and notifying the administering agency in writing when a union with whom the Contractor has a collective bargaining agreement has failed to refer a minority or woman worker. These and other affirmative action measures shall include all actions required to guarantee equal employment opportunity for all persons, regardless of race, color, religious creed, national origin, sex, sexual orientation, genetic information, military service, age, ancestry or disability. One purpose of this provision is to ensure to the fullest extent possible an adequate supply of skilled tradesmen for this and future Commonwealth public construction projects.

III. Minority and Women Workforce Participation

Pursuant to his/her obligations under the preceding section, the Contractor shall strive to achieve on this project the labor participation goals contained herein. Said participation goals shall apply in each job category on this project including but not limited to bricklayers, carpenters, cement masons, electricians, ironworkers, operating engineers and those classes of work enumerated in Section 44F of Chapter 149 of the Massachusetts General Laws. The participation goals for this project shall be 15.3% for minorities and 6.9% for women. The participation goals, as set forth herein, shall not be construed as quotas or set-asides; rather, such participation goals will be used to measure the progress of the Commonwealth's equal opportunity, non-discrimination and affirmative action program. Additionally, the participation goals contained herein should not be seen or treated as a floor or as a ceiling for the employment of particular individuals or group of individuals.

IV. Liaison Committee

At the discretion of the agency that administers the contract for the construction project there may be established for the life of the contract a body to be known as the Liaison Committee. The Liaison Committee shall be composed of one representative each from the agency or agencies administering the contract for the construction project, hereinafter called the administering agency, a representative from the Office of Affirmative action, and such other representatives as may be designated by the administering agency. The Contractor (or his/her agent, if any, designated by him/her 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.

V. Reports and Records

The Contractor shall prepare projected workforce tables on a quarterly basis when required by the administering agency. 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 also, when updated, to the administering agency and the Liaison Committee when required.

The Contractor shall prepare weekly reports in a form approved by the administering agency, unless information required is required to be reported electronically by the administering agency, the number of hours worked in each trade by each employee, identified as woman, minority, or non-minority. Copies of these shall be provided at the end of each such week to the administering agency and the Liaison Committee.

Records of employment referral orders, prepared by the Contractor, shall be made available to the administering agency on request.

The Contractor will provide all information and reports required by the administering agency on instructions issued by the administering agency and will permit access to its facilities and any books, records, accounts and other sources of information which may be determined by the administering agency to effect the employment of personnel. This provision shall apply only to information pertinent to the Commonwealth's supplementary non-discrimination, equal opportunity and access and opportunity 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 administering agency and shall set forth what efforts he has made to obtain the information.

VI. Access to Work Site

A designee of the administering agency and a designee of the Liaison Committee shall each have a right to access the work site.

VII. Solicitations for Subcontracts, and for the Procurement of Materials and Equipment

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 equal opportunity.

VIII. Sanctions

Whenever the administering agency believes the General or Prime Contractor or any subcontractor may not be operating in compliance with the provisions of the Fair Employment Practices Law of the Commonwealth (Massachusetts General Laws Chapter 151B), the administering agency may refer the matter to the Massachusetts Commission Against Discrimination ("Commission") for investigation.

Following the referral of a matter by the administering agency to the Massachusetts Commission Against Discrimination, and while the matter is pending before the MCAD, the administering agency may withhold payments from contractors and subcontractors when it has documentation that the contractor or subcontractor has violated the Fair Employment Practices Law with respect to its activities on the Project, or if the administering agency determines that the contractor has materially failed to comply with its obligations and the requirements of this Section. The amount withheld shall not exceed a withhold of payment to the General or Prime Contractor of 1/100 or 1% of the contract award price or \$5,000, whichever sum is greater, or, if a subcontractor is in non-compliance, a withhold by the administering agency from the General Contractor, to be assessed by the General Contractor as a charge against the subcontractor, of 1/100 or 1% of the subcontractor price, or \$1,000 whichever sum is greater, for each violation of the applicable law or contract requirements. The total withheld from anyone General or Prime Contractor or subcontractor on a Project shall not exceed \$20,000 overall. No withhold of payments or investigation by the Commission or its agent shall be initiated without the administering agency providing prior notice to the Contractor.

If, after investigation, the Massachusetts Commission Against Discrimination finds that a General or Prime Contractor or subcontractor, in commission of a state construction contract or state-assisted construction contract, violated the provisions of the Fair Employment Practices Law, the administering agency may convert the amount withheld as set forth above into a permanent sanction, as a permanent deduct from payments to the General or Prime Contractor or subcontractor, which sanction will be in addition to any such sanctions, fines or penalties imposed by the Massachusetts Commission Against Discrimination.

No sanction enumerated under this Section shall be imposed by the administering agency except after notice to the General or Prime Contractor or subcontractor and an adjudicatory proceeding, as that term is used, under Massachusetts General Laws Chapter 30A, has been conducted.

IX. Severability

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

X. Contractor's Certification

After award and prior to the execution of any contract for a state construction contract or a state assisted construction contract, the Prime or General Contractor shall certify that it will comply with all provisions of this Document 00820 Supplemental Equal Employment Opportunity, Non-Discrimination and Affirmative Action Program, by executing Document 00859 Contractor/Subcontractor Certification Form.

XI. Subcontractor Requirements

Prior to the award of any subcontract for a state construction contract or a state assisted construction contract, the Prime or General Contractor shall provide all prospective subcontractors with a complete copy of this Document 00820 entitled "Supplemental Equal Employment Opportunity, Non-Discrimination and Affirmative Action Program" and will incorporate the provisions of this Document 00820 into any and all contracts or work orders for all subcontractors providing work on the Project. In order to ensure that the said subcontractor's certification becomes a part of all subcontracts under the prime contract, the Prime or General Contractor shall certify in writing to the administering agency that it has complied with the requirements as set forth in the preceeding paragraph by executing Document 00859 Contractor/Subcontractor Certification Form.

Rev'd 03/07/14

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DOCUMENT 00821

**ELECTRONIC REPORTING REQUIREMENTS
CIVIL RIGHTS PROGRAMS AND CERTIFIED PAYROLL**

Implemented on March 2, 2009

Revised June 04, 2019

The Massachusetts Department Of Transportation (MassDOT) has replaced the CHAMP reporting system with Equitable Business Opportunity Solution (EBO), a new web-based civil rights reporting software system. This system is capable of handling both civil rights reporting requirements and certified payrolls. The program's functions include the administration of Equal Employment Opportunity (EEO) requirements, On-The-Job Training requirements (OJT), Disadvantage Business Enterprise (DBE) and/or Minority / Women's Business Enterprise (M/WBE) subcontracting requirements, and the electronic collection of certified payrolls associated with MassDOT projects. In addition, this system is used to generate various data required as part of the American Recovery and Reinvestment Act (ARRA). Contractors are responsible for all coordination with all sub-contractors to ensure timely and accurate electronic submission of all required data.

Contractor and Sub-Contractor EBO User Certification

All contractors and sub-contractors must use the EBO software system. The software vendor, Internet Government Solutions (IGS), has developed an online EBO Training Module that is available to contractors and sub-contractors. This module is a self-tutorial which allows all users in the company to access the training, complete the tutorial, and become certified as EBO users for a one time fee of \$75.00. This is the only cost to contractors and sub-contractors associated with the EBO software system. The online EBO Training Module can be accessed at www.ebotraining.com. Click the "Register My Company" button on the login page to begin your training registration. Questions regarding EBO online training should be directed to Gerry Anguilano, IGS at (440) 238-1684.

MassDOT will track contractors and sub-contractors who have successfully completed the on-line training module. All persons performing civil rights program and/or certified payroll functions should be EBO certified.

Vetting of Firms and Designated Firm Individuals

Contractors must authorize a Primary Log-In ID Holder who has completed EBO on-line training to have access to the EBO system by completing and submitting the "Request For EBO System Log-In/Password Form" located on the MassDOT website at: <https://www.mass.gov/how-to/how-to-get-an-ebo-login>. Contractors must also agree to comply with the EBO system user agreement located on the MassDOT website.

All subcontracts entered into on a project must include language that identifies the submission and training requirements that the sub-contractor must perform. Sub-contractors will be approved by the respective District Office of MassDOT through the existing approval process. When new sub-contractors, who have not previously worked for MassDOT, are initially selected by a general contractor, the new sub-contractor must be approved by the District before taking the EBO on-line training module.

Interim Reporting Requirements

Until MassDOT is satisfied that the EBO system is fully operational and functioning as designed, contractors and sub-contractors will be required to submit certified payrolls manually. There will be a transition period where dual reporting, through manual and electronic submission, will be required. MassDOT, however, will notify contractors and sub-contractors when they may cease manual submission of certified payrolls.

*** END OF DOCUMENT ***

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DOCUMENT 00859

CONTRACTOR/SUBCONTRACTOR CERTIFICATION FORM ‡*The contractor shall submit this completed document 00859 to MassDOT for each subcontract.*_____
(Contractor) Date: __________
(Subcontractor) ☐ District Approved
SubcontractorContract No: 126586 Project No. 608851 Federal Aid No.: BFS(BR-OFF)-003S(750)XLocation: HARDWICK-NEW BRAINTREEProject Description: Bridge Replacement, H-08-003=N-07-002, Creamery Road over Ware River

PART 1 CONTRACTOR CERTIFICATION: I hereby certify, as an authorized official of this company, that to the best of my knowledge, information and belief, the company is in compliance with all applicable federal and state laws, rules, and regulations governing fair labor and employment practices, that the company will not discriminate in their employment practices, that the company will make good faith efforts to comply with the minority employee and women employee workforce participation ratio goals and specific affirmative action steps contained in Contract Document 00820 The Commonwealth of Massachusetts Supplemental Equal Employment Opportunity, Non-Discrimination and Affirmative Action Program, and that the company will comply with the special provisions and documentation indicated below (as checked).

I further hereby certify, as an authorized official of this company, that the special provisions and documentation indicated below (as checked) have been or are included in, and made part of, the Subcontractor Agreement entered into with the firm named above.

☐ **This is not a Federally-aided construction project****Document #**

- ☐ 00718 –Participation By Minority Or Women's Business Enterprises and SDVOBE†
- ☐ 00761 –Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion
- ☐ 00820 – MA Supplemental Equal Employment Opportunity, Non-Discrimination, and Affirmative Action Program
- ☐ 00821 – Electronic Reporting Requirements, Civil Rights Programs, and Certified Payroll
- ☐ 00859 – Contractor/Subcontractor Certification Form (this document)
- ☐ 00860 – MA Employment Laws
- ☐ 00861 – Applicable State Wage Rates in the Contract Proposal**
- ☐ B00842 – MA Schedule of Participation By Minority or Women Business Enterprises (M/WBEs)†
- ☐ B00843 – MA Letter of Intent – M/WBEs†
 - ** Does not apply to Material Suppliers, unless performing work on-site
 - † Applies only if Subcontractor is a M/WBE; only include these forms for the particular M/WBE Entity
- ☐ B00844 - Schedule of Participation By SDVOBE
- ☐ B00845 - Letter of Intent – SDVOBE
- ☐ B00846 – M/WBE or SDVOBE Joint Check Arrangement Approval Form
- ☐ B00847 – Joint Venture Affidavit

☐ **This is a Federally-aided construction project (Federal Aid Number is present)****Document #**

- ☐ 00719 – Special Provisions for Participation by Disadvantaged Business Enterprises†
- ☐ 00760 - Form FHWA 1273 - Required Contract Provisions for Federal-Aid Construction Contracts
- ☐ 00820 – MA Supplemental Equal Employment Opportunity, Non-Discrimination and Affirmative Action Program
- ☐ 00821 – Electronic Reporting Requirements, Civil Rights Programs and Certified Payroll
- ☐ 00859 – Contractor/Subcontractor Certification Form (this document)
- ☐ 00860 – MA Employment Laws
- ☐ 00870 – Standard Federal Equal Employment Opportunity Construction Contract Specifications Executive Order 11246, (41 CFR Parts 60-4.2 and 60-4.3 (Solicitations and Equal Opportunity Clauses))*
- ☐ 00875 – Federal Trainee Special Provisions

- ☐ B00853 – Schedule of Participation by Disadvantaged Business Enterprise†
☐ B00854 – Letter of Intent – DBEs†
☐ B00855 – DBE Joint Check Arrangement Approval Form
☐ B00856 – Joint Venture Affidavit
☐ 00861/00880 - Applicable state and federal wage rates from Contract Proposal**

*Applicable only to Contracts or Subcontracts in excess of \$10,000

**Does not apply to Material Suppliers, unless performing work on-site

† Applies only if Subcontractor is a DBE; only include these forms for the particular DBE Entity

Signed this _____ Day of _____, 20____ Under The Pains And Penalties Of Perjury.

(Print Name and Title)

(Authorized Signature)

PART 2

PART 2. SUBCONTRACTOR CERTIFICATION: I hereby certify, as an authorized official of this company, that the required documents in Part 1 above were physically incorporated in our Agreement/Subcontract with the Contractor and give assurance that this company will fully comply or make every good faith effort to comply with the same. I further certify that:

1. This company recognizes that if this is a Federal-Aid Project, then this Contract is covered by the equal employment opportunity laws administered and enforced by the United States Department of Labor ("USDOL"), Office of Federal Contract Compliance Programs ("OFCCP"). By signing below, we acknowledge that this company has certain reporting obligations to the OFCCP, as specified by 41 CFR Part 60-4.2.
2. This company further acknowledges that any contractor with fifty (50) or more employees on a Federal-aid Contract with a value of fifty-thousand (\$50,000) dollars or more must annually file an EEO-1 Report (SF 100) to the EEOC, Joint Reporting Committee, on or before September 30th, each year, as specified by 41 CFR Part 60-1.7a.
3. For more information regarding the federal reporting requirements, please contact the USDOL, OFCCP Regional Office, at 1-646-264-3170 or EEO-1, Joint Reporting Committee at 1-866-286-6440. You may also find guidance at: <http://www.dol.gov/ofccp/TAguides/constagtag.pdf> or <http://www.wdol.gov/dba.aspx#0>.
4. This company ☐ has, ☐ has not, participated in a previous contract or subcontract subject to the Equal Opportunity clauses set forth in 41 CFR Part 60-4 and Executive Order 11246, and where required, has filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance Programs or the EEO Commission all reports due under the applicable filing requirements.
5. This company is in full compliance with applicable Federal and Commonwealth of Massachusetts laws, rules, and regulations and is not currently debarred or disqualified from bidding on or participating in construction contracts in any jurisdiction of the United States. See : <https://www.mass.gov/service-details/contractors-and-vendors-suspended-or-debarred-by-massdot>
6. This company is properly registered and in good standing with the Office of the Secretary of the Commonwealth.

Signed this _____ Day of _____, 20____, Under The Pains And Penalties Of Perjury.

Firm: _____

Address: _____

Telephone Number: _____

Federal I.D. Number: _____

Estimated Start Date: _____

Estimated Completion Date: _____

Estimated Dollar Amount: _____

(Print Name and Title)

(Authorized Signature)

(Date)

DOCUMENT 00860

COMMONWEALTH OF MASSACHUSETTS PUBLIC EMPLOYMENT LAWS

Revised February 20, 2019

The Contractor's attention is directed to Massachusetts General Laws, Chapter 149, Sections 26 through 27H, and 150A. This contract is considered to fall within the ambit of that law, which provides that in general, the Prevailing Rate or Total Rate must be paid to employees working on projects funded by the Commonwealth of Massachusetts or any political subdivision including Massachusetts Department of Transportation (MassDOT).

A Federal Aid project is also subject to the Federal Minimum Wage Rate law for construction. When comparing a state minimum wage rate, monitored by the Massachusetts Attorney General, versus federal minimum wage rate, monitored by the U.S. Department of Labor Wage and Hour Division, for a particular job classification the higher wage is at all times to be paid to the affected employee.

Every contractor or subcontractor engaged in this contract to which sections twenty-seven and twenty-seven A apply will keep a true and accurate record of all mechanics and apprentices, teamsters, chauffeurs and laborers employed thereon, showing the name, address and occupational classification of each such employee on this contract, and the hours worked by, and the wages paid to, each such employee, and shall furnish to the MassDOT's Resident Engineer, on a weekly basis, a copy of said record, in a form approved by MassDOT and in accordance with M.G.L. c. 149, § 27B, signed by the employer or his/her authorized agent under the penalties of perjury.

Each such contractor or subcontractor shall preserve its payroll records for a period of three years from the date of completion of the contract.

The Prevailing Wage Rate generally includes the following:

Minimum Hourly Wage + Employer Contributions to Benefit Plans = Prevailing Wage Rate or Total Rate

Any employer who does not make contributions to Benefit Plans must pay the total Prevailing Wage Rate directly to the employee.

Any deduction from the Prevailing Wage Rate or Total Rate for contributions to benefit plans can only be for a Health & Welfare, Pension, or Supplementary Unemployment plan meeting the requirements of the Employee Retirement Income Security Act (ERISA) of 1974. The maximum allowable deduction for these benefits from the prevailing wage rate cannot be greater than the amount allowed by Executive Office of Labor (EOL) for the specified benefits. Any additional expense of providing benefits to the employees is to be borne by the employer and cannot be deducted from the Minimum Hourly Wage. If the employer's benefit expense is less than that so provided by EOL the difference will be paid directly to the employee. The rate established must be paid to all employees who perform work on the project.

When an employer makes deductions from the Minimum Hourly Wage for an employee's contribution to social security, state taxes, federal taxes, and/or other contribution programs, allowed by law, the employer shall furnish each employee a suitable pay slip, check stub or envelope notifying the employee of the amount of the deductions.

No contractor or subcontractor contracting for any part of the contract week shall require or permit any laborer or mechanic to be employed on such work in excess of forty hours in any workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times his basic rate of pay for all hours worked in excess of forty hours in such workweek, whichever is the greater number of overtime hours.

Apprentice Rates are permitted only when there is an Apprentice Agreement registered with the Massachusetts Division of Apprentice Training in accordance with M.G.L. c. 23, § 11E-11L.

The Prevailing Wage Rates issued for each project shall be the rates paid for the entire project. The Prevailing Wage Rates must be posted on the job site at all times and be visible from a public way.

In addition, each such contractor and subcontractor shall furnish to the MassDOT's Resident Engineer, within fifteen days after completion of its portion of the work, a statement, executed by the contractor or subcontractor or by any authorized officer or employee of the contractor or subcontractor who supervises the payment of wages, in the following form:

STATEMENT OF COMPLIANCE

Date: _____

I, _____ do hereby state:
(Name of signatory party) (Title)

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

(Contractor or Subcontractor)

on the _____
(MassDOT Project Location and Contract Number)

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 _____

The above-mentioned copies of payroll records and statements of compliance shall be available for inspection by any interested party filing a written request to the MassDOT's Resident Engineer for such inspection and copying.

Massachusetts General Laws c. 149, §27, requires annual updates to prevailing wage schedules for all public construction contracts lasting longer than one year. MassDOT will request the required updates and furnish them to the Contractor. The Contractor is required to pay no less than the wage rates indicated on the annual updated wage schedules.

MassDOT will request the updates no later than two weeks before the anniversary of the Notice to Proceed date of the contract to allow for adequate processing by the Department of Labor Standards (DLS). The effective date for the new rates will be the anniversary date of the contract (i.e. the notice to proceed date), regardless of the date of issuance on the schedule from DLS.

All bidders are cautioned that the aforementioned laws require that employers pay to covered employees no less than the applicable minimum wages. In addition, the same laws require that the applicable prevailing wages become incorporated as part of this contract. The prevailing minimum wage law establishes serious civil and criminal penalties for violations, including imprisonment and exclusion from future public contracts. Bidders are cautioned to carefully read the relevant sections of the Massachusetts General Laws.

*** END OF DOCUMENT ***

DOCUMENT 00861

STATE PREVAILING WAGE RATES

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MAURA HEALEY
Governor

KIM DRISCOLL
Lt. Governor

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DEPARTMENT OF LABOR STANDARDS

Prevailing Wage Rates

**As determined by the Director under the provisions of the
Massachusetts General Laws, Chapter 149, Sections 26 to 27H**

LAUREN JONES
Secretary

MICHAEL FLANAGAN
Director

Awarding Authority: MassDOT Highway
Contract Number: 126586 **City/Town:** HARDWICK
Description of Work: HARDWICK-NEW BRAINTREE: Federal Aid Project No. BFS(BR-OFF)-003S(750)X Bridge Replacement, H-08-003=N-07-002, Creamery Road over Ware River
Job Location: Creamery Road over Ware River

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

- The wage rates will remain in effect for the duration of the project, except in the case of multi-year public construction projects. For construction projects lasting longer than one year, awarding authorities must request an updated wage schedule no later than two weeks before the anniversary of the date the contract was executed by the awarding authority and the general contractor. For multi-year CM AT RISK projects, the awarding authority must request an annual update no later than two weeks before the anniversary date, determined as the earlier of: (a) the execution date of the GMP Amendment, or (b) the execution date of the first amendment to permit procurement of construction services. The annual update requirement is not applicable to 27F "rental of equipment" contracts. **The updated wage schedule must be provided to all contractors, including general and sub-contractors, working on the construction project.**
- This wage schedule applies only to the specific project referenced at the top of this page and uniquely identified by the "Wage Request Number" on all pages of this schedule.
- An Awarding Authority must request an updated wage schedule if it has not opened bids or selected a contractor within 90 days of the date of issuance of the wage schedule. For CM AT RISK projects (bid pursuant to G.L. c.149A), the earlier of: (a) the execution date of the GMP Amendment, or (b) the bid for the first construction scope of work must be within 90-days of the wage schedule issuance date.
- The wage schedule shall be incorporated in any advertisement or call for bids for the project as required by M.G.L. c. 149, § 27. The wage schedule shall be made a part of the contract awarded for the project. The wage schedule must be posted in a conspicuous place at the work site for the life of the project in accordance with M.G.L. c. 149 § 27. The wages listed on the wage schedule must be paid to employees performing construction work on the project whether they are employed by the prime contractor, a filed sub-bidder, or a sub-contractor.
- Apprentices working on the project are required to be registered with the Massachusetts Division of Apprentice Standards (DAS). Apprentices must keep their apprentice identification card on their persons during all work hours on the project. An apprentice registered with DAS may be paid the lower apprentice wage rate at the applicable step as provided on the prevailing wage schedule. **Any apprentice not registered with DAS regardless of whether they are registered with another federal, state, local, or private agency must be paid the journeyworker's rate.**
- Every contractor or subcontractor working on the construction project must submit weekly payroll reports and a Statement of Compliance directly to the awarding authority by mail or email and keep them on file for three years. Each weekly payroll report must contain: the employee's name, address, occupational classification, hours worked, and wages paid. Do not submit weekly payroll reports to DLS. For a sample payroll reporting form go to <http://www.mass.gov/dols/pw>.
- Contractors with questions about the wage rates or classifications included on the wage schedule have an affirmative obligation to inquire with DLS at (617) 626-6953.
- Contractors must obtain the wage schedules from awarding authorities. Failure of a contractor or subcontractor to pay the prevailing wage rates listed on the wage schedule to all employees who perform construction work on the project is a violation of the law and subjects the contractor or subcontractor to civil and criminal penalties.
- Employees not receiving the prevailing wage rate set forth on the wage schedule may file a complaint with the Fair Labor Division of the office of the Attorney General at (617) 727-3465.

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Construction						
(2 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	06/01/2024	\$39.95	\$15.07	\$18.67	\$0.00	\$73.69
	12/01/2024	\$39.95	\$15.07	\$20.17	\$0.00	\$75.19
	01/01/2025	\$39.95	\$15.57	\$20.17	\$0.00	\$75.69
	06/01/2025	\$40.95	\$15.57	\$20.17	\$0.00	\$76.69
	12/01/2025	\$40.95	\$15.57	\$21.78	\$0.00	\$78.30
	01/01/2026	\$40.95	\$16.17	\$21.78	\$0.00	\$78.90
	06/01/2026	\$41.95	\$16.17	\$21.78	\$0.00	\$79.90
	12/01/2026	\$41.95	\$16.17	\$23.52	\$0.00	\$81.64
	01/01/2027	\$41.95	\$16.77	\$23.52	\$0.00	\$82.24
(3 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	06/01/2024	\$40.02	\$15.07	\$18.67	\$0.00	\$73.76
	12/01/2024	\$40.02	\$15.07	\$20.17	\$0.00	\$75.26
	01/01/2025	\$40.02	\$15.57	\$20.17	\$0.00	\$75.76
	06/01/2025	\$41.02	\$15.57	\$20.17	\$0.00	\$76.76
	12/01/2025	\$41.02	\$15.57	\$21.78	\$0.00	\$78.37
	01/01/2026	\$41.02	\$16.17	\$21.78	\$0.00	\$78.97
	06/01/2026	\$42.02	\$16.17	\$21.78	\$0.00	\$79.97
	12/01/2026	\$42.02	\$16.17	\$23.52	\$0.00	\$81.71
	01/01/2027	\$42.02	\$16.77	\$23.52	\$0.00	\$82.31
(4 & 5 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	06/01/2024	\$40.14	\$15.07	\$18.67	\$0.00	\$73.88
	12/01/2024	\$40.14	\$15.07	\$20.17	\$0.00	\$75.38
	01/01/2025	\$40.14	\$15.57	\$20.17	\$0.00	\$75.88
	06/01/2025	\$41.14	\$15.57	\$20.17	\$0.00	\$76.88
	12/01/2025	\$41.14	\$15.57	\$21.78	\$0.00	\$78.49
	01/01/2026	\$41.14	\$16.17	\$21.78	\$0.00	\$79.09
	06/01/2026	\$42.14	\$16.17	\$21.78	\$0.00	\$80.09
	12/01/2026	\$42.14	\$16.17	\$23.52	\$0.00	\$81.83
	01/01/2027	\$42.14	\$16.77	\$23.52	\$0.00	\$82.43
ADS/SUBMERSIBLE PILOT <i>PILE DRIVER LOCAL 56 (ZONE 2)</i>	08/01/2020	\$103.05	\$9.40	\$23.12	\$0.00	\$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.61	\$9.65	\$17.14	\$0.00	\$65.40
For apprentice rates see "Apprentice- LABORER"						
AIR TRACK OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	06/01/2024	\$39.28	\$9.65	\$17.80	\$0.00	\$66.73
	12/01/2024	\$40.61	\$9.65	\$17.80	\$0.00	\$68.06
	06/01/2025	\$42.00	\$9.65	\$17.80	\$0.00	\$69.45
	12/01/2025	\$43.38	\$9.65	\$17.80	\$0.00	\$70.83
	06/01/2026	\$44.82	\$9.65	\$17.80	\$0.00	\$72.27
	12/01/2026	\$46.26	\$9.65	\$17.80	\$0.00	\$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
ASBESTOS WORKER (PIPES & TANKS) <i>HEAT & FROST INSULATORS LOCAL 6 (WORCESTER)</i>	06/01/2024	\$41.80	\$14.50	\$11.05	\$0.00	\$67.35
	12/01/2024	\$42.80	\$14.50	\$11.05	\$0.00	\$68.35
	06/01/2025	\$43.80	\$14.50	\$11.05	\$0.00	\$69.35
	12/01/2025	\$44.80	\$14.50	\$11.05	\$0.00	\$70.35

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
ASPHALT RAKER <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						
ASPHALT RAKER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	06/01/2024	\$38.78	\$9.65	\$17.80	\$0.00	\$66.23
	12/01/2024	\$40.11	\$9.65	\$17.80	\$0.00	\$67.56
	06/01/2025	\$41.50	\$9.65	\$17.80	\$0.00	\$68.95
	12/01/2025	\$42.88	\$9.65	\$17.80	\$0.00	\$70.33
	06/01/2026	\$44.32	\$9.65	\$17.80	\$0.00	\$71.77
	12/01/2026	\$45.76	\$9.65	\$17.80	\$0.00	\$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
AUTOMATIC GRADER-EXCAVATOR (RECLAIMER) <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BARCO-TYPE JUMPING TAMPER <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						
BATCH/CEMENT PLANT - ON SITE <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.03	\$13.78	\$15.15	\$0.00	\$67.96
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BLOCK PAVER, RAMMER / CURB SETTER <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.61	\$9.65	\$17.14	\$0.00	\$65.40
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	06/01/2024	\$39.28	\$9.65	\$17.80	\$0.00	\$66.73
	12/01/2024	\$40.61	\$9.65	\$17.80	\$0.00	\$68.06
	06/01/2025	\$42.00	\$9.65	\$17.80	\$0.00	\$69.45
	12/01/2025	\$43.38	\$9.65	\$17.80	\$0.00	\$70.83
	06/01/2026	\$44.82	\$9.65	\$17.80	\$0.00	\$72.27
	12/01/2026	\$46.26	\$9.65	\$17.80	\$0.00	\$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
BOILER MAKER <i>BOILERMAKERS LOCAL 29</i>	01/01/2024	\$48.12	\$7.07	\$20.60	\$0.00	\$75.79

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Apprentice - BOILERMAKER - Local 29						
Effective Date - 01/01/2024						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	\$31.28	\$7.07	\$13.22	\$0.00	\$51.57
2	65	\$31.28	\$7.07	\$13.22	\$0.00	\$51.57
3	70	\$33.68	\$7.07	\$14.23	\$0.00	\$54.98
4	75	\$36.09	\$7.07	\$15.24	\$0.00	\$58.40
5	80	\$38.50	\$7.07	\$16.25	\$0.00	\$61.82
6	85	\$40.90	\$7.07	\$17.28	\$0.00	\$65.25
7	90	\$43.31	\$7.07	\$18.28	\$0.00	\$68.66
8	95	\$45.71	\$7.07	\$19.32	\$0.00	\$72.10
Notes:						
Apprentice to Journeyworker Ratio:1:4						

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING)	02/01/2024	\$60.26	\$11.49	\$22.90	\$0.00	\$94.65
BRICKLAYERS LOCAL 3 (WORCESTER)	08/01/2024	\$62.36	\$11.49	\$22.90	\$0.00	\$96.75
	02/01/2025	\$63.66	\$11.49	\$22.90	\$0.00	\$98.05
	08/01/2025	\$65.81	\$11.49	\$22.90	\$0.00	\$100.20
	02/01/2026	\$67.16	\$11.49	\$22.90	\$0.00	\$101.55
	08/01/2026	\$69.36	\$11.49	\$22.90	\$0.00	\$103.75
	02/01/2027	\$70.76	\$11.49	\$22.90	\$0.00	\$105.15

Classification

Effective Date

Base Wage

Health

Pension

Supplemental
Unemployment

Total Rate

Apprentice - BRICK/PLASTER/CEMENT MASON - Local 3 Worcester**Effective Date - 02/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$30.13	\$11.49	\$22.90	\$0.00	\$64.52
2	60	\$36.16	\$11.49	\$22.90	\$0.00	\$70.55
3	70	\$42.18	\$11.49	\$22.90	\$0.00	\$76.57
4	80	\$48.21	\$11.49	\$22.90	\$0.00	\$82.60
5	90	\$54.23	\$11.49	\$22.90	\$0.00	\$88.62

Effective Date - 08/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$31.18	\$11.49	\$22.90	\$0.00	\$65.57
2	60	\$37.42	\$11.49	\$22.90	\$0.00	\$71.81
3	70	\$43.65	\$11.49	\$22.90	\$0.00	\$78.04
4	80	\$49.89	\$11.49	\$22.90	\$0.00	\$84.28
5	90	\$56.12	\$11.49	\$22.90	\$0.00	\$90.51

Notes:**Apprentice to Journeyworker Ratio:1:5**

BULLDOZER/POWER SHOVEL/TREE SHREDDER /CLAM SHELL OPERATING	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
ENGINEERS LOCAL 98 For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
CAISSON & UNDERPINNING BOTTOM MAN LABORERS - FOUNDATION AND MARINE	06/01/2024	\$46.63	\$9.65	\$18.22	\$0.00	\$74.50
	12/01/2024	\$48.10	\$9.65	\$18.22	\$0.00	\$75.97
	06/01/2025	\$49.60	\$9.65	\$18.22	\$0.00	\$77.47
	12/01/2025	\$51.10	\$9.65	\$18.22	\$0.00	\$78.97
	06/01/2026	\$52.65	\$9.65	\$18.22	\$0.00	\$80.52
	12/01/2026	\$54.15	\$9.65	\$18.22	\$0.00	\$82.02
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING LABORER LABORERS - FOUNDATION AND MARINE	06/01/2024	\$45.48	\$9.65	\$18.22	\$0.00	\$73.35
	12/01/2024	\$46.95	\$9.65	\$18.22	\$0.00	\$74.82
	06/01/2025	\$48.45	\$9.65	\$18.22	\$0.00	\$76.32
	12/01/2025	\$49.95	\$9.65	\$18.22	\$0.00	\$77.82
	06/01/2026	\$51.50	\$9.65	\$18.22	\$0.00	\$79.37
	12/01/2026	\$53.00	\$9.65	\$18.22	\$0.00	\$80.87
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING TOP MAN LABORERS - FOUNDATION AND MARINE	06/01/2024	\$45.81	\$9.65	\$18.22	\$0.00	\$73.68
	12/01/2024	\$47.28	\$9.65	\$18.22	\$0.00	\$75.15
	06/01/2025	\$48.78	\$9.65	\$18.22	\$0.00	\$76.65
	12/01/2025	\$50.28	\$9.65	\$18.22	\$0.00	\$78.15
	06/01/2026	\$51.83	\$9.65	\$18.22	\$0.00	\$79.70
	12/01/2026	\$53.33	\$9.65	\$18.22	\$0.00	\$81.20
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CARBIDE CORE DRILL OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						

CARPENTER <i>CARPENTERS -ZONE 2 (Eastern Massachusetts)</i>	03/01/2024	\$47.12	\$9.83	\$19.97	\$0.00	\$76.92
	09/01/2024	\$48.37	\$9.83	\$19.97	\$0.00	\$78.17
	03/01/2025	\$49.62	\$9.83	\$19.97	\$0.00	\$79.42
	09/01/2025	\$50.87	\$9.83	\$19.97	\$0.00	\$80.67
	03/01/2026	\$52.12	\$9.83	\$19.97	\$0.00	\$81.92
	09/01/2026	\$53.37	\$9.83	\$19.97	\$0.00	\$83.17
	03/01/2027	\$54.62	\$9.83	\$19.97	\$0.00	\$84.42

Apprentice - CARPENTER - Zone 2 Eastern MA

Effective Date - 03/01/2024

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

Effective Date - 09/01/2024

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

Notes:

Apprentice to Journeyworker Ratio:1:5

CARPENTER WOOD FRAME <i>CARPENTERS-ZONE 3 (Wood Frame)</i>	10/01/2023	\$25.55	\$7.02	\$4.80	\$0.00	\$37.37
	10/01/2024	\$26.65	\$7.02	\$4.80	\$0.00	\$38.47
	10/01/2025	\$27.75	\$7.02	\$4.80	\$0.00	\$39.57
	10/01/2026	\$28.85	\$7.02	\$4.80	\$0.00	\$40.67

All Aspects of New Wood Frame Work

Classification

Effective Date

Base Wage

Health

Pension

Supplemental
Unemployment

Total Rate

Apprentice - CARPENTER (Wood Frame) - Zone 3**Effective Date -** 10/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$15.33	\$7.02	\$0.00	\$0.00	\$22.35
2	60	\$15.33	\$7.02	\$0.00	\$0.00	\$22.35
3	65	\$16.61	\$7.02	\$1.00	\$0.00	\$24.63
4	70	\$17.89	\$7.02	\$1.00	\$0.00	\$25.91
5	75	\$19.16	\$7.02	\$4.80	\$0.00	\$30.98
6	80	\$20.44	\$7.02	\$4.80	\$0.00	\$32.26
7	85	\$21.72	\$7.02	\$4.80	\$0.00	\$33.54
8	90	\$23.00	\$7.02	\$4.80	\$0.00	\$34.82

Effective Date - 10/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$15.99	\$7.02	\$0.00	\$0.00	\$23.01
2	60	\$15.99	\$7.02	\$0.00	\$0.00	\$23.01
3	65	\$17.32	\$7.02	\$1.00	\$0.00	\$25.34
4	70	\$18.66	\$7.02	\$1.00	\$0.00	\$26.68
5	75	\$19.99	\$7.02	\$4.80	\$0.00	\$31.81
6	80	\$21.32	\$7.02	\$4.80	\$0.00	\$33.14
7	85	\$22.65	\$7.02	\$4.80	\$0.00	\$34.47
8	90	\$23.99	\$7.02	\$4.80	\$0.00	\$35.81

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
 Step 1&2 \$18.52/ 3&4 \$21.07/ 5&6 \$28.70/ 7&8 \$31.26

Apprentice to Journeyworker Ratio:1:5

CEMENT MASONRY/PLASTERING

01/01/2024

\$49.33

\$13.00

\$23.57

\$1.30

\$87.20

BRICKLAYERS LOCAL 3 (WORCESTER)

Apprentice - CEMENT MASONRY/PLASTERING - Worcester**Effective Date -** 01/01/2024

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

Notes:

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

Apprentice to Journeyworker Ratio:1:3

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CHAIN SAW OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						
COMPRESSOR OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.03	\$13.78	\$15.15	\$0.00	\$67.96
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
CRANE OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$43.06	\$13.78	\$15.15	\$0.00	\$71.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DELEADER (BRIDGE) <i>PAINTERS LOCAL 35 - ZONE 2</i>	01/01/2024	\$56.06	\$9.95	\$23.95	\$0.00	\$89.96
	07/01/2024	\$57.26	\$9.95	\$23.95	\$0.00	\$91.16
	01/01/2025	\$58.46	\$9.95	\$23.95	\$0.00	\$92.36

Apprentice - PAINTER Local 35 - BRIDGES/TANKS

Effective Date - 01/01/2024

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

Effective Date - 07/01/2024

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

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

DEMO: ADZEMAN <i>LABORERS - ZONE 2</i>	12/01/2023	\$44.48	\$9.65	\$18.07	\$0.00	\$72.20
For apprentice rates see "Apprentice- LABORER"						
DEMO: BACKHOE/LOADER/HAMMER OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2023	\$45.48	\$9.65	\$18.07	\$0.00	\$73.20
For apprentice rates see "Apprentice- LABORER"						
DEMO: BURNERS <i>LABORERS - ZONE 2</i>	12/01/2023	\$45.23	\$9.65	\$18.07	\$0.00	\$72.95

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"						
DEMO: CONCRETE CUTTER/SAWYER <i>LABORERS - ZONE 2</i>	12/01/2023	\$45.48	\$9.65	\$18.07	\$0.00	\$73.20
For apprentice rates see "Apprentice- LABORER"						
DEMO: JACKHAMMER OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2023	\$45.23	\$9.65	\$18.07	\$0.00	\$72.95
For apprentice rates see "Apprentice- LABORER"						
DEMO: WRECKING LABORER <i>LABORERS - ZONE 2</i>	12/01/2023	\$44.48	\$9.65	\$18.07	\$0.00	\$72.20
For apprentice rates see "Apprentice- LABORER"						
DIVER <i>PILE DRIVER LOCAL 56 (ZONE 2)</i>	08/01/2020	\$68.70	\$9.40	\$23.12	\$0.00	\$101.22
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER <i>PILE DRIVER LOCAL 56 (ZONE 2)</i>	08/01/2020	\$49.07	\$9.40	\$23.12	\$0.00	\$81.59
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 2)</i>	08/01/2020	\$73.60	\$9.40	\$23.12	\$0.00	\$106.12
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER/SLURRY (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 2)</i>	08/01/2020	\$103.05	\$9.40	\$23.12	\$0.00	\$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
DRAWBRIDGE OPERATOR (Construction) <i>DRAWBRIDGE - SEIU LOCAL 888</i>	07/01/2020	\$26.77	\$6.67	\$3.93	\$0.16	\$37.53
ELECTRICIAN <i>ELECTRICIANS LOCAL 96</i>	09/03/2023	\$45.99	\$13.00	\$18.84	\$0.00	\$77.83
	09/01/2024	\$47.05	\$13.99	\$19.22	\$0.00	\$80.26
	09/07/2025	\$48.16	\$14.98	\$19.60	\$0.00	\$82.74
	09/06/2026	\$49.38	\$15.96	\$20.00	\$0.00	\$85.34

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - *ELECTRICIAN - Local 96*

Effective Date - 09/03/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$18.40	\$13.00	\$0.55	\$0.00	\$31.95
2	45	\$20.70	\$13.00	\$0.62	\$0.00	\$34.32
3	48	\$22.08	\$13.00	\$15.49	\$0.00	\$50.57
4	55	\$25.29	\$13.00	\$15.94	\$0.00	\$54.23
5	65	\$29.89	\$13.00	\$16.59	\$0.00	\$59.48
6	80	\$36.79	\$13.00	\$17.55	\$0.00	\$67.34

Effective Date - 09/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$18.82	\$13.99	\$0.56	\$0.00	\$33.37
2	45	\$21.17	\$13.99	\$0.64	\$0.00	\$35.80
3	48	\$22.58	\$13.99	\$15.79	\$0.00	\$52.36
4	55	\$25.88	\$13.99	\$16.26	\$0.00	\$56.13
5	65	\$30.58	\$13.99	\$16.91	\$0.00	\$61.48
6	80	\$37.64	\$13.99	\$17.90	\$0.00	\$69.53

Notes:

Steps 1-2 are 1000 hrs; Steps 3-6 are 1500 hrs.

Apprentice to Journeyworker Ratio:2:3***

ELEVATOR CONSTRUCTOR	01/01/2024	\$61.98	\$16.18	\$20.96	\$0.00	\$99.12
ELEVATOR CONSTRUCTORS LOCAL 41	01/01/2025	\$62.83	\$16.28	\$21.36	\$0.00	\$100.47
	01/01/2026	\$63.68	\$16.38	\$21.76	\$0.00	\$101.82
	01/01/2027	\$64.53	\$16.48	\$22.16	\$0.00	\$103.17

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Apprentice - ELEVATOR CONSTRUCTOR - Local 41						
Effective Date - 01/01/2024						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$30.99	\$16.18	\$0.00	\$0.00	\$47.17
2	55	\$34.09	\$16.18	\$20.96	\$0.00	\$71.23
3	65	\$40.29	\$16.18	\$20.96	\$0.00	\$77.43
4	70	\$43.39	\$16.18	\$20.96	\$0.00	\$80.53
5	80	\$49.58	\$16.18	\$20.96	\$0.00	\$86.72
Effective Date - 01/01/2025						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$31.42	\$16.28	\$0.00	\$0.00	\$47.70
2	55	\$34.56	\$16.28	\$21.36	\$0.00	\$72.20
3	65	\$40.84	\$16.28	\$21.36	\$0.00	\$78.48
4	70	\$43.98	\$16.28	\$21.36	\$0.00	\$81.62
5	80	\$50.26	\$16.28	\$21.36	\$0.00	\$87.90
Notes:						
Steps 1-2 are 6 mos.; Steps 3-5 are 1 year						
Apprentice to Journeyworker Ratio:1:1						
ELEVATOR CONSTRUCTOR HELPER	01/01/2024	\$43.39	\$16.18	\$20.96	\$0.00	\$80.53
ELEVATOR CONSTRUCTORS LOCAL 41	01/01/2025	\$43.98	\$16.28	\$21.36	\$0.00	\$81.62
	01/01/2026	\$44.58	\$16.38	\$21.76	\$0.00	\$82.72
	01/01/2027	\$45.17	\$16.48	\$22.16	\$0.00	\$83.81
For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"						
FENCE & GUARD RAIL ERECTOR (HEAVY & HIGHWAY)	06/01/2024	\$38.78	\$9.65	\$17.80	\$0.00	\$66.23
LABORERS - ZONE 2 (HEAVY & HIGHWAY)	12/01/2024	\$40.11	\$9.65	\$17.80	\$0.00	\$67.56
	06/01/2025	\$41.50	\$9.65	\$17.80	\$0.00	\$68.95
	12/01/2025	\$42.88	\$9.65	\$17.80	\$0.00	\$70.33
	06/01/2026	\$44.32	\$9.65	\$17.80	\$0.00	\$71.77
	12/01/2026	\$45.76	\$9.65	\$17.80	\$0.00	\$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
FIELD ENG.INST/ROD-BLDG,SITE,HVY/HWY	06/01/1999	\$18.84	\$4.80	\$4.10	\$0.00	\$27.74
OPERATING ENGINEERS LOCAL 98						
FIELD ENG.PARTY CHIEF:BLDG,SITE,HVY/HWY	06/01/1999	\$21.33	\$4.80	\$4.10	\$0.00	\$30.23
OPERATING ENGINEERS LOCAL 98						
FIELD ENG.SURVEY CHIEF-BLDG,SITE,HVY/HWY	06/01/1999	\$22.33	\$4.80	\$4.10	\$0.00	\$31.23
OPERATING ENGINEERS LOCAL 98						
FIRE ALARM INSTALLER	09/03/2023	\$45.99	\$13.00	\$18.84	\$0.00	\$77.83
ELECTRICIANS LOCAL 96	09/01/2024	\$47.05	\$13.99	\$19.22	\$0.00	\$80.26
	09/07/2025	\$48.16	\$14.98	\$19.60	\$0.00	\$82.74
	09/06/2026	\$49.38	\$15.96	\$20.00	\$0.00	\$85.34
For apprentice rates see "Apprentice- ELECTRICIAN"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FIRE ALARM REPAIR / MAINT/COMMISSIONING <i>ELECTRICIANS LOCAL 96</i>	09/03/2023	\$45.99	\$13.00	\$18.84	\$0.00	\$77.83
	09/01/2024	\$47.05	\$13.99	\$19.22	\$0.00	\$80.26
	09/07/2025	\$48.16	\$14.98	\$19.60	\$0.00	\$82.74
	09/06/2026	\$49.38	\$15.96	\$20.00	\$0.00	\$85.34
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIREMAN <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.03	\$13.78	\$15.15	\$0.00	\$67.96

Apprentice - OPERATING ENGINEERS - Local 98 Class 3**Effective Date -** 12/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$23.42	\$13.78	\$15.15	\$0.00	\$52.35
2	70	\$27.32	\$13.78	\$15.15	\$0.00	\$56.25
3	80	\$31.22	\$13.78	\$15.15	\$0.00	\$60.15
4	90	\$35.13	\$13.78	\$15.15	\$0.00	\$64.06

Notes:

Steps 1-2 are 1000 hrs.; Steps 3-4 are 2000 hrs.

Apprentice to Journeyworker Ratio:1:6

FLAGGER & SIGNALER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	06/01/2024	\$27.01	\$9.65	\$17.80	\$0.00	\$54.46
	12/01/2024	\$27.01	\$9.65	\$17.80	\$0.00	\$54.46
	06/01/2025	\$28.09	\$9.65	\$17.80	\$0.00	\$55.54
	12/01/2025	\$28.09	\$9.65	\$17.80	\$0.00	\$55.54
	06/01/2026	\$29.21	\$9.65	\$17.80	\$0.00	\$56.66
	12/01/2026	\$29.21	\$9.65	\$17.80	\$0.00	\$56.66

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

FLOORCOVERER <i>FLOORCOVERERS LOCAL 2168 ZONE II</i>	03/01/2024	\$49.47	\$8.83	\$20.27	\$0.00	\$78.57
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Apprentice - FLOORCOVERER - Local 2168 Zone II**Effective Date -** 03/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.74	\$8.83	\$1.76	\$0.00	\$35.33
2	55	\$27.21	\$8.83	\$1.76	\$0.00	\$37.80
3	60	\$29.68	\$8.83	\$3.52	\$0.00	\$42.03
4	65	\$32.16	\$8.83	\$3.52	\$0.00	\$44.51
5	70	\$34.63	\$8.83	\$16.75	\$0.00	\$60.21
6	75	\$37.10	\$8.83	\$16.75	\$0.00	\$62.68
7	80	\$39.58	\$8.83	\$18.51	\$0.00	\$66.92
8	85	\$42.05	\$8.83	\$18.51	\$0.00	\$69.39

Notes: Steps are 750 hrs.

% After 10/1/17; 45/45/55/55/70/70/80/80 (1500hr Steps)

Step 1&2 \$32.63/ 3&4 \$39.28/ 5&6 \$59.86/ 7&8 \$66.52

Apprentice to Journeyworker Ratio:1:1

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FORK LIFT <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.25	\$13.78	\$15.15	\$0.00	\$68.18
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GENERATORS/LIGHTING PLANTS <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$35.80	\$13.78	\$15.15	\$0.00	\$64.73
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS) <i>GLAZIERS LOCAL 35 (ZONE 2)</i>	01/01/2024	\$45.56	\$9.95	\$23.95	\$0.00	\$79.46
	07/01/2024	\$46.76	\$9.95	\$23.95	\$0.00	\$80.66
	01/01/2025	\$47.96	\$9.95	\$23.95	\$0.00	\$81.86

Apprentice - GLAZIER - Local 35 Zone 2

Effective Date - 01/01/2024

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

Effective Date - 07/01/2024

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

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

GRADER/TRENCHING MACHINE/DERRICK <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
HVAC (DUCTWORK) <i>SHEETMETAL WORKERS LOCAL 63</i>	01/01/2024	\$40.22	\$11.96	\$18.74	\$2.13	\$73.05
	07/01/2024	\$40.98	\$12.20	\$18.74	\$2.13	\$74.05
	01/01/2025	\$42.23	\$12.20	\$18.74	\$2.13	\$75.30
For apprentice rates see "Apprentice- SHEET METAL WORKER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HVAC (ELECTRICAL CONTROLS) <i>ELECTRICIANS LOCAL 96</i>	09/03/2023	\$45.99	\$13.00	\$18.84	\$0.00	\$77.83
	09/01/2024	\$47.05	\$13.99	\$19.22	\$0.00	\$80.26
	09/07/2025	\$48.16	\$14.98	\$19.60	\$0.00	\$82.74
	09/06/2026	\$49.38	\$15.96	\$20.00	\$0.00	\$85.34
For apprentice rates see "Apprentice- ELECTRICIAN"						
HVAC (TESTING AND BALANCING - AIR) <i>SHEETMETAL WORKERS LOCAL 63</i>	01/01/2024	\$40.22	\$11.96	\$18.74	\$2.13	\$73.05
	07/01/2024	\$40.98	\$12.20	\$18.74	\$2.13	\$74.05
	01/01/2025	\$42.23	\$12.20	\$18.74	\$2.13	\$75.30
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (TESTING AND BALANCING -WATER) <i>PLUMBERS LOCAL 4</i>	03/01/2024	\$53.95	\$9.90	\$17.42	\$0.00	\$81.27
	09/01/2024	\$55.35	\$9.90	\$17.42	\$0.00	\$82.67
	03/01/2025	\$56.75	\$9.90	\$17.42	\$0.00	\$84.07
	09/01/2025	\$58.15	\$9.90	\$17.42	\$0.00	\$85.47
	03/01/2026	\$59.55	\$9.90	\$17.42	\$0.00	\$86.87
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HVAC MECHANIC <i>PLUMBERS LOCAL 4</i>	03/01/2024	\$53.95	\$9.90	\$17.42	\$0.00	\$81.27
	09/01/2024	\$55.35	\$9.90	\$17.42	\$0.00	\$82.67
	03/01/2025	\$56.75	\$9.90	\$17.42	\$0.00	\$84.07
	09/01/2025	\$58.15	\$9.90	\$17.42	\$0.00	\$85.47
	03/01/2026	\$59.55	\$9.90	\$17.42	\$0.00	\$86.87
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HYDRAULIC DRILLS <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.61	\$9.65	\$17.14	\$0.00	\$65.40
For apprentice rates see "Apprentice- LABORER"						
HYDRAULIC DRILLS (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	06/01/2024	\$39.28	\$9.65	\$17.80	\$0.00	\$66.73
	12/01/2024	\$40.61	\$9.65	\$17.80	\$0.00	\$68.06
	06/01/2025	\$42.00	\$9.65	\$17.80	\$0.00	\$69.45
	12/01/2025	\$43.38	\$9.65	\$17.80	\$0.00	\$70.83
	06/01/2026	\$44.82	\$9.65	\$17.80	\$0.00	\$72.27
	12/01/2026	\$46.26	\$9.65	\$17.80	\$0.00	\$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
INSULATOR (PIPES & TANKS) <i>HEAT & FROST INSULATORS LOCAL 6 (WORCESTER)</i>	09/01/2023	\$48.15	\$14.75	\$19.61	\$0.00	\$82.51
	09/01/2024	\$51.23	\$14.75	\$19.61	\$0.00	\$85.59
	09/01/2025	\$54.31	\$14.75	\$19.61	\$0.00	\$88.67
	09/01/2026	\$57.38	\$14.75	\$19.61	\$0.00	\$91.74

Classification

Effective Date

Base Wage

Health

Pension

Supplemental
Unemployment

Total Rate

Apprentice - ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Worcester**Effective Date -** 09/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.08	\$14.75	\$14.32	\$0.00	\$53.15
2	60	\$28.89	\$14.75	\$15.37	\$0.00	\$59.01
3	70	\$33.71	\$14.75	\$16.43	\$0.00	\$64.89
4	80	\$38.52	\$14.75	\$17.49	\$0.00	\$70.76

Effective Date - 09/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.62	\$14.75	\$14.32	\$0.00	\$54.69
2	60	\$30.74	\$14.75	\$15.37	\$0.00	\$60.86
3	70	\$35.86	\$14.75	\$16.43	\$0.00	\$67.04
4	80	\$40.98	\$14.75	\$17.49	\$0.00	\$73.22

Notes:

Steps are 1 year

Apprentice to Journeyworker Ratio:1:4

IRONWORKER/WELDER

IRONWORKERS LOCAL 7 (WORCESTER AREA)

03/16/2024

\$53.67

\$8.35

\$26.70

\$0.00

\$88.72

Apprentice - IRONWORKER - Local 7 Worcester**Effective Date -** 03/16/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$32.20	\$8.35	\$26.70	\$0.00	\$67.25
2	70	\$37.57	\$8.35	\$26.70	\$0.00	\$72.62
3	75	\$40.25	\$8.35	\$26.70	\$0.00	\$75.30
4	80	\$42.94	\$8.35	\$26.70	\$0.00	\$77.99
5	85	\$45.62	\$8.35	\$26.70	\$0.00	\$80.67
6	90	\$48.30	\$8.35	\$26.70	\$0.00	\$83.35

Notes:**Apprentice to Journeyworker Ratio:1:4**

JACKHAMMER & PAVING BREAKER OPERATOR

LABORERS - ZONE 2

12/01/2023

\$38.11

\$9.65

\$17.14

\$0.00

\$64.90

For apprentice rates see "Apprentice- LABORER"

LABORER

LABORERS - ZONE 2

12/01/2023

\$37.86

\$9.65

\$17.14

\$0.00

\$64.65

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - LABORER - Zone 2**Effective Date -** 12/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$22.72	\$9.65	\$16.89	\$0.00	\$49.26
2	70	\$26.50	\$9.65	\$16.89	\$0.00	\$53.04
3	80	\$30.29	\$9.65	\$16.89	\$0.00	\$56.83
4	90	\$34.07	\$9.65	\$16.89	\$0.00	\$60.61

Notes:**Apprentice to Journeyworker Ratio:1:5**

LABORER (HEAVY & HIGHWAY)	06/01/2024	\$38.53	\$9.65	\$17.80	\$0.00	\$65.98
LABORERS - ZONE 2 (HEAVY & HIGHWAY)	12/01/2024	\$39.86	\$9.65	\$17.80	\$0.00	\$67.31
	06/01/2025	\$41.25	\$9.65	\$17.80	\$0.00	\$68.70
	12/01/2025	\$42.63	\$9.65	\$17.80	\$0.00	\$70.08
	06/01/2026	\$44.07	\$9.65	\$17.80	\$0.00	\$71.52
	12/01/2026	\$45.51	\$9.65	\$17.80	\$0.00	\$72.96

Apprentice - LABORER (Heavy & Highway) - Zone 2**Effective Date -** 06/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$23.12	\$9.65	\$17.80	\$0.00	\$50.57
2	70	\$26.97	\$9.65	\$17.80	\$0.00	\$54.42
3	80	\$30.82	\$9.65	\$17.80	\$0.00	\$58.27
4	90	\$34.68	\$9.65	\$17.80	\$0.00	\$62.13

Effective Date - 12/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$23.92	\$9.65	\$17.80	\$0.00	\$51.37
2	70	\$27.90	\$9.65	\$17.80	\$0.00	\$55.35
3	80	\$31.89	\$9.65	\$17.80	\$0.00	\$59.34
4	90	\$35.87	\$9.65	\$17.80	\$0.00	\$63.32

Notes:**Apprentice to Journeyworker Ratio:1:5**

LABORER: CARPENTER TENDER	12/01/2023	\$37.86	\$9.65	\$17.14	\$0.00	\$64.65
LABORERS - ZONE 2						

For apprentice rates see "Apprentice- LABORER"

LABORER: CEMENT FINISHER TENDER	12/01/2023	\$38.36	\$9.40	\$16.89	\$0.00	\$64.65
LABORERS - ZONE 2						

For apprentice rates see "Apprentice- LABORER"

LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER	12/01/2023	\$37.95	\$9.65	\$17.20	\$0.00	\$64.80
LABORERS - ZONE 2						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	06/01/2024	\$38.78	\$9.65	\$17.80	\$0.00	\$66.23
	12/01/2024	\$40.11	\$9.65	\$17.80	\$0.00	\$67.56
	06/01/2025	\$41.50	\$9.65	\$17.80	\$0.00	\$68.95
	12/01/2025	\$42.88	\$9.65	\$17.80	\$0.00	\$70.33
	06/01/2026	\$44.32	\$9.65	\$17.80	\$0.00	\$71.77
	12/01/2026	\$45.76	\$9.65	\$17.80	\$0.00	\$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
LABORER: MULTI-TRADE TENDER <i>LABORERS - ZONE 2</i>	12/01/2023	\$37.86	\$9.65	\$17.14	\$0.00	\$64.65
For apprentice rates see "Apprentice- LABORER"						
LABORER: TREE REMOVER <i>LABORERS - ZONE 2</i>	12/01/2023	\$37.86	\$9.65	\$17.14	\$0.00	\$64.65
This classification applies to the removal of standing trees, and the trimming and removal of branches and limbs when related to public works construction or site clearance incidental to construction . For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	06/01/2024	\$38.78	\$9.65	\$17.80	\$0.00	\$66.23
	12/01/2024	\$40.11	\$9.65	\$17.80	\$0.00	\$67.56
	06/01/2025	\$41.50	\$9.65	\$17.80	\$0.00	\$68.95
	12/01/2025	\$42.88	\$9.65	\$17.80	\$0.00	\$70.33
	06/01/2026	\$44.32	\$9.65	\$17.80	\$0.00	\$71.77
	12/01/2026	\$45.76	\$9.65	\$17.80	\$0.00	\$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
MARBLE & TILE FINISHERS <i>BRICKLAYERS LOCAL 3 - MARBLE & TILE</i>	02/01/2024	\$47.89	\$11.49	\$21.37	\$0.00	\$80.75
	08/01/2024	\$49.57	\$11.49	\$21.37	\$0.00	\$82.43
	02/01/2025	\$50.61	\$11.49	\$21.37	\$0.00	\$83.47
	08/01/2025	\$52.33	\$11.49	\$21.37	\$0.00	\$85.19
	02/01/2026	\$53.41	\$11.49	\$21.37	\$0.00	\$86.27
	08/01/2026	\$55.17	\$11.49	\$21.37	\$0.00	\$88.03
	02/01/2027	\$56.29	\$11.49	\$21.37	\$0.00	\$89.15

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - MARBLE & TILE FINISHER - Local 3 Marble & Tile

Effective Date - 02/01/2024

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

Effective Date - 08/01/2024

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

Notes:

Apprentice to Journeyworker Ratio:1:3

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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - MARBLE-TILE-TERRAZZO MECHANIC - Local 3 Marble & Tile

Effective Date - 02/01/2024

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

Effective Date - 08/01/2024

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

Notes:

Apprentice to Journeyworker Ratio:1:5

MECH. SWEEPER OPERATOR (ON CONST. SITES) OPERATING ENGINEERS LOCAL 98 For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
MECHANIC/WELDER/BOOM TRUCK OPERATING ENGINEERS LOCAL 98 For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2023	\$39.03	\$13.78	\$15.15	\$0.00	\$67.96
MILLWRIGHT (Zone 3) MILLWRIGHTS LOCAL 1121 - Zone 3	01/01/2024	\$41.20	\$10.08	\$21.22	\$0.00	\$72.50
	01/06/2025	\$43.48	\$10.08	\$21.22	\$0.00	\$74.78
	01/05/2026	\$45.76	\$10.08	\$21.22	\$0.00	\$77.06

Classification

Effective Date

Base Wage

Health

Pension

Supplemental
Unemployment

Total Rate

Apprentice - MILLWRIGHT - Local 1121 Zone 3**Effective Date -** 01/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$22.66	\$10.08	\$5.36	\$0.00	\$38.10
2	65	\$26.78	\$10.08	\$6.34	\$0.00	\$43.20
3	75	\$30.90	\$10.08	\$18.78	\$0.00	\$59.76
4	85	\$35.02	\$10.08	\$19.76	\$0.00	\$64.86

Effective Date - 01/06/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$23.91	\$10.08	\$5.36	\$0.00	\$39.35
2	65	\$28.26	\$10.08	\$6.34	\$0.00	\$44.68
3	75	\$32.61	\$10.08	\$18.78	\$0.00	\$61.47
4	85	\$36.96	\$10.08	\$19.76	\$0.00	\$66.80

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

Apprentice to Journeyworker Ratio:1:4

MORTAR MIXER <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						
OILER <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$35.02	\$13.78	\$15.15	\$0.00	\$63.95
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OTHER POWER DRIVEN EQUIPMENT - CLASS VI <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$32.74	\$13.78	\$15.15	\$0.00	\$61.67
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PAINTER (BRIDGES/TANKS) <i>PAINTERS LOCAL 35 - ZONE 2</i>	01/01/2024	\$56.06	\$9.95	\$23.95	\$0.00	\$89.96
	07/01/2024	\$57.26	\$9.95	\$23.95	\$0.00	\$91.16
	01/01/2025	\$58.46	\$9.95	\$23.95	\$0.00	\$92.36

Classification

Effective Date

Base Wage

Health

Pension

Supplemental
Unemployment

Total Rate

Apprentice - PAINTER Local 35 - BRIDGES/TANKS**Effective Date - 01/01/2024**

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

Effective Date - 07/01/2024

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

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, NEW) *

01/01/2024

\$46.96

\$9.95

\$23.95

\$0.00

\$80.86

* If 30% or more of surfaces to be painted are new construction,

07/01/2024

\$48.16

\$9.95

\$23.95

\$0.00

\$82.06

NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 2

01/01/2025

\$49.36

\$9.95

\$23.95

\$0.00

\$83.26

Classification			Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Apprentice - PAINTER Local 35 Zone 2 - Spray/Sandblast - New								
Effective Date -			01/01/2024					
Step	percent	Apprentice Base Wage		Health	Pension	Supplemental Unemployment		Total Rate
1	50	\$23.48		\$9.95	\$0.00	\$0.00		\$33.43
2	55	\$25.83		\$9.95	\$6.66	\$0.00		\$42.44
3	60	\$28.18		\$9.95	\$7.26	\$0.00		\$45.39
4	65	\$30.52		\$9.95	\$7.87	\$0.00		\$48.34
5	70	\$32.87		\$9.95	\$20.32	\$0.00		\$63.14
6	75	\$35.22		\$9.95	\$20.93	\$0.00		\$66.10
7	80	\$37.57		\$9.95	\$21.53	\$0.00		\$69.05
8	90	\$42.26		\$9.95	\$22.74	\$0.00		\$74.95
Effective Date -			07/01/2024					
Step	percent	Apprentice Base Wage		Health	Pension	Supplemental Unemployment		Total Rate
1	50	\$24.08		\$9.95	\$0.00	\$0.00		\$34.03
2	55	\$26.49		\$9.95	\$6.66	\$0.00		\$43.10
3	60	\$28.90		\$9.95	\$7.26	\$0.00		\$46.11
4	65	\$31.30		\$9.95	\$7.87	\$0.00		\$49.12
5	70	\$33.71		\$9.95	\$20.32	\$0.00		\$63.98
6	75	\$36.12		\$9.95	\$20.93	\$0.00		\$67.00
7	80	\$38.53		\$9.95	\$21.53	\$0.00		\$70.01
8	90	\$43.34		\$9.95	\$22.74	\$0.00		\$76.03
Notes:								
Steps are 750 hrs.								
Apprentice to Journeyworker Ratio:1:1								
PAINTER (SPRAY OR SANDBLAST, REPAINT)			01/01/2024	\$45.02	\$9.95	\$23.95	\$0.00	\$78.92
PAINTERS LOCAL 35 - ZONE 2			07/01/2024	\$46.22	\$9.95	\$23.95	\$0.00	\$80.12
			01/01/2025	\$47.42	\$9.95	\$23.95	\$0.00	\$81.32

Classification

Effective Date

Base Wage

Health

Pension

Supplemental
Unemployment

Total Rate

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

Effective Date - 01/01/2024

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

Effective Date - 07/01/2024

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

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
Apprentice - PAINTER - Local 35 Zone 2 - BRUSH NEW							
Effective Date - 01/01/2024							
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
1	50	\$22.78	\$9.95	\$0.00	\$0.00	\$32.73	
2	55	\$25.06	\$9.95	\$6.66	\$0.00	\$41.67	
3	60	\$27.34	\$9.95	\$7.26	\$0.00	\$44.55	
4	65	\$29.61	\$9.95	\$7.87	\$0.00	\$47.43	
5	70	\$31.89	\$9.95	\$20.32	\$0.00	\$62.16	
6	75	\$34.17	\$9.95	\$20.93	\$0.00	\$65.05	
7	80	\$36.45	\$9.95	\$21.53	\$0.00	\$67.93	
8	90	\$41.00	\$9.95	\$22.74	\$0.00	\$73.69	
Effective Date - 07/01/2024							
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
1	50	\$23.38	\$9.95	\$0.00	\$0.00	\$33.33	
2	55	\$25.72	\$9.95	\$6.66	\$0.00	\$42.33	
3	60	\$28.06	\$9.95	\$7.26	\$0.00	\$45.27	
4	65	\$30.39	\$9.95	\$7.87	\$0.00	\$48.21	
5	70	\$32.73	\$9.95	\$20.32	\$0.00	\$63.00	
6	75	\$35.07	\$9.95	\$20.93	\$0.00	\$65.95	
7	80	\$37.41	\$9.95	\$21.53	\$0.00	\$68.89	
8	90	\$42.08	\$9.95	\$22.74	\$0.00	\$74.77	
Notes: Steps are 750 hrs.							
Apprentice to Journeyworker Ratio:1:1							
PAINTER / TAPER (BRUSH, REPAINT)		01/01/2024	\$43.62	\$9.95	\$23.95	\$0.00	\$77.52
PAINTERS LOCAL 35 - ZONE 2		07/01/2024	\$44.82	\$9.95	\$23.95	\$0.00	\$78.72
		01/01/2025	\$46.02	\$9.95	\$23.95	\$0.00	\$79.92

Classification

Effective Date

Base Wage

Health

Pension

Supplemental
Unemployment

Total Rate

Apprentice - PAINTER Local 35 Zone 2 - BRUSH REPAINT**Effective Date - 01/01/2024**

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

Effective Date - 07/01/2024

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

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1**PAINTER TRAFFIC MARKINGS (HEAVY/HIGHWAY)***LABORERS - ZONE 2 (HEAVY & HIGHWAY)*

06/01/2024	\$38.53	\$9.65	\$17.80	\$0.00	\$65.98
12/01/2024	\$39.86	\$9.65	\$17.80	\$0.00	\$67.31
06/01/2025	\$41.25	\$9.65	\$17.80	\$0.00	\$68.70
12/01/2025	\$42.63	\$9.65	\$17.80	\$0.00	\$70.08
06/01/2026	\$44.07	\$9.65	\$17.80	\$0.00	\$71.52
12/01/2026	\$45.51	\$9.65	\$17.80	\$0.00	\$72.96

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

PANEL & PICKUP TRUCKS DRIVER*TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*

06/01/2024	\$39.78	\$15.07	\$18.67	\$0.00	\$73.52
12/01/2024	\$39.78	\$15.07	\$20.17	\$0.00	\$75.02
01/01/2025	\$39.78	\$15.57	\$20.17	\$0.00	\$75.52
06/01/2025	\$40.78	\$15.57	\$20.17	\$0.00	\$76.52
12/01/2025	\$40.78	\$15.57	\$21.78	\$0.00	\$78.13
01/01/2026	\$40.78	\$16.17	\$21.78	\$0.00	\$78.73
06/01/2026	\$41.78	\$16.17	\$21.78	\$0.00	\$79.73
12/01/2026	\$41.78	\$16.17	\$23.52	\$0.00	\$81.47
01/01/2027	\$41.78	\$16.77	\$23.52	\$0.00	\$82.07

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) <i>PILE DRIVER LOCAL 56 (ZONE 2)</i> For apprentice rates see "Apprentice- PILE DRIVER"	08/01/2020	\$46.11	\$9.40	\$23.12	\$0.00	\$78.63
PILE DRIVER <i>PILE DRIVER LOCAL 56 (ZONE 2)</i>	08/01/2020	\$46.11	\$9.40	\$23.12	\$0.00	\$78.63

Apprentice - PILE DRIVER - Local 56 Zone 2**Effective Date -** 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00

Notes: Apprentice wages shall be no less than the following Steps;

(Same as set in Zone 1)

1\$57.06/2\$61.96/3\$66.87/4\$69.32/5\$71.78/6\$71.78/7\$76.68/8\$76.68

Apprentice to Journeyworker Ratio:1:5

PIPELAYER <i>LABORERS - ZONE 2</i> For apprentice rates see "Apprentice- LABORER"	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
PIPELAYER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	06/01/2024	\$38.78	\$9.65	\$17.80	\$0.00	\$66.23
	12/01/2024	\$40.11	\$9.65	\$17.80	\$0.00	\$67.56
	06/01/2025	\$41.50	\$9.65	\$17.80	\$0.00	\$68.95
	12/01/2025	\$42.88	\$9.65	\$17.80	\$0.00	\$70.33
	06/01/2026	\$44.32	\$9.65	\$17.80	\$0.00	\$71.77
	12/01/2026	\$45.76	\$9.65	\$17.80	\$0.00	\$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
PLUMBER & PIPEFITTER <i>PLUMBERS LOCAL 4</i>	03/01/2024	\$53.95	\$9.90	\$17.42	\$0.00	\$81.27
	09/01/2024	\$55.35	\$9.90	\$17.42	\$0.00	\$82.67
	03/01/2025	\$56.75	\$9.90	\$17.42	\$0.00	\$84.07
	09/01/2025	\$58.15	\$9.90	\$17.42	\$0.00	\$85.47
	03/01/2026	\$59.55	\$9.90	\$17.42	\$0.00	\$86.87

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - PLUMBER/PIPEFITTER - Local 4

Effective Date - 03/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$21.58	\$9.90	\$0.00	\$0.00	\$31.48
2	50	\$26.98	\$9.90	\$0.00	\$0.00	\$36.88
3	60	\$32.37	\$9.90	\$0.00	\$0.00	\$42.27
4	70	\$37.77	\$9.90	\$7.71	\$0.00	\$55.38
5	80	\$43.16	\$9.90	\$7.71	\$0.00	\$60.77

Effective Date - 09/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$22.14	\$9.90	\$0.00	\$0.00	\$32.04
2	50	\$27.68	\$9.90	\$0.00	\$0.00	\$37.58
3	60	\$33.21	\$9.90	\$0.00	\$0.00	\$43.11
4	70	\$38.75	\$9.90	\$7.71	\$0.00	\$56.36
5	80	\$44.28	\$9.90	\$7.71	\$0.00	\$61.89

Notes:

Steps - 2000 hrs; Step 4 w/lic 75%, Step 5 w/lic 85%
Step 4 w/lic \$52.59, Step 5 w/lic \$57.44

Apprentice to Journeyworker Ratio:1:3

PNEUMATIC CONTROLS (TEMP.) <i>PLUMBERS LOCAL 4</i>	03/01/2024	\$53.95	\$9.90	\$17.42	\$0.00	\$81.27
	09/01/2024	\$55.35	\$9.90	\$17.42	\$0.00	\$82.67
	03/01/2025	\$56.75	\$9.90	\$17.42	\$0.00	\$84.07
	09/01/2025	\$58.15	\$9.90	\$17.42	\$0.00	\$85.47
	03/01/2026	\$59.55	\$9.90	\$17.42	\$0.00	\$86.87

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

PNEUMATIC DRILL/TOOL OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
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For apprentice rates see "Apprentice- LABORER"

PNEUMATIC DRILL/TOOL OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	06/01/2024	\$38.78	\$9.65	\$17.80	\$0.00	\$66.23
	12/01/2024	\$40.11	\$9.65	\$17.80	\$0.00	\$67.56
	06/01/2025	\$41.50	\$9.65	\$17.80	\$0.00	\$68.95
	12/01/2025	\$42.88	\$9.65	\$17.80	\$0.00	\$70.33
	06/01/2026	\$44.32	\$9.65	\$17.80	\$0.00	\$71.77
	12/01/2026	\$45.76	\$9.65	\$17.80	\$0.00	\$73.21

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

POWDERMAN & BLASTER <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.86	\$9.65	\$17.14	\$0.00	\$65.65
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For apprentice rates see "Apprentice- LABORER"

POWDERMAN & BLASTER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	06/01/2024	\$39.53	\$9.40	\$17.55	\$0.00	\$66.48
	12/01/2024	\$40.86	\$9.40	\$17.55	\$0.00	\$67.81
	06/01/2025	\$42.25	\$9.40	\$17.55	\$0.00	\$69.20
	12/01/2025	\$43.63	\$9.40	\$17.55	\$0.00	\$70.58
	06/01/2026	\$45.07	\$9.40	\$17.55	\$0.00	\$72.02
	12/01/2026	\$46.51	\$9.40	\$17.55	\$0.00	\$73.46

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
PUMP OPERATOR (CONCRETE) <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.03	\$13.78	\$15.15	\$0.00	\$67.96
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY-MIX CONCRETE DRIVER <i>TEAMSTERS 404 - Construction Service (Northampton)</i>	05/01/2024	\$26.14	\$11.82	\$7.25	\$0.00	\$45.21
RIDE-ON MOTORIZED BUGGY OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						
ROLLER OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$38.42	\$13.78	\$15.15	\$0.00	\$67.35
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Inc.Roofers Waterproofing &Roofers Dampproofg) <i>ROOFERS LOCAL 33</i>	02/01/2024	\$50.03	\$12.78	\$21.45	\$0.00	\$84.26
	08/01/2024	\$51.53	\$12.78	\$21.45	\$0.00	\$85.76
	02/01/2025	\$52.78	\$12.78	\$21.45	\$0.00	\$87.01
	08/01/2025	\$54.28	\$12.78	\$21.45	\$0.00	\$88.51
	02/01/2026	\$55.53	\$12.78	\$21.45	\$0.00	\$89.76

Apprentice - ROOFER - Local 33**Effective Date -** 02/01/2024

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

Effective Date - 08/01/2024

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

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

Apprentice to Journeyworker Ratio:**

ROOFER SLATE / TILE / PRECAST CONCRETE <i>ROOFERS LOCAL 33</i>	02/01/2024	\$50.28	\$12.78	\$21.45	\$0.00	\$84.51
	08/01/2024	\$51.78	\$12.78	\$21.45	\$0.00	\$86.01
	02/01/2025	\$53.03	\$12.78	\$21.45	\$0.00	\$87.26
	08/01/2025	\$54.53	\$12.78	\$21.45	\$0.00	\$88.76
	02/01/2026	\$55.78	\$12.78	\$21.45	\$0.00	\$90.01
For apprentice rates see "Apprentice- ROOFER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SCRAPER <i>OPERATING ENGINEERS LOCAL 98</i> For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2023	\$39.03	\$13.78	\$15.15	\$0.00	\$67.96
SELF-POWERED ROLLERS AND COMPACTORS (TAMPERS) <i>OPERATING ENGINEERS LOCAL 98</i> For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2023	\$38.42	\$13.78	\$15.15	\$0.00	\$67.35
SELF-PROPELLED POWER BROOM <i>OPERATING ENGINEERS LOCAL 98</i> For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2023	\$35.80	\$13.78	\$15.15	\$0.00	\$64.73
SHEETMETAL WORKER <i>SHEETMETAL WORKERS LOCAL 63</i>	01/01/2024	\$40.22	\$11.96	\$18.74	\$2.13	\$73.05
	07/01/2024	\$40.98	\$12.20	\$18.74	\$2.13	\$74.05
	01/01/2025	\$42.23	\$12.20	\$18.74	\$2.13	\$75.30

Apprentice - SHEET METAL WORKER - Local 63

Effective Date - 01/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$18.10	\$5.38	\$4.86	\$0.85	\$29.19
2	50	\$20.11	\$5.98	\$5.40	\$0.94	\$32.43
3	55	\$22.12	\$6.58	\$9.71	\$1.15	\$39.56
4	60	\$24.13	\$7.18	\$9.71	\$1.23	\$42.25
5	65	\$26.14	\$7.77	\$9.71	\$1.31	\$44.93
6	70	\$28.15	\$8.37	\$9.71	\$1.39	\$47.62
7	75	\$30.17	\$8.97	\$9.71	\$1.47	\$50.32
8	80	\$32.18	\$9.57	\$17.66	\$1.78	\$61.19
9	85	\$34.19	\$10.17	\$17.66	\$1.86	\$63.88
10	90	\$36.20	\$10.76	\$17.66	\$1.94	\$66.56

Effective Date - 07/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$18.44	\$5.49	\$4.86	\$0.85	\$29.64
2	50	\$20.49	\$6.10	\$5.40	\$0.94	\$32.93
3	55	\$22.54	\$6.71	\$9.71	\$1.15	\$40.11
4	60	\$24.59	\$7.32	\$9.71	\$1.23	\$42.85
5	65	\$26.64	\$7.93	\$9.71	\$1.31	\$45.59
6	70	\$28.69	\$8.54	\$9.71	\$1.39	\$48.33
7	75	\$30.74	\$9.15	\$9.71	\$1.47	\$51.07
8	80	\$32.78	\$9.76	\$17.66	\$1.78	\$61.98
9	85	\$34.83	\$10.37	\$17.66	\$1.86	\$64.72
10	90	\$36.88	\$10.98	\$17.66	\$1.94	\$67.46

Notes:

Apprentice to Journeyworker Ratio:1:3

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SPECIALIZED EARTH MOVING EQUIP < 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	06/01/2024	\$40.24	\$15.07	\$18.67	\$0.00	\$73.98
	12/01/2024	\$40.24	\$15.07	\$20.17	\$0.00	\$75.48
	01/01/2025	\$40.24	\$15.57	\$20.17	\$0.00	\$75.98
	06/01/2025	\$41.24	\$15.57	\$20.17	\$0.00	\$76.98
	12/01/2025	\$41.24	\$15.57	\$21.78	\$0.00	\$78.59
	01/01/2026	\$41.24	\$16.17	\$21.78	\$0.00	\$79.19
	06/01/2026	\$42.24	\$16.17	\$21.78	\$0.00	\$80.19
	12/01/2026	\$42.24	\$16.17	\$23.52	\$0.00	\$81.93
	01/01/2027	\$42.24	\$16.77	\$23.52	\$0.00	\$82.53
SPECIALIZED EARTH MOVING EQUIP > 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	06/01/2024	\$40.53	\$15.07	\$18.67	\$0.00	\$74.27
	12/01/2024	\$40.53	\$15.07	\$20.17	\$0.00	\$75.77
	01/01/2025	\$40.53	\$15.57	\$20.17	\$0.00	\$76.27
	06/01/2025	\$41.53	\$15.57	\$20.17	\$0.00	\$77.27
	12/01/2025	\$41.53	\$15.57	\$21.78	\$0.00	\$78.88
	01/01/2026	\$41.53	\$16.17	\$21.78	\$0.00	\$79.48
	06/01/2026	\$42.53	\$16.17	\$21.78	\$0.00	\$80.48
	12/01/2026	\$42.53	\$16.17	\$23.52	\$0.00	\$82.22
	01/01/2027	\$42.53	\$16.77	\$23.52	\$0.00	\$82.82
SPRINKLER FITTER <i>SPRINKLER FITTERS LOCAL 669</i>	04/01/2023	\$47.43	\$11.45	\$16.61	\$0.00	\$75.49

Apprentice - SPRINKLER FITTER - Local 669

Effective Date - 04/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$21.34	\$8.22	\$0.00	\$0.00	\$29.56
2	50	\$23.72	\$8.22	\$0.00	\$0.00	\$31.94
3	55	\$26.09	\$11.45	\$7.20	\$0.00	\$44.74
4	60	\$28.46	\$11.45	\$8.35	\$0.00	\$48.26
5	65	\$30.83	\$11.45	\$8.35	\$0.00	\$50.63
6	70	\$33.20	\$11.45	\$8.60	\$0.00	\$53.25
7	75	\$35.57	\$11.45	\$8.60	\$0.00	\$55.62
8	80	\$37.94	\$11.45	\$8.60	\$0.00	\$57.99
9	85	\$40.32	\$11.45	\$8.60	\$0.00	\$60.37
10	90	\$42.69	\$11.45	\$8.60	\$0.00	\$62.74

Notes:

Apprentice to Journeyworker Ratio:1:1

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TERRAZZO FINISHERS <i>BRICKLAYERS LOCAL 3 - MARBLE & TILE</i>	02/01/2024	\$61.34	\$11.49	\$23.59	\$0.00	\$96.42
	08/01/2024	\$63.44	\$11.49	\$23.59	\$0.00	\$98.52
	02/01/2025	\$64.74	\$11.49	\$23.59	\$0.00	\$99.82
	08/01/2025	\$66.89	\$11.49	\$23.59	\$0.00	\$101.97
	02/01/2026	\$68.24	\$11.49	\$23.59	\$0.00	\$103.32
	08/01/2026	\$70.44	\$11.49	\$23.59	\$0.00	\$105.52
	02/01/2027	\$71.84	\$11.49	\$23.59	\$0.00	\$106.92

Apprentice - TERRAZZO FINISHER - Local 3 Marble & Tile

Effective Date - 02/01/2024

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

Effective Date - 08/01/2024

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

Notes:

Apprentice to Journeyworker Ratio:1:3

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

For apprentice rates see "Apprentice- LABORER"

TEST BORING DRILLER HELPER <i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2024	\$45.60	\$9.65	\$18.22	\$0.00	\$73.47
	12/01/2024	\$47.07	\$9.65	\$18.22	\$0.00	\$74.94
	06/01/2025	\$48.57	\$9.65	\$18.22	\$0.00	\$76.44
	12/01/2025	\$50.07	\$9.65	\$18.22	\$0.00	\$77.94
	06/01/2026	\$51.62	\$9.65	\$18.22	\$0.00	\$79.49
	12/01/2026	\$53.12	\$9.65	\$18.22	\$0.00	\$80.99

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TEST BORING LABORER <i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2024	\$45.48	\$9.65	\$18.22	\$0.00	\$73.35
	12/01/2024	\$46.95	\$9.65	\$18.22	\$0.00	\$74.82
	06/01/2025	\$48.45	\$9.65	\$18.22	\$0.00	\$76.32
	12/01/2025	\$49.95	\$9.65	\$18.22	\$0.00	\$77.82
	06/01/2026	\$51.50	\$9.65	\$18.22	\$0.00	\$79.37
	12/01/2026	\$53.00	\$9.65	\$18.22	\$0.00	\$80.87
For apprentice rates see "Apprentice- LABORER"						
TRACTORS <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$38.42	\$13.78	\$15.15	\$0.00	\$67.35
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TRAILERS FOR EARTH MOVING EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	06/01/2024	\$40.82	\$15.07	\$18.67	\$0.00	\$74.56
	12/01/2024	\$40.82	\$15.07	\$20.17	\$0.00	\$76.06
	01/01/2025	\$40.82	\$15.57	\$20.17	\$0.00	\$76.56
	06/01/2025	\$41.82	\$15.57	\$20.17	\$0.00	\$77.56
	12/01/2025	\$41.82	\$15.57	\$21.78	\$0.00	\$79.17
	01/01/2026	\$41.82	\$16.17	\$21.78	\$0.00	\$79.77
	06/01/2026	\$42.82	\$16.17	\$21.78	\$0.00	\$80.77
	12/01/2026	\$42.82	\$16.17	\$23.52	\$0.00	\$82.51
	01/01/2027	\$42.82	\$16.77	\$23.52	\$0.00	\$83.11
TUNNEL WORK - COMPRESSED AIR <i>LABORERS (COMPRESSED AIR)</i>	06/01/2024	\$57.71	\$9.65	\$19.00	\$0.00	\$86.36
	12/01/2024	\$59.18	\$9.65	\$19.00	\$0.00	\$87.83
	06/01/2025	\$60.68	\$9.65	\$19.00	\$0.00	\$89.33
	12/01/2025	\$62.18	\$9.65	\$19.00	\$0.00	\$90.83
	06/01/2026	\$63.73	\$9.65	\$19.00	\$0.00	\$92.38
	12/01/2026	\$65.23	\$9.65	\$19.00	\$0.00	\$93.88
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) <i>LABORERS (COMPRESSED AIR)</i>	06/01/2024	\$59.71	\$9.65	\$19.00	\$0.00	\$88.36
	12/01/2024	\$61.18	\$9.65	\$19.00	\$0.00	\$89.83
	06/01/2025	\$62.68	\$9.65	\$19.00	\$0.00	\$91.33
	12/01/2025	\$64.18	\$9.65	\$19.00	\$0.00	\$92.83
	06/01/2026	\$65.73	\$9.65	\$19.00	\$0.00	\$94.38
	12/01/2026	\$67.23	\$9.65	\$19.00	\$0.00	\$95.88
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR <i>LABORERS (FREE AIR TUNNEL)</i>	06/01/2024	\$49.78	\$9.65	\$19.00	\$0.00	\$78.43
	12/01/2024	\$51.25	\$9.65	\$19.00	\$0.00	\$79.90
	06/01/2025	\$52.75	\$9.65	\$19.00	\$0.00	\$81.40
	12/01/2025	\$54.25	\$9.65	\$19.00	\$0.00	\$82.90
	06/01/2026	\$55.80	\$9.65	\$19.00	\$0.00	\$84.45
	12/01/2026	\$57.30	\$9.65	\$19.00	\$0.00	\$85.95
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR (HAZ. WASTE) <i>LABORERS (FREE AIR TUNNEL)</i>	06/01/2024	\$51.78	\$9.65	\$19.00	\$0.00	\$80.43
	12/01/2024	\$53.25	\$9.65	\$19.00	\$0.00	\$81.90
	06/01/2025	\$54.75	\$9.65	\$19.00	\$0.00	\$83.40
	12/01/2025	\$56.25	\$9.65	\$19.00	\$0.00	\$84.90
	06/01/2026	\$57.80	\$9.65	\$19.00	\$0.00	\$86.45
	12/01/2026	\$59.30	\$9.65	\$19.00	\$0.00	\$87.95
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
VAC-HAUL	06/01/2024	\$40.24	\$15.07	\$18.67	\$0.00	\$73.98
TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	12/01/2024	\$40.24	\$15.07	\$20.17	\$0.00	\$75.48
	01/01/2025	\$40.24	\$15.57	\$20.17	\$0.00	\$75.98
	06/01/2025	\$41.24	\$15.57	\$20.17	\$0.00	\$76.98
	12/01/2025	\$41.24	\$15.57	\$21.78	\$0.00	\$78.59
	01/01/2026	\$41.24	\$16.17	\$21.78	\$0.00	\$79.19
	06/01/2026	\$42.24	\$16.17	\$21.78	\$0.00	\$80.19
	12/01/2026	\$42.24	\$16.17	\$23.52	\$0.00	\$81.93
	01/01/2027	\$42.24	\$16.77	\$23.52	\$0.00	\$82.53
VOICE-DATA-VIDEO TECHNICIAN	09/03/2023	\$34.49	\$13.00	\$17.22	\$0.00	\$64.71
ELECTRICIANS LOCAL 96	09/01/2024	\$35.29	\$13.99	\$17.57	\$0.00	\$66.85
	09/07/2025	\$36.12	\$14.98	\$17.91	\$0.00	\$69.01
	09/06/2026	\$37.04	\$15.96	\$18.27	\$0.00	\$71.27

Apprentice - VOICE-DATA-VIDEO TECHNICIAN - Local 96

Effective Date - 09/03/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$17.25	\$13.00	\$4.31	\$0.00	\$34.56
2	55	\$18.97	\$13.00	\$4.36	\$0.00	\$36.33
3	60	\$20.69	\$13.00	\$16.81	\$0.00	\$50.50
4	65	\$22.42	\$13.00	\$16.86	\$0.00	\$52.28
5	70	\$24.14	\$13.00	\$16.91	\$0.00	\$54.05
6	75	\$25.87	\$13.00	\$16.97	\$0.00	\$55.84
7	80	\$27.59	\$13.00	\$17.02	\$0.00	\$57.61
8	85	\$29.32	\$13.00	\$17.07	\$0.00	\$59.39

Effective Date - 09/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$17.65	\$13.99	\$4.41	\$0.00	\$36.05
2	55	\$19.41	\$13.99	\$4.46	\$0.00	\$37.86
3	60	\$21.17	\$13.99	\$17.15	\$0.00	\$52.31
4	65	\$22.94	\$13.99	\$17.20	\$0.00	\$54.13
5	70	\$24.70	\$13.99	\$17.25	\$0.00	\$55.94
6	75	\$26.47	\$13.99	\$17.30	\$0.00	\$57.76
7	80	\$28.23	\$13.99	\$17.36	\$0.00	\$59.58
8	85	\$30.00	\$13.99	\$17.41	\$0.00	\$61.40

Notes:

Apprentice to Journeyworker Ratio:1:1

WAGON DRILL OPERATOR	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
LABORERS - ZONE 2						

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
WAGON DRILL OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	06/01/2024	\$38.78	\$9.65	\$17.80	\$0.00	\$66.23
	12/01/2024	\$40.11	\$9.65	\$17.80	\$0.00	\$67.56
	06/01/2025	\$41.50	\$9.65	\$17.80	\$0.00	\$68.95
	12/01/2025	\$42.88	\$9.65	\$17.80	\$0.00	\$70.33
	06/01/2026	\$44.32	\$9.65	\$17.80	\$0.00	\$71.77
	12/01/2026	\$45.76	\$9.65	\$17.80	\$0.00	\$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
WATER METER INSTALLER <i>PLUMBERS LOCAL 4</i>	03/01/2024	\$53.95	\$9.90	\$17.42	\$0.00	\$81.27
	09/01/2024	\$55.35	\$9.90	\$17.42	\$0.00	\$82.67
	03/01/2025	\$56.75	\$9.90	\$17.42	\$0.00	\$84.07
	09/01/2025	\$58.15	\$9.90	\$17.42	\$0.00	\$85.47
	03/01/2026	\$59.55	\$9.90	\$17.42	\$0.00	\$86.87
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						
Marine Drilling						
BLASTER <i>MARINE DRILLING</i>	01/01/2018	\$41.82	\$7.63	\$3.60	\$0.00	\$53.05
BOAT CAPTAIN <i>MARINE DRILLING</i>	01/01/2018	\$33.87	\$7.63	\$3.30	\$0.00	\$44.80
BOAT CAPTAIN / Over 1,000 hp <i>MARINE DRILLING</i>	01/01/2018	\$38.06	\$7.63	\$3.60	\$0.00	\$49.29
CORE DRILLER <i>MARINE DRILLING</i>	01/01/2018	\$31.43	\$7.63	\$2.90	\$0.00	\$41.96
CORE DRILLER HELPER <i>MARINE DRILLING</i>	01/01/2018	\$28.47	\$7.63	\$3.00	\$0.00	\$39.10
DRILLER <i>MARINE DRILLING</i>	01/01/2018	\$39.70	\$7.63	\$3.60	\$0.00	\$50.93
ENGINEER <i>MARINE DRILLING</i>	01/01/2018	\$39.69	\$7.63	\$3.50	\$0.00	\$50.82
HELPER <i>MARINE DRILLING</i>	01/01/2018	\$34.24	\$7.63	\$3.00	\$0.00	\$44.87
MACHINIST <i>MARINE DRILLING</i>	01/01/2018	\$38.88	\$7.63	\$3.30	\$0.00	\$49.81
OILER - MARINE DRILLING <i>MARINE DRILLING</i>	01/01/2018	\$34.24	\$7.63	\$3.00	\$0.00	\$44.87
TUG DECKHAND <i>MARINE DRILLING</i>	01/01/2018	\$27.61	\$7.63	\$3.00	\$0.00	\$38.24
WELDER <i>MARINE DRILLING</i>	01/01/2018	\$38.88	\$7.63	\$3.30	\$0.00	\$49.81
Op Eng Marine (Dredging Work)						
BOAT OPERATOR <i>OPERATING ENGINEERS - MARINE DIVISION</i>	10/01/2017	\$29.26	\$7.63	\$3.30	\$0.00	\$40.19
CERTIFIED WELDER <i>OPERATING ENGINEERS - MARINE DIVISION</i>	10/01/2017	\$31.09	\$7.63	\$3.60	\$0.00	\$42.32
CHIEF WELDER/ CHIEF MATE <i>OPERATING ENGINEERS - MARINE DIVISION</i>	10/01/2017	\$33.02	\$7.63	\$3.60	\$0.00	\$44.25
DERRICK / SPIDER / SPILLBARGE OPERATOR <i>OPERATING ENGINEERS - MARINE DIVISION</i>	10/01/2017	\$33.02	\$7.63	\$3.60	\$0.00	\$44.25
DRAG BARGE OPERATOR / WELDER / MATE <i>OPERATING ENGINEERS - MARINE DIVISION</i>	10/01/2017	\$30.24	\$7.63	\$3.30	\$0.00	\$41.17

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
ENGINEER / ELECTRICIAN <i>OPERATING ENGINEERS - MARINE DIVISION</i>	10/01/2017	\$33.02	\$7.63	\$3.60	\$0.00	\$44.25
LICENSED BOAT OPERATOR <i>OPERATING ENGINEERS - MARINE DIVISION</i>	10/01/2017	\$33.02	\$7.63	\$3.60	\$0.00	\$44.25
LICENSED TUG OPERATOR OVER 1000HP <i>OPERATING ENGINEERS - MARINE DIVISION</i>	10/01/2017	\$38.18	\$7.63	\$3.60	\$0.00	\$49.41
MAINTENANCE ENGINEER <i>OPERATING ENGINEERS - MARINE DIVISION</i>	10/01/2017	\$33.03	\$7.63	\$3.60	\$0.00	\$44.26
OILER - MARINE DIVISION <i>OPERATING ENGINEERS - MARINE DIVISION</i>	10/01/2017	\$24.30	\$7.63	\$3.00	\$0.00	\$34.93
OPERATOR / LEVERMAN <i>OPERATING ENGINEERS - MARINE DIVISION</i>	10/01/2017	\$38.18	\$7.63	\$3.60	\$0.00	\$49.41
RODMAN / SCOWMAN <i>OPERATING ENGINEERS - MARINE DIVISION</i>	10/01/2017	\$24.30	\$7.63	\$3.00	\$0.00	\$34.93
SHOREMAN / DECKHAND <i>OPERATING ENGINEERS - MARINE DIVISION</i>	10/01/2017	\$24.30	\$7.63	\$3.00	\$0.00	\$34.93
Outside Electrical - East						
CABLE TECHNICIAN (Power Zone) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	\$29.67	\$9.25	\$1.89	\$0.00	\$40.81
CABLEMAN (Underground Ducts & Cables) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	\$42.03	\$9.25	\$10.27	\$0.00	\$61.55
DRIVER / GROUNDMAN CDL <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	\$34.62	\$9.25	\$10.07	\$0.00	\$53.94
DRIVER / GROUNDMAN -Inexperienced (<2000 Hrs) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	\$27.20	\$9.25	\$1.82	\$0.00	\$38.27
EQUIPMENT OPERATOR (Class A CDL) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	\$42.03	\$9.25	\$14.35	\$0.00	\$65.63
EQUIPMENT OPERATOR (Class B CDL) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	\$37.09	\$9.25	\$10.87	\$0.00	\$57.21
GROUNDMAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	\$27.20	\$9.25	\$1.82	\$0.00	\$38.27
GROUNDMAN -Inexperienced (<2000 Hrs.) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	\$22.25	\$9.25	\$1.82	\$0.00	\$33.32
JOURNEYMAN LINEMAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2020	\$49.45	\$9.25	\$17.48	\$0.00	\$76.18

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - LINEMAN (Outside Electrical) - East Local 104

Effective Date - 08/30/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$29.67	\$9.25	\$3.39	\$0.00	\$42.31
2	65	\$32.14	\$9.25	\$3.46	\$0.00	\$44.85
3	70	\$34.62	\$9.25	\$3.54	\$0.00	\$47.41
4	75	\$37.09	\$9.25	\$5.11	\$0.00	\$51.45
5	80	\$39.56	\$9.25	\$5.19	\$0.00	\$54.00
6	85	\$42.03	\$9.25	\$5.26	\$0.00	\$56.54
7	90	\$44.51	\$9.25	\$7.34	\$0.00	\$61.10

Notes:

Apprentice to Journeyworker Ratio:1:2

TELEDATA CABLE SPLICER <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	02/04/2019	\$30.73	\$4.70	\$3.17	\$0.00	\$38.60
TELEDATA LINEMAN/EQUIPMENT OPERATOR <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	02/04/2019	\$28.93	\$4.70	\$3.14	\$0.00	\$36.77
TELEDATA WIREMAN/INSTALLER/TECHNICIAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	02/04/2019	\$28.93	\$4.70	\$3.14	\$0.00	\$36.77

Additional Apprentice Information:

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

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

All steps are six months (1000 hours.)

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

** Multiple ratios are listed in the comment field.

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

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



MAURA HEALEY
Governor

KIM DRISCOLL
Lt. Governor

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DEPARTMENT OF LABOR STANDARDS

Prevailing Wage Rates

**As determined by the Director under the provisions of the
Massachusetts General Laws, Chapter 149, Sections 26 to 27H**

LAUREN JONES
Secretary

MICHAEL FLANAGAN
Director

Awarding Authority: MassDOT Highway
Contract Number: 126586 **City/Town:** NEW BRAINTREE
Description of Work: HARDWICK-NEW BRAINTREE: Federal Aid Project No. BFS(BR-OFF)-003S(750)X Bridge Replacement, H-08-003=N-07-002, Creamery Road over Ware River
Job Location: Creamery Road over Ware River

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

- The wage rates will remain in effect for the duration of the project, except in the case of multi-year public construction projects. For construction projects lasting longer than one year, awarding authorities must request an updated wage schedule no later than two weeks before the anniversary of the date the contract was executed by the awarding authority and the general contractor. For multi-year CM AT RISK projects, the awarding authority must request an annual update no later than two weeks before the anniversary date, determined as the earlier of: (a) the execution date of the GMP Amendment, or (b) the execution date of the first amendment to permit procurement of construction services. The annual update requirement is not applicable to 27F "rental of equipment" contracts. **The updated wage schedule must be provided to all contractors, including general and sub-contractors, working on the construction project.**
- This wage schedule applies only to the specific project referenced at the top of this page and uniquely identified by the "Wage Request Number" on all pages of this schedule.
- An Awarding Authority must request an updated wage schedule if it has not opened bids or selected a contractor within 90 days of the date of issuance of the wage schedule. For CM AT RISK projects (bid pursuant to G.L. c.149A), the earlier of: (a) the execution date of the GMP Amendment, or (b) the bid for the first construction scope of work must be within 90-days of the wage schedule issuance date.
- The wage schedule shall be incorporated in any advertisement or call for bids for the project as required by M.G.L. c. 149, § 27. The wage schedule shall be made a part of the contract awarded for the project. The wage schedule must be posted in a conspicuous place at the work site for the life of the project in accordance with M.G.L. c. 149 § 27. The wages listed on the wage schedule must be paid to employees performing construction work on the project whether they are employed by the prime contractor, a filed sub-bidder, or a sub-contractor.
- Apprentices working on the project are required to be registered with the Massachusetts Division of Apprentice Standards (DAS). Apprentices must keep their apprentice identification card on their persons during all work hours on the project. An apprentice registered with DAS may be paid the lower apprentice wage rate at the applicable step as provided on the prevailing wage schedule. **Any apprentice not registered with DAS regardless of whether they are registered with another federal, state, local, or private agency must be paid the journeyworker's rate.**
- Every contractor or subcontractor working on the construction project must submit weekly payroll reports and a Statement of Compliance directly to the awarding authority by mail or email and keep them on file for three years. Each weekly payroll report must contain: the employee's name, address, occupational classification, hours worked, and wages paid. Do not submit weekly payroll reports to DLS. For a sample payroll reporting form go to <http://www.mass.gov/dols/pw>.
- Contractors with questions about the wage rates or classifications included on the wage schedule have an affirmative obligation to inquire with DLS at (617) 626-6953.
- Contractors must obtain the wage schedules from awarding authorities. Failure of a contractor or subcontractor to pay the prevailing wage rates listed on the wage schedule to all employees who perform construction work on the project is a violation of the law and subjects the contractor or subcontractor to civil and criminal penalties.
- Employees not receiving the prevailing wage rate set forth on the wage schedule may file a complaint with the Fair Labor Division of the office of the Attorney General at (617) 727-3465.

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Construction						
(2 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	06/01/2024	\$39.95	\$15.07	\$18.67	\$0.00	\$73.69
	12/01/2024	\$39.95	\$15.07	\$20.17	\$0.00	\$75.19
	01/01/2025	\$39.95	\$15.57	\$20.17	\$0.00	\$75.69
	06/01/2025	\$40.95	\$15.57	\$20.17	\$0.00	\$76.69
	12/01/2025	\$40.95	\$15.57	\$21.78	\$0.00	\$78.30
	01/01/2026	\$40.95	\$16.17	\$21.78	\$0.00	\$78.90
	06/01/2026	\$41.95	\$16.17	\$21.78	\$0.00	\$79.90
	12/01/2026	\$41.95	\$16.17	\$23.52	\$0.00	\$81.64
	01/01/2027	\$41.95	\$16.77	\$23.52	\$0.00	\$82.24
(3 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	06/01/2024	\$40.02	\$15.07	\$18.67	\$0.00	\$73.76
	12/01/2024	\$40.02	\$15.07	\$20.17	\$0.00	\$75.26
	01/01/2025	\$40.02	\$15.57	\$20.17	\$0.00	\$75.76
	06/01/2025	\$41.02	\$15.57	\$20.17	\$0.00	\$76.76
	12/01/2025	\$41.02	\$15.57	\$21.78	\$0.00	\$78.37
	01/01/2026	\$41.02	\$16.17	\$21.78	\$0.00	\$78.97
	06/01/2026	\$42.02	\$16.17	\$21.78	\$0.00	\$79.97
	12/01/2026	\$42.02	\$16.17	\$23.52	\$0.00	\$81.71
	01/01/2027	\$42.02	\$16.77	\$23.52	\$0.00	\$82.31
(4 & 5 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	06/01/2024	\$40.14	\$15.07	\$18.67	\$0.00	\$73.88
	12/01/2024	\$40.14	\$15.07	\$20.17	\$0.00	\$75.38
	01/01/2025	\$40.14	\$15.57	\$20.17	\$0.00	\$75.88
	06/01/2025	\$41.14	\$15.57	\$20.17	\$0.00	\$76.88
	12/01/2025	\$41.14	\$15.57	\$21.78	\$0.00	\$78.49
	01/01/2026	\$41.14	\$16.17	\$21.78	\$0.00	\$79.09
	06/01/2026	\$42.14	\$16.17	\$21.78	\$0.00	\$80.09
	12/01/2026	\$42.14	\$16.17	\$23.52	\$0.00	\$81.83
	01/01/2027	\$42.14	\$16.77	\$23.52	\$0.00	\$82.43
ADS/SUBMERSIBLE PILOT <i>PILE DRIVER LOCAL 56 (ZONE 2)</i>	08/01/2020	\$103.05	\$9.40	\$23.12	\$0.00	\$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.61	\$9.65	\$17.14	\$0.00	\$65.40
For apprentice rates see "Apprentice- LABORER"						
AIR TRACK OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	06/01/2024	\$39.28	\$9.65	\$17.80	\$0.00	\$66.73
	12/01/2024	\$40.61	\$9.65	\$17.80	\$0.00	\$68.06
	06/01/2025	\$42.00	\$9.65	\$17.80	\$0.00	\$69.45
	12/01/2025	\$43.38	\$9.65	\$17.80	\$0.00	\$70.83
	06/01/2026	\$44.82	\$9.65	\$17.80	\$0.00	\$72.27
	12/01/2026	\$46.26	\$9.65	\$17.80	\$0.00	\$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
ASBESTOS WORKER (PIPES & TANKS) <i>HEAT & FROST INSULATORS LOCAL 6 (WORCESTER)</i>	06/01/2024	\$41.80	\$14.50	\$11.05	\$0.00	\$67.35
	12/01/2024	\$42.80	\$14.50	\$11.05	\$0.00	\$68.35
	06/01/2025	\$43.80	\$14.50	\$11.05	\$0.00	\$69.35
	12/01/2025	\$44.80	\$14.50	\$11.05	\$0.00	\$70.35

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
ASPHALT RAKER <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						
ASPHALT RAKER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	06/01/2024	\$38.78	\$9.65	\$17.80	\$0.00	\$66.23
	12/01/2024	\$40.11	\$9.65	\$17.80	\$0.00	\$67.56
	06/01/2025	\$41.50	\$9.65	\$17.80	\$0.00	\$68.95
	12/01/2025	\$42.88	\$9.65	\$17.80	\$0.00	\$70.33
	06/01/2026	\$44.32	\$9.65	\$17.80	\$0.00	\$71.77
	12/01/2026	\$45.76	\$9.65	\$17.80	\$0.00	\$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
AUTOMATIC GRADER-EXCAVATOR (RECLAIMER) <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BARCO-TYPE JUMPING TAMPER <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						
BATCH/CEMENT PLANT - ON SITE <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.03	\$13.78	\$15.15	\$0.00	\$67.96
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BLOCK PAVER, RAMMER / CURB SETTER <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.61	\$9.65	\$17.14	\$0.00	\$65.40
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	06/01/2024	\$39.28	\$9.65	\$17.80	\$0.00	\$66.73
	12/01/2024	\$40.61	\$9.65	\$17.80	\$0.00	\$68.06
	06/01/2025	\$42.00	\$9.65	\$17.80	\$0.00	\$69.45
	12/01/2025	\$43.38	\$9.65	\$17.80	\$0.00	\$70.83
	06/01/2026	\$44.82	\$9.65	\$17.80	\$0.00	\$72.27
	12/01/2026	\$46.26	\$9.65	\$17.80	\$0.00	\$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
BOILER MAKER <i>BOILERMAKERS LOCAL 29</i>	01/01/2024	\$48.12	\$7.07	\$20.60	\$0.00	\$75.79

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Apprentice - BOILERMAKER - Local 29						
Effective Date - 01/01/2024						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	\$31.28	\$7.07	\$13.22	\$0.00	\$51.57
2	65	\$31.28	\$7.07	\$13.22	\$0.00	\$51.57
3	70	\$33.68	\$7.07	\$14.23	\$0.00	\$54.98
4	75	\$36.09	\$7.07	\$15.24	\$0.00	\$58.40
5	80	\$38.50	\$7.07	\$16.25	\$0.00	\$61.82
6	85	\$40.90	\$7.07	\$17.28	\$0.00	\$65.25
7	90	\$43.31	\$7.07	\$18.28	\$0.00	\$68.66
8	95	\$45.71	\$7.07	\$19.32	\$0.00	\$72.10
Notes:						
Apprentice to Journeyworker Ratio:1:4						

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING)	02/01/2024	\$60.26	\$11.49	\$22.90	\$0.00	\$94.65
BRICKLAYERS LOCAL 3 (WORCESTER)	08/01/2024	\$62.36	\$11.49	\$22.90	\$0.00	\$96.75
	02/01/2025	\$63.66	\$11.49	\$22.90	\$0.00	\$98.05
	08/01/2025	\$65.81	\$11.49	\$22.90	\$0.00	\$100.20
	02/01/2026	\$67.16	\$11.49	\$22.90	\$0.00	\$101.55
	08/01/2026	\$69.36	\$11.49	\$22.90	\$0.00	\$103.75
	02/01/2027	\$70.76	\$11.49	\$22.90	\$0.00	\$105.15

Classification

Effective Date

Base Wage

Health

Pension

Supplemental
Unemployment

Total Rate

Apprentice - BRICK/PLASTER/CEMENT MASON - Local 3 Worcester**Effective Date - 02/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$30.13	\$11.49	\$22.90	\$0.00	\$64.52
2	60	\$36.16	\$11.49	\$22.90	\$0.00	\$70.55
3	70	\$42.18	\$11.49	\$22.90	\$0.00	\$76.57
4	80	\$48.21	\$11.49	\$22.90	\$0.00	\$82.60
5	90	\$54.23	\$11.49	\$22.90	\$0.00	\$88.62

Effective Date - 08/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$31.18	\$11.49	\$22.90	\$0.00	\$65.57
2	60	\$37.42	\$11.49	\$22.90	\$0.00	\$71.81
3	70	\$43.65	\$11.49	\$22.90	\$0.00	\$78.04
4	80	\$49.89	\$11.49	\$22.90	\$0.00	\$84.28
5	90	\$56.12	\$11.49	\$22.90	\$0.00	\$90.51

Notes:**Apprentice to Journeyworker Ratio:1:5**

BULLDOZER/POWER SHOVEL/TREE SHREDDER /CLAM SHELL OPERATING	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
ENGINEERS LOCAL 98 For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
CAISSON & UNDERPINNING BOTTOM MAN LABORERS - FOUNDATION AND MARINE	06/01/2024	\$46.63	\$9.65	\$18.22	\$0.00	\$74.50
	12/01/2024	\$48.10	\$9.65	\$18.22	\$0.00	\$75.97
	06/01/2025	\$49.60	\$9.65	\$18.22	\$0.00	\$77.47
	12/01/2025	\$51.10	\$9.65	\$18.22	\$0.00	\$78.97
	06/01/2026	\$52.65	\$9.65	\$18.22	\$0.00	\$80.52
	12/01/2026	\$54.15	\$9.65	\$18.22	\$0.00	\$82.02
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING LABORER LABORERS - FOUNDATION AND MARINE	06/01/2024	\$45.48	\$9.65	\$18.22	\$0.00	\$73.35
	12/01/2024	\$46.95	\$9.65	\$18.22	\$0.00	\$74.82
	06/01/2025	\$48.45	\$9.65	\$18.22	\$0.00	\$76.32
	12/01/2025	\$49.95	\$9.65	\$18.22	\$0.00	\$77.82
	06/01/2026	\$51.50	\$9.65	\$18.22	\$0.00	\$79.37
	12/01/2026	\$53.00	\$9.65	\$18.22	\$0.00	\$80.87
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING TOP MAN LABORERS - FOUNDATION AND MARINE	06/01/2024	\$45.81	\$9.65	\$18.22	\$0.00	\$73.68
	12/01/2024	\$47.28	\$9.65	\$18.22	\$0.00	\$75.15
	06/01/2025	\$48.78	\$9.65	\$18.22	\$0.00	\$76.65
	12/01/2025	\$50.28	\$9.65	\$18.22	\$0.00	\$78.15
	06/01/2026	\$51.83	\$9.65	\$18.22	\$0.00	\$79.70
	12/01/2026	\$53.33	\$9.65	\$18.22	\$0.00	\$81.20
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CARBIDE CORE DRILL OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						

CARPENTER <i>CARPENTERS -ZONE 2 (Eastern Massachusetts)</i>	03/01/2024	\$47.12	\$9.83	\$19.97	\$0.00	\$76.92
	09/01/2024	\$48.37	\$9.83	\$19.97	\$0.00	\$78.17
	03/01/2025	\$49.62	\$9.83	\$19.97	\$0.00	\$79.42
	09/01/2025	\$50.87	\$9.83	\$19.97	\$0.00	\$80.67
	03/01/2026	\$52.12	\$9.83	\$19.97	\$0.00	\$81.92
	09/01/2026	\$53.37	\$9.83	\$19.97	\$0.00	\$83.17
	03/01/2027	\$54.62	\$9.83	\$19.97	\$0.00	\$84.42

Apprentice - CARPENTER - Zone 2 Eastern MA**Effective Date - 03/01/2024**

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

Effective Date - 09/01/2024

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

Notes:**Apprentice to Journeyworker Ratio:1:5**

CARPENTER WOOD FRAME <i>CARPENTERS-ZONE 3 (Wood Frame)</i>	10/01/2023	\$25.55	\$7.02	\$4.80	\$0.00	\$37.37
	10/01/2024	\$26.65	\$7.02	\$4.80	\$0.00	\$38.47
	10/01/2025	\$27.75	\$7.02	\$4.80	\$0.00	\$39.57
	10/01/2026	\$28.85	\$7.02	\$4.80	\$0.00	\$40.67

All Aspects of New Wood Frame Work

Classification

Effective Date

Base Wage

Health

Pension

Supplemental
Unemployment

Total Rate

Apprentice - CARPENTER (Wood Frame) - Zone 3**Effective Date - 10/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$15.33	\$7.02	\$0.00	\$0.00	\$22.35
2	60	\$15.33	\$7.02	\$0.00	\$0.00	\$22.35
3	65	\$16.61	\$7.02	\$1.00	\$0.00	\$24.63
4	70	\$17.89	\$7.02	\$1.00	\$0.00	\$25.91
5	75	\$19.16	\$7.02	\$4.80	\$0.00	\$30.98
6	80	\$20.44	\$7.02	\$4.80	\$0.00	\$32.26
7	85	\$21.72	\$7.02	\$4.80	\$0.00	\$33.54
8	90	\$23.00	\$7.02	\$4.80	\$0.00	\$34.82

Effective Date - 10/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$15.99	\$7.02	\$0.00	\$0.00	\$23.01
2	60	\$15.99	\$7.02	\$0.00	\$0.00	\$23.01
3	65	\$17.32	\$7.02	\$1.00	\$0.00	\$25.34
4	70	\$18.66	\$7.02	\$1.00	\$0.00	\$26.68
5	75	\$19.99	\$7.02	\$4.80	\$0.00	\$31.81
6	80	\$21.32	\$7.02	\$4.80	\$0.00	\$33.14
7	85	\$22.65	\$7.02	\$4.80	\$0.00	\$34.47
8	90	\$23.99	\$7.02	\$4.80	\$0.00	\$35.81

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
 Step 1&2 \$18.52/ 3&4 \$21.07/ 5&6 \$28.70/ 7&8 \$31.26

Apprentice to Journeyworker Ratio:1:5

CEMENT MASONRY/PLASTERING

01/01/2024

\$49.33

\$13.00

\$23.57

\$1.30

\$87.20

BRICKLAYERS LOCAL 3 (WORCESTER)

Apprentice - CEMENT MASONRY/PLASTERING - Worcester**Effective Date - 01/01/2024**

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

Notes:

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

Apprentice to Journeyworker Ratio:1:3

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CHAIN SAW OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						
COMPRESSOR OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.03	\$13.78	\$15.15	\$0.00	\$67.96
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
CRANE OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$43.06	\$13.78	\$15.15	\$0.00	\$71.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DELEADER (BRIDGE) <i>PAINTERS LOCAL 35 - ZONE 2</i>	01/01/2024	\$56.06	\$9.95	\$23.95	\$0.00	\$89.96
	07/01/2024	\$57.26	\$9.95	\$23.95	\$0.00	\$91.16
	01/01/2025	\$58.46	\$9.95	\$23.95	\$0.00	\$92.36

Apprentice - PAINTER Local 35 - BRIDGES/TANKS

Effective Date - 01/01/2024

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

Effective Date - 07/01/2024

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

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

DEMO: ADZEMAN <i>LABORERS - ZONE 2</i>	12/01/2023	\$44.48	\$9.65	\$18.07	\$0.00	\$72.20
For apprentice rates see "Apprentice- LABORER"						
DEMO: BACKHOE/LOADER/HAMMER OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2023	\$45.48	\$9.65	\$18.07	\$0.00	\$73.20
For apprentice rates see "Apprentice- LABORER"						
DEMO: BURNERS <i>LABORERS - ZONE 2</i>	12/01/2023	\$45.23	\$9.65	\$18.07	\$0.00	\$72.95

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"						
DEMO: CONCRETE CUTTER/SAWYER <i>LABORERS - ZONE 2</i>	12/01/2023	\$45.48	\$9.65	\$18.07	\$0.00	\$73.20
For apprentice rates see "Apprentice- LABORER"						
DEMO: JACKHAMMER OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2023	\$45.23	\$9.65	\$18.07	\$0.00	\$72.95
For apprentice rates see "Apprentice- LABORER"						
DEMO: WRECKING LABORER <i>LABORERS - ZONE 2</i>	12/01/2023	\$44.48	\$9.65	\$18.07	\$0.00	\$72.20
For apprentice rates see "Apprentice- LABORER"						
DIVER <i>PILE DRIVER LOCAL 56 (ZONE 2)</i>	08/01/2020	\$68.70	\$9.40	\$23.12	\$0.00	\$101.22
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER <i>PILE DRIVER LOCAL 56 (ZONE 2)</i>	08/01/2020	\$49.07	\$9.40	\$23.12	\$0.00	\$81.59
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 2)</i>	08/01/2020	\$73.60	\$9.40	\$23.12	\$0.00	\$106.12
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER/SLURRY (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 2)</i>	08/01/2020	\$103.05	\$9.40	\$23.12	\$0.00	\$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
DRAWBRIDGE OPERATOR (Construction) <i>DRAWBRIDGE - SEIU LOCAL 888</i>	07/01/2020	\$26.77	\$6.67	\$3.93	\$0.16	\$37.53
ELECTRICIAN <i>ELECTRICIANS LOCAL 96</i>	09/03/2023	\$45.99	\$13.00	\$18.84	\$0.00	\$77.83
	09/01/2024	\$47.05	\$13.99	\$19.22	\$0.00	\$80.26
	09/07/2025	\$48.16	\$14.98	\$19.60	\$0.00	\$82.74
	09/06/2026	\$49.38	\$15.96	\$20.00	\$0.00	\$85.34

Classification

Effective Date

Base Wage

Health

Pension

Supplemental
Unemployment

Total Rate

Apprentice - *ELECTRICIAN - Local 96*

Effective Date - 09/03/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$18.40	\$13.00	\$0.55	\$0.00	\$31.95
2	45	\$20.70	\$13.00	\$0.62	\$0.00	\$34.32
3	48	\$22.08	\$13.00	\$15.49	\$0.00	\$50.57
4	55	\$25.29	\$13.00	\$15.94	\$0.00	\$54.23
5	65	\$29.89	\$13.00	\$16.59	\$0.00	\$59.48
6	80	\$36.79	\$13.00	\$17.55	\$0.00	\$67.34

Effective Date - 09/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$18.82	\$13.99	\$0.56	\$0.00	\$33.37
2	45	\$21.17	\$13.99	\$0.64	\$0.00	\$35.80
3	48	\$22.58	\$13.99	\$15.79	\$0.00	\$52.36
4	55	\$25.88	\$13.99	\$16.26	\$0.00	\$56.13
5	65	\$30.58	\$13.99	\$16.91	\$0.00	\$61.48
6	80	\$37.64	\$13.99	\$17.90	\$0.00	\$69.53

Notes:

Steps 1-2 are 1000 hrs; Steps 3-6 are 1500 hrs.

Apprentice to Journeyworker Ratio:2:3***

ELEVATOR CONSTRUCTOR

ELEVATOR CONSTRUCTORS LOCAL 41

01/01/2024	\$61.98	\$16.18	\$20.96	\$0.00	\$99.12
01/01/2025	\$62.83	\$16.28	\$21.36	\$0.00	\$100.47
01/01/2026	\$63.68	\$16.38	\$21.76	\$0.00	\$101.82
01/01/2027	\$64.53	\$16.48	\$22.16	\$0.00	\$103.17

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Apprentice - ELEVATOR CONSTRUCTOR - Local 41						
Effective Date - 01/01/2024						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$30.99	\$16.18	\$0.00	\$0.00	\$47.17
2	55	\$34.09	\$16.18	\$20.96	\$0.00	\$71.23
3	65	\$40.29	\$16.18	\$20.96	\$0.00	\$77.43
4	70	\$43.39	\$16.18	\$20.96	\$0.00	\$80.53
5	80	\$49.58	\$16.18	\$20.96	\$0.00	\$86.72
Effective Date - 01/01/2025						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$31.42	\$16.28	\$0.00	\$0.00	\$47.70
2	55	\$34.56	\$16.28	\$21.36	\$0.00	\$72.20
3	65	\$40.84	\$16.28	\$21.36	\$0.00	\$78.48
4	70	\$43.98	\$16.28	\$21.36	\$0.00	\$81.62
5	80	\$50.26	\$16.28	\$21.36	\$0.00	\$87.90
Notes:						
Steps 1-2 are 6 mos.; Steps 3-5 are 1 year						
Apprentice to Journeyworker Ratio:1:1						
ELEVATOR CONSTRUCTOR HELPER	01/01/2024	\$43.39	\$16.18	\$20.96	\$0.00	\$80.53
ELEVATOR CONSTRUCTORS LOCAL 41	01/01/2025	\$43.98	\$16.28	\$21.36	\$0.00	\$81.62
	01/01/2026	\$44.58	\$16.38	\$21.76	\$0.00	\$82.72
	01/01/2027	\$45.17	\$16.48	\$22.16	\$0.00	\$83.81
For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"						
FENCE & GUARD RAIL ERECTOR (HEAVY & HIGHWAY)	06/01/2024	\$38.78	\$9.65	\$17.80	\$0.00	\$66.23
LABORERS - ZONE 2 (HEAVY & HIGHWAY)	12/01/2024	\$40.11	\$9.65	\$17.80	\$0.00	\$67.56
	06/01/2025	\$41.50	\$9.65	\$17.80	\$0.00	\$68.95
	12/01/2025	\$42.88	\$9.65	\$17.80	\$0.00	\$70.33
	06/01/2026	\$44.32	\$9.65	\$17.80	\$0.00	\$71.77
	12/01/2026	\$45.76	\$9.65	\$17.80	\$0.00	\$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
FIELD ENG.INST/ROD-BLDG,SITE,HVY/HWY	06/01/1999	\$18.84	\$4.80	\$4.10	\$0.00	\$27.74
OPERATING ENGINEERS LOCAL 98						
FIELD ENG.PARTY CHIEF:BLDG,SITE,HVY/HWY	06/01/1999	\$21.33	\$4.80	\$4.10	\$0.00	\$30.23
OPERATING ENGINEERS LOCAL 98						
FIELD ENG.SURVEY CHIEF-BLDG,SITE,HVY/HWY	06/01/1999	\$22.33	\$4.80	\$4.10	\$0.00	\$31.23
OPERATING ENGINEERS LOCAL 98						
FIRE ALARM INSTALLER	09/03/2023	\$45.99	\$13.00	\$18.84	\$0.00	\$77.83
ELECTRICIANS LOCAL 96	09/01/2024	\$47.05	\$13.99	\$19.22	\$0.00	\$80.26
	09/07/2025	\$48.16	\$14.98	\$19.60	\$0.00	\$82.74
	09/06/2026	\$49.38	\$15.96	\$20.00	\$0.00	\$85.34
For apprentice rates see "Apprentice- ELECTRICIAN"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FIRE ALARM REPAIR / MAINT/COMMISSIONING <i>ELECTRICIANS LOCAL 96</i>	09/03/2023	\$45.99	\$13.00	\$18.84	\$0.00	\$77.83
	09/01/2024	\$47.05	\$13.99	\$19.22	\$0.00	\$80.26
	09/07/2025	\$48.16	\$14.98	\$19.60	\$0.00	\$82.74
	09/06/2026	\$49.38	\$15.96	\$20.00	\$0.00	\$85.34
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIREMAN <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.03	\$13.78	\$15.15	\$0.00	\$67.96

Apprentice - OPERATING ENGINEERS - Local 98 Class 3**Effective Date -** 12/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$23.42	\$13.78	\$15.15	\$0.00	\$52.35
2	70	\$27.32	\$13.78	\$15.15	\$0.00	\$56.25
3	80	\$31.22	\$13.78	\$15.15	\$0.00	\$60.15
4	90	\$35.13	\$13.78	\$15.15	\$0.00	\$64.06

Notes:

Steps 1-2 are 1000 hrs.; Steps 3-4 are 2000 hrs.

Apprentice to Journeyworker Ratio:1:6

FLAGGER & SIGNALER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	06/01/2024	\$27.01	\$9.65	\$17.80	\$0.00	\$54.46
	12/01/2024	\$27.01	\$9.65	\$17.80	\$0.00	\$54.46
	06/01/2025	\$28.09	\$9.65	\$17.80	\$0.00	\$55.54
	12/01/2025	\$28.09	\$9.65	\$17.80	\$0.00	\$55.54
	06/01/2026	\$29.21	\$9.65	\$17.80	\$0.00	\$56.66
	12/01/2026	\$29.21	\$9.65	\$17.80	\$0.00	\$56.66
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						

FLOORCOVERER <i>FLOORCOVERERS LOCAL 2168 ZONE II</i>	03/01/2024	\$49.47	\$8.83	\$20.27	\$0.00	\$78.57
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Apprentice - FLOORCOVERER - Local 2168 Zone II**Effective Date -** 03/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.74	\$8.83	\$1.76	\$0.00	\$35.33
2	55	\$27.21	\$8.83	\$1.76	\$0.00	\$37.80
3	60	\$29.68	\$8.83	\$3.52	\$0.00	\$42.03
4	65	\$32.16	\$8.83	\$3.52	\$0.00	\$44.51
5	70	\$34.63	\$8.83	\$16.75	\$0.00	\$60.21
6	75	\$37.10	\$8.83	\$16.75	\$0.00	\$62.68
7	80	\$39.58	\$8.83	\$18.51	\$0.00	\$66.92
8	85	\$42.05	\$8.83	\$18.51	\$0.00	\$69.39

Notes: Steps are 750 hrs.

% After 10/1/17; 45/45/55/55/70/70/80/80 (1500hr Steps)

Step 1&2 \$32.63/ 3&4 \$39.28/ 5&6 \$59.86/ 7&8 \$66.52

Apprentice to Journeyworker Ratio:1:1

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FORK LIFT <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.25	\$13.78	\$15.15	\$0.00	\$68.18
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GENERATORS/LIGHTING PLANTS <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$35.80	\$13.78	\$15.15	\$0.00	\$64.73
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS) <i>GLAZIERS LOCAL 35 (ZONE 2)</i>	01/01/2024	\$45.56	\$9.95	\$23.95	\$0.00	\$79.46
	07/01/2024	\$46.76	\$9.95	\$23.95	\$0.00	\$80.66
	01/01/2025	\$47.96	\$9.95	\$23.95	\$0.00	\$81.86

Apprentice - GLAZIER - Local 35 Zone 2

Effective Date - 01/01/2024

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

Effective Date - 07/01/2024

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

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

GRADER/TRENCHING MACHINE/DERRICK <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
HVAC (DUCTWORK) <i>SHEETMETAL WORKERS LOCAL 63</i>	01/01/2024	\$40.22	\$11.96	\$18.74	\$2.13	\$73.05
	07/01/2024	\$40.98	\$12.20	\$18.74	\$2.13	\$74.05
	01/01/2025	\$42.23	\$12.20	\$18.74	\$2.13	\$75.30
For apprentice rates see "Apprentice- SHEET METAL WORKER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HVAC (ELECTRICAL CONTROLS) <i>ELECTRICIANS LOCAL 96</i>	09/03/2023	\$45.99	\$13.00	\$18.84	\$0.00	\$77.83
	09/01/2024	\$47.05	\$13.99	\$19.22	\$0.00	\$80.26
	09/07/2025	\$48.16	\$14.98	\$19.60	\$0.00	\$82.74
	09/06/2026	\$49.38	\$15.96	\$20.00	\$0.00	\$85.34
For apprentice rates see "Apprentice- ELECTRICIAN"						
HVAC (TESTING AND BALANCING - AIR) <i>SHEETMETAL WORKERS LOCAL 63</i>	01/01/2024	\$40.22	\$11.96	\$18.74	\$2.13	\$73.05
	07/01/2024	\$40.98	\$12.20	\$18.74	\$2.13	\$74.05
	01/01/2025	\$42.23	\$12.20	\$18.74	\$2.13	\$75.30
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (TESTING AND BALANCING -WATER) <i>PLUMBERS LOCAL 4</i>	03/01/2024	\$53.95	\$9.90	\$17.42	\$0.00	\$81.27
	09/01/2024	\$55.35	\$9.90	\$17.42	\$0.00	\$82.67
	03/01/2025	\$56.75	\$9.90	\$17.42	\$0.00	\$84.07
	09/01/2025	\$58.15	\$9.90	\$17.42	\$0.00	\$85.47
	03/01/2026	\$59.55	\$9.90	\$17.42	\$0.00	\$86.87
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HVAC MECHANIC <i>PLUMBERS LOCAL 4</i>	03/01/2024	\$53.95	\$9.90	\$17.42	\$0.00	\$81.27
	09/01/2024	\$55.35	\$9.90	\$17.42	\$0.00	\$82.67
	03/01/2025	\$56.75	\$9.90	\$17.42	\$0.00	\$84.07
	09/01/2025	\$58.15	\$9.90	\$17.42	\$0.00	\$85.47
	03/01/2026	\$59.55	\$9.90	\$17.42	\$0.00	\$86.87
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HYDRAULIC DRILLS <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.61	\$9.65	\$17.14	\$0.00	\$65.40
For apprentice rates see "Apprentice- LABORER"						
HYDRAULIC DRILLS (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	06/01/2024	\$39.28	\$9.65	\$17.80	\$0.00	\$66.73
	12/01/2024	\$40.61	\$9.65	\$17.80	\$0.00	\$68.06
	06/01/2025	\$42.00	\$9.65	\$17.80	\$0.00	\$69.45
	12/01/2025	\$43.38	\$9.65	\$17.80	\$0.00	\$70.83
	06/01/2026	\$44.82	\$9.65	\$17.80	\$0.00	\$72.27
	12/01/2026	\$46.26	\$9.65	\$17.80	\$0.00	\$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
INSULATOR (PIPES & TANKS) <i>HEAT & FROST INSULATORS LOCAL 6 (WORCESTER)</i>	09/01/2023	\$48.15	\$14.75	\$19.61	\$0.00	\$82.51
	09/01/2024	\$51.23	\$14.75	\$19.61	\$0.00	\$85.59
	09/01/2025	\$54.31	\$14.75	\$19.61	\$0.00	\$88.67
	09/01/2026	\$57.38	\$14.75	\$19.61	\$0.00	\$91.74

Classification

Effective Date

Base Wage

Health

Pension

**Supplemental
Unemployment**

Total Rate

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

Effective Date - 09/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.08	\$14.75	\$14.32	\$0.00	\$53.15
2	60	\$28.89	\$14.75	\$15.37	\$0.00	\$59.01
3	70	\$33.71	\$14.75	\$16.43	\$0.00	\$64.89
4	80	\$38.52	\$14.75	\$17.49	\$0.00	\$70.76

Effective Date - 09/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.62	\$14.75	\$14.32	\$0.00	\$54.69
2	60	\$30.74	\$14.75	\$15.37	\$0.00	\$60.86
3	70	\$35.86	\$14.75	\$16.43	\$0.00	\$67.04
4	80	\$40.98	\$14.75	\$17.49	\$0.00	\$73.22

Notes:

Steps are 1 year

Apprentice to Journeyworker Ratio:1:4

IRONWORKER/WELDER

IRONWORKERS LOCAL 7 (WORCESTER AREA)

03/16/2024

\$53.67

\$8.35

\$26.70

\$0.00

\$88.72

Apprentice - IRONWORKER - Local 7 Worcester

Effective Date - 03/16/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$32.20	\$8.35	\$26.70	\$0.00	\$67.25
2	70	\$37.57	\$8.35	\$26.70	\$0.00	\$72.62
3	75	\$40.25	\$8.35	\$26.70	\$0.00	\$75.30
4	80	\$42.94	\$8.35	\$26.70	\$0.00	\$77.99
5	85	\$45.62	\$8.35	\$26.70	\$0.00	\$80.67
6	90	\$48.30	\$8.35	\$26.70	\$0.00	\$83.35

Notes:

Apprentice to Journeyworker Ratio:1:4

JACKHAMMER & PAVING BREAKER OPERATOR

LABORERS - ZONE 2

12/01/2023

\$38.11

\$9.65

\$17.14

\$0.00

\$64.90

For apprentice rates see "Apprentice- LABORER"

LABORER

LABORERS - ZONE 2

12/01/2023

\$37.86

\$9.65

\$17.14

\$0.00

\$64.65

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - LABORER - Zone 2**Effective Date - 12/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$22.72	\$9.65	\$16.89	\$0.00	\$49.26
2	70	\$26.50	\$9.65	\$16.89	\$0.00	\$53.04
3	80	\$30.29	\$9.65	\$16.89	\$0.00	\$56.83
4	90	\$34.07	\$9.65	\$16.89	\$0.00	\$60.61

Notes:**Apprentice to Journeyworker Ratio:1:5**

LABORER (HEAVY & HIGHWAY)	06/01/2024	\$38.53	\$9.65	\$17.80	\$0.00	\$65.98
LABORERS - ZONE 2 (HEAVY & HIGHWAY)	12/01/2024	\$39.86	\$9.65	\$17.80	\$0.00	\$67.31
	06/01/2025	\$41.25	\$9.65	\$17.80	\$0.00	\$68.70
	12/01/2025	\$42.63	\$9.65	\$17.80	\$0.00	\$70.08
	06/01/2026	\$44.07	\$9.65	\$17.80	\$0.00	\$71.52
	12/01/2026	\$45.51	\$9.65	\$17.80	\$0.00	\$72.96

Apprentice - LABORER (Heavy & Highway) - Zone 2**Effective Date - 06/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$23.12	\$9.65	\$17.80	\$0.00	\$50.57
2	70	\$26.97	\$9.65	\$17.80	\$0.00	\$54.42
3	80	\$30.82	\$9.65	\$17.80	\$0.00	\$58.27
4	90	\$34.68	\$9.65	\$17.80	\$0.00	\$62.13

Effective Date - 12/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$23.92	\$9.65	\$17.80	\$0.00	\$51.37
2	70	\$27.90	\$9.65	\$17.80	\$0.00	\$55.35
3	80	\$31.89	\$9.65	\$17.80	\$0.00	\$59.34
4	90	\$35.87	\$9.65	\$17.80	\$0.00	\$63.32

Notes:**Apprentice to Journeyworker Ratio:1:5**

LABORER: CARPENTER TENDER	12/01/2023	\$37.86	\$9.65	\$17.14	\$0.00	\$64.65
LABORERS - ZONE 2						

For apprentice rates see "Apprentice- LABORER"

LABORER: CEMENT FINISHER TENDER	12/01/2023	\$38.36	\$9.40	\$16.89	\$0.00	\$64.65
LABORERS - ZONE 2						

For apprentice rates see "Apprentice- LABORER"

LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER	12/01/2023	\$37.95	\$9.65	\$17.20	\$0.00	\$64.80
LABORERS - ZONE 2						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	06/01/2024	\$38.78	\$9.65	\$17.80	\$0.00	\$66.23
	12/01/2024	\$40.11	\$9.65	\$17.80	\$0.00	\$67.56
	06/01/2025	\$41.50	\$9.65	\$17.80	\$0.00	\$68.95
	12/01/2025	\$42.88	\$9.65	\$17.80	\$0.00	\$70.33
	06/01/2026	\$44.32	\$9.65	\$17.80	\$0.00	\$71.77
	12/01/2026	\$45.76	\$9.65	\$17.80	\$0.00	\$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
LABORER: MULTI-TRADE TENDER <i>LABORERS - ZONE 2</i>	12/01/2023	\$37.86	\$9.65	\$17.14	\$0.00	\$64.65
For apprentice rates see "Apprentice- LABORER"						
LABORER: TREE REMOVER <i>LABORERS - ZONE 2</i>	12/01/2023	\$37.86	\$9.65	\$17.14	\$0.00	\$64.65
This classification applies to the removal of standing trees, and the trimming and removal of branches and limbs when related to public works construction or site clearance incidental to construction . For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	06/01/2024	\$38.78	\$9.65	\$17.80	\$0.00	\$66.23
	12/01/2024	\$40.11	\$9.65	\$17.80	\$0.00	\$67.56
	06/01/2025	\$41.50	\$9.65	\$17.80	\$0.00	\$68.95
	12/01/2025	\$42.88	\$9.65	\$17.80	\$0.00	\$70.33
	06/01/2026	\$44.32	\$9.65	\$17.80	\$0.00	\$71.77
	12/01/2026	\$45.76	\$9.65	\$17.80	\$0.00	\$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
MARBLE & TILE FINISHERS <i>BRICKLAYERS LOCAL 3 - MARBLE & TILE</i>	02/01/2024	\$47.89	\$11.49	\$21.37	\$0.00	\$80.75
	08/01/2024	\$49.57	\$11.49	\$21.37	\$0.00	\$82.43
	02/01/2025	\$50.61	\$11.49	\$21.37	\$0.00	\$83.47
	08/01/2025	\$52.33	\$11.49	\$21.37	\$0.00	\$85.19
	02/01/2026	\$53.41	\$11.49	\$21.37	\$0.00	\$86.27
	08/01/2026	\$55.17	\$11.49	\$21.37	\$0.00	\$88.03
	02/01/2027	\$56.29	\$11.49	\$21.37	\$0.00	\$89.15

Classification			Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Apprentice - MARBLE & TILE FINISHER - Local 3 Marble & Tile								
Effective Date - 02/01/2024								
Step	percent			Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50			\$23.95	\$11.49	\$21.37	\$0.00	\$56.81
2	60			\$28.73	\$11.49	\$21.37	\$0.00	\$61.59
3	70			\$33.52	\$11.49	\$21.37	\$0.00	\$66.38
4	80			\$38.31	\$11.49	\$21.37	\$0.00	\$71.17
5	90			\$43.10	\$11.49	\$21.37	\$0.00	\$75.96
Effective Date - 08/01/2024								
Step	percent			Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50			\$24.79	\$11.49	\$21.37	\$0.00	\$57.65
2	60			\$29.74	\$11.49	\$21.37	\$0.00	\$62.60
3	70			\$34.70	\$11.49	\$21.37	\$0.00	\$67.56
4	80			\$39.66	\$11.49	\$21.37	\$0.00	\$72.52
5	90			\$44.61	\$11.49	\$21.37	\$0.00	\$77.47
Notes:								
Apprentice to Journeyworker Ratio:1:3								
MARBLE MASONS,TILELAYERS & TERRAZZO MECH			02/01/2024	\$62.42	\$11.49	\$23.56	\$0.00	\$97.47
BRICKLAYERS LOCAL 3 - MARBLE & TILE			08/01/2024	\$64.52	\$11.49	\$23.56	\$0.00	\$99.57
			02/01/2025	\$65.82	\$11.49	\$23.56	\$0.00	\$100.87
			08/01/2025	\$67.97	\$11.49	\$23.56	\$0.00	\$103.02
			02/01/2026	\$69.32	\$11.49	\$23.56	\$0.00	\$104.37
			08/01/2026	\$71.52	\$11.49	\$23.56	\$0.00	\$106.57
			02/01/2027	\$72.92	\$11.49	\$23.56	\$0.00	\$107.97

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - MARBLE-TILE-TERRAZZO MECHANIC - Local 3 Marble & Tile

Effective Date - 02/01/2024

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

Effective Date - 08/01/2024

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

Notes:

Apprentice to Journeyworker Ratio:1:5

MECH. SWEEPER OPERATOR (ON CONST. SITES) OPERATING ENGINEERS LOCAL 98 For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
MECHANIC/WELDER/BOOM TRUCK OPERATING ENGINEERS LOCAL 98 For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2023	\$39.03	\$13.78	\$15.15	\$0.00	\$67.96
MILLWRIGHT (Zone 3) MILLWRIGHTS LOCAL 1121 - Zone 3	01/01/2024	\$41.20	\$10.08	\$21.22	\$0.00	\$72.50
	01/06/2025	\$43.48	\$10.08	\$21.22	\$0.00	\$74.78
	01/05/2026	\$45.76	\$10.08	\$21.22	\$0.00	\$77.06

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Apprentice - MILLWRIGHT - Local 1121 Zone 3						
Effective Date - 01/01/2024						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$22.66	\$10.08	\$5.36	\$0.00	\$38.10
2	65	\$26.78	\$10.08	\$6.34	\$0.00	\$43.20
3	75	\$30.90	\$10.08	\$18.78	\$0.00	\$59.76
4	85	\$35.02	\$10.08	\$19.76	\$0.00	\$64.86
Effective Date - 01/06/2025						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$23.91	\$10.08	\$5.36	\$0.00	\$39.35
2	65	\$28.26	\$10.08	\$6.34	\$0.00	\$44.68
3	75	\$32.61	\$10.08	\$18.78	\$0.00	\$61.47
4	85	\$36.96	\$10.08	\$19.76	\$0.00	\$66.80
<div> Notes: Step 1&2 Appr. indentured after 1/6/2020 receive no pension, but do receive annuity. (Step 1 \$5.72, Step 2 \$6.66) Steps are 2,000 hours </div>						
Apprentice to Journeyworker Ratio:1:4						
MORTAR MIXER LABORERS - ZONE 2	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						
OILER OPERATING ENGINEERS LOCAL 98	12/01/2023	\$35.02	\$13.78	\$15.15	\$0.00	\$63.95
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OTHER POWER DRIVEN EQUIPMENT - CLASS VI OPERATING ENGINEERS LOCAL 98	12/01/2023	\$32.74	\$13.78	\$15.15	\$0.00	\$61.67
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PAINTER (BRIDGES/TANKS) PAINTERS LOCAL 35 - ZONE 2	01/01/2024	\$56.06	\$9.95	\$23.95	\$0.00	\$89.96
	07/01/2024	\$57.26	\$9.95	\$23.95	\$0.00	\$91.16
	01/01/2025	\$58.46	\$9.95	\$23.95	\$0.00	\$92.36

Classification

Effective Date

Base Wage

Health

Pension

Supplemental
Unemployment

Total Rate

Apprentice - PAINTER Local 35 - BRIDGES/TANKS**Effective Date - 01/01/2024**

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

Effective Date - 07/01/2024

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

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, NEW) *

01/01/2024

\$46.96

\$9.95

\$23.95

\$0.00

\$80.86

* If 30% or more of surfaces to be painted are new construction,

07/01/2024

\$48.16

\$9.95

\$23.95

\$0.00

\$82.06

NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 2

01/01/2025

\$49.36

\$9.95

\$23.95

\$0.00

\$83.26

Classification			Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Apprentice - PAINTER Local 35 Zone 2 - Spray/Sandblast - New								
Effective Date -			01/01/2024					
Step	percent	Apprentice Base Wage		Health	Pension	Supplemental Unemployment	Total Rate	
1	50	\$23.48		\$9.95	\$0.00	\$0.00	\$33.43	
2	55	\$25.83		\$9.95	\$6.66	\$0.00	\$42.44	
3	60	\$28.18		\$9.95	\$7.26	\$0.00	\$45.39	
4	65	\$30.52		\$9.95	\$7.87	\$0.00	\$48.34	
5	70	\$32.87		\$9.95	\$20.32	\$0.00	\$63.14	
6	75	\$35.22		\$9.95	\$20.93	\$0.00	\$66.10	
7	80	\$37.57		\$9.95	\$21.53	\$0.00	\$69.05	
8	90	\$42.26		\$9.95	\$22.74	\$0.00	\$74.95	
Effective Date -			07/01/2024					
Step	percent	Apprentice Base Wage		Health	Pension	Supplemental Unemployment	Total Rate	
1	50	\$24.08		\$9.95	\$0.00	\$0.00	\$34.03	
2	55	\$26.49		\$9.95	\$6.66	\$0.00	\$43.10	
3	60	\$28.90		\$9.95	\$7.26	\$0.00	\$46.11	
4	65	\$31.30		\$9.95	\$7.87	\$0.00	\$49.12	
5	70	\$33.71		\$9.95	\$20.32	\$0.00	\$63.98	
6	75	\$36.12		\$9.95	\$20.93	\$0.00	\$67.00	
7	80	\$38.53		\$9.95	\$21.53	\$0.00	\$70.01	
8	90	\$43.34		\$9.95	\$22.74	\$0.00	\$76.03	
Notes:								
Steps are 750 hrs.								
Apprentice to Journeyworker Ratio:1:1								
PAINTER (SPRAY OR SANDBLAST, REPAINT)			01/01/2024	\$45.02	\$9.95	\$23.95	\$0.00	\$78.92
PAINTERS LOCAL 35 - ZONE 2			07/01/2024	\$46.22	\$9.95	\$23.95	\$0.00	\$80.12
			01/01/2025	\$47.42	\$9.95	\$23.95	\$0.00	\$81.32

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
Apprentice - PAINTER Local 35 Zone 2 - Spray/Sandblast - Repaint							
Effective Date - 01/01/2024							
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
1	50	\$22.51	\$9.95	\$0.00	\$0.00	\$32.46	
2	55	\$24.76	\$9.95	\$6.66	\$0.00	\$41.37	
3	60	\$27.01	\$9.95	\$7.26	\$0.00	\$44.22	
4	65	\$29.26	\$9.95	\$7.87	\$0.00	\$47.08	
5	70	\$31.51	\$9.95	\$20.32	\$0.00	\$61.78	
6	75	\$33.77	\$9.95	\$20.93	\$0.00	\$64.65	
7	80	\$36.02	\$9.95	\$21.53	\$0.00	\$67.50	
8	90	\$40.52	\$9.95	\$22.74	\$0.00	\$73.21	
Effective Date - 07/01/2024							
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
1	50	\$23.11	\$9.95	\$0.00	\$0.00	\$33.06	
2	55	\$25.42	\$9.95	\$6.66	\$0.00	\$42.03	
3	60	\$27.73	\$9.95	\$7.26	\$0.00	\$44.94	
4	65	\$30.04	\$9.95	\$7.87	\$0.00	\$47.86	
5	70	\$32.35	\$9.95	\$20.32	\$0.00	\$62.62	
6	75	\$34.67	\$9.95	\$20.93	\$0.00	\$65.55	
7	80	\$36.98	\$9.95	\$21.53	\$0.00	\$68.46	
8	90	\$41.60	\$9.95	\$22.74	\$0.00	\$74.29	
Notes: Steps are 750 hrs.							
Apprentice to Journeyworker Ratio:1:1							
PAINTER / TAPER (BRUSH, NEW) *		01/01/2024	\$45.56	\$9.95	\$23.95	\$0.00	\$79.46
* If 30% or more of surfaces to be painted are new construction,		07/01/2024	\$46.76	\$9.95	\$23.95	\$0.00	\$80.66
NEW paint rate shall be used.PAINTERS LOCAL 35 - ZONE 2		01/01/2025	\$47.96	\$9.95	\$23.95	\$0.00	\$81.86

Classification	Effective Date		Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Apprentice - PAINTER - Local 35 Zone 2 - BRUSH NEW							
Effective Date - 01/01/2024							
Step	percent	Apprentice Base Wage		Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.78		\$9.95	\$0.00	\$0.00	\$32.73
2	55	\$25.06		\$9.95	\$6.66	\$0.00	\$41.67
3	60	\$27.34		\$9.95	\$7.26	\$0.00	\$44.55
4	65	\$29.61		\$9.95	\$7.87	\$0.00	\$47.43
5	70	\$31.89		\$9.95	\$20.32	\$0.00	\$62.16
6	75	\$34.17		\$9.95	\$20.93	\$0.00	\$65.05
7	80	\$36.45		\$9.95	\$21.53	\$0.00	\$67.93
8	90	\$41.00		\$9.95	\$22.74	\$0.00	\$73.69
Effective Date - 07/01/2024							
Step	percent	Apprentice Base Wage		Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.38		\$9.95	\$0.00	\$0.00	\$33.33
2	55	\$25.72		\$9.95	\$6.66	\$0.00	\$42.33
3	60	\$28.06		\$9.95	\$7.26	\$0.00	\$45.27
4	65	\$30.39		\$9.95	\$7.87	\$0.00	\$48.21
5	70	\$32.73		\$9.95	\$20.32	\$0.00	\$63.00
6	75	\$35.07		\$9.95	\$20.93	\$0.00	\$65.95
7	80	\$37.41		\$9.95	\$21.53	\$0.00	\$68.89
8	90	\$42.08		\$9.95	\$22.74	\$0.00	\$74.77
Notes: Steps are 750 hrs.							
Apprentice to Journeyworker Ratio:1:1							
PAINTER / TAPER (BRUSH, REPAINT)		01/01/2024	\$43.62	\$9.95	\$23.95	\$0.00	\$77.52
PAINTERS LOCAL 35 - ZONE 2		07/01/2024	\$44.82	\$9.95	\$23.95	\$0.00	\$78.72
		01/01/2025	\$46.02	\$9.95	\$23.95	\$0.00	\$79.92

Classification

Effective Date

Base Wage

Health

Pension

Supplemental
Unemployment

Total Rate

Apprentice - PAINTER Local 35 Zone 2 - BRUSH REPAINT**Effective Date - 01/01/2024**

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

Effective Date - 07/01/2024

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

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER TRAFFIC MARKINGS (HEAVY/HIGHWAY)	06/01/2024	\$38.53	\$9.65	\$17.80	\$0.00	\$65.98
LABORERS - ZONE 2 (HEAVY & HIGHWAY)	12/01/2024	\$39.86	\$9.65	\$17.80	\$0.00	\$67.31
	06/01/2025	\$41.25	\$9.65	\$17.80	\$0.00	\$68.70
	12/01/2025	\$42.63	\$9.65	\$17.80	\$0.00	\$70.08
	06/01/2026	\$44.07	\$9.65	\$17.80	\$0.00	\$71.52
	12/01/2026	\$45.51	\$9.65	\$17.80	\$0.00	\$72.96
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
PANEL & PICKUP TRUCKS DRIVER	06/01/2024	\$39.78	\$15.07	\$18.67	\$0.00	\$73.52
TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	12/01/2024	\$39.78	\$15.07	\$20.17	\$0.00	\$75.02
	01/01/2025	\$39.78	\$15.57	\$20.17	\$0.00	\$75.52
	06/01/2025	\$40.78	\$15.57	\$20.17	\$0.00	\$76.52
	12/01/2025	\$40.78	\$15.57	\$21.78	\$0.00	\$78.13
	01/01/2026	\$40.78	\$16.17	\$21.78	\$0.00	\$78.73
	06/01/2026	\$41.78	\$16.17	\$21.78	\$0.00	\$79.73
	12/01/2026	\$41.78	\$16.17	\$23.52	\$0.00	\$81.47
	01/01/2027	\$41.78	\$16.77	\$23.52	\$0.00	\$82.07

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) <i>PILE DRIVER LOCAL 56 (ZONE 2)</i> For apprentice rates see "Apprentice- PILE DRIVER"	08/01/2020	\$46.11	\$9.40	\$23.12	\$0.00	\$78.63
PILE DRIVER <i>PILE DRIVER LOCAL 56 (ZONE 2)</i>	08/01/2020	\$46.11	\$9.40	\$23.12	\$0.00	\$78.63

Apprentice - PILE DRIVER - Local 56 Zone 2**Effective Date -** 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00

Notes: Apprentice wages shall be no less than the following Steps;
(Same as set in Zone 1)

1\$57.06/2\$61.96/3\$66.87/4\$69.32/5\$71.78/6\$71.78/7\$76.68/8\$76.68

Apprentice to Journeyworker Ratio:1:5

PIPELAYER <i>LABORERS - ZONE 2</i> For apprentice rates see "Apprentice- LABORER"	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
PIPELAYER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	06/01/2024	\$38.78	\$9.65	\$17.80	\$0.00	\$66.23
	12/01/2024	\$40.11	\$9.65	\$17.80	\$0.00	\$67.56
	06/01/2025	\$41.50	\$9.65	\$17.80	\$0.00	\$68.95
	12/01/2025	\$42.88	\$9.65	\$17.80	\$0.00	\$70.33
	06/01/2026	\$44.32	\$9.65	\$17.80	\$0.00	\$71.77
	12/01/2026	\$45.76	\$9.65	\$17.80	\$0.00	\$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
PLUMBER & PIPEFITTER <i>PLUMBERS LOCAL 4</i>	03/01/2024	\$53.95	\$9.90	\$17.42	\$0.00	\$81.27
	09/01/2024	\$55.35	\$9.90	\$17.42	\$0.00	\$82.67
	03/01/2025	\$56.75	\$9.90	\$17.42	\$0.00	\$84.07
	09/01/2025	\$58.15	\$9.90	\$17.42	\$0.00	\$85.47
	03/01/2026	\$59.55	\$9.90	\$17.42	\$0.00	\$86.87

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - PLUMBER/PIPEFITTER - Local 4**Effective Date - 03/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$21.58	\$9.90	\$0.00	\$0.00	\$31.48
2	50	\$26.98	\$9.90	\$0.00	\$0.00	\$36.88
3	60	\$32.37	\$9.90	\$0.00	\$0.00	\$42.27
4	70	\$37.77	\$9.90	\$7.71	\$0.00	\$55.38
5	80	\$43.16	\$9.90	\$7.71	\$0.00	\$60.77

Effective Date - 09/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$22.14	\$9.90	\$0.00	\$0.00	\$32.04
2	50	\$27.68	\$9.90	\$0.00	\$0.00	\$37.58
3	60	\$33.21	\$9.90	\$0.00	\$0.00	\$43.11
4	70	\$38.75	\$9.90	\$7.71	\$0.00	\$56.36
5	80	\$44.28	\$9.90	\$7.71	\$0.00	\$61.89

Notes:

Steps - 2000 hrs; Step 4 w/lic 75%, Step 5 w/lic 85%
Step 4 w/lic \$52.59, Step 5 w/lic \$57.44

Apprentice to Journeyworker Ratio:1:3

PNEUMATIC CONTROLS (TEMP.)	03/01/2024	\$53.95	\$9.90	\$17.42	\$0.00	\$81.27
PLUMBERS LOCAL 4	09/01/2024	\$55.35	\$9.90	\$17.42	\$0.00	\$82.67
	03/01/2025	\$56.75	\$9.90	\$17.42	\$0.00	\$84.07
	09/01/2025	\$58.15	\$9.90	\$17.42	\$0.00	\$85.47
	03/01/2026	\$59.55	\$9.90	\$17.42	\$0.00	\$86.87

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

PNEUMATIC DRILL/TOOL OPERATOR	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
LABORERS - ZONE 2						

For apprentice rates see "Apprentice- LABORER"

PNEUMATIC DRILL/TOOL OPERATOR (HEAVY & HIGHWAY)	06/01/2024	\$38.78	\$9.65	\$17.80	\$0.00	\$66.23
LABORERS - ZONE 2 (HEAVY & HIGHWAY)	12/01/2024	\$40.11	\$9.65	\$17.80	\$0.00	\$67.56
	06/01/2025	\$41.50	\$9.65	\$17.80	\$0.00	\$68.95
	12/01/2025	\$42.88	\$9.65	\$17.80	\$0.00	\$70.33
	06/01/2026	\$44.32	\$9.65	\$17.80	\$0.00	\$71.77
	12/01/2026	\$45.76	\$9.65	\$17.80	\$0.00	\$73.21

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

POWDERMAN & BLASTER	12/01/2023	\$38.86	\$9.65	\$17.14	\$0.00	\$65.65
LABORERS - ZONE 2						

For apprentice rates see "Apprentice- LABORER"

POWDERMAN & BLASTER (HEAVY & HIGHWAY)	06/01/2024	\$39.53	\$9.40	\$17.55	\$0.00	\$66.48
LABORERS - ZONE 2 (HEAVY & HIGHWAY)	12/01/2024	\$40.86	\$9.40	\$17.55	\$0.00	\$67.81
	06/01/2025	\$42.25	\$9.40	\$17.55	\$0.00	\$69.20
	12/01/2025	\$43.63	\$9.40	\$17.55	\$0.00	\$70.58
	06/01/2026	\$45.07	\$9.40	\$17.55	\$0.00	\$72.02
	12/01/2026	\$46.51	\$9.40	\$17.55	\$0.00	\$73.46

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
PUMP OPERATOR (CONCRETE) <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.03	\$13.78	\$15.15	\$0.00	\$67.96
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY-MIX CONCRETE DRIVER <i>TEAMSTERS 404 - Construction Service (Northampton)</i>	05/01/2024	\$26.14	\$11.82	\$7.25	\$0.00	\$45.21
RIDE-ON MOTORIZED BUGGY OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						
ROLLER OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$38.42	\$13.78	\$15.15	\$0.00	\$67.35
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Inc.Roofers Waterproofing &Roofers Dampproofing) <i>ROOFERS LOCAL 33</i>	02/01/2024	\$50.03	\$12.78	\$21.45	\$0.00	\$84.26
	08/01/2024	\$51.53	\$12.78	\$21.45	\$0.00	\$85.76
	02/01/2025	\$52.78	\$12.78	\$21.45	\$0.00	\$87.01
	08/01/2025	\$54.28	\$12.78	\$21.45	\$0.00	\$88.51
	02/01/2026	\$55.53	\$12.78	\$21.45	\$0.00	\$89.76

Apprentice - ROOFER - Local 33

Effective Date - 02/01/2024

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

Effective Date - 08/01/2024

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

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

Apprentice to Journeyworker Ratio:**

ROOFER SLATE / TILE / PRECAST CONCRETE <i>ROOFERS LOCAL 33</i>	02/01/2024	\$50.28	\$12.78	\$21.45	\$0.00	\$84.51
	08/01/2024	\$51.78	\$12.78	\$21.45	\$0.00	\$86.01
	02/01/2025	\$53.03	\$12.78	\$21.45	\$0.00	\$87.26
	08/01/2025	\$54.53	\$12.78	\$21.45	\$0.00	\$88.76
	02/01/2026	\$55.78	\$12.78	\$21.45	\$0.00	\$90.01
For apprentice rates see "Apprentice- ROOFER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SCRAPER <i>OPERATING ENGINEERS LOCAL 98</i> For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2023	\$39.03	\$13.78	\$15.15	\$0.00	\$67.96
SELF-POWERED ROLLERS AND COMPACTORS (TAMPERS) <i>OPERATING ENGINEERS LOCAL 98</i> For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2023	\$38.42	\$13.78	\$15.15	\$0.00	\$67.35
SELF-PROPELLED POWER BROOM <i>OPERATING ENGINEERS LOCAL 98</i> For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2023	\$35.80	\$13.78	\$15.15	\$0.00	\$64.73
SHEETMETAL WORKER <i>SHEETMETAL WORKERS LOCAL 63</i>	01/01/2024	\$40.22	\$11.96	\$18.74	\$2.13	\$73.05
	07/01/2024	\$40.98	\$12.20	\$18.74	\$2.13	\$74.05
	01/01/2025	\$42.23	\$12.20	\$18.74	\$2.13	\$75.30

Apprentice - SHEET METAL WORKER - Local 63**Effective Date - 01/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$18.10	\$5.38	\$4.86	\$0.85	\$29.19
2	50	\$20.11	\$5.98	\$5.40	\$0.94	\$32.43
3	55	\$22.12	\$6.58	\$9.71	\$1.15	\$39.56
4	60	\$24.13	\$7.18	\$9.71	\$1.23	\$42.25
5	65	\$26.14	\$7.77	\$9.71	\$1.31	\$44.93
6	70	\$28.15	\$8.37	\$9.71	\$1.39	\$47.62
7	75	\$30.17	\$8.97	\$9.71	\$1.47	\$50.32
8	80	\$32.18	\$9.57	\$17.66	\$1.78	\$61.19
9	85	\$34.19	\$10.17	\$17.66	\$1.86	\$63.88
10	90	\$36.20	\$10.76	\$17.66	\$1.94	\$66.56

Effective Date - 07/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$18.44	\$5.49	\$4.86	\$0.85	\$29.64
2	50	\$20.49	\$6.10	\$5.40	\$0.94	\$32.93
3	55	\$22.54	\$6.71	\$9.71	\$1.15	\$40.11
4	60	\$24.59	\$7.32	\$9.71	\$1.23	\$42.85
5	65	\$26.64	\$7.93	\$9.71	\$1.31	\$45.59
6	70	\$28.69	\$8.54	\$9.71	\$1.39	\$48.33
7	75	\$30.74	\$9.15	\$9.71	\$1.47	\$51.07
8	80	\$32.78	\$9.76	\$17.66	\$1.78	\$61.98
9	85	\$34.83	\$10.37	\$17.66	\$1.86	\$64.72
10	90	\$36.88	\$10.98	\$17.66	\$1.94	\$67.46

Notes:**Apprentice to Journeyworker Ratio:1:3**

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SPECIALIZED EARTH MOVING EQUIP < 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	06/01/2024	\$40.24	\$15.07	\$18.67	\$0.00	\$73.98
	12/01/2024	\$40.24	\$15.07	\$20.17	\$0.00	\$75.48
	01/01/2025	\$40.24	\$15.57	\$20.17	\$0.00	\$75.98
	06/01/2025	\$41.24	\$15.57	\$20.17	\$0.00	\$76.98
	12/01/2025	\$41.24	\$15.57	\$21.78	\$0.00	\$78.59
	01/01/2026	\$41.24	\$16.17	\$21.78	\$0.00	\$79.19
	06/01/2026	\$42.24	\$16.17	\$21.78	\$0.00	\$80.19
	12/01/2026	\$42.24	\$16.17	\$23.52	\$0.00	\$81.93
	01/01/2027	\$42.24	\$16.77	\$23.52	\$0.00	\$82.53
SPECIALIZED EARTH MOVING EQUIP > 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	06/01/2024	\$40.53	\$15.07	\$18.67	\$0.00	\$74.27
	12/01/2024	\$40.53	\$15.07	\$20.17	\$0.00	\$75.77
	01/01/2025	\$40.53	\$15.57	\$20.17	\$0.00	\$76.27
	06/01/2025	\$41.53	\$15.57	\$20.17	\$0.00	\$77.27
	12/01/2025	\$41.53	\$15.57	\$21.78	\$0.00	\$78.88
	01/01/2026	\$41.53	\$16.17	\$21.78	\$0.00	\$79.48
	06/01/2026	\$42.53	\$16.17	\$21.78	\$0.00	\$80.48
	12/01/2026	\$42.53	\$16.17	\$23.52	\$0.00	\$82.22
	01/01/2027	\$42.53	\$16.77	\$23.52	\$0.00	\$82.82
SPRINKLER FITTER <i>SPRINKLER FITTERS LOCAL 669</i>	04/01/2023	\$47.43	\$11.45	\$16.61	\$0.00	\$75.49

Apprentice - SPRINKLER FITTER - Local 669

Effective Date - 04/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$21.34	\$8.22	\$0.00	\$0.00	\$29.56
2	50	\$23.72	\$8.22	\$0.00	\$0.00	\$31.94
3	55	\$26.09	\$11.45	\$7.20	\$0.00	\$44.74
4	60	\$28.46	\$11.45	\$8.35	\$0.00	\$48.26
5	65	\$30.83	\$11.45	\$8.35	\$0.00	\$50.63
6	70	\$33.20	\$11.45	\$8.60	\$0.00	\$53.25
7	75	\$35.57	\$11.45	\$8.60	\$0.00	\$55.62
8	80	\$37.94	\$11.45	\$8.60	\$0.00	\$57.99
9	85	\$40.32	\$11.45	\$8.60	\$0.00	\$60.37
10	90	\$42.69	\$11.45	\$8.60	\$0.00	\$62.74

Notes:

Apprentice to Journeyworker Ratio:1:1

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TERRAZZO FINISHERS <i>BRICKLAYERS LOCAL 3 - MARBLE & TILE</i>	02/01/2024	\$61.34	\$11.49	\$23.59	\$0.00	\$96.42
	08/01/2024	\$63.44	\$11.49	\$23.59	\$0.00	\$98.52
	02/01/2025	\$64.74	\$11.49	\$23.59	\$0.00	\$99.82
	08/01/2025	\$66.89	\$11.49	\$23.59	\$0.00	\$101.97
	02/01/2026	\$68.24	\$11.49	\$23.59	\$0.00	\$103.32
	08/01/2026	\$70.44	\$11.49	\$23.59	\$0.00	\$105.52
	02/01/2027	\$71.84	\$11.49	\$23.59	\$0.00	\$106.92

Apprentice - TERRAZZO FINISHER - Local 3 Marble & Tile

Effective Date - 02/01/2024

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

Effective Date - 08/01/2024

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

Notes:

Apprentice to Journeyworker Ratio:1:3

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

For apprentice rates see "Apprentice- LABORER"

TEST BORING DRILLER HELPER <i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2024	\$45.60	\$9.65	\$18.22	\$0.00	\$73.47
	12/01/2024	\$47.07	\$9.65	\$18.22	\$0.00	\$74.94
	06/01/2025	\$48.57	\$9.65	\$18.22	\$0.00	\$76.44
	12/01/2025	\$50.07	\$9.65	\$18.22	\$0.00	\$77.94
	06/01/2026	\$51.62	\$9.65	\$18.22	\$0.00	\$79.49
	12/01/2026	\$53.12	\$9.65	\$18.22	\$0.00	\$80.99

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TEST BORING LABORER <i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2024	\$45.48	\$9.65	\$18.22	\$0.00	\$73.35
	12/01/2024	\$46.95	\$9.65	\$18.22	\$0.00	\$74.82
	06/01/2025	\$48.45	\$9.65	\$18.22	\$0.00	\$76.32
	12/01/2025	\$49.95	\$9.65	\$18.22	\$0.00	\$77.82
	06/01/2026	\$51.50	\$9.65	\$18.22	\$0.00	\$79.37
	12/01/2026	\$53.00	\$9.65	\$18.22	\$0.00	\$80.87
For apprentice rates see "Apprentice- LABORER"						
TRACTORS <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$38.42	\$13.78	\$15.15	\$0.00	\$67.35
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TRAILERS FOR EARTH MOVING EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	06/01/2024	\$40.82	\$15.07	\$18.67	\$0.00	\$74.56
	12/01/2024	\$40.82	\$15.07	\$20.17	\$0.00	\$76.06
	01/01/2025	\$40.82	\$15.57	\$20.17	\$0.00	\$76.56
	06/01/2025	\$41.82	\$15.57	\$20.17	\$0.00	\$77.56
	12/01/2025	\$41.82	\$15.57	\$21.78	\$0.00	\$79.17
	01/01/2026	\$41.82	\$16.17	\$21.78	\$0.00	\$79.77
	06/01/2026	\$42.82	\$16.17	\$21.78	\$0.00	\$80.77
	12/01/2026	\$42.82	\$16.17	\$23.52	\$0.00	\$82.51
	01/01/2027	\$42.82	\$16.77	\$23.52	\$0.00	\$83.11
TUNNEL WORK - COMPRESSED AIR <i>LABORERS (COMPRESSED AIR)</i>	06/01/2024	\$57.71	\$9.65	\$19.00	\$0.00	\$86.36
	12/01/2024	\$59.18	\$9.65	\$19.00	\$0.00	\$87.83
	06/01/2025	\$60.68	\$9.65	\$19.00	\$0.00	\$89.33
	12/01/2025	\$62.18	\$9.65	\$19.00	\$0.00	\$90.83
	06/01/2026	\$63.73	\$9.65	\$19.00	\$0.00	\$92.38
	12/01/2026	\$65.23	\$9.65	\$19.00	\$0.00	\$93.88
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) <i>LABORERS (COMPRESSED AIR)</i>	06/01/2024	\$59.71	\$9.65	\$19.00	\$0.00	\$88.36
	12/01/2024	\$61.18	\$9.65	\$19.00	\$0.00	\$89.83
	06/01/2025	\$62.68	\$9.65	\$19.00	\$0.00	\$91.33
	12/01/2025	\$64.18	\$9.65	\$19.00	\$0.00	\$92.83
	06/01/2026	\$65.73	\$9.65	\$19.00	\$0.00	\$94.38
	12/01/2026	\$67.23	\$9.65	\$19.00	\$0.00	\$95.88
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR <i>LABORERS (FREE AIR TUNNEL)</i>	06/01/2024	\$49.78	\$9.65	\$19.00	\$0.00	\$78.43
	12/01/2024	\$51.25	\$9.65	\$19.00	\$0.00	\$79.90
	06/01/2025	\$52.75	\$9.65	\$19.00	\$0.00	\$81.40
	12/01/2025	\$54.25	\$9.65	\$19.00	\$0.00	\$82.90
	06/01/2026	\$55.80	\$9.65	\$19.00	\$0.00	\$84.45
	12/01/2026	\$57.30	\$9.65	\$19.00	\$0.00	\$85.95
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR (HAZ. WASTE) <i>LABORERS (FREE AIR TUNNEL)</i>	06/01/2024	\$51.78	\$9.65	\$19.00	\$0.00	\$80.43
	12/01/2024	\$53.25	\$9.65	\$19.00	\$0.00	\$81.90
	06/01/2025	\$54.75	\$9.65	\$19.00	\$0.00	\$83.40
	12/01/2025	\$56.25	\$9.65	\$19.00	\$0.00	\$84.90
	06/01/2026	\$57.80	\$9.65	\$19.00	\$0.00	\$86.45
	12/01/2026	\$59.30	\$9.65	\$19.00	\$0.00	\$87.95
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
VAC-HAUL	06/01/2024	\$40.24	\$15.07	\$18.67	\$0.00	\$73.98
TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	12/01/2024	\$40.24	\$15.07	\$20.17	\$0.00	\$75.48
	01/01/2025	\$40.24	\$15.57	\$20.17	\$0.00	\$75.98
	06/01/2025	\$41.24	\$15.57	\$20.17	\$0.00	\$76.98
	12/01/2025	\$41.24	\$15.57	\$21.78	\$0.00	\$78.59
	01/01/2026	\$41.24	\$16.17	\$21.78	\$0.00	\$79.19
	06/01/2026	\$42.24	\$16.17	\$21.78	\$0.00	\$80.19
	12/01/2026	\$42.24	\$16.17	\$23.52	\$0.00	\$81.93
	01/01/2027	\$42.24	\$16.77	\$23.52	\$0.00	\$82.53
VOICE-DATA-VIDEO TECHNICIAN	09/03/2023	\$34.49	\$13.00	\$17.22	\$0.00	\$64.71
ELECTRICIANS LOCAL 96	09/01/2024	\$35.29	\$13.99	\$17.57	\$0.00	\$66.85
	09/07/2025	\$36.12	\$14.98	\$17.91	\$0.00	\$69.01
	09/06/2026	\$37.04	\$15.96	\$18.27	\$0.00	\$71.27

Apprentice - VOICE-DATA-VIDEO TECHNICIAN - Local 96

Effective Date - 09/03/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$17.25	\$13.00	\$4.31	\$0.00	\$34.56
2	55	\$18.97	\$13.00	\$4.36	\$0.00	\$36.33
3	60	\$20.69	\$13.00	\$16.81	\$0.00	\$50.50
4	65	\$22.42	\$13.00	\$16.86	\$0.00	\$52.28
5	70	\$24.14	\$13.00	\$16.91	\$0.00	\$54.05
6	75	\$25.87	\$13.00	\$16.97	\$0.00	\$55.84
7	80	\$27.59	\$13.00	\$17.02	\$0.00	\$57.61
8	85	\$29.32	\$13.00	\$17.07	\$0.00	\$59.39

Effective Date - 09/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$17.65	\$13.99	\$4.41	\$0.00	\$36.05
2	55	\$19.41	\$13.99	\$4.46	\$0.00	\$37.86
3	60	\$21.17	\$13.99	\$17.15	\$0.00	\$52.31
4	65	\$22.94	\$13.99	\$17.20	\$0.00	\$54.13
5	70	\$24.70	\$13.99	\$17.25	\$0.00	\$55.94
6	75	\$26.47	\$13.99	\$17.30	\$0.00	\$57.76
7	80	\$28.23	\$13.99	\$17.36	\$0.00	\$59.58
8	85	\$30.00	\$13.99	\$17.41	\$0.00	\$61.40

Notes:

Apprentice to Journeyworker Ratio:1:1

WAGON DRILL OPERATOR	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
LABORERS - ZONE 2						

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
WAGON DRILL OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	06/01/2024	\$38.78	\$9.65	\$17.80	\$0.00	\$66.23
	12/01/2024	\$40.11	\$9.65	\$17.80	\$0.00	\$67.56
	06/01/2025	\$41.50	\$9.65	\$17.80	\$0.00	\$68.95
	12/01/2025	\$42.88	\$9.65	\$17.80	\$0.00	\$70.33
	06/01/2026	\$44.32	\$9.65	\$17.80	\$0.00	\$71.77
	12/01/2026	\$45.76	\$9.65	\$17.80	\$0.00	\$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
WATER METER INSTALLER <i>PLUMBERS LOCAL 4</i>	03/01/2024	\$53.95	\$9.90	\$17.42	\$0.00	\$81.27
	09/01/2024	\$55.35	\$9.90	\$17.42	\$0.00	\$82.67
	03/01/2025	\$56.75	\$9.90	\$17.42	\$0.00	\$84.07
	09/01/2025	\$58.15	\$9.90	\$17.42	\$0.00	\$85.47
	03/01/2026	\$59.55	\$9.90	\$17.42	\$0.00	\$86.87
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						
Marine Drilling						
BLASTER <i>MARINE DRILLING</i>	01/01/2018	\$41.82	\$7.63	\$3.60	\$0.00	\$53.05
BOAT CAPTAIN <i>MARINE DRILLING</i>	01/01/2018	\$33.87	\$7.63	\$3.30	\$0.00	\$44.80
BOAT CAPTAIN / Over 1,000 hp <i>MARINE DRILLING</i>	01/01/2018	\$38.06	\$7.63	\$3.60	\$0.00	\$49.29
CORE DRILLER <i>MARINE DRILLING</i>	01/01/2018	\$31.43	\$7.63	\$2.90	\$0.00	\$41.96
CORE DRILLER HELPER <i>MARINE DRILLING</i>	01/01/2018	\$28.47	\$7.63	\$3.00	\$0.00	\$39.10
DRILLER <i>MARINE DRILLING</i>	01/01/2018	\$39.70	\$7.63	\$3.60	\$0.00	\$50.93
ENGINEER <i>MARINE DRILLING</i>	01/01/2018	\$39.69	\$7.63	\$3.50	\$0.00	\$50.82
HELPER <i>MARINE DRILLING</i>	01/01/2018	\$34.24	\$7.63	\$3.00	\$0.00	\$44.87
MACHINIST <i>MARINE DRILLING</i>	01/01/2018	\$38.88	\$7.63	\$3.30	\$0.00	\$49.81
OILER - MARINE DRILLING <i>MARINE DRILLING</i>	01/01/2018	\$34.24	\$7.63	\$3.00	\$0.00	\$44.87
TUG DECKHAND <i>MARINE DRILLING</i>	01/01/2018	\$27.61	\$7.63	\$3.00	\$0.00	\$38.24
WELDER <i>MARINE DRILLING</i>	01/01/2018	\$38.88	\$7.63	\$3.30	\$0.00	\$49.81
Op Eng Marine (Dredging Work)						
BOAT OPERATOR <i>OPERATING ENGINEERS - MARINE DIVISION</i>	10/01/2017	\$29.26	\$7.63	\$3.30	\$0.00	\$40.19
CERTIFIED WELDER <i>OPERATING ENGINEERS - MARINE DIVISION</i>	10/01/2017	\$31.09	\$7.63	\$3.60	\$0.00	\$42.32
CHIEF WELDER/ CHIEF MATE <i>OPERATING ENGINEERS - MARINE DIVISION</i>	10/01/2017	\$33.02	\$7.63	\$3.60	\$0.00	\$44.25
DERRICK / SPIDER / SPILLBARGE OPERATOR <i>OPERATING ENGINEERS - MARINE DIVISION</i>	10/01/2017	\$33.02	\$7.63	\$3.60	\$0.00	\$44.25
DRAG BARGE OPERATOR / WELDER / MATE <i>OPERATING ENGINEERS - MARINE DIVISION</i>	10/01/2017	\$30.24	\$7.63	\$3.30	\$0.00	\$41.17

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
ENGINEER / ELECTRICIAN <i>OPERATING ENGINEERS - MARINE DIVISION</i>	10/01/2017	\$33.02	\$7.63	\$3.60	\$0.00	\$44.25
LICENSED BOAT OPERATOR <i>OPERATING ENGINEERS - MARINE DIVISION</i>	10/01/2017	\$33.02	\$7.63	\$3.60	\$0.00	\$44.25
LICENSED TUG OPERATOR OVER 1000HP <i>OPERATING ENGINEERS - MARINE DIVISION</i>	10/01/2017	\$38.18	\$7.63	\$3.60	\$0.00	\$49.41
MAINTENANCE ENGINEER <i>OPERATING ENGINEERS - MARINE DIVISION</i>	10/01/2017	\$33.03	\$7.63	\$3.60	\$0.00	\$44.26
OILER - MARINE DIVISION <i>OPERATING ENGINEERS - MARINE DIVISION</i>	10/01/2017	\$24.30	\$7.63	\$3.00	\$0.00	\$34.93
OPERATOR / LEVERMAN <i>OPERATING ENGINEERS - MARINE DIVISION</i>	10/01/2017	\$38.18	\$7.63	\$3.60	\$0.00	\$49.41
RODMAN / SCOWMAN <i>OPERATING ENGINEERS - MARINE DIVISION</i>	10/01/2017	\$24.30	\$7.63	\$3.00	\$0.00	\$34.93
SHOREMAN / DECKHAND <i>OPERATING ENGINEERS - MARINE DIVISION</i>	10/01/2017	\$24.30	\$7.63	\$3.00	\$0.00	\$34.93
Outside Electrical - East						
CABLE TECHNICIAN (Power Zone) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	\$29.67	\$9.25	\$1.89	\$0.00	\$40.81
CABLEMAN (Underground Ducts & Cables) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	\$42.03	\$9.25	\$10.27	\$0.00	\$61.55
DRIVER / GROUNDMAN CDL <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	\$34.62	\$9.25	\$10.07	\$0.00	\$53.94
DRIVER / GROUNDMAN -Inexperienced (<2000 Hrs) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	\$27.20	\$9.25	\$1.82	\$0.00	\$38.27
EQUIPMENT OPERATOR (Class A CDL) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	\$42.03	\$9.25	\$14.35	\$0.00	\$65.63
EQUIPMENT OPERATOR (Class B CDL) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	\$37.09	\$9.25	\$10.87	\$0.00	\$57.21
GROUNDMAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	\$27.20	\$9.25	\$1.82	\$0.00	\$38.27
GROUNDMAN -Inexperienced (<2000 Hrs.) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	\$22.25	\$9.25	\$1.82	\$0.00	\$33.32
JOURNEYMAN LINEMAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2020	\$49.45	\$9.25	\$17.48	\$0.00	\$76.18

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - LINEMAN (Outside Electrical) - East Local 104

Effective Date - 08/30/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$29.67	\$9.25	\$3.39	\$0.00	\$42.31
2	65	\$32.14	\$9.25	\$3.46	\$0.00	\$44.85
3	70	\$34.62	\$9.25	\$3.54	\$0.00	\$47.41
4	75	\$37.09	\$9.25	\$5.11	\$0.00	\$51.45
5	80	\$39.56	\$9.25	\$5.19	\$0.00	\$54.00
6	85	\$42.03	\$9.25	\$5.26	\$0.00	\$56.54
7	90	\$44.51	\$9.25	\$7.34	\$0.00	\$61.10

Notes:

Apprentice to Journeyworker Ratio:1:2

TELEDATA CABLE SPLICER <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	02/04/2019	\$30.73	\$4.70	\$3.17	\$0.00	\$38.60
TELEDATA LINEMAN/EQUIPMENT OPERATOR <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	02/04/2019	\$28.93	\$4.70	\$3.14	\$0.00	\$36.77
TELEDATA WIREMAN/INSTALLER/TECHNICIAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	02/04/2019	\$28.93	\$4.70	\$3.14	\$0.00	\$36.77

Additional Apprentice Information:

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

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

All steps are six months (1000 hours.)

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

** Multiple ratios are listed in the comment field.

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

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

DOCUMENT 00870

STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION CONTRACT
SPECIFICATIONS
(EXECUTIVE ORDER 11246)
Revised April 9, 2019

1. As used in these specifications:
 - a. "Covered area" means the geographical area described in the solicitation from which this contract resulted:
 - b. "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority.
 - c. "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941.
 - d. "Minority" includes:
 - (i) Black (all persons having origins in any of the black African racial groups not of Hispanic origin);
 - (ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
 - (iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
 - (iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).
2. Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$ 10,000 the provisions of the specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.
3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.
4. The Contractor shall implement the specific affirmative action standards provided in Paragraphs 7a through p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. The Contractor is expected to make substantially uniform progress toward its goals in each craft during the period specified.
5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.

6. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.
7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:
 - a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.
 - b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.
 - c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.
 - d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.
 - e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7b above.
 - f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.
 - g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with on-site supervisory personnel such as Superintendents, General Foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.
 - h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.

- i. Direct its recruitment efforts both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.
 - j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's work force.
 - k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.
 - l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.
 - m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.
 - n. Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.
 - o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.
 - p. Conduct a review, at least annually, of all supervisor's adherence to and performance under the Contractor's EEO policies and affirmative action obligations.
8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through p of these Specifications provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female work force participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.
 9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).
 10. The Contractor shall not use the goals and timetables of affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.
 11. The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.
13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.
14. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as many be required by the Government and keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.
15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

APPENDIX A

The following goals and timetables for female utilization shall be included in all Federal and federally assisted construction contracts and subcontracts in excess of \$ 10,000. The goals are applicable to the Contractor's aggregate on-site construction workforce whether or not part of that workforce is performing work on a Federal or federally-assisted construction contract or subcontract.

Area covered: Goal for Women apply nationwide

Goals and TimetablesTimetableGoals (percent)

From Apr. 1, 1980 until further notice

6.9

APPENDIX B-80

Until further notice, the following goals for minority utilization in each construction craft and trade shall included in all Federal or federally assisted construction contracts and subcontracts in excess of \$ 10,000 to be performed in the respective geographical areas. The goals are applicable to each nonexempt contractor's total on- site construction workforce, regardless of whether or not part of that workforce is performing work on a Federal, federally assisted or nonfederally related project, contract or subcontract.

Construction contractors participating in an approved Hometown Plan (see 41 CFR 6-4.5) are required to comply with the goals of the Hometown Plan with regard to construction work they perform in the area covered by the Hometown Plan. With regard to all their other covered construction work, such contractors are required to comply with the applicable SMSA or EA goal contained in this Appendix B-80.

Economic AreasSTATE:Goals (percent)

MASSACHUSETTS

004 Boston MA:

SMSA Counties:

1123 Boston-Lowell-Brockton-Lawrence-Haverhill, MA-NH

4.0

MA Essex, MA Middlesex, MA Norfolk, MA Plymouth,

MA Suffolk, NH Rockingham.

5403 Fall River- New Bedford MA, Bristol

1.6

9243 Worcester-Fitchburg-Leominster, MA

1.6

6323 Springfield-Chicopee-Holyoke MA-CT

4.8

MA Hampden, MA Hampshire

Non-SMSA Counties: MA Barnstable, MA Dukes, MA Nantucket

3.6

Non-SMSA Counties: MA Franklin

5.9

APPENDIX C

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the “contractor”) agrees as follows:

1. **Compliance with Regulations:** The contractor (hereinafter includes consultants) will comply with the Acts and Regulations relative to Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, Federal Highway Administration (FHWA), as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.
2. **Non-discrimination:** The contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, national origin (including limited English proficiency), age, sex, disability, or low-income status in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.
3. **Solicitations for Subcontractors, including Procurements of Materials and Equipment:** In all solicitations, either by competitive bidding, or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the contractor of the contractor’s obligations under this contract and the Acts and the Regulations relative to nondiscrimination on the grounds of race, color, national origin (including limited English proficiency), age, sex, disability, or low-income status.
4. **Information and Reports:** The contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto, and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Massachusetts Department of Transportation (MassDOT) or FHWA to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish this information, the contractor will so certify to MassDOT or FHWA, as appropriate, and will set forth what efforts it has made to obtain the information.
5. **Sanctions for Noncompliance:** In the event of a contractor’s noncompliance with the Nondiscrimination provisions of this contract, MassDOT will impose such contract sanctions as it or FHWA may determine to be appropriate, including, but not limited to:
 - a. withholding payments to the contractor under the contract until the contractor complies; and/or
 - b. cancelling, terminating, or suspending a contract, in whole or in part.
6. **Incorporation of Provisions:** The contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations, and directives issued pursuant thereto. The contractor will take action with respect to any subcontract or procurement as MassDOT or FHWA may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the contractor may request MassDOT to enter into any litigation to protect the interests of MassDOT. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.

APPENDIX D

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the “contractor,” which includes consultants) agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

PERTINENT NON-DISCRIMINATION AUTHORITIES:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq.*, 78 stat. 252) (prohibits discrimination on the basis of race, color, national origin); and 49 CFR Part 21
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 U.S.C. § 4601) (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-Aid programs and projects)
- Federal-Aid Highway Act of 1973 (23 U.S.C. § 324 *et seq.*) (prohibits discrimination on the basis of sex)
- Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. § 794 *et seq.*), as amended (prohibits discrimination on the basis of disability) and 49 CFR Part 27
- The Age Discrimination Act of 1975, as amended (42 U.S.C. § 6101 *et seq.*) (prohibits discrimination on the basis of age)
- Airport and Airway Improvement Act of 1982 (49 U.S.C. § 471, Section 47123), as amended (prohibits discrimination based on race, creed, color, national origin, or sex)
- The Civil Rights Restoration Act of 1987 (PL 100-209) (broadened the scope, coverage, and applicability of Title VI of the Civil Rights Act of 1964, the Age Discrimination Act of 1975, and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms “programs or activities” to include all of the programs or activities of Federal-Aid recipients, sub-recipients, and contractors, whether such programs or activities are Federally funded or not)
- Titles II and III of the Americans with Disabilities Act (42 U.S.C. §§ 12131-12189), as implemented by Department of Transportation regulations at 49 CFR parts 37 and 38 (prohibits discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities)
- The Federal Aviation Administration’s Non-Discrimination Statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex)
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (ensures discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations)
- Executive Order 13166, Improving Access to Services for People with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100)
- Title IX of the Education Amendments Act of 1972, as amended (20 U.S.C. 1681 *et seq.*) (prohibits discrimination on the basis of sex in education programs or activities)

*** END OF DOCUMENT ***

DOCUMENT 00880

Revised January 12, 2022



DEPARTMENT OF LABOR

Employment Standards Administration

MINIMUM WAGES FOR FEDERAL AND FEDERALLY ASSISTED CONTRACTS

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"General Decision Number: MA20240025 06/21/2024

Superseded General Decision Number: MA20230025

State: Massachusetts

Construction Type: Highway

County: Worcester County in Massachusetts.

HIGHWAY CONSTRUCTION PROJECTS

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

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022: 	. Executive Order 14026 generally applies to the contract. . The contractor must pay all covered workers at least \$17.20 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2024.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022: 	. Executive Order 13658 generally applies to the contract. . The contractor must pay all covered workers at least \$12.90 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2024.

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

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

Modification Number	Publication Date
0	01/05/2024
1	01/19/2024
2	03/22/2024
3	05/31/2024
4	06/21/2024

CARP0336-004 03/01/2024

	Rates	Fringes
CARPENTER (Includes Form Work)...	\$ 46.86	30.94

ELEC0103-007 03/01/2024

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

* ENGI0004-030 06/01/2024

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
Group 1.....	\$ 56.03	32.75
Group 2.....	\$ 55.41	32.75

FOOTNOTE FOR POWER EQUIPMENT OPERATORS:

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

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

Group 1: Backhoe/Excavator/Trackhoe; Bobcat/Skid Steer/Skid Loader; Broom/Sweeper; Gradall; Loader; Paver (Asphalt, Aggregate, and Concrete); Post Driver (Guardrail/Fences)
 Group 2: Bulldozer; Grader/Blade; Roller

* ENGI0004-031 05/23/2024

	Rates	Fringes
POWER EQUIPMENT OPERATOR:		
(Milling Machine).....	\$ 56.03	32.75

FOOTNOTE FOR POWER EQUIPMENT OPERATORS:

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

 IRON0007-028 03/16/2024

	Rates	Fringes
IRONWORKER, STRUCTURAL.....	\$ 54.38	36.48

IRON0007-029 03/16/2024

	Rates	Fringes
IRONWORKER, ORNAMENTAL.....	\$ 54.68	36.48

LABO0039-003 06/01/2018

	Rates	Fringes
LABORER Asphalt, Includes Raker, Shoveler, Spreader and Distributor.....	\$ 33.50	22.92
Common or General.....	\$ 33.25	22.92
Guardrail Installation.....	\$ 33.50	22.92

PAIN0035-023 01/01/2024

	Rates	Fringes
PAINTER (Steel).....	\$ 56.06	35.60

SUMA2014-015 01/11/2017

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER...	\$ 56.70	21.08
IRONWORKER, REINFORCING.....	\$ 56.48	20.62
LABORER: Concrete Saw (Hand Held/Walk Behind).....	\$ 41.78	18.37
LABORER: Landscape.....	\$ 40.39	17.68
OPERATOR: Crane.....	\$ 52.14	21.08
OPERATOR: Forklift.....	\$ 64.67	0.00

OPERATOR: Mechanic.....	\$ 48.14	17.02
OPERATOR: Piledriver.....	\$ 44.46	16.94
PAINTER: Spray (Linestriping)....	\$ 48.00	0.00
PILEDRIVERMAN.....	\$ 45.65	23.33
TRAFFIC CONTROL: Flagger.....	\$ 23.00	20.44
TRAFFIC CONTROL: Laborer-Cones/ Barricades/Barrels - Setter/Mover/Sweeper.....		
	\$ 44.49	12.41
TRUCK DRIVER: Concrete Truck....	\$ 33.69	15.79
TRUCK DRIVER: Dump Truck.....	\$ 30.38	7.20
TRUCK DRIVER: Flatbed Truck.....	\$ 48.53	0.00

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

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

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

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

Union Rate Identifiers

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

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

Survey Rate Identifiers

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

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

Union Average Rate Identifiers

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

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

State Adopted Rate Identifiers

Classifications listed under the "SA" identifier indicate that the prevailing wage rate set by a state (or local) government was adopted under 29 C.F.R. 21.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 01/03/2024 reflects the date on which the classifications and rates under the SA identifier took effect under state law in the state from which the rates were adopted.

WAGE DETERMINATION APPEALS PROCESS

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

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

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

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

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

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

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

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

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

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

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

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END OF GENERAL DECISION"

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"General Decision Number: MA20240002 07/05/2024

Superseded General Decision Number: MA20230002

State: Massachusetts

Construction Type: Heavy
HEAVY CONSTRUCTION PROJECTS; AND
MARINE CONSTRUCTION PROJECTS

County: Worcester County in Massachusetts.

HEAVY CONSTRUCTION PROJECTS; AND MARINE CONSTRUCTION PROJECTS

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

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022: 	. Executive Order 14026 generally applies to the contract. . The contractor must pay all covered workers at least \$17.20 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2024.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022: 	. Executive Order 13658 generally applies to the contract. . The contractor must pay all covered workers at least \$12.90 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2024.

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

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

Modification Number	Publication Date
0	01/05/2024
1	01/19/2024
2	02/09/2024
3	03/01/2024
4	03/22/2024
5	05/31/2024
6	06/14/2024
7	07/05/2024

ASBE0006-005 09/01/2023

	Rates	Fringes
Insulator/asbestos worker		
Includes the application of all insulating materials, protective coverings, coating, and finishes all types of mechanical systems.....	\$ 48.15	35.16
Includes the application of all insulating materials, protective coverings, coating, and finishes to all types of mechanical systems.....	\$ 37.50	24.35

BOIL0029-001 01/01/2021

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

BRMA0001-002 08/01/2023

SPRINGFIELD/PITTSFIELD CHAPTER WORCESTER (Warren County)

Rates	Fringes
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Bricklayer, Cement Mason,
Plasterer & Stonemason.....\$ 50.81 32.27

BRMA0001-014 08/01/2023

WORCESTER CHAPTER

WORCESTER (Auburn Barre, Blackstone, Berlin, Bolton, Boylston,
the Brookfields, Charlton, Clinton, Douglas, Dudley, Grafton,
Hardwick, Holden, Leicester, Mendon, Millbury, Milville, New
Braintree, Northboro, Northbridge, Oakham, Oxford, Paxton,
Rutland, Shrewbury, Southbridge, Spencer, Sturbridge, Sutton,
Upton, Uxbridge, Webster, Westboro, West Boylston, Worcester)

	Rates	Fringes
Bricklayer, Cement Mason, Plasterer & Stonemason.....	\$ 60.26	33.71

BRMA0001-015 08/01/2023

LOWELL CHAPTER

WORCESTER (Hopedale, Milford, Southboro)

	Rates	Fringes
Bricklayer, Cement Mason, Plasterer & Stonemason.....	\$ 60.26	33.71

BRMA0001-023 08/01/2023

LOWELL CHAPTER

WORCESTER (Ashburham, Athol, Fitchburg, Gardner, Harvard,
Hubbardston, Lancaster, Leominster, Lunenburg, Petersham,
Phillipston, Princeton, Royalston, Sterling, Templeton,
Westminster, Winchendon)

	Rates	Fringes
Bricklayer, Cement Mason, Plasterer & Stonemason.....	\$ 60.26	33.71

BRMA0003-001 08/01/2023

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

CARP0056-004 08/01/2022

	Rates	Fringes
DIVER TENDER.....	\$ 52.15	34.10
DIVER.....	\$ 68.70	35.57

CARP0056-008 08/01/2022

	Rates	Fringes
FILEDRIVERMAN.....	\$ 45.74	34.10

CARP0336-002 03/01/2024

WORCESTER (Except Gilbertville, Harwick, Warren, West
Brookfield)

	Rates	Fringes
Carpenter/Lather.....	\$ 46.86	30.94

CARP0336-007 03/01/2024

WORCESTER (Gilbertville, Hardwick, Warren, West Brookfield)

	Rates	Fringes
Carpenter/Lather.....	\$ 46.86	30.94

CARP1121-004 01/01/2024

	Rates	Fringes
MILLWRIGHT.....	\$ 41.20	32.99

ELEC0096-002 09/04/2022

WORCESTER (Warren)

	Rates	Fringes
ELECTRICIAN.....	\$ 45.59	30.92

ELEC0104-001 08/29/2022

	Rates	Fringes
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Line Construction:

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

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

 ELEV0041-002 01/01/2024

	Rates	Fringes
ELEVATOR MECHANIC.....	\$ 63.71	37.885+a+b

FOOTNOTE:

a.Vacation: 6%/under 5 years based on regular hourly rate for all hours worked. 8%/over 5 years based on regular hourly rate for all hours worked.

b. PAID HOLIDAYS: New Year's Day; Memorial Day; Independence Day; Labor Day; Veterans' Day; Thanksgiving Day; the Friday after Thanksgiving Day; and Christmas Day.

 ENGI0004-003 06/01/2024

WORCESTER (Except Athol, Barre, Brookfield, East Brookfield, Hardwick, New Braintree, North Brookfield, Oakham, Petersham, Phillipston, Royalston, Strutbridge, Templeton, Warren, West Brookfield, Winchendon)

	Rates	Fringes
Power equipment operators:		
BUILDING, HEAVY & MARINE		
GROUP 1.....	\$ 48.73	29.25
Group 1.....	\$ 56.03	32.75
GROUP 2.....	\$ 48.23	29.25
Group 2.....	\$ 55.41	32.75
GROUP 3.....	\$ 32.47	29.25
Group 3.....	\$ 36.17	32.75
GROUP 4.....	\$ 39.89	29.25
Group 4.....	\$ 45.23	32.75
GROUP 5.....	\$ 23.08	29.25
Group 5.....	\$ 24.71	32.75
GROUP 6.....	\$ 27.64	29.25
Group 6.....	\$ 30.28	32.75

FOOTNOTE FOR POWER EQUIPMENT OPERATORS:

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

HOURLY PREMIUM FOR BOOM LENGTHS (Including Jib):

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

POWER EQUIPMENT OPERATORS CLASSIFICATIONS BUILDING AND HEAVY CONSTRUCTION

GROUP 1: Power shovel; crane; truck crane; derrick; pile driver; trenching machine; mechanical hoist pavement breaker; cement concrete paver; dragline; hoisting engine; three drum machine; pumpcrete machine; loaders; shovel dozer; front end loader; mucking machine; shaft hoist; steam engine; backhoe; gradall; cable way; fork lift; cherry picker; boring machine; rotary drill; post hole hammer; port hole digger; asphalt plant on job site; concrete batching and/or mixing plant on job site; crusher plant on job site; paving concrete mixer; timber jack
GROUP 2: Sonic or vibratory hammer; grader; scraper; tandem scraper; bulldozer; tractor; mechanic - maintenance; York rake; mulching machine; paving screed machine; stationary steam boiler; paving concrete finishing machine; grout pump; portable steam boiler; portable steam generator; roller; spreader; asphalt paver; locomotives or machines used in place thereof; tamper (self propelled or tractor-draw); cal tracks; ballast regulator; rail anchor machine; switch tamper; tire truck
GROUP 3: Pumps (1-3 grouped); compressor; welding machines (1-3 grouped); generator; sighting plant; heaters (power driven, 1- 5); syphon-pulsometer; concrete mixer; valves controlling permanent plant air steam, conveyor, wellpoint system (operating)

GROUP 4: Assitant engineer (fireman)

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

GROUP 6: Oiler (on truck cranes and gradalls)

POWER EQUIPMENT OPERATORS CLASSIFICATIONS MARINE CONSTRUCTION

GROUP 1: Shovel; crane; truck crane; cherry picker; derrick; pile driver; two or more drum machines; lighters; derrick boats; trenching machines; mechanic hoist pavement breakers; cement concrete pavers; draglines; hoisting engines; pumpcrete machines; elevating graders; shovel dozer; front end loader; backhoe; gradall; cable ways; boring machine; rotary drill; post hole hammer; post hole digger; fork lift; timber jack; asphalt plant (on site);

concrete batching and/or mixing plant (on site); crusher plant (on site); paving concrete mixer
 GROUP 2: Portable steam boiler; portable steam generator; sonic or vibratory hammer; grader; scraper; tandem scraper; concrete pump; bulldozer; tractor; York rake; mulching machine; roller; spreader; tamper (self-propelled or tractor-drawn); asphalt paver; concrete mixer with side loader; mechanic - maintenance; cal tracks; ballast regulator; switch tamper; rail anchor machine; tire truck
 GROUP 3: Pumps (1-3 grouped); compressor; welding machines (1-3 grouped); generator; lighting plant; heaters (power driven 1-5); syphon-pulsometer; concrete mixer; valves controlling permanent plant air or steam; conveyor; well point systems; auger (powered by independent engines and attached to pile drivers); hydraulic saws

GROUP 4: Fireman

GROUP 5: Assistant engineer (other than truck crane and gradall)

GROUP 6: Assistant engineer (on truck crane and gradall)

 ENGI0098-005 12/01/2016

	Rates	Fringes
Power equipment operators:		
Group 1.....	\$ 33.68	23.96+A
Group 2.....	\$ 33.37	23.96+A
Group 3.....	\$ 33.15	23.96+A
Group 4.....	\$ 32.54	23.96+A
Group 5.....	\$ 29.92	23.96+A
Group 6.....	\$ 28.80	23.96+A
Group 7.....	\$ 26.86	23.96+A
Group 8.....	\$ 305.95	23.96+A
Group 9.....	\$ 230.69	23.96+A
Group 10.....	\$ 35.17	23.96+A
Group 11.....	\$ 38.18	23.96+A
Group 12.....	\$ 39.68	23.96+A
Group 13.....	\$ 40.68	23.96+A
Group 14.....	\$ 41.68	23.96+A
Group 15.....	\$ 43.18	23.96+A

HAZARDOUS WASTE PREMIUM \$2.00

FOOTNOTE FOR POWER EQUIPMENT OPERATORS:

Group 8 and Group 9 are per day wages.

A. Paid Holidays: New year's Day, Washington's Birthday, Memorial Day, Independence Day, Labor Day, Columbus Day, Veterans Day, Thanksgiving Day and Christmas Day

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

Group 1: Shovels; crawlers and truck cranes including all tower; self-propelled hydraulic cranes 10 tons and over; draglines; clam shells; cableways; shaft hoists; mucking machines derricks; backhoes; bulldozers; gradalls; elevating graders; pile drivers; concrete pavers; trenching machines; front end loaders- 5 1/2 cu yds and over; dual drum paver; automatic grader-excavator(C.M.I. or equal); scrapers towing pan or wagon; tandem dozers or push cats(2 units in tandem); shotcrete machine; tunnel boring machine; combination backhoe/loader 3/4 cu yd hoe or over; jet engine dryer; tree shredder; post hole digger; post hole hammer; post extractor; truck mounted concrete pump with boom; roto-mill; Grader; Horizontal Drilling Machine; John Henry Rock Drill and similar equipment.

Group 2: Rotary drill with mounted compressor; compressor house (3 to 6 compressors); rock and earth boring machines (excluding McCarthy and similar drills); front end loaders 4 cu yds to 5 1/2 cu yds); forklifts-7 ft lift and over 3 ton capacity; scraper 21 yds and over (struck load); sonic hammer console; reclaimers road planer/milling machine; cal tracks; ballast regulators; rail anchor machines; switch tampers, asphalt pavers; mechanic; welder and transfer machine.

Group 3: Combination backhoe/loader up to 3/4 cu yd; scrapers up to 21 cu yd (struck load, self propelled or tractor drawn); tireman; front end loaders up to 4 yds; well drillers; engineer or fireman on high pressure boiler; self-loading batch plant; well point operators electric pumps used in well point system; pumps, 16 inches and over (total discharge); compressor, one or two 900 cu ft and over; powered grease truck; tunnel locomotives and dingys; grout pumps; hydraulic jacks; boom truck; hydraulic cranes-up to 10 ton.

Group 4: Asphalt rollers; self-powered rollers and compactors; tractor without blade drawing sheepsfoot roller; rubber tire roller; vibratory roller or other type of compactors including machines for pulverizing and aerating soil; york rake.

Group 5: Hoists; conveyors; power pavement breakers; self-powered concrete pavement finishing machines; two bag mixers with skip; McCarthy and similar drills; batch plants (not self loading); bulk cement plants; self-propelled material spreaders; three or more 10 KW light plants; 30 KW or more generators; power broom.

Group 6: Compressor (one or two) 315 cu ft to 900 cu ft; pumps 4 inches to 16 inches (total discharge).

Group 7: Compressors up to 315 cu ft; small mixers with skip; pumps up to 4 inches; power heaters; oiler; A-frame trucks; forklifts-up to 7 ft. lift and up to 3 ton capacity; hydro broom; stud welder.

Group 8: Truck crane crews

Group 9: Oiler

Group 10: Master Mechanic

Group 11: Boom lengths over 150 feet including jib

Group 12: Boom lengths over 200 feet including jib

Group 13: Boom lengths over 250 feet including jib

Group 14: Boom lengths over 300 feet including jib

Group 15: Boom lengths over 350 feet including jib

IRON0007-012 03/16/2024

	Rates	Fringes
IRONWORKER.....	\$ 54.38	36.48

LABO0022-001 12/01/2023

	Rates	Fringes
Laborers: (HEAVY CONSTRUCTION)		
GROUP 1.....	\$ 37.86	27.59
GROUP 2.....	\$ 38.11	27.59
GROUP 3.....	\$ 38.61	27.59
GROUP 4.....	\$ 38.86	27.59
GROUP 5.....	\$ 25.40	27.59
GROUP 6.....	\$ 39.86	27.59

LABORERS CLASSIFICATIONS

GROUP 1: Laborers; carpenter tenders; cement finisher
tenders, plasterer tendersGROUP 2: Asphalt raker; fence and guard rail erector; laser
beam operator; mason tender; pipelayer; pneumatic drill
operator; pneumatic tool operator; wagon drill operator,
jack hammer operator, pavement breaker, carbide core
drilling machine, chain saw operator, barco type jumping
tampers, concrete pump, motorized mortar mixer,
ride-on-motorized buggyGROUP 3: Air track operator; block paver; rammer; curb
setter, hydraulic and similar self powered drills

GROUP 4: Blaster; powderman

GROUP 5: Flagger

GROUP 6: Asbestos Abatement; Toxic and Hazardous Waste
Laborers

 LABO0022-003 12/01/2021

	Rates	Fringes
Plasterer tender		
BARNSTABLE, BRISTOL, DUKES, ESSEX, NANTUCKET, MIDDLESEX (with the exception of Arlington, Belmont, Burlington, Cambridge, Everett, Malden, Medford, Melrose, Reading, Somerville, Stoneham, Wakefield, Winchester, Winthrop and Woburn); NORFOLK (with the exception of Brookline Dedham and Milton) COUNTIES.	\$ 35.41	26.59
SUFFOLK COUNTY (Boston, Chelsea, Revere, Winthrop, Deer Island, Nut Island); MIDDLESEX COUNTY (Arlington, Belmont, Burlington, Cambridge, Everett, Malden, Medford, Melrose, Reading, Somerville, Stoneham, Wakefield, Winchester, Winthrop and Woburn only); NORFOLK COUNTY (Brookline, Dedham, and Milton only)....	\$ 41.18	27.52

 LABO0022-013 12/01/2021

	Rates	Fringes
Laborers:		
(FREE AIR OPERATION):		
SHIELD DRIVEN AND LINER PLATE IN FREE AIR)		
GROUP 1.....	\$ 45.48	28.02
GROUP 2.....	\$ 45.48	28.02
(OPEN AIR CASSONS, UNDERPINNING AND TEST BORING INDUSTRIES):		
TEST BORING & WELL DRILLING		
Driller.....	\$ 42.58	27.67
Laborer.....	\$ 41.18	27.67
(OPEN AIR CASSONS, UNDERPINNING AND TEST BORING INDUSTRIES):		

OPEN AIR CASSON, UNDERPINNING WORK & BORING CREW		
Bottom man.....	\$ 42.33	27.67
Laborers; Top man.....	\$ 41.18	27.67
(TUNNELS, CAISSON & CYLINDER WORK IN COMPRESSED AIR)		
GROUP 1.....	\$ 42.93	28.02
GROUP 2.....	\$ 53.41	28.02
GROUP 3.....	\$ 53.41	28.02
GROUP 4.....	\$ 53.41	28.02
GROUP 5.....	\$ 53.41	28.02
GROUP 6.....	\$ 55.41	28.02
CLEANING CONCRETE AND CAULKING TUNNEL (Both New & Existing)		
GROUP 1.....	\$ 45.48	28.02
GROUP 2.....	\$ 45.48	28.02
ROCK SHAFT, CONCRETE LINING OF SAME AND TUNNEL IN FREE AIR		
GROUP 1.....	\$ 42.93	28.02
GROUP 2.....	\$ 45.48	28.02
GROUP 3.....	\$ 45.48	28.02
GROUP 4.....	\$ 45.48	28.02
GROUP 5.....	\$ 47.48	28.02

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

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

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

GROUP 3: Motorman, miner

GROUP 4: Blaster

GROUP 5: Mucking machine operator

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

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

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

GROUP 2: Brakeman; trackman

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

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

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

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

GROUP 1: Change house attendants

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

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

GROUP 4: Miner; cage tender; bellman

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

FOOTNOTE FOR LABORERS:

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

LABO1421-003 12/01/2021

Rates

Fringes

Laborers: (WRECKING)

Group 1.....	\$ 41.33	27.37
Group 2.....	\$ 42.08	27.37
Group 3.....	\$ 42.33	27.37
Group 4.....	\$ 37.33	27.37
Group 5.....	\$ 40.43	27.37
Group 6.....	\$ 41.33	27.37

Group 1: Adzeman, Wrecking Laborer.

Group 2: Burners, Jackhammers.

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

Group 4: Yardman (Salvage Yard Only).

Group 5: Yardman, Burners, Sawyers.

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

PAIN0035-006 01/01/2024

	Rates	Fringes
PAINTER		
NEW CONSTRUCTION:		
Bridge.....	\$ 56.06	35.60
Brush, Taper.....	\$ 45.56	35.60
Spray, Sandblast.....	\$ 46.96	35.60
REPAINT		
Bridge.....	\$ 56.06	35.60
Brush, Taper.....	\$ 43.62	35.60
Spray, Sandblast.....	\$ 45.02	35.60

PAIN0035-021 01/01/2024

	Rates	Fringes
GLAZIER.....	\$ 45.56	35.60

PLUM0004-002 03/01/2024

WORCESTER (Except Hopedale and Southboro)

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

PLUM0012-002 03/03/2024

WORCESTER (Hopedale and Southboro)

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

ROOF0033-001 02/01/2024

Rates Fringes

Roofers:

All Tear-off and/or
removal of any types of
roofing and all spudding,
sweeping, vacuuming and/or
cleanup of any and all
areas of any type where a
roof is to be relaid.....\$ 50.03

34.94

SFMA0669-002 04/01/2024

Rates Fringes

SPRINKLER FITTER.....\$ 49.70 29.16

SHEE0017-004 02/01/2024

WORCESTER (Harvard, Lancaster)

Rates Fringes

Sheet metal worker.....\$ 57.22 46.46

* SHEE0063-002 07/01/2024

WORCESTER (Except Harvard & Lancaster)

Rates Fringes

Sheet metal worker.....\$ 40.98 34.59

* TEAM0379-003 06/01/2024

Rates Fringes

Truck drivers:

Group 1.....\$ 39.78	35.24+a+b
Group 2.....\$ 39.95	35.24+a+b
Group 3.....\$ 40.02	35.24+a+b
Group 4.....\$ 40.14	35.24+a+b
Group 5.....\$ 40.24	35.24+a+b
Group 6.....\$ 40.53	35.24+a+b
Group 7.....\$ 40.82	35.24+a+b

TRUCK DRIVERS CLASSIFICATIONS

Group 1: Station wagons; panel trucks; and pickup trucks

Group 2: Two axle equipment; & forklift operator

Group 3: Three axle equipment and tireman

Group 4: Four and Five Axle equipment

Group 5: Specialized earth moving equipment under 35 tons
other than conventional type trucks; low bed; vachual;
mechanics, paving restoration equipment

Group 6: Specialized earth moving equipment over 35 tons

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

POWER TRUCKS \$.25 DIFFERENTIAL BY AXLE TUNNEL WORK
(UNDERGROUND ONLY) \$.40 DIFFERENTIAL BY AXLE HAZARDOUS
MATERIALS (In Hot Zone Only) \$2.00 premium

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

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

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

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave
for Federal Contractors applies to all contracts subject to the
Davis-Bacon Act for which the contract is awarded (and any
solicitation was issued) on or after January 1, 2017. If this
contract is covered by the EO, the contractor must provide
employees with 1 hour of paid sick leave for every 30 hours
they work, up to 56 hours of paid sick leave each year.
Employees must be permitted to use paid sick leave for their
own illness, injury or other health-related needs, including
preventive care; to assist a family member (or person who is
like family to the employee) who is ill, injured, or has other
health-related needs, including preventive care; or for reasons

resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at <https://www.dol.gov/agencies/whd/government-contracts>.

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

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

Union Rate Identifiers

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

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

Survey Rate Identifiers

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

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

Union Average Rate Identifiers

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

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

State Adopted Rate Identifiers

Classifications listed under the "SA" identifier indicate that the prevailing wage rate set by a state (or local) government was adopted under 29 C.F.R. 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 01/03/2024 reflects the date on which the classifications and rates under the ?SA? identifier took effect under state law in the state from which the rates were adopted.

WAGE DETERMINATION APPEALS PROCESS

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

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

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

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

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

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

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

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

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

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

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

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END OF GENERAL DECISION"

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"General Decision Number: MA20240006 01/05/2024

Superseded General Decision Number: MA20230006

State: Massachusetts

Construction Type: Heavy Dredging

Counties: Massachusetts Statewide.
STATEWIDE

Massachusetts All Dredging, except self-propelled hopper dredges, on the Atlantic Coast & tributary waters emptying into the Atlantic Ocean.

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

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022: 	. Executive Order 14026 generally applies to the contract. . The contractor must pay all covered workers at least \$17.20 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2024.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022: 	. Executive Order 13658 generally applies to the contract. . The contractor must pay all covered workers at least \$12.90 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2024.

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

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

Modification Number	Publication Date
0	01/05/2024

ENGI0025-001 10/01/2023

STATEWIDE

	Rates	Fringes
Dredging:		
CLASS A1.....	\$ 45.26	15.17+a+b
CLASS A2.....	\$ 40.33	14.82+a+b
CLASS B1.....	\$ 39.14	14.74+a+b
CLASS B2.....	\$ 36.84	14.58+a+b
CLASS C1.....	\$ 35.83	14.26+a+b
CLASS C2.....	\$ 34.68	14.18+a+b
CLASS D.....	\$ 28.81	13.77+a+b

CLASSIFICATIONS:

CLASS A1: Deck Captain; Mechanical Dredge Operator, Leverman, Licensed Tug Operator over 1000 HP.

CLASS A2: Crane Operator (360 swing).

CLASS B1: Derrick Operator (180 swing), Spider/Spill Barge Operator, Engineer, Electrician, Chief Welder, Chief Mate, Fill Placer, Operator II, Maintenance Engineer, Licensed Boat Operator, Licensed Crew Boat Operator.

CLASS B2: Certified Welder.

CLASS C1: Mate, Drag Barge Operator, Assistant Fill Placer, Welder, Steward.

CLASS C2: Boat Operator.

CLASS D: Oiler, Deckhand, Shoreman, Rodman, Scowman, Cook, Messman, Porter/Janitor.

INCENTIVE PAY: (Add to Hourly Rate)

Operator (NCCCO License/Certification) \$1.80 Licensed Tug Operator over 1000 HP (Assigned as Master) (USCG licensed Master of Towing Vessels (MOTV) \$1.80; Licensed Boat Operator (Assigned as lead boat captain) USCG licensed boat operator \$1.30; Engineer (QMED and Tankerman endorsement or licensed engineer (USCG) \$1.80

Oiler (QMED and Tankerman endorsement (USCG) \$1.80; All classifications (Tankerman endorsement only) USCG \$1.55; Deckhand or Mate (AB with Lifeboatman endorsement (USCG) \$1.80; All classifications (lifeboatman endorsement only (USCG) \$1.55; Welder (ABS certification) \$1.55

FOOTNOTES APPLICABLE TO ABOVE CRAFTS:

- a. PAID HOLIDAYS: New Year's Day, Martin Luther King, Jr.'s Birthday, Memorial Day, Good Friday, Independence Day, Labor Day, Veterans' Day, Thanksgiving Day and Christmas Day
- b. VACATION: Eight percent (8%) of the straight time rate, multiplied by the total hours worked.

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

=====

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

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

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

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

WAGE DETERMINATION APPEALS PROCESS

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

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
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With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

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

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

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

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

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

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

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

=====

END OF GENERAL DECISION"

DOCUMENT A00801

SPECIAL PROVISIONS**HARDWICK – NEW BRAINTREE****Federal Aid Project No. BFS(BR-OFF)-003S(750)X
Bridge Replacement, H-08-003=N-07-002, Creamery Road over Ware River**

Labor participation goals for this Project shall be 15.3% for minorities and 6.9% for women for each job category. The goals are applicable to both Contractor's and Subcontractor's on-site construction workforce. Refer to Document 00820 for details.

SCOPE OF WORK

All work under this Contract shall be done in conformance with the *2024 Standard Specifications for Highways and Bridges*, the *Supplemental Specifications* contained in this book, the *2017 Construction Standard Details*, the *Traffic Management Plans and Detail Drawings*, *MassDOT Work Zone Safety Temporary Traffic Control*, the *1990 Standard Drawings for Signs and Supports*; the *2015 Overhead Signal Structure and Foundation Standard Drawings*, the *2009 Manual on Uniform Traffic Control Devices (MUTCD) with Revisions 1, 2, and 3* and the *November 2022 Massachusetts Amendments to the MUTCD*; the *1968 Standard Drawings for Traffic Signals and Highway Lighting*; *The American Standard for Nursery Stock*; the Plans and these Special Provisions.

The work done under this contract consists of furnishing all necessary labor, materials, equipment, and services to replace the existing bridge as shown on the contract plans. The project involves a road closure in conjunction with a 3.7-mile detour around the work site. The work also includes, but is not limited to, demolition of the existing structure, tree cutting, clearing and grubbing, pavement construction, construction of a wetland replication area, and construction of a retaining wall. Also, this contract includes utility pole relocations by National Grid. The work also includes traffic signing and all incidental items necessary to complete the work shown on the plans and described herein.

SUBSECTION 7.05 INSURANCE REQUIREMENTS**B. Public Liability Insurance**

The insurance requirements set forth in this section are in addition to the requirements of the Standard Specifications and supersede all other requirements.

Paragraphs 1 and 2

The Massachusetts Department of Transportation and applicable railroads shall be named as additional insureds.

CONTRACTOR QUESTIONS AND ADDENDUM ACKNOWLEDGEMENTS

Prospective bidders are required to submit all questions to the Construction Contracts Engineer by 3:00 P.M. on the Tuesday of the previous week before the scheduled bid opening date. Any questions received after this time will not be considered for review by the Department.

Contractors should email questions and addendum acknowledgements to the following email address massdotSpecifications@dot.state.ma.us. The MassDOT project file number and municipality are to be placed in the subject line.

SECTION 8.00: PROSECUTION AND PROGRESS**SUBSECTION 8.03: Prosecution of Work**

Add/amend the following at the end of the Subsection:

Contract Milestones

This Contract contains the following Contract Milestones that shall be included in the Contractor's Baseline Contract Progress Schedule submission. The Contractor shall identify the completion of the work pertaining to each Contract Milestone through the inclusion of a Finish Milestone in the Baseline Contract Progress Schedule.

Milestone #3 - Full Beneficial Use

The Contractor shall achieve this Milestone within (680) Calendar Days from Notice to Proceed (NTP).

Full Beneficial Use - The majority of Contract Work has been completed and the asset(s) has been opened for full multi-modal transportation use, except for limited Contract Work items that do not materially impair or hinder the intended public use of the transportation facility. All anticipated lane takings have been completed, except for minor, short-term work items.

Milestone #2 - Substantial Completion

The Contractor shall achieve this Milestone within (723) Calendar Days from Notice to Proceed (NTP).

Substantial Completion - A walkthrough of the entire Contract Work has been performed by the Resident Engineer, a Punch List has been generated and the Work required by the Contract, including paperwork, has been completed, except for work having a Contract Price of less than one percent of the adjusted total Contract Price, including overruns, underruns and all contract amendments. All material submittals must have been received by the District Materials Lab.

SUBSECTION 8.03 (Continued)**Milestone #1 - Contractor Field Completion**

The Contractor shall achieve this Milestone within (730) Calendar Days from Notice to Proceed (NTP).

Contractor Field Completion - All physical Contract Work is complete. The Contractor has fully de-mobilized from field operations and has no remaining field activities to complete.

WORK SCHEDULE

The work schedule in this Contract shall conform to the relevant provisions of Subsection 7.09 of the Standard Specifications and the following:

The work shall be performed on an 8-hour day, 5-day week, Monday through Friday between the hours of 7:00 A.M. and 3:30 P.M.

NORTHERN LONG-EARED BAT PROTECTION

The U.S. Fish and Wildlife Service (USFWS) has listed the northern long-eared bat (NLEB) as endangered under the Endangered Species Act (ESA) and the following requirements exist to protect the bat and its habitat. This project has been consulted with the USFWS through the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), and Federal Transit Administration (FTA) Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat revised February 5, 2018.

On July 24 – 27, 2023, VHB, on behalf of MassDOT Highway Division Environmental Services, conducted a northern long-eared bat summer presence/absence survey using acoustic detection methods, in accordance with the 2023 survey guidelines. The survey did not detect northern long-eared bat, and as stated within the survey guidelines, the survey is valid for five years. Due to the 5-year validity of the negative presence/absence survey, it is recommended that the contractor conduct all activities that could result in stressors to the bats such as tree removal/trimming, bridge and/or structure removal/maintenance, lighting, or use of percussive, by July 24, 2028. If additional stressor producing work is proposed by the Contractor past this date, additional review is required by the MassDOT Highway Division's Environmental Services Section, and additional review and restrictions may be required by the USFWS.

Due to the negative survey results, the project is eligible for a May Affect, Not Likely to Adversely Affect (NLAA) determination, without Avoidance and Minimizations Measures (AMMs), in accordance with the FHWA, FRA and FTA Range-wide Programmatic Consultation for Indiana Bat and Northern Long-eared Bat. On behalf of FHWA, the lead federal agency for Section 7 consultation, MassDOT submitted a Programmatic Consultation for Transportation Projects affecting NLEB or Indiana Bat to the USFWS through the Information for Planning and Consultation (IPaC) webpage and generated a NLAA documentation letter (see Document A00844).

NORTHERN LONG-EARED BAT PROTECTION (Continued)

Therefore, the project has completed Section 7 consultation through the Endangered Species Act, and no AMMs apply to the project.

The Contractor shall ensure all personnel working in on the project site are aware of all environmental commitments related to NLEB, including all applicable AMMs. NLEB Bat information (<https://www.fws.gov/midwest/endangered/mammals/nleb/>) shall be made available to all personnel.

PUBLIC SAFETY AND CONVENIENCE

(Supplementing Subsection 7.09)

Before the start of work, the Contractor shall post all locations in compliance with the Manual of Uniform Traffic Control Devices (MUTCD) and the Temporary Traffic Control Plans in the Contract documents.

The Contractor shall familiarize himself or herself with the provisions of the Manual of Uniform Traffic Control Devices Part VI Construction and Maintenance. The Contractor shall be responsible for providing, positioning, repositioning, maintaining and removing signs through the course of the project as deemed necessary by MassDOT or the Engineer.

When it is deemed necessary by the Chief of Police that detail Police Officers are needed, they will be provided by the Contractor. MassDOT shall reimburse the Contractor evenly without mark-up for the cost of the Police Detail upon presentation of the cancelled check. It is the Contractor's responsibility to cancel a Police Detail at a minimum of four hours in advance of the start of the shift if conditions so warrant. The Contractor shall not be reimbursed for Police Details if the Contractor fails to show for the job or if the Contractor fails to cancel the detail with adequate advance notice.

This provision of Police Details shall not relieve the Contractor of the responsibility of providing proper traffic control devices when operating adjacent to the roadway while it is open to the public. Any costs associated with these devices are the responsibility of the Contractor and shall be accounted for in the unit costs unless otherwise provided for.

The Contractor shall be responsible for securing the project site from unauthorized access. The Contractor shall provide sufficient fencing, barricades and signage and otherwise provide for security around all excavations and stockpiles. Cost for these items shall be included in the unit costs for the items of work.

The above provisions represent minimal requirements for maintenance of traffic and safety and may be modified at the discretion of the Engineer.

PUBLIC SAFETY AND CONVENIENCE (Continued)

If, at any time, in the judgment of the Engineer, the Work is not properly made safe in regard to public travel, persons on or about the Work, or public or private property, the Engineer shall have the right to order such safeguards to be erected and such precautions to be taken as he deems advisable, and the Contractor shall comply promptly with such orders. If, under such circumstances, the Contractor does not or cannot immediately put the work and the safeguard into proper and approved condition or if the Contractor or his representative is not upon the site so that he can be notified immediately of the insufficiency of safety precautions, the Engineer may put the work into such condition that it shall be, in his opinion, in all respects safe. The Contractor shall pay all costs and expenses incurred by the Engineer or MassDOT in so doing. Such action of the Engineer or his or her failure to take such action, shall in no way relieve or diminish the responsibility of the Contractor for any and all costs, expenses, losses, liability, claims, suits, proceedings, judgments, awards, or damages resulting from by reason of, or in connection with the failure to take precautions or the insufficiency of the safety precautions taken by him or her or by the Engineer acting under authority of this section.

Any automotive equipment, not protected by traffic cones or plastic drums, that is working on a public way under this project shall have one amber flashing warning light mounted on the cab roof or on the highest practical point of the machinery visible to both oncoming and overtaking vehicles, at least 32 candlepower and 50 - 60 flashes per minute. This light shall be in operation while the equipment is working or traveling in the work area at a speed of less than 25 mph, and a slow-moving vehicle emblem shall also be displayed.

Construction equipment shall not be parked within any traveled way unless said equipment is adequately lighted and protected by safety devices and vehicular traffic is appropriately detoured.

Appropriate MUTCD requirements shall apply.

HOLIDAY WORK RESTRICTIONS

(Supplementing Subsection 7.09)

The District Highway Director (DHD) may authorize work to continue during these specified time periods if it is determined by the District that the work will not negatively impact the traveling public. DHD may allow work in those areas on a case by case basis and where work is behind barrier and will not impact traffic

Below are the holiday work restrictions:

New Years Day (Federal Holiday)

No work on major arterial roadways from 5:00 AM on the day before until the normal start of business on the next subsequent business day. No work on local roadways on the holiday without permission by the DHD and the local police chief.

HOLIDAY WORK RESTRICTIONS (Continued)**Martin Luther King's Birthday (Federal Holiday)**

No work restrictions due to traffic concerns, however work on local roadways requires permission by the DHD and local police chief.

President's Day (Federal Holiday)

No work restrictions due to traffic concerns, however work on local roadways requires permission by the DHD and local police chief.

Evacuation Day (Suffolk County State Holiday)

No work restrictions due to traffic concerns.

Patriot's Day (State Holiday)

Work restrictions will be in place for Districts 3 and 6 along the entire Boston Marathon route and any other locations that the DHD in those districts determine are warranted so as to not to impact the marathon. All other districts work restrictions will be as per DHD.

Mother's Day

No work on Western Turnpike and Metropolitan Highway System from 5:00 AM on the Friday before, until the normal start of business on the following day.

Memorial Day (Federal Holiday)

No work on major arterial roadways from 5:00 AM on the Friday before, until the normal start of business on the following day.

Bunker Hill Day (Suffolk County State Holiday)

No work restrictions due to traffic concerns.

Juneteenth

No work restrictions due to traffic concerns, however work on local roadways requires permission by the DHD and local police chief.

Independence Day (Federal Holiday)

No work on major arterial roadways from 5:00 AM on the day before until the normal start of business on the next subsequent business day. No work on local roadways on the holiday without permission by the DHD and the local police chief.

Labor Day (Federal Holiday)

No work on major arterial roadways from 5:00 AM on the Friday before, until the normal start of business on the following day.

Columbus Day (Federal Holiday)

No work on major arterials from 5:00 AM on the Friday before, until the normal start of business on the following day

HOLIDAY WORK RESTRICTIONS (Continued)**Veterans' Day (Federal Holiday)**

No work restrictions due to traffic concerns.

Thanksgiving Day (Federal Holiday)

No work on major arterials from 5:00 AM two days before until the normal start of business on the following Monday.

Christmas Day (Federal Holiday)

No work on major arterial roadways from 5:00 AM on the day before until the normal start of business on the next subsequent business day.

SUBSECTION 8.14 UTILITY COORDINATION, DOCUMENTATION, AND MONITORING RESPONSIBILITIES**A. GENERAL**

In accordance with the provisions of Section 8.00 Prosecution and Progress, utility coordination is a critical aspect to this Contract. This section defines the responsibility of the Contractor and MassDOT, with regard to the initial utility relocation plan and changes that occur as the prosecution of the Work progresses. The Engineer, with assistance from the Contractor shall coordinate with Utility companies that are impacted by the Contractor's operations. To support this effort, the Contractor shall provide routine and accurate schedule updates, provide notification of delays, and provide documentation of the steps taken to resolve any conflicts for the temporary and/or permanent relocations of the impacted utilities. The Contractor shall provide copies to the Engineer of the Contractor communication with the Utility companies, including but not limited to:

- Providing advanced notice, for all utility-related meetings initiated by the Contractor.
- Providing meeting minutes for all utility-related meetings that the Contractor attends.
- Providing all test pit records.
- Request for Early Utility work requirements of this section (see below).
- Notification letters for any proposed changes to Utility start dates and/or sequencing.
- Written notification to the Engineer of all apparent utility delays within seven (7) Calendar Days after a recognized delay to actual work in the field – either caused by a Utility or the Contractor.
- Any communication, initiated by the Contractor, associated with additional Right-of-Way needs in support of utility work.
- Submission of completed Utility Completion Forms.

B. PROJECT UTILITY COORDINATION (PUC) FORM

The utility schedule and sequence information provided in the Project Utility Coordination Form (if applicable) is the best available information at the time of the bid and has been considered in setting the contract duration. The Contractor shall use all of this information in developing the bid price and the Baseline Schedule Submission, inclusive of the individual utility durations sequencing requirements, and any work that has been noted as potentially concurrent utility installations.

SUBSECTION 8.14 (Continued)**C. INITIATION OF UTILITY WORK**

The Engineer will issue all initial notice-to-proceed dates to each Utility company based on either the:

- 1) Contractor's accepted Baseline Schedule
- 2) An approved Early Utility Request in the form of an Early Utility sub-net schedule (in accordance with the requirements of this Subsection)
- 3) An approved Proposal Schedule

C.1 - BASELINE SCHEDULE – UTILITY BASIS

The Contractor shall provide a Baseline Schedule submission in accordance with the requirements of Subsection 8.02 and inclusive of all of the information provided in the PUC Form that has been issued in the Contract documents. This is to include the utility durations, sequencing of work, allowable concurrent work, and all applicable considerations that have been depicted on the PUC Form.

C.2 – EARLY UTILITY REQUEST – (aka SUBNET SCHEDULE) PRIOR TO THE BASELINE

All early utility work is defined as any anticipated/required utility relocations that need to occur prior to the Baseline Schedule acceptance. In all cases of proposed early utility relocation, the Contractor shall present all known information at the pre-construction conference in the form of a 'sub-net' schedule showing when each early utility activity needs to be issued a notice-to-proceed. The Contractor shall provide advance notification of this intent to request early utility work in writing at or prior to the Pre-Construction meeting. Prior to officially requesting approval for early utility work, the Contractor shall also coordinate with MassDOT and all utility companies (private, state or municipal) which may be impacted by the Contract. If this request is acceptable to the Utilities and to MassDOT, the Engineer will issue a notice-to-proceed to the affected Utilities, based on these accepted dates.

C.3 – PROPOSAL SCHEDULE - CHANGES TO THE PUC FORM

If the Contractor intends to submit a schedule (in accordance with MassDOT Standard Specifications, Division I, Subsection 8.02) that contains durations or sequencing that vary from those provided in the Project Utility Coordination (PUC) Form, the Contractor must submit this as an intended change, in the form of a Proposal Schedule and in accordance with MassDOT Standard Specifications, Division I, Subsection 8.02. These proposed changes are subject to the approval of the Engineer and the impacted utilities, in the form of this Proposal Schedule and a proposed revision to the PUC form. The Contractor shall not proceed with any changes of this type without written authorization from the Engineer, that references the approved Proposal Schedule and PUC form changes. The submission of the Baseline Schedule should not include any of these types of proposed utility changes and should not delay the submission of the Baseline Schedule. As a prerequisite to the Proposal Schedule submission, and in advance of the utility notification(s) period, the Contractor shall coordinate the proposed utility changes with the Engineer and the utility companies, to develop a mutually agreed upon schedule, prior to the start of construction.

SUBSECTION 8.14 (Continued)**D. UTILITY DELAYS**

The Contractor shall notify the Engineer upon becoming aware that a Utility owner is not advancing the work in accordance with the approved utility schedule. Such notice shall be provided to the Engineer no later than seven (7) calendar days after the occurrence of the event that the Contractor believes to be a utility delay. After such notice, the Engineer and the Contractor shall continue to diligently seek the Utility Owner's cooperation in performing their scope of Work.

In order to demonstrate that a critical path delay has been caused by a third-party Utility, the Contractor must demonstrate, through the requirements of the monthly Progress Schedule submissions and the supporting contract records associated with Subsection 8.02, 8.10 and 8.14, that the delays were beyond the control of the Contractor.

All documentation provided in this section is subject to the review and verification of the Engineer and, if required, the Utility Owner. In accordance with MassDOT Specifications, Division I, Subsection 8.10, a Time Extension will be granted for a delay caused by a Utility, only if the actual duration of the utility work is in excess of that shown on the Project Utility Coordination Form, and only if;

- 1) proper Notification of Delay was provided to MassDOT in accordance with the time requirements that are specified in this Section
- 2) the utility delay is a critical path impact to the Baseline Schedule (or most recently approved Progress Schedule)

E. LOCATION OF UTILITIES

The locations of existing utilities are shown on the Contract drawings as an approximation only. The Contractor shall perform a pre-construction utility survey, including any required test pits, to determine the location of all known utilities no later than thirty (30) calendar days before commencing physical site work in the affected area.

F. POST UTILITY SURVEY – NOTIFICATION

Following completion of a utility survey of existing locations, the Contractor will be responsible to notify the Engineer of any known conflicts associated with the actual location of utilities prior to the start of the work. The Engineer and the Contractor will coordinate with any utility whose assets are to be affected by the Work of this Contract. A partial list of utility contact information is provided in the Project Utility Coordination Form.

G. MEETINGS AND COOPERATION WITH UTILITY OWNERS

The Contractor shall notify the Engineer in advance of any meeting they initiate with a Utility Owner's representative to allow MassDOT to participate in the meeting if needed.

SUBSECTION 8.14 (Continued)

Prior to the Pre-Construction Meeting, the Contractor should meet with all Utility Owners who will be required to perform utility relocations within the first 6 months of the project, to update the affected utilities of the Project Utility Coordination Form and all other applicable Contract requirements that impact the Utilities. The Contractor shall copy the Engineer on any correspondence between the Utility Owner and the Contractor.

H. FORCE ACCOUNT / UTILITY MONITORING REQUIREMENTS

The Engineer will be responsible for recording daily Utility work force reports. The start, suspension, re-start, and completion dates of each of the Utilities, within each phase of the utility relocation work, will be monitored and agreed to by the Engineer and the Contractor as the work progresses.

I. ACCESS AND INSPECTION

The Contractor shall be responsible for allowing Utility owners access to their own utilities to perform the relocations and/or inspections. The Contractor shall schedule their work accordingly so as not to delay or prevent each utility from maintaining their relocation schedule.

NATIONAL GRID EMERGENCY TELEPHONE NUMBERS**GAS:**

Emergency: 1-800-233-5325

New Service: 1- 877-696-4743

Customer Support: 1-800-732-3400

ELECTRIC:

Outage/ Emergency: 1-800-465-1212

New Service: 1-800-375-7405

Customer Support: 1-800-322-3223

NOTICE TO OWNERS OF UTILITIES

(Supplementing Subsection 7.13)

There is one utility pole within the vicinity of the bridge that needs to be shifted to accommodate the proposed guardrail.

National Grid is responsible for the utility poles within the project. Verizon, National Grid, and Charter occupy the poles. Poles 12 and 13 will be replaced in repositioned locations and pole 14 will be replaced in the approximate same location.

The pole contains Verizon and National Grid utilities. National Grid will be responsible for relocating the utility pole.

NOTICE TO OWNERS OF UTILITIES (Continued)

Tree trimming with no vertical limit shall be conducted to the easement limits labeled on the plans in coordination with the utility companies.

Written notice shall be given by the Contractor to all public service corporations or officials owning or having charge of publicly or privately owned utilities of his intention to commence operations affecting such utilities at least one week in advance of the commencement of such non-emergency operations and the Contractor shall at that time file a copy of such notice with the Engineer.

The following website lists the names and addresses of the utilities may be affected, but the completeness of the list is not guaranteed:

<https://www.mass.gov/info-details/utility-contacts-by-district-and-municipality>

Select “District 2”, and then select “Hardwick” and “New Braintree”.

SUBSECTION 8.02 SCHEDULE OF OPERATIONS

Replace this subsection with the following:

An integrated cost and schedule controls program shall be implemented by the Contractor to track and document the progress of the Work from Notice to Proceed (NTP) through the Contractor Field Completion (CFC) Milestone. The Contractor’s schedules will be used by the Engineer to monitor project progress, plan the level-of-effort required by the Department’s work force and consultants and as a critical decision-making tool. Accordingly, the Contractor shall ensure that it complies fully with the requirements specified herein and that its schedules are both accurate and updated as required by the specification throughout the life of the project. Detailed requirements are provided in Division II, Section 722 Construction Scheduling.

COMPLIANCE WITH THE NATIONAL DEFENSE AUTHORIZATION ACT**(Supplementing Subsection 7.01)**

On all projects, the “Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment” Regulation (2 CFR 200.216) prohibits the Contractor from using or furnishing the following telecommunications equipment or services:

- Telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).
- For the purpose of public safety, security of government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities).
- Telecommunications or video surveillance services provided by such entities or using such equipment.
- Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of the National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country.

This prohibition applies to all products manufactured by the aforementioned companies, including any individual components or parts.

By submitting a bid on a project, the Contractor certifies that all work will be in compliance with the terms of 2 CFR 200.216. The Contractor shall submit a COC indicating compliance with the above provisions for all telecommunications equipment or services included in the Contract.

Payment for the item in which the materials are incorporated may be withheld until these COCs are received. Any cost involved in furnishing the certificate(s) shall be borne by the Contractor.

BIDDERS LIST

Pursuant to the provisions of 49 CFR Part 26.11 all official bidders will be required to report the names, addresses and telephone numbers of all firms that submitted bids or quotes in connection with this project. Failure to comply with a written request for this information within 15 business days may result in a recommendation to the Prequalification Committee that prequalification status be suspended until the information is received.

The Department will survey all firms that have submitted bids or quotes during the previous year prior to setting the annual goal and shall request that each firm report its age and gross receipts for the year.

BUILD AMERICA BUY AMERICA PREFERENCE

On Federally-aid projects the Buy America (23.CFR § 635.410) and Build America, Buy America Act (Pub. L. No. 117-58, §§ 70901-52). requires the following,

- (1) all iron and steel used in the project are produced in the United States--this means all manufacturing processes, from the initial melting stage through the application of coatings, must occur in the United States. Foreign steel and iron can be used if the cost of the materials does not exceed 0.1% of the total Contract cost or \$2,500, whichever is greater. The action of applying a coating to a covered material (i.e., steel and iron) is deemed a manufacturing process subject to Buy America. Coating includes epoxy coating, galvanizing, painting and any other coating that protects or enhances the value of a material subject to requirements of Build America, Buy America. Steel used for temporary support of excavation, including H piles, soldier piles, and sheeting when the steel is required to be left in place is subject to requirements of Build America, Buy America. Temporary steel, shall remain in place when it falls within the influence zone of the soil supporting any structure or railroad tracks.
- (2) all manufactured products used in the project are produced in the United States—this means the manufactured product was manufactured in the United States; and the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product, unless another standard for determining the minimum amount of domestic content of the manufactured product has been established under applicable law or regulation; and

BUILD AMERICA BUY AMERICA PREFERENCE (Continued)

- (3) all construction materials are manufactured in the United States—this means that all manufacturing processes for the construction material occurred in the United States. “Construction materials” includes an article, material, or supply—other than an item of primarily iron or steel; a manufactured product; cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives—that is or consists primarily of:

- non-ferrous metals,
- plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables),
- glass (including optic glass),
- lumber; or
- drywall.

The Buy America preference only applies to articles, materials, and supplies that are consumed in, incorporated into, or affixed to an infrastructure project. As such, it does not apply to tools, equipment, and supplies, such as temporary scaffolding, brought to the construction site and removed at or before the completion of the infrastructure project. Nor does a Buy America preference apply to equipment and furnishings, such as movable chairs, desks, and portable computer equipment, that are used at or within the finished infrastructure project but are not an integral part of the structure or permanently affixed to the infrastructure project.

NOTE: The requirements for manufactured products indicated in paragraph (2) above are not in effect for this contract.

PROJECT PERMITS FROM MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION AND U.S. ARMY CORPS OF ENGINEERS

This project is subject to Section 401 of the federal Clean Water Act, 33 U.S.C. 1251 et seq and has been issued a General Permit (GP) by the Army Corps of Engineers. The GP and respective Application are to be considered as part of this contract and a copy of the GP and all plans/attachments shall be on-site while activities regulated by the GP are being performed. The Contractor’s attention is directed to the fact that specific time restrictions for work in water and other conditions/requirements may be associated with the GP and Application. It is the Contractor’s responsibility to be aware of and comply with these restrictions and requirements and plan his/her work and schedule accordingly. The Contractor is hereby notified that he/she will be responsible and held accountable for performing any/all work necessary to satisfy and comply with the entire GP and respective Application. Arrangements to view the GP and/or Application can be made by calling the District #2 Environmental Section at (413) 582-0542. If the Contractor wishes to obtain copies, s/he shall do so at his own expense. For a Self Verification (SV) Projects,

PROJECT PERMITS FROM MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION AND U.S. ARMY CORPS OF ENGINEERS

(Continued)

Appendix C must be completed and submitted as required. For Pre-Construction Notification (PCN) Projects, The Work-Start Notification Form and the Compliance Certification Form (both provided with the PCN authorization Letter) shall be completed and returned to the Corps. The Contractor is advised that no additional compensation will be allowed for work required to establish, achieve, and maintain compliance with the GP and Application, as payment for the work shall be included in the various bid items, unless specified elsewhere. This work may include, but is not limited to, the following: preparation and submission of as built plans; wetland replication.

This project is subjected to the Massachusetts Clean Water Act, M.G.L. c. 21 sections 26 through 53 and has been issued a Water Quality Certification (“WQC”) by the Department of Environmental Protection. The WQC and Application are to be considered part of this contract and a copy of the WQC and all plans/attachments shall be on-site while activities regulated by the WQC are being performed. The Contractor’s attention is directed to the fact that special conditions and other requirements are associated with this WQC and Application. It is the Contractor’s responsibility to be aware of and comply with these conditions and requirements and plan his/her work and schedule accordingly. The Contractor is hereby notified that s/her will be responsible and held accountable for performing any/all work necessary to satisfy and comply with the entire WQC and Application. Arrangements to view the WQC and/or Application can be made by calling the District #2 Environmental Section at (413) 582-0542. If the Contractor wishes to obtain copies, s/he shall do so at his own expense. The Contractor is advised that no additional compensation will be allowed for work required to establish, achieve, and maintain compliance with the WQC and Application, as payment for the work shall be included in the various bid items, unless otherwise specified. This work may include, but is not limited to, the following: preparation and submission of as-built plans; wetland flagging; wetland replication monitoring reports, etc.

GENERAL REQUIREMENTS FOR DEMOLITION AND WORK INVOLVING PAINTED STEEL

(02/06/2020)

Demolition and work involving painted steel shall conform to the requirements of Subsection 961 of the Standard Specifications.

Work Involving Painted Steel.

Hazardous materials shall be removed in the immediate area of any intended welding, heating, saw cutting or burning of steel. Hazardous material removal is required to allow the demolition of structural steel, railings, drainage systems, utility supports, steel lamp posts, etc.

**GENERAL REQUIREMENTS FOR DEMOLITION AND
WORK INVOLVING PAINTED STEEL** (Continued)

The contractor shall assume that the coatings on the steel contain lead (Pb), unless otherwise determined by testing. The contractor shall certify in writing to the Engineer the results of all testing, and shall also certify that any lead (Pb) coated steel removed from the project was not reused or buried, but was sent to a scrap metal recycling facility.

Implement and maintain programs and procedures, which comply with the requirements of this specification and all applicable standards and regulations. Comply with all applicable regulations even if the regulation is not specifically referenced herein. If a state or local regulation is more restrictive than the regulation of this specification, follow the more restrictive requirements.

This requirement is intended only for the demolition and preparation prior to repair and does not include provisions for recoating of steel.

Environmental

All applicable portions of Subsections 961.65 “Worker Protection” and 961.66 “Environmental Protection and Monitoring” shall be followed when performing this work.

During chemical stripping a hand washing facility may be used in lieu of a decontamination/changing facility.

Hazardous material shall be collected during the disassembly and disposed of as outlined in Subsection 961.68 “Handling of Hazardous Waste and Reporting Release Programs”.

The applicable submittals shall be according to Subsection 961.69 “Submittals”.

Cleaning/Removal**Cutting Or Burning Of Steel**

All surfaces to be welded, heated, saw cut or burned shall be cleaned so as to remove all contaminants and/or hazardous materials, which could be discharged to the environment as a function of the subsequent operations.

Lead paint shall be removed in its entirety in an area prescribed by a 6 inch (15 cm) minimum offset from the required work. The paint removal operation may be dry abrasive blasting, wet abrasive blasting or chemical stripping.

Proper level of containment shall be used when performing this work in accordance with Subsection 961.67 “Containment”. Full containment is not required during chemical stripping operation however; the Contractor shall install proper shielding and/or tarpaulins under the chemical stripping operations in order to catch all debris generated during this procedure. A cleaned area must be inspected and approved before the demolition operations are started.

**GENERAL REQUIREMENTS FOR DEMOLITION AND
WORK INVOLVING PAINTED STEEL** (Continued)

During cleaning operations the Contractor shall be required to furnish and erect temporary floodlights illuminating the steel surface at a minimum of 30-foot candles. This lighting shall be used in areas where there is insufficient lighting for proper cleaning operations and inspection. The Contractor shall supply electrical power.

The Contractor shall provide support for interim and final inspection of the bridge during cleaning operations. This support shall include the necessary traffic controls and safe access to the work.

Mechanical Disassembly Of Steel

All surfaces to be mechanically disassembled by shear cutting or removing bolts or rivets shall not require deleading. When shear cutting or removing bolts or rivets, the Contractor shall not use any method that will cause dust and/or particles to be emitted and/or dispersed into the environment to an extent that would expose the workers above the Action Levels of $30\mu\text{g}/\text{m}^3$.

For purposes of limiting the lead (Pb) dust, the Contractor will be required to dampen the lead paint work areas.

The contractor shall install a proper shielding and/or tarpaulins under all lead-paint-coated surfaces to be shear cut or bolts or rivets ordered removed in order to catch any loose lead paint chips, dust or particles.

PIGEON WASTE

The Contractor shall remove and dispose of the pigeon waste and any other debris accumulated on the steel members and bridge seats in areas where work is being performed. Pigeon waste and debris material contaminants will require special handling and disposal in accordance with all Federal, state, and local requirements. No separate payment will be made for removal and disposal of pigeon waste. Cost shall be incidental to the contract pay items.

EMERALD ASH BORER ADVISORY

To the extent possible, all trees and brush shall be disposed on site, typically chipped and spread in place. When trees or brush must be removed, such as in urban, or otherwise populated areas, Contractor shall identify proposed location for disposal, and provide written notification to the Engineer for approval. Disposal shall be in city or town of project, or at minimum, within county, of construction operations.

EQUIVALENT SINGLE AXLE LOADS (ESALS)

The estimated traffic level to be used for SUPERPAVE HMA mixture designs for this contract, expressed in Equivalent Single Axle Loads (ESALs) for the design travel lane over a 20-year period, is 119,355 18-kip (80-kn) ESALs.

MUSSEL TRANSLOCATION

In accordance with Document A00846, the MESA Determination Letter dated November 16, 2023, issued by the Natural Heritage & Endangered Species Program (NHESP) of the Massachusetts Division of Fisheries & Wildlife (the “Division”), a Mussel Sweep and Translocation plan must be completed by MassDOT’s on-call mussel biologist prior to any work in water.

The MESA Determination Letter (the “Letter”) is to be considered part of this contract and a copy of the Letter shall be on-site while activities regulated by the Letter are being performed. MassDOT’s on-call biologist will perform the required Mussel Sweep and Translocation Plan, however, the contractor shall inform all contractors and sub-contractors associated with the project of the likely presence of State-listed species on the property and indicate that no work in water may commence until authorized.

The Mussel Sweep and Translocation Plan must be conducted as close as possible to the start of any work in water and only during suitable weather conditions for mussel relocation (i.e., within the **June 1 to October 1** timeframe, water temperature >60.0F, high water clarity, average to below-average river flows, and fair weather). Once the mussel translocation is complete, work in water can proceed.

The Contractor and/or Resident Engineer must contact MassDOT’s Wildlife and Endangered Species Unit (**WESU contact: David Paulson, 857-262-3378, david.j.paulson@dot.state.ma.us**) once the construction schedule is drafted, and no later than 90 days prior to the start of work, to ensure that the mussel relocation can be conducted during the **June 1 to October 1** timeframe. If there are questions or concerns regarding the mussel relocation timing, the Resident Engineer can contact WESU.

Basis of Payment:

There will be no payment for the work conducted by the Mussel Biologist, as the Biologist will be provided to the Contractor as a free service by MassDOT.

WOOD TURTLE (*Glyptemys insculpta*) PROTECTION PLAN

General

This section outlines the requirements of the Natural Heritage and Endangered Species Program (NHESP) of the Division of Fisheries and Wildlife (DFW) for projects that occur in the vicinity of high-priority wood turtle (*Glyptemys insculpta*) populations. The work to be done consists of the monitoring and protection of turtles during the replacement of Creamery Road Bridge over the Ware River in the Towns of Hardwick and New Braintree, Massachusetts.

One Time Sweeps – Prior to Vegetation Clearing and In-water Cofferdam Installation

The Turtle Monitor (the Monitor) shall be a MassDOT biologist (David J. Paulson, (857) 262-3378, david.paulson@state.ma.us; or a representative from MassDOT Wildlife and Endangered Species Unit) approved by the Natural Heritage and Endangered Species Program (NHESP). The Monitor shall obtain a scientific collecting permit from the NHESP to handle wood turtles. The Monitor shall visit the site prior to the start of work, and the Contractor and/or Resident Engineer shall coordinate this site visit with the Monitor at least 60 days prior to construction commencement. The Monitor shall sweep the site prior to any site clearing, grubbing, earth disturbance, or site preparations. The Monitor shall inspect vegetation within 200-feet of the stream, prior to the establishment of the limit of work line and Turtle Exclusion Fence Barrier.

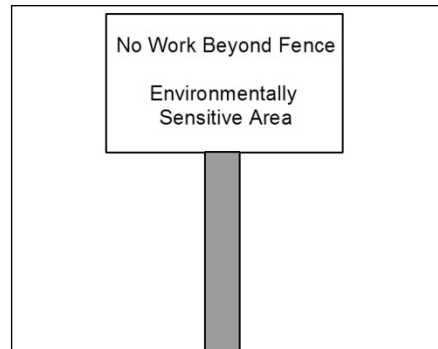
In addition, the Monitor shall provide a sweep of the site prior to any work in water. The Monitor shall inspect all areas of land under water where cofferdams are to be installed, paying close attention to overhanging banks and in water coarse woody debris.

The Monitor shall visually sweep the described areas immediately before machines enter the area and relocate any turtles to suitable habitat immediately beyond the construction site. The Monitor shall provide contact information to the project supervisor in the event a wood turtle is discovered on-site. The Monitor may visit the site on only one day if the vegetation clearing and in-water work are initiated on the same day. Upon completion of the monitoring, the Monitor shall provide the NHESP with a summary of activities at the construction site. This report shall include the number and duration of visits and rare species observation forms for all state-listed species encountered. In the event of finding an injured turtle, the turtle shall be transported to a suitable veterinarian. In the event of finding a turtle with a radio transmitter, the NHESP and the contact on the transmitter shall be alerted immediately.

All state-listed species encountered in or near the project shall be reported to the NHESP through a Rare Animal/Plant Observation Report with the required supporting materials within 10 days of the observation. No state-listed species may be removed from the project site unless under the direct supervision of the Monitor or the NHESP.

Establishment of a Limit of Work Barrier

Following the sweep of the work site, a limit of work barrier shall be installed. This line shall consist of staked compost filter tubes and Turtle Exclusion Fence Barrier (silt fence as the outer boundary) and shall contain signage clearly identifying it as the limits of work in all four quadrants. Refer to the attached sketch for the approximate location of the Turtle Exclusion Fence Barrier.

WOOD TURTLE (*Glyptemys insculpta*) PROTECTION PLAN (Continued)

Example limit of work sign.

Installation of the barrier must be conducted using methods that result in a minimum of disturbance (i.e., hand-dug, “2-man” trencher or auger). It is not appropriate to clear large access paths prior to sweeps for turtle. No clearing may occur outside the limit of work approved by the NHESP without additional review and approval by the NHESP.

1. The barrier must be composed of at least 2 1/2 feet of vertical barrier above ground and an additional 4-6 inches buried below ground.
2. The face of the material must be relatively smooth. Materials commonly used are staked at 6 - 10 foot intervals and include tightly woven geotextile, aluminum flashing, or other such materials stapled or tacked to stakes. Loosely woven geotextile fabrics, hay/straw bales, wattles or tubular materials are not generally sufficient.
3. The bottom of the silt fencing must be carefully buried in a 4-6 inch deep trench. The trench must be backfilled and compacted. If it is not possible to dig a trench, then the bottom of the barrier must be affixed to the surface.
4. If project phasing and the traffic management plan allow, the barrier shall only include a single gap at each limit of the project large enough for vehicle passage to access the construction area. These gaps must be closed each night during the turtle active season (March 15 – October 31) with a gate and/or silt fence barrier, and the bottom of the silt barrier weighted down with a solid wood post or sand bags. A solid wooden, plastic or metal turtle barrier gate may be furnished by the contractor in order to close the gap locations. The turtle barrier gate must be keyed into the barrier so that turtles cannot enter the construction area.
5. If hay or straw bales are to be used with silt fencing, they shall be installed on the work-side of the silt fence to avoid turtles using these to breach the barrier.
6. Once installed, the barrier shall be taut between the stakes. Slumps or loose materials will undermine the effectiveness of the barrier. In some circumstances, geotextile fabrics may need to be reinforced with backer material to ensure integrity. Backer material is typically similar to hardware cloth.

WOOD TURTLE (*Glyptemys insculpta*) PROTECTION PLAN (Continued)

Once per week, a person familiar with silt barrier maintenance and installation shall inspect the barrier and facilitate any repairs or alterations. The limit of work barrier should remain taut between stakes and any holes along the bottom repaired. MassDOT shall provide the NHESP with the name and contact information of the Resident Engineer responsible for coordinating necessary sweeps and maintaining appropriate barriers.

Construction Worker Training:

The Monitor shall provide to the construction foreperson wood turtle identification and handling pamphlets. All construction, landscaping, and other sub-contractors associated with the Project shall be informed in writing of the likely presence of State-listed Species on the Property and what measures (observation and injury protection) should be implemented to minimize direct harm to State-listed Species.

Further, no wildlife shall be removed from the Property without approval of a qualified wildlife biologist or the Division except as necessary to receive veterinary treatment in the case of harm during construction.

This protocol may require only one to three days of labor, including field surveys and correspondence with the NHESP.

Basis of Payment:

There will be no payment for the work conducted by the Turtle Monitor, as the Monitor will be provided to the Contractor as a free service by MassDOT.

Installation of a limit of work barrier, turtle barrier gates, and limit of work signage shall be considered incidental under ITEM 767.121 SEDIMENT CONTROL BARRIER.

SECTION 722 CONSTRUCTION SCHEDULING

DESCRIPTION

722.20 General

The Contractor's approach to prosecution of the Work shall be disclosed to the Department by submission of a Critical Path Method (CPM) schedule and a cost/resource loaded Construction Schedule when required in this Subsection. These requirements are in addition to, and not in limitation of, requirements imposed in other sections.

The requirements for scheduling submissions are established based on the Project Value at the time of the bid and are designated as Type A, B, C or D. The definitions of these Schedule Requirement Types are summarized below. Complete descriptions of all detailed requirements are established elsewhere in this specification.

Type A – for all Site-Specific Contracts with a Project Value over \$20 Million

- Schedule Planning Session
- Baseline CPM Schedule
- Monthly Update CPM Schedule
- Short-term Construction Schedule
- Contract Schedule Update Meeting
- Resource-Loading
- Resources Graphic Reporting
- Cash Flow Projections from the CPM
- Cash Flow Charts
- Cost-loaded CPM
- Contractor-furnished CPM software, computer and training

Type B – for all Site-Specific Contracts with a Project Value between \$10 Million and \$20 Million

- Schedule Planning Session
- Baseline CPM Schedule
- Monthly Update CPM Schedule
- Short-term Construction Schedule
- Contract Schedule Update Meeting
- Cost-loaded CPM
- Resource-Loading
- Monthly Projected Spending Report (PSR)
- Contractor-furnished CPM software, computer and training

SECTION 722 (Continued)

Type C – for all Site-Specific Contracts with a Project Value between \$3 Million and \$10 Million

- Schedule Planning Session
- Baseline CPM Schedule
- Monthly Update CPM Schedule
- Short-term Construction Schedule
- Contract Schedule Update Meeting
- Monthly Projected Spending Report (PSR)
- Contractor-furnished CPM software, computer and training

Type D - for all contracts with a Project Value less than \$3 Million; various locations contracts of any dollar amount; contracts with durations less than one-hundred and eighty (180) Calendar Days; and other contracts as determined by the Engineer.

- Bar chart schedule updated monthly or at the request of the Engineer (See Section 722.62.B - Bar Charts.)
- Monthly Projected Spending Report (PSR) (See Section 722.62.F - Projected Spending Reports.)

MATERIALS, EQUIPMENT, PERSONNEL**722.40 General****A. Software Requirements** (Types A, B and C)

The Contractor shall use Primavera P6 computer scheduling software.

In addition to the requirements of Section 740 – Engineer’s Field Office and Equipment, the Contractor shall provide to the Department one (1) copy of the scheduling software, one (1) software license and one (1) computer capable of running the scheduling software for the duration of the Contract. This computer and software shall be installed in the Engineer’s Field Office within twenty-eight (28) Calendar Days after Notice to Proceed. The computer and software shall be maintained and serviced as recommended by the computer manufacturer and/or as required by the Engineer during the duration of the Contract at no additional cost to the Department. The Contractor shall provide professional training in the basic use of the software for up to eight (8) Department employees. The trainer shall be approved by the Engineer. This training shall be provided within twenty-eight (28) Calendar Days after Notice to Proceed.

B. Scheduler Requirements

For all schedule types, if the Contractor plans to use outside scheduling services, the scheduler shall be approved as a subcontractor by the Engineer.

For Type A, B and C Schedules the name of the Contractor’s Project Scheduler together with his/her qualifications shall be submitted to the Department for approval by the Engineer within seven (7) Calendar Days after NTP. The Project Scheduler shall have a minimum of five [5] years of project CPM scheduling experience, three [3] years of which shall be on projects of similar scope and value as the project for which the Project Scheduler is being proposed. References shall be provided from past projects that can attest to the capabilities of the Project Scheduler.

SECTION 722 (Continued)**CONSTRUCTION METHODS****722.60 General****A. Schedule Planning Session**
(Types A, B and C)

The Contractor shall conduct a schedule planning session within seven (7) Calendar Days after the Contractor receives the NTP and prior to submission of the Baseline Schedule. This session will be attended by the Department and its consultants. During this session, the Contractor shall present its planned approach to the project including, but not limited to:

1. the Work to be performed by the Contractor and its subcontractors;
2. the planned construction sequence and phasing; planned crew sizes;
3. summary of equipment types, sizes, and numbers to be used for each work activity;
4. all early work related to third party utilities;
5. identification of the most critical submittals and projected submission timelines;
6. estimated durations of major work activities;
7. the anticipated Critical Path of the project and a summary of the activities on that Critical Path;
8. a summary of the most difficult schedule challenges the Contractor is anticipating and how it plans to manage and control those challenges;
9. a summary of the anticipated quarterly cash flow over the life of the project.

This will be an interactive session and the Contractor shall answer all questions that the Department and its consultants may have. The Contractor shall provide a minimum of five (5) copies of a written summary of the information presented and discussed during the session to the Engineer. The Contractor's Baseline Schedule and accompanying Schedule Narrative shall incorporate the information discussed at this Schedule Planning Session.

B. Schedule Reviews by the Department (All Types)**1. Baseline Schedule Reviews**

The Engineer will respond to the Baseline Schedule Submission within thirty (30) Calendar Days of receipt providing comments, questions and/or disposition that either accepts the schedule or requires revision and resubmittal. Baseline Schedules shall be resubmitted within fifteen (15) Calendar Days after receipt of the Engineer's comments.

2. Contract Progress Schedule / Monthly Update Reviews

The Engineer will respond to each submittal within twenty one (21) Calendar Days. Schedules shall be resubmitted by the Contractor within five (5) Calendar Days after receipt of the Engineer's comments.

Failure to submit schedules as and when required could result in the withholding of full or partial pay estimate payments by the Engineer.

SECTION 722 (Continued)**722.61 Schedule Content and Preparation Requirements**
(Types A, B and C unless otherwise noted)

Each Contract Progress Schedule shall fully conform to these requirements.

A. LOGIC

The schedules shall divide the Work into activities with appropriate logic ties to show:

1. conformance with the requirements of this Section and Division I, Subsection 8.02 - Schedule of Operations
2. the Contractor's overall approach to the planning, scheduling and execution of the Work
3. conformance with any additional sequences of Work required by the Contract Documents, including, but not limited to, Subsection 8.03 - Prosecution of Work and Subsection 8.06 – Limitations of Operations.

B. ACTIVITIES

The schedules shall clearly define the progression of the Work from NTP to Contractor Field Completion (CFC) by using separate activities for each of the following items:

1. NTP
2. Each component of the Work defined by specific activities
3. Detailed activities to satisfy permit requirements
4. Procurement of fabricated materials and equipment with long lead times, including time for review and approval of submittals required before purchasing
5. The preparation and submission of shop drawings, procedures and other required submittals, with a planned duration that is to be demonstrated to the Engineer as reasonable
6. The review and return of shop drawings, procedures and other required submittals, approved or with comments, the duration of which shall be thirty (30) Calendar Days, unless otherwise specified or as approved by the Engineer
7. Interfaces with adjacent work, utility companies, other public agencies, sensitive abutters, and/or any other third party work affecting the Contract
8. The Critical Path, clearly defined and organized
9. Float shall be clearly identified
10. Access Restraints – restrictions on access to areas of the Work that are defined by the Department in the bid package, in Subsection 8.06 – Limitations of Operations or elsewhere in the Contract
11. Milestones listed in Subsection 8.03 - Prosecution of Work or elsewhere in the Contract Documents
12. Subcontractor approvals at fifteen (15) Calendar Days from submittal to response
13. Full Beneficial Use (FBU) Contract Milestone per the requirements of Subsection 8.03 - Prosecution of Work
14. Contractor's request for validation of FBU (ready to open to traffic)
15. The Department's confirmation of completed work to allow for FBU

SECTION 722 (Continued)

16. Substantial Completion Contract Milestone per the requirements of Subsections 7.15 - Claims Against Contractors for Payment of Labor, Materials and Other Purposes and 8.03 - Prosecution of Work
17. Contractor's request for validation of Substantial Completion
18. Punchlist Completion Period of at least thirty (30) Calendar Days per the requirements of Subsections 5.11 - Final Acceptance, 7.15 - Claims Against Contractors for Payment of Labor, Materials and Other Purposes and 8.03 - Prosecution of Work
19. Contractor confirmation that all punchlist work and documentation has been completed
20. Physical Completion of the Work Contract Milestone per the requirements of Subsections 5.11 - Final Acceptance and 8.03 - Prosecution of Work
21. Documentation Completion per the requirements of Subsections 5.11 - Final Acceptance and 8.03 - Prosecution of Work
22. Contractor Field Completion Contract Milestone per the requirements of Subsections 5.11 - Final Acceptance and 8.03 - Prosecution of Work
23. Utility work to be performed in accordance with the Project Utility Coordination (PUC) Form as provided in Section 8.14 - Utilities Coordination, Documentation and Monitoring Responsibilities
24. Traffic work zone set-up and removal, night work and phasing
25. Early Utility Relocation (by others) that has been identified in the Contract
26. Right-of-Way (ROW) takings that have been identified in the Contract
27. Material Certifications
28. Work Breakdown Structure in accordance with the MassDOT-Highway Division Contractor Construction Schedule Toolkit located on the MassDOT-Highway Division website at:
<https://www.mass.gov/info-details/massdot-highway-contractors-schedule-toolkit>
29. For Type A and B Contracts only: All items to be paid, including all Unit Price and Lump Sum pay items, shall be identified by activity. This shall include all non-construction activities such as engineering work; purchase of permanent materials and equipment, purchase of structural steel stock, equipment procurement, equipment delivery to the site or storage location and the representative amount of overhead/indirect costs that was included in the Contractor's Bid Prices.

C. EARLY AND LATE DATES

Early Dates shall be based on proceeding with the Work or a designated part of the Work exactly on the date when the corresponding Contract Time commences. Late Dates shall be based on completing the Work or a designated part of the Work exactly on the corresponding Contract Time, even if the Contractor anticipates early completion.

SECTION 722 (Continued)**D. DURATIONS**

Activity durations shall be in Work Days. Planned Original Durations shall be established with consideration to resources and production rates that correspond to the Contractor's Bid Price. Within all of the Department-required schedules, the Contractor shall plan the Work using durations for all physical construction activities of no less than one (1) Work Day and no greater than fourteen (14) Work Days, unless approved by the Engineer as part of the Baseline Schedule Review.

Should there be an activity with a duration that is determined by the Engineer to be unreasonable, the Contractor will be asked to provide a basis of the duration using bid documents, historic production rates for similar work, or other form of validation that is acceptable to the Engineer. Should the Contractor and the Engineer be unable to agree on reasonable activity durations, the Engineer will, at a minimum, note the disagreement in the Baseline Schedule Review along with a duration the Engineer considers reasonable and the basis for that duration. A schedule that contains a substantial number of activities with durations that are deemed unreasonable by the Engineer will not be accepted.

E. MATERIALS ON HAND (for Types A and B only)

The Contractor shall identify in the Baseline Schedule all items of permanent materials (Materials On Hand) for which the Contractor intends to request payment prior to the incorporation of such items into the Work.

F. ACTIVITY DESCRIPTIONS

The Contractor shall use activity descriptions in all schedules that clearly describe the work to be performed using a combination of words, structure numbers, station numbers, bid item numbers, work breakdown structure (WBS) and/or elevations in a concise and compact label as specified in the MassDOT-Highway Division Contractor Construction Schedule Toolkit located on the MassDOT-Highway Division website at:

<https://www.mass.gov/info-details/massdot-highway-contractors-schedule-toolkit>

G. ACTIVITY IDENTIFICATION NUMBERS

The Contractor shall use the activity identification numbering system specified in the MassDOT-Highway Division Contractor Construction Schedule Toolkit located online at the address above.

H. ACTIVITY CODES

The Contractor shall use the activity codes specified in the MassDOT-Highway Division Contractor Construction Schedule Toolkit located online at the address above.

I. CALENDARS

Different calendars may be created and assigned to all activities or to individual activities. Calendars define the available hours of work in each Calendar Day, holidays and general or project-specific non-Work Days such as Fish Migration Periods, time of year (TOY) restrictions and/or area roadway restrictions.

SECTION 722 (Continued)

Examples of special calendars include, but are not limited to:

- Winter Shutdown Period, specific work is required by separate special provision to be performed during the winter. See Special Provision 8.03 (if applicable)
- Peak traffic hours on heavily traveled roadways. This shall be from 6:30 am to 9:30 am and from 3:30 pm to 7:00 pm, unless specified differently elsewhere in the Contract.
- Special requirements by sensitive abutters, railroads, utilities and/or other state agencies as defined in the Contract.
- Cape Cod and the Islands Summer Roadway Work Restrictions: A general restriction against highway and bridge construction is enforced between Memorial Day and Labor Day, unless otherwise directed by the Engineer. Refer to the Project Special Provisions for specific restrictions.
- Cape Ann Summer Roadway Work Restrictions: While there are no general restrictions for Cape Ann as there are for Cape Cod and the Islands, project-specific restrictions may be enforced. Refer to the Project Special Provisions for specific restrictions.
- Turtle and/or Fish Migration Periods and/or other in-water work restrictions: Refer to the Project Special Provisions for specific restrictions.
- Working over Waterways Restricted Periods: Refer to the Project Special Provisions for specific restrictions.
- Night-time paving and striping operations, traffic and temperature restrictions: Refer to the Project Special Provisions for specific restrictions.
- Utility Restrictions shall be as specified within the Contract.

J. FLOAT

For the calculation of float in the CPM schedule, the setting for *Retained Logic* is required for all schedule submissions, starting with the Baseline Schedule Submission. Should the Contractor have a reason to propose that an alternative calculation setting such as *Progress Override* be used, the Contractor shall obtain the Engineer's approval prior to modifying to this setting.

K. COST AND RESOURCE LOADING (Types A and B only)

For all Type A and B Schedules, the Contractor shall provide a cost and resource-loaded schedule with an accurate allocation of the costs and resources necessary to complete the Work. The costs and resources shall be assigned to all schedule activities in order to enable the Contractor to efficiently execute the Contract requirements and the Engineer to validate the original plan, monitor progress, provide cash flow projections and analyze delays.

1. Each schedule activity shall have an assigned cost that accurately represents the value of the Work. Each schedule activity shall have its resources assigned to it by craft and the anticipated hours to accomplish the work. Each schedule activity's equipment resources shall be assigned to it by equipment type and hours operated. Front-loading or other unbalancing of the cost distribution will not be permitted.
2. The sum of the cost of all schedule activities shall be equal to the Contractor's Bid Price.
3. Indicating the labor hours per individual, per day, by craft and equipment hours/day will be acceptable.

SECTION 722 (Continued)

4. The Engineer reserves the right to use the cost-loading as a means to resolve changes, disputes, time entitlement evaluations, increases or decreases in the scope of Work, unit price renegotiations and/or claims.
5. For all Type A and B Schedules, all subnets, fragnets, Proposal Schedules, and Recovery Schedules shall be cost and resource- loaded to help to quickly validate and monitor the duration of the Work to be performed.
6. For Type A Schedules, cost-loading of the schedule will also be used for cash flow projection purposes.
7. The cost-loading of each activity shall indicate the portion of the cost for that activity that is applicable to a specific bid item (cost account.) The total cost for each cost account must equal the bid item price.
8. For Type A Schedules, each month, the Contractor will be paid using the Cost-loaded CPM activities for Lump Sum payment items. This requirement supersedes any requirements elsewhere in this Contract regarding partial payments of schedule-of-values for all Lump Sum items.

L. NOT TO BE USED IN THE CONTRACTOR'S CPM SCHEDULE

1. Milestones or constraint dates not specified in the Contract
2. Scheduled work not required for the accomplishment of a Contract Milestone
3. Use of activity durations, logic ties and/or sequences deemed unreasonable by the Engineer
4. Delayed starts of follow-on trades
5. Float suppression techniques

722.62 Submittal Requirements

All schedules shall be prepared and submitted in accordance with the requirements listed below.

Each monthly Contract Progress Schedule submittal shall be uniquely identified.

Except as stated elsewhere in this subsection, schedule submittals shall include each of the documents listed below, prepared in two formats, for distribution as follows:

- a. four (4) compact discs (CD); one (1) each for the Office of Project Controls and Performance Oversight (O-PC&PO), the Boston Construction Section Office, the District Construction Office and the Resident Engineer's Office. Additional copies shall be required if the work is performed in more than one district.
- b. two (2) hard copies plotted in color on 24" X 36" paper; one (1) copy each for the District Construction Office and the Resident Engineer's Office. No copies for the O-PC&PO and the Boston Construction Section Office. Additional copies shall be required if the work is performed in more than one district.

SECTION 722 (Continued)**A. Narratives**

A written narrative shall be submitted with every schedule submittal. The narrative shall:

1. itemize and describe the flow of work for all activities on the Critical Path in a format that includes any changes made to the schedule since the previous Contract Progress Schedule / Monthly Update or the Baseline Schedule, whichever is most recent;
2. provide a description of any specification requirements that are not being followed. Identify those that are improvements and those that are not considered to be meeting the requirements;
3. provide all references to any Notice of Delay that has been issued, within the time period of the Contract Progress Schedule Update, by letter to the Engineer. Note that any Notice of Delay that is not issued by letter will not be recognized by the Engineer. See Subsection 722.64.A - Notice of Delay;
4. provide a description of each third-party utility's planned vs. actual progress and note any that are trending late or are late per the durations and commitments as provided in the PUC Form; provide a description of the five (5) most important responses needed from the Department and the need date for the responses in order to maintain the current Schedule of Record;
5. provide a description of all critical issues that are not within the control of the Contractor or the Department (third party) and any impact they had or may have on the Critical Path;
6. provide a description of any possible considerations to improve the probability of completing the project early or on-time;
7. compare Early and Late Dates for activities on the Critical Path and describe reasons for changes in the top three (3) most critical paths ;
8. describe the Contractor's plan, approach, methodologies and resources to be employed for completing the various operations and elements of the Work for the top three (3) most critical paths. For update schedules, describe and propose changes to those plans and verify that a Proposal Schedule is not required;
9. describe, in general, the need for shifts that are not 5 days/week, 8 hours/day, the holidays that are inserted into each calendar and a tabulation of each calendar that has been used in the schedule;
10. describe any out-of-sequence logic and provide an explanation of why each out-of-sequence activity does not require a correction, if one has not been provided, and an adequate demonstration that these changes represent the basis of how these activities will be built, including considerations for resources, dependencies and previously-approved production rates;
11. identify any possible duration increases resulting from actual or anticipated unit price item quantity overruns as compared to the baseline duration, with a corresponding suggestion to mitigate any possible delays to the Critical Path. If the delay is anticipated to impact the Critical Path, refer to Subsections 4.06 - Increased or Decreased Contract Quantities and 8.10 - Determination and Extension of Contract Time for Completion and submit a letter to the Engineer notifying of a potential delay;
12. include a schedule log consisting of the name of the schedule, the data date and the date submitted.

SECTION 722 (Continued)**B. Bar Charts (Types A, B, C and D)**

One (1) time-scaled bar chart containing all activities shall be prepared and submitted using a scale that yields readable plots and that meets the requirements of Subsection 722.61 - Schedule Content and Preparation Requirements. Activities shall be linked by logic ties and shown on their Early Dates. Critical Paths shall be highlighted and Total Float shall be shown for all activities.

A second time-scaled bar chart shall also be prepared containing only the Critical Path or, if the Critical Path is not the longest path, the Longest Path using a scale that yields readable plots and that meets the requirements of Subsection 722.61 - Schedule Content and Preparation Requirements. Activities shall be linked by logic ties and shown on their Early Dates. Total Float shall be shown for all activities.

Bar Charts shall be printed in color and submitted on 11" X 17" paper or, if approved by the Engineer, as a .pdf file.

C. Detailed Activity Schedule Comparisons

A Detailed Activity Schedule Comparison (DASC) is a simple reporting tool in the format of a graphical report that will provide Resident Engineers with immediate, timely and up-to-date information. The DASC consists of an updated bar chart that overlays the current time period's bar chart onto the previous time period's bar chart for an easily-read comparison of progress during the present and previous reporting periods. The DASC shall be prepared and submitted in accordance with the instructions contained in the Construction Schedule Toolkit located on the MassDOT-Highway Division website at:

<https://www.mass.gov/info-details/massdot-highway-contractors-schedule-toolkit>

The reports described in Subsections D, E and F below shall be submitted with all of the schedules listed in Subsection 722.20 - General:

D. Activity Cost Report and Monthly Cash Flow Projections (Type A only)

With each Contractor Quantity Estimate (CQE), the Contractor shall submit an Activity Cost Report and Cash Flow Projection that includes all activities grouped by Contract Bid Item.

The Activity Cost Report shall be generated from the Schedule of Record and shall be the basis of the Monthly Cash Flow Projection. Within each contract Bid Item, activities shall be sequenced by ascending activity identification number and shall show:

1. activity ID and description,
2. forecast start and finish dates for each activity and,
3. when submitted as a revised schedule, actual start and finish dates for each completed activity.

For Unit Price pay items, in addition to the above, estimates to complete and any variance to the estimated Contract quantity shall be shown.

E. Resource Graphs (Type A only)

Monthly and cumulative resource graphs for the remaining Contract period using the Early Dates and Late Dates in the Contract Progress Schedule shall be included as part of each schedule submittal.

SECTION 722 (Continued)**F. Projected Spending Reports (Types B, C and D)**

A Projected Spending Report (PSR) shall be prepared and submitted in accordance with the instructions listed at the end of this section. The PSR shall indicate the monthly spending (cash flow) projection for each month from NTP to Contractor Field Completion (CFC). Each month's actual spending shall be calculated using all CQEs paid during that month. If the difference between the Contractor's monthly projections vs. the actual spending is greater than 10%, the Contractor's monthly spending projection shall be revised and resubmitted within fifteen (15) Calendar Days.

The Projected Spending Report (PSR) shall be depicted in a tabular format and printed in color on 11 x 17-sized paper or larger as approved by the Engineer. For additional instructions and a template for preparing the Projected Spending Report (PSR), refer to the Contractor's Construction Schedule Toolkit located on the MassDOT-Highway Division website at:

<https://www.mass.gov/info-details/massdot-highway-contractors-schedule-toolkit> or consult with the District Construction Scheduler.

722.63. Progress Schedule Requirements**A. Baseline Schedule**

The Baseline Schedule shall be due thirty (30) Calendar Days after Notice to Proceed (NTP.) The Baseline Schedule shall only reflect the Work awarded to the Contractor and shall not include any additional work involving Extra Work Orders or any other type of alleged delay. The Baseline Schedule shall be prepared and submitted in accordance with Subsections 722.61 - Schedule Content and Preparation Requirements and 722.62 - Submittal Requirements. Once the Baseline Schedule has been accepted by the Engineer, with or without comments, it shall represent the as-planned schedule for the Work and become the Contract Progress Schedule of Record until such time as the schedule is updated or revised under Subsections 722.63.C - Contract Progress Schedules / Monthly Updates, 722.64.C - Recovery Schedules and 722.64.D - Proposal Schedules.

The Cost and Resource-Loading information (Types A and B only) shall be provided by the Contractor within forty-five (45) Calendar Days after NTP.

The Engineer's review comments on the Baseline Schedule and the Contractor's responses to them will be maintained for the duration of the Contract and will be used by the Engineer to monitor the Contractor's work progress by comparing it to the Contract Progress Schedule / Monthly Update.

B. Interim Progress-Only Schedule Submissions

The first monthly update of the Contract Progress Schedule/Monthly Update is due within seventy (70) Calendar Days after Notice to Proceed (NTP.) The Baseline Schedule review period ends at sixty (60) Calendar Days after NTP, see Subsection 722.60.B - Schedule Reviews by the Department. If the Baseline Schedule has not been accepted within sixty (60) Calendar Days after NTP, an Interim Progress-Only Schedule shall be due within seventy (70) Calendar Days after NTP. The purpose of the Interim Progress-Only Schedule is to document the actual progress of all activities, including non-construction activities, from NTP until the Baseline Schedule is accepted.

SECTION 722 (Continued)**C. Contract Progress Schedules / Monthly Updates (Types A, B, C and D)**

The first Contract Progress Schedule shall be submitted by the Contractor no later than seventy (70) Calendar Days after NTP. The data date for this first Progress Schedule shall be sixty (60) Calendar Days after NTP. Subsequent Progress Schedules shall be submitted monthly.

Each Contract Progress Schedule shall reflect progress up to the data date. Updated progress shall be limited to as-built sequencing and as-built dates for completed and in-progress activities. As-built data shall include actual start dates, remaining Work Days and actual finish dates for each activity, but shall not change any activity descriptions, the Original Durations, or the Original Resources (as planned at the time of bid), without the acceptance of the Engineer. If any activities have been completed out-of-sequence, the Contractor shall propose new logic ties for affected in-progress and future activities that accurately reflect the previously-approved sequencing. Alternatively, the Contractor may submit to the Engineer for approval an explanation of why an out-of-sequence activity does not require a correction and an adequate demonstration that the changes accurately represent how the activities will be built, including considerations for resources, dependencies and previously approved production rates. Once approved by the Engineer, the Contractor may incorporate the changes in the next Contract Progress Schedule/Monthly Update with the affected activities clearly identified and explained in the Schedule Narrative.

No revisions to logic ties; sequence, description or duration of future activities; or planned resource costs shall be made without prior approval by the Engineer.

Any proposed logic changes for in-progress or future activities shall be submitted to the Engineer for approval before being incorporated into a Contract Progress Schedule. The logic changes must be submitted using a Proposal Schedule or a schedule fragnet submission. Once approved by the Engineer, the Contractor may incorporate the logic in the next Contract Progress Schedule/Monthly Update with the affected activities clearly identified and explained in the Schedule Narrative.

For any proposed changes to the original sequence, description or duration of future activities, the Contractor shall submit to the Engineer for approval an explanation of how the proposed description or duration change reflects how the activity will be progressed, including considerations for resources and previously approved production rates. Any description or duration change that does not accurately reflect how the activity will be progressed will not be approved by the Engineer. Once approved by the Engineer, the Contractor may incorporate the changes in the next Contract Progress Schedule/Monthly Update with the affected activities clearly identified and explained in the Schedule Narrative.

Except as otherwise designated by a Contract Modification, no Contract Progress Schedule that extends performance beyond the Contract Time and/or beyond any Contract Milestone shall be approved by the Engineer. The Contractor shall submit a Recovery Schedule if any Contract Progress Schedule/Monthly Update indicates a failure to meet the Contract Dates.

D. Short-Term Construction Schedule

The Contractor shall provide a Short-Term Construction Schedule that details daily work activities, including any multiple shift work that the Contractor intends to conduct, in a bar chart format. The daily activities shall directly correspond to the Contract Progress Schedule activities, with a matching reference to the activity identification number in the Contract Progress Schedule, and may be at a greater level of detail.

SECTION 722 (Continued)

The Short-Term Construction Schedule shall be submitted every two weeks. It shall display all work for a thirty-five (35) Calendar Day period consisting of completed work for the two (2) week period prior and all planned work for the following three (3) week period. The initial submission shall be provided no later than thirty (30) Calendar Days after NTP or as required by the Engineer.

The Contractor shall be prepared to discuss the Short-Term Construction Schedule, in detail, with the Engineer in order to coordinate field inspection staff requirements, the schedule of work affecting abutters and any corresponding work with affected utilities. Short-Term Construction Schedules shall be prepared and submitted in accordance with Subsections 722.61 - Schedule Content and Preparation Requirements and 722.62 - Submittal Requirements.

Failure to submit Short-Term Construction Schedules every two (2) weeks may result in withholding of full or partial payments by the Engineer.

722.64 Impacted Schedule Requirements**A. Notice of Delay**

The Contractor shall notify the Engineer in writing, with copies to the District and State Construction Engineers, within three (3) Calendar Days of the start of any delays to the Critical Path that are caused by actions or inactions that were not within the control of the Contractor. Delay notifications that are not provided in a letter to the Engineer, such as a delay notification in the schedule narrative, will not be recognized as contractual notice in the determination of any Time Extension related to the impacts to the work associated with this specific alleged delay. Should such delay continue for more than one (1) week, the Contractor shall note it in the Schedule Narrative until the delay is no longer impacting the Critical Path for the completion of the Contract Milestones. The Engineer will evaluate the alleged delay and its impact and will respond to the Contractor within ten (10) Calendar Days after receipt of a notice of delay.

B. Time Entitlement Analysis

A Time Entitlement Analysis (TEA) shall consist of a descriptive narrative, prepared in accordance with Subsection 722.62.A - Narratives, and an as-built CPM schedule, which may be in the form of a schedule fragnet (that has been developed from the project's Contract Progress Schedule of Record, and illustrates the impact of a delay to the Critical Path, Contract Milestones and/or Contract Completion Date as required in Subsection 8.10 - Determination and Extension of Contract Time for Completion. TEAs shall also be used to determine the schedule impact of proposed Extra Work Orders (EWO) as also required in Subsection 8.10.

TEAs shall be prepared and submitted in accordance with the requirements of Subsections 722.61 - Schedule Content and Preparation Requirements and 722.62 - Submittal Requirements and shall be based on the Contract Progress Schedule of Record applicable at the start of the delay or impact from an EWO. A TEA fragnet must start with a specific new activity describing the work contained in either a Notice of Delay previously submitted to the Department per Subsection 722.64.A - Notice of Delay or an EWO.

SECTION 722 (Continued)

TEAs shall be submitted:

1. as part of any Extra Work Order that may impact Contract Time,
2. with a request for a Time Extension,
3. within fourteen (14) Calendar Days after a request for a TEA by the Engineer for any other reason.

A TEA shall be submitted to the Engineer before any Time Extension is granted to the Contractor. Time Extensions will not be granted unless the TEA accurately reflects an evaluation of all past delays and the actual events that occurred that impacted the Critical Path. The TEA must also demonstrate a plan for the efficient completion of all of the remaining work through an optimized CPM Schedule. The analysis shall include all delays, including Contractor-caused delays, and shall be subdivided into timeframes and causes of delays.

TEAs shall incorporate any proposed activities, logic ties, resource considerations, and activity costs required to most efficiently demonstrate the schedule impacts in addition to detailing all impacts to existing activities, logic ties, the Critical Path, Contract Milestones and the Contract Completion Date. In addition, TEAs shall accurately reflect any changes made to activities, logic ties, restraints and activity costs, necessitated by an Extra Work Order or other schedule impact, for the completion of the remaining work. The Contractor shall provide TEAs that demonstrate that all delays have been mitigated to the fullest extent possible without requiring an Equitable Adjustment to the original bid basis.

All TEAs shall clearly indicate any overtime hours, additional shifts and the resource that are proposed to be incorporated in the schedule. The Engineer shall have final discretion over the use of overtime hours and additional shifts. The Engineer shall have the right to require that overtime hours and/or additional shifts be used to minimize the duration of Time Extensions if it is determined to be in the best interest of the Department to do so.

When accepted, the changes included in a TEA shall be incorporated into the next Contract Progress Schedule per the requirements of Subsection 722.63.C - Contract Progress Schedules / Monthly Updates.

During the review of any TEA, all Contract Progress Schedules shall continue to be submitted as required.

The Engineer may request that the Contractor prepare a Proposal Schedule or a Recovery Schedule to further mitigate any delays that are shown in the accepted TEA/Contract Progress Schedule.

C. Recovery Schedules

The Contractor shall promptly report to the Engineer all schedule delays during the prosecution of the Work. Except as otherwise designated by a Contract Modification, no Contract Progress Schedule that extends performance beyond the Contract Time and/or beyond any Contract Milestone shall be approved by the Engineer. The Contractor shall submit a Recovery Schedule within fourteen (14) Calendar Days of a Contract Progress Schedule submission that shows failure to meet the Contract Dates. This requirement is critical to the Department's ability to make informed decisions regarding Contract Time and costs.

SECTION 722 (Continued)

During the prosecution of the Work, should the Contractor's progress on a critical operation clearly not meet anticipated production, without cause by fault of the Department, or should a critical activity or series of activities not be staffed in accordance with the Contractor's approved Baseline Schedule resource planning, the Contractor shall be obligated to recover such delay. Recovery Schedules shall be prepared and submitted in accordance with Subsections 722.61 - Schedule Content and Preparation Requirements and 722.62 - Submittal Requirements within fourteen (14) Calendar Days of any of the cases listed above.

Recovery Schedules shall clearly indicate any proposed overtime hours, additional shifts, and the resources that are proposed to be incorporated in to the schedule. The Engineer shall have final discretion over the use of overtime hours and additional shifts and shall have the right to require that overtime hours and/or additional shifts be used to minimize the duration of Time Extensions, without additional compensation for any Contractor delays, if it is determined to be in the best interest of the Department to do so.

During the review of any Recovery Schedule, all Contract Progress Schedules shall continue to be required every month.

The Engineer may request that the Contractor prepare a Recovery Schedule to further mitigate any delays that are shown in an accepted TEA/Contract Progress Schedule.

Changes represented in accepted Recovery Schedules shall be incorporated into the next Contract Progress Schedule.

D. Proposal Schedules

A Proposal Schedule is an alternative schedule used to evaluate proposed changes to the Contract scope or significant alternatives to previously approved approaches to complete the Work, which may include changes to activity durations, logic and sequence. For Types A and B Schedules, the Proposal Schedule shall be cost and resource-loaded.

A Proposal Schedule may be requested by the Department at any time or may be offered by the Contractor. The Engineer may request that the Contractor prepare a Proposal Schedule to further mitigate any delays that are shown in an accepted TEA/Contract Progress Schedule.

The Contractor shall submit the Proposal Schedule within thirty (30) Calendar Days of a request from the Department.

The Proposal Schedule shall not be considered a Schedule of Record until the logic, durations, narrative and basis of the Proposal Schedule have been accepted by the Engineer. If the Proposal Schedule took the form of a fragnet, it must be incorporated into the Contract Progress Schedule of Record showing the current progress of all other activities and the impacts/results of the changes made by the Proposal Schedule before the Proposal Schedule is accepted by the Department.

Proposal Schedules shall clearly indicate any proposed overtime hours, additional shifts, and the resources that are proposed to be incorporated in the schedule. The Engineer shall have final discretion over the use of overtime hours and additional shifts.

Changes represented in accepted Proposal Schedules shall be incorporated into the next Contract Progress Schedule. During the review of any Proposal Schedule, all Contract Progress Schedules shall continue to be required every month.

SECTION 722 (Continued)**E. Disputes (Types A, B, C and D)**

All schedules shall be submitted, reviewed, dispositioned and accepted in the timely manner specified herein so as to provide the greatest possible benefit to the execution of this Contract.

Any dispute concerning the acceptance of a schedule or any other question of fact arising under this subsection shall be determined by the Engineer. Pending resolution of any dispute, the last schedule accepted by the Engineer will remain the Contract Schedule of Record.

COMPENSATION**722.80 Method of Measurement and Basis of Payment (Types A, B, C and D)**

The Special Provisions will specify the fixed-price amount to be paid to the Contractor for the Project Schedule requirements contained herein. Each bidder shall include this lump-sum, fixed-price bid item amount in his/her bid. Failure to do so may be grounds for the rejection of the bid.

All required schedule-related work, including, but not limited to computers, computer software, the planning and coordination with utilities, training, schedule preparation and schedule submittals will be paid for under the fixed price amount.

This fixed price amount is for payment purposes only and is separate from what the Department considers to be the Contractor's General Condition costs. If the Contractor deems it necessary to include additional costs to provide all of the requirements of this section, these additional costs shall be included in the Contractor's overall bid price.

Twenty percent (20%) of this pay item will be paid upon the Engineer's acceptance of the Contractor's Baseline Schedule, prepared and submitted in accordance with Subsection 722.63.A.

The remaining eighty percent (80%) of this pay item will be paid in equal monthly installments distributed across the Contract Duration from Notice to Proceed (NTP) to Contractor Field Completion (CFC), less the 2 months required for the submittal and review of the Baseline Schedule in accordance with the following formula:

$$\text{Monthly Payment} = \frac{\text{Remaining Fixed Price amount (80\% of Item 100.)}}{\text{Contract Duration in whole months} - 2 \text{ months}}$$

The timely and accurate submission of the Baseline Schedule is critical to the Contract and the Department's ability to make informed decisions. Only payments under Item 740 - Engineer's Field Office and Item 748 - Mobilization will be made until the Baseline Schedule is accepted by the Engineer.

SECTION 722 (Continued)

No payment for any other pay item will be processed beyond seventy-five (75) Calendar Days from Notice to Proceed (NTP) until the Baseline Schedule is accepted by the Engineer. Until the Engineer's acceptance of the Baseline Schedule, the combined total of all payments made to the Contractor will be limited to an amount no greater than the total price for Item 748 - Mobilization or 3% of the contract price, whichever is less.

All Contract Progress Schedule Updates submitted later than ten (10) Calendar Days after the CQE (Contract Quantity Estimate) completion date, or greater than forty (40) Calendar Days from the Data Date of the previous submission, will be deemed to be no longer useful and will not qualify for payment. Late submittal of missed Contract Progress Monthly Updates will not result in recovery of the previously forfeited portion of the Schedule of Operations Fixed Price Payment Item.

Failure to submit schedules as and when required may result in the forfeiture of that portion of the Schedule of Operations Fixed Price Payment and/or the withholding of the full or partial CQE payments by the Engineer.

Failure to submit schedules that are acceptable to the Engineer may result in the forfeiture of that portion of the Schedule of Operations Fixed Price Payment and/or the withholding of the full or partial CQE payments by the Engineer.

The Schedule of Operations pay item will be adjusted to pay for only the actual quantity of schedules that have been submitted in accordance with this section.

The Contractor's failure or refusal to comply with the requirements of this Section shall be reasonable evidence that the Contractor is not prosecuting the Work with due diligence and may result in the withholding of full or partial payments by the Engineer.

Should there be a Time Extension granted to the Contractor, the Engineer may provide an Equitable Adjustment for additional Contract Progress Schedule Updates at intervals directed by the Engineer. Item 100. will be the basis for this Equitable Adjustment.

722.82 Payment Items

100. SCHEDULE OF OPERATIONS - FIXED PRICE \$ _____ LUMP SUM

<u>ITEM 102.3</u>	<u>HERBICIDE TREATMENT OF INVASIVE PLANTS</u>	<u>HOURLY</u>
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This work must be performed by persons who meet the qualifications below and are approved by the Landscape Design Section.

Work under this item consists of herbicide treatment of invasive plants currently existing within the project limits and as directed. An Invasive Plant Management Strategy (IPMS) shall be submitted to the Engineer for review and approval and the IPMS shall be implemented on-site. The IPMS shall be measured and paid for under Item 102.33 Invasive Plant Management Strategy.

Work under this item shall be coordinated with work and schedule for Selective Clearing, Clearing and Grubbing, Mowing, Tree Removal, Planting, and Wetland Mitigation items.

Payment is per hour on-site and shall be compensation for a minimum crew of 2 licensed applicators, 2 back-pack sprayers and mist-blowers, a properly equipped spray truck with spray hoses, and a tank with sufficient capacity for a full day of work. This item is not intended for manual removal of plants.

Management of plants determined to have been introduced to the site via imported loam, compost, mulch, plants, equipment, or other construction activities will be the Contractor's responsibility and at the Contractor's expense.

Herbicide shall be applied during daytime hours only.

Measures to prevent the introduction of invasive plant species to the site and to correct their introduction as a result of construction-related activities shall be covered under the Standard Specifications, Division I - Subsections 7.01(D) Plant Pest Control and 7.13 Protection and Restoration of Property as amended in these Special Provisions.

Plant species targeted for management under this item shall be as determined in the field per the site walk and as specified in the IPMS.

The definition of invasive plant species shall be as described by Massachusetts Invasive Plant Advisory Group (MIPAG): "non-native species that have spread into native or minimally managed plant systems in Massachusetts, causing economic or environmental harm by developing self-sustaining populations and becoming dominant and/or disruptive to those systems."

Control of invasive plants shall begin immediately with the initiation of construction activities and prior to any clearing or site disturbance. Treatment areas shall include stockpile locations and may, upon approval of the Engineer, extend outside the project limit. Treatment shall be done each consecutive year for the duration of the contract unless specified otherwise in the IPMS or unless directed otherwise by the MassDOT invasive species contact. Work shall be done during the growing season from May – October unless otherwise specified in the IPMS.

ITEM 102.3 (Continued)

Areas identified for vegetation control measures shall be as shown on the plans and as determined in the field by the Engineer and a MassDOT Landscape Architect. Contact at MassDOT Landscape Design Section is: stephanie.smoot@state.ma.us.

QUALIFICATIONS

The applicators shall submit and meet the qualifications outlined below. A list of contractors specializing in invasive management and approved by MassDOT Landscape Design Section is available on the following website: <https://www.mass.gov/lists/landscape-design-and-roadside-maintenance> under Invasive Plant Management.

Requirements

1. Company must provide proof of qualifications by providing the following:
 - a. Narrative describing company, its expertise and experience with invasive plant control.
 - b. Demonstrate experience with herbicide treatment as part of restorations and in sensitive areas
 - c. Describe company's technical qualifications and past performance.
2. Company must meet licensing requirements:
 - a. All crew applicators must have a Massachusetts Commercial Applicator License (CORE).
 - b. At least one or more applicator must have a ROW certification, if required for work.
 - c. Company must provide name(s) of applicator(s) and Applicator License/Certification number for all contractor crew leaders working on the project.
 - d. Company must provide documentation of any warnings, penalties or fines received in the last three (3) years.
3. Company must provide proof of experience with invasive plant control and include following:
 - a. At least five (5) references from prior invasive plant control work completed in last five (5) years. Provide contact information including address, phone number and email.
 - b. Provide a summary of each of these projects including nature of the problem, specific invasive vegetation treated, dates and period of treatment, methodologies used, and summary of success or not in terms of meeting performance objectives. Include summary of equipment used.
 - c. Photo documentation of these projects.
 - d. GPS coordinates of project locations, if available.
4. Crew leader must have expertise with invasive plant control and provide the following:
 - a. Have held Core license for at least five (5) years.
 - b. Resume listing five (5) or more years of experience applying pesticides with the company or with another company specializing in vegetation management.

The following companies are pre-approved by MassDOT Landscape Design Section:

ITEM 102.3 (Continued)***Groundscapes Express, Inc.***

P.O. Box 737
Wrentham, MA 02093
Contact: Butch Goodwin
Email: butch@groundscapesexpress.com
Phone: 508-400-5366

Solitude Lake Management

590 Lake Street
Shrewsbury, MA 01545
Contact: Keith Gazaille
kgazaille@solitudelake.com
Phone: 508-885-0101

Land Stewardship, Inc.

PO Box 511
Turner Falls, MA 01376
Contact: Chris Polatin
Email: info@landstewardshipinc.com
Phone: 413-367-5292

SWCA Environmental Consultants

15 Research Drive
Contact: Scott Fisher
Phone: 413-658.2056
Email: sfisher@swca.com
Amherst, MA 01002

Native Habitat Restoration

P.O. Box 582
Stockbridge, MA 01262
Contact: Jess M. Toro : 413-358-7400
Email: nativehabitatrestoration@gmail.com
Phone: 413-394-0277

Vegetation Control Service, Inc.

2342 Main St.
Athol, MA 01331
Contact: Andrew Powers
Email: apowers@vegetationcontrol.com
Phone: 800-323-7706

Invasive Plant Management Strategy (IPMS)

At least thirty (30) days prior to proposed treatment the IPMS shall be submitted for approval by the Engineer and MassDOT Landscape Architect. All chemicals, methods and work done under this item shall be consistent with the IPMS. The IPMS shall be as described under Item 102.33.

Herbicide Use Report

Within two (2) weeks after each application, the Contractor shall provide to the Engineer a completed and signed MassDOT Herbicide Use Report.

Photo Documentation

Digital photos with date and time of herbicide application work may be required and shall be submitted upon request.

ITEM 102.3 (Continued)**MATERIALS**

All proposed herbicides shall be as approved in the IPMS. Herbicides shall be labeled for the method of treatment and shall meet all federal, state and local regulation requirements. Application rates will depend on herbicide proposed and shall be per the manufacturer's label for specific application.

METHODS

All methods used shall be as approved in the IPMS which shall be determined during the Initial Site Walk as described under Item 102.33 Invasive Plant Management Strategy.

The Contractor shall be responsible for marking delineated areas and plants to be preserved, removed, or otherwise treated. Fencing or other materials needed for marking and delineating protected areas shall be incidental to this item.

The Contractor shall notify the Engineer a minimum of 3 days prior to date of expected herbicide application. Applicators shall notify the Engineer upon arriving on-site.

Herbicide Applications

All herbicide application shall conform to Massachusetts Pesticide Laws and Regulations per the Massachusetts Department of Agricultural Resources (MDAR) Pesticide Bureau.

Mixing, applying and/or disposing of herbicides shall always be in accordance with instructions on their labels and all applicable federal, state, and local regulations. Mixing shall not occur within sensitive areas, wetlands, or buffer zones.

Contractor shall not spray 2 hours prior to precipitation, during rain, or during windy conditions. The Contractor shall be responsible for monitoring weather conditions and adjusting the work schedule as appropriate for the herbicide and application method to be used.

Targeted vegetation shall be identified and marked prior to treatment. Plants treated by foliar spray, injection or glove application or other methods that leave standing vegetation, as opposed to cut-stump application, shall remain clearly marked for identification through the contract period.

Desirable vegetation shall be protected from both spray and other physical damage.

Contractor is responsible for any damage to vegetation not designated for removal or treatment. Vegetation damaged shall be restored. Cost of replacement plants and/or restoration shall be borne by the Contractor.

ITEM 102.3 (Continued)

Contractor shall ensure that the public does not enter a work area while herbicide application or spraying is underway.

Disposal Of Invasive Plant Material

All material to be cleared shall become the property of the Contractor. The satisfactory disposal of all cleared plant material (seeds, roots, woody vegetation, associated soils, etc.) shall be the Contractor's responsibility.

The Contractor shall take measures to prevent viable plant material from leading to further infestations (seeds, roots, woody material, etc.) while stockpiled, in transit, or at final disposal locations. All precautions shall be taken to avoid contamination of natural landscapes with invasive plants or invasive plant material.

Chipping, shredding, or on-site burning of plant material must be approved by the Engineer and included in the IPMS.

For plant material taken to an incinerating facility per the IPMS, a receipt from that facility shall be submitted to the Engineer as proof of disposal.

Where feasible, it is preferable to dispose of plants on-site or to bury them on-site with on-going monitoring for re-sprouting. Disposal locations and methods must be approved and included in the IPMS. Site work such as grading and seeding to stabilize and restore disposal area shall be incidental to this item.

The Contractor shall be responsible for treating or otherwise managing areas of re-growth due to improper disposal. Treatment shall be at the Contractor's expense.

Follow-Up Treatment

Plants and areas shall be re-treated as necessary and as appropriate to the time of year. Treatment shall be for the duration of the contract and per the IPMS.

MEASURE OF SUCCESS

The expectation is a minimum of 85-95 percent control achieved after the first treatment, depending on plants targeted and extent of population, and based on the expectations laid out in the IPMS. The expectation for the contract duration is 95-100% eradication by the end of the treatment period, unless otherwise specified in the IPMS.

ITEM 102.3 (Continued)**METHOD OF MEASUREMENT**

Item 102.3 will be measured for payment by the Hour of crew time spent on the project doing actual herbicide application work. A crew shall be defined as a minimum of two licensed applicators each equipped with (at minimum) back-pack sprayer and mist blower. The crew shall also have a properly equipped spray truck with hoses and a tank with sufficient capacity for a full day of work.

BASIS OF PAYMENT

Item 102.3 will be paid at the contract unit price per Hour, which price shall include all labor, materials, equipment, tools, and all incidentals required to complete the work.

Payment will be based upon time spent on the project doing actual work and shall not include travel time to and from the Contractor's place of business and shall also not include time for investigative field trips.

If there is only one applicator, hourly payment shall be adjusted to 50 percent of the unit price.

The Invasive Plant Management Strategy will be paid for under Item 102.33.

ITEM 102.33**INVASIVE PLANT MANAGEMENT STRATEGY****HOUR**

This item consists of providing an Invasive Plant Management Strategy (IPMS) for the control of invasive plants currently existing on the project site and/or as directed and shall be coordinated with Item 102.3 Herbicide Treatment of Invasive Plants. The IPMS shall be submitted for review and approval and the IPMS shall be implemented on-site.

Herbicide treatment for invasive plants shall be as described under Item 102.3 Herbicide Treatment of Invasive Plants and shall be compensated per that Item.

Work under this item shall be coordinated with work and schedule for Selective Clearing, Clearing and Grubbing, Mowing, Tree Removal, Planting, and Wetland Mitigation as relevant to the project.

Individual attending the site walk and determining the Invasive Plant Management Strategy must demonstrate expertise with vegetation management and invasive plant control.

SUBMITTALS

Task Summary: For measurement of payment, the contractor shall submit the total sum and a breakdown of hours for the following tasks performed, which shall include at least: Site Walk/s, IPMS Written Reports, Site Monitoring if required by MassDOT, and Final Report if required by MassDOT.

Qualifications

Individual shall be from the same company as that providing services for Item 102.3 Herbicide Treatment of Invasive Plants or shall meet the following requirements:

- Submit copy of current Core license.
- Submit a resume listing five (5) or more years of experience managing invasive plants with a company specializing in vegetation management. References shall be submitted if requested.
- References shall be submitted if requested.

Invasive Plant Management Strategy (IPMS)

At least thirty (30) days prior to construction activities and/or any proposed treatment, submit a written IPMS proposal for approval by the Engineer and MassDOT Landscape Architect. All chemicals and methods proposed shall be consistent with applicable Massachusetts Wetlands Protection Act Order of Conditions.

ITEM 102.33 (Continued)

The IPMS shall be completed in coordination with the Roadway Contractor and the Engineer and shall include the following as appropriate to the project:

I. Project Information

- a. Company writing IPMS and performing herbicide application.
- b. Date of site walk
- c. Attendees at site walk
- d. Expected end date of contract and expected last treatment (month/season)

II. Brief Description of Conditions

- a. Provide a free-hand sketch on construction plans or aerial image showing species, location, and as relevant, show or note extent of population as relevant to Strategy (i.e., population extends off ROW preventing eradication, small population and eradication deemed feasible within contract schedule, etc.).

III. Coordination with Roadway Contractor regarding other work

- a. Tree Work: Note coordination to be implemented with tree removal, clearing, and clearing and grubbing as applicable to the project.
- b. Wetland Mitigation - Include management proposed for wetland mitigation areas in the IPMS, if and as required.
- c. Planting: If there will be planting in areas proposed for treatment, propose treatment and schedule to avoid herbicide damage to plants.
- d. Mowing: If coordination is required with state mowers, note need in IPMS.

IV. Soil Management

- a. Provide specifics on how soil with invasive plant roots (in particular) or seeds will be handled (i.e., separate stockpiles, plant material will be buried on-site, re-used on-site, disposed off site and if so, where?).
- b. Show stockpile locations on plan and include treatment schedule.
- c. Note measures that will be implemented to avoid spread through equipment, including how and where equipment will be cleaned.

V. Invasive Plant Treatment & Management

- a. Proposed chemical and methods of treatment for each species or area.
- b. Time of treatment based on target plant species.
- c. Submit product label including application methods and rates (entire MSDS information need not be submitted if available online).
- d. Proposed performance metrics or measure of treatment success if different from that specified under Item 102.3.
- e. Method for disposing invasive plant material. This includes material that may result in spread (i.e., seeds, roots) and material that has been treated and/or is not viable (foliage, dead wood, etc.). Methods may include grinding in place, stockpiling and treating, and incinerating offsite.
- f. Expected follow-up treatment for duration of contract.

ITEM 102.33 (Continued)**VI. Monitoring Schedule** if requested by MassDOT.

Note: The IPMS is critical for identifying pre-construction conditions as well as strategies for minimizing import or spread of invasive plants. Failure to provide an approved IPMS may jeopardize this item, in which case, the contractor will be responsible for management of invasive plants found on-site at no cost to the contract.

Photo Documentation

Digital photos with date and time verification shall be provided with the IPMS and with any follow-up monitoring or reporting.

IPMS Follow-up Amendments

The IPMS may be amended to address additional concerns or adjust to conditions. The amended IPMS shall be submitted to the Engineer and MassDOT Landscape Architect for approval at least thirty (30) days prior to any proposed treatment.

Final Report

A final inspection and report documenting the status of the invasive control may be required for regulatory purposes or for instances where control will be continued by others. The report shall include photo documentation of pre-construction (existing) and post-treatment conditions, notations on a plan or aerial image of area treated, summary of treatment performed, and control achieved.

INITIAL SITE WALK

Prior to any work the Contractor shall walk the site with the Engineer and the MassDOT Landscape Architect to determine the IPMS. During the site walk the Contractor shall identify limits of work and, as necessary, mark locations of areas designated for treatment and individual plants targeted for treatment or removal. The Contractor shall be responsible for marking delineated areas and plants to be preserved, removed, or otherwise treated. Fencing or other materials needed for marking and delineating protected areas shall be incidental to this item.

METHOD OF MEASUREMENT

Item 102.33 will be measured for payment by the Hour. The basis for measurement shall be per the completion of tasks as approved under the Task Summary submittal.

ITEM 102.33 (Continued)

BASIS OF PAYMENT

Item 102.33 will be paid at the contract unit price per Hour, which price shall include all labor, materials, equipment, tools, and all incidentals required to complete the work.

Payment shall not include travel time to and from the Contractor's place of business.

ITEM 115.1 **DEMOLITION OF BRIDGE NO. H-08-003=N-07-002** **LUMP SUM**

The work under this Item shall include the removal and legal disposal of the existing superstructure and portions of existing substructure in conformance with the relevant provisions of Sections 112, 960 and 961 of the Standard Specifications and the following:

The work shall consist of the removal and disposal of the existing superstructure as indicated on the contract drawings and temporary protective shielding, as required, to prevent construction debris from falling to the Ware River below. The work shall also consist of removal and disposal of the existing substructure as indicated on the contract drawings.

The work includes furnishing all labor, materials and equipment required to perform demolition of the entire existing bridge superstructure and portions of the existing substructure to the limits as shown on the Plans or as required by the Engineer. Except as specified, all material and debris shall become the property of the Contractor, and shall be recycled, reused, or disposed of in accordance with all applicable local, state, and federal requirements.

The demolition of the existing superstructure and substructure shall include but not limit to the following bridge elements:

- Existing Bridge Railings
- Existing End Posts
- Existing Concrete Curbs
- Existing Bridge Deck (Concrete, rebars, and pavement)
- Existing steel beams and diaphragms
- Existing Abutments
- Existing Top of Wingwalls

Before operations begin to remove the bridge, the Contractor shall provide suitable temporary barriers, fences, and safety signing. The Contractor shall take every precaution during his operations to ensure that the traveling public in the vicinity of the bridge shall be protected from entering the work area.

The Contractor shall erect a temporary shielding system beneath the entire existing superstructure during removal to prevent demolition debris from falling into the Ware River. Shielding shall be in place prior to the start of any demolition or removal. No foreign material or debris resulting from the Contractor's operations shall be permitted to enter or remain in the Ware River.

The Contractor shall be required to remove any debris which is generated by demolition from the site immediately and to restore portions of the site affected by the operation to their original, undisturbed condition or better. Removal of debris generated by demolition will be performed at the Contractor's own expense.

ITEM 115.1 (Continued)

The Contractor is informed that:

All costs for permits, dump fees, taxes, special handling of hazardous materials, and all other items which are incidental to the demolition, shall be included in the bid price of the demolition item.

While demolishing the bridge superstructure, care shall be taken to avoid damaging or overloading the existing abutments. It shall be the contractor's responsibility to maintain the existing bridge including substructure during demolition. Any damage to the bridge is the contractor's responsibility to repair at his/her own expense. The existing utilities in the vicinity of the existing bridge shall be relocated as indicated on the contract drawings.

All material removed under this item shall become the property of the Contractor and shall be removed from the job site.

SUBMITTALS

The Contractor shall make the following submittals:

1. Plan identifying off-site disposal locations.
2. A program for demolition indicating, in detail, design calculations; procedures; sequence of operations; equipment types and placement; noise, water runoff and dust control; protective measures; shielding plan; and demolition plan.
3. The Contractor shall submit a proposed method of demolition, including crane capacity and location, radii of movement, max pick weight, equipment, tools, procedures, etc., to the Engineer for review. The Contractor shall submit to the Engineer for approval a demolition plan that includes calculations of loads, selection of crane and delineates the methods the Contractor will use to ensure that all demolition materials will be prevented from falling onto the Ware River.

The demolition procedure and any necessary calculations and drawings shall all be stamped by a Professional Structural Engineer registered in the Commonwealth of Massachusetts. Work under this Item may not commence until the Engineer has given written approval of the method of demolition.

CONSTRUCTION METHODS

The Contractor shall submit to the Engineer, a proposed method of deck, superstructure, and substructure removal including equipment, tools, devices etc., at the preconstruction conference.

During the prosecution of the work under this Item, the Engineer may reject the use of any method or equipment which causes undue vibration or possible damage to the remaining structure or part thereof.

ITEM 115.1 (Continued)

All materials from the demolition and other work, shall become the property of the Contractor who shall legally dispose of the materials outside and away from the site at certified off-site disposal location accepted by the Engineer.

Upon completion of demolition, all temporary fences, barriers, and remaining debris shall be removed from the site as per the approved construction sequence. The site, and all areas adjacent to it, shall be left in a neat and safe condition.

The Contractor shall dispose of as much of the steel and rubble as possible at a facility that will recycle such materials.

Demolition materials shall not be allowed to accumulate and shall be promptly removed from the site.

Materials shall be salvaged for reuse at the site as accepted by the Engineer.

Water runoff generated by dust control, demolition equipment and other demolition activities shall be retained on the site and disposed of in accordance with the requirements of the appropriate regulatory agencies, and drainage utility.

DISPOSAL OF EXCESS MATERIAL

Surplus materials obtained from any type of excavation, and all existing and other materials not required to be removed and stacked or needed for use on the project, as determined by the Engineer, shall become the property of the Contractor, and disposed of subject to the regulations and requirements of local authorities governing the disposal of such materials, at no additional compensation.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 115.1 will be paid for at the contract unit price, Lump Sum and will not be measured for payment. This price shall be full compensation for all design, bracing, shoring, labor, tools, equipment, materials, testing, loading, transportation, disposal fees necessary or incidental, approvals, permits, and incidental work necessary for the completion of the work, as specified above, as shown on the Contract Plans, and/or as required by the Engineer. Testing and removal of hazardous materials shall be paid as incidental under Item 115.1.

Miscellaneous demolition, removals and disposals that are not specifically listed for payment under another item shall be incidental to Item 115.1.

<u>ITEM 184.1</u>	<u>DISPOSAL OF TREATED WOOD PRODUCTS</u>	<u>TON</u>
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Work under this item shall include the loading, transportation and final off-site disposal/recycling/treatment of all treated existing wood product as shown in the plans or directed by the Engineer.

This item shall include all costs for sampling, laboratory tested, loading, transportation, and disposal of the treated wood. The Contractor is required to submit disposal manifests to the Engineer prior to completion of the project. The disposal of treated wood products should be completed in accordance with State and Federal regulations.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 184.1 will be measured for payment by the TON, of treated wood loaded, transported, and accepted at a licensed facility.

Item 184.1 will be paid at the Contract unit price per TON, of treated wood loaded, transported, and accepted at a licensed facility, which price shall be full compensation for all labor, tools, equipment, materials, testing, loading, transportation, approvals, and permits necessary for the completion of work.

ITEM 402.12 DENSE GRADED CRUSHED STONE FOR SHOULDERS CUBIC YARD

The work under this Item shall include crusher-run coarse aggregates of crushed stone or gravel and fine aggregates of natural sand or stone screenings uniformly pre-mixed and placed in close conformity with the lines and grades of the crushed stone shoulder shown on the plans or established by the Engineer.

Material shall meet the requirements specified in Section M2.01.7 of the Standard Specifications.

Grade control survey shall conform to Subsection 5.07 of the Standard Specifications. The Contractor shall furnish, set, and maintain all line and grade stakes.

The Dense Graded Crushed Stone shall be spread in layers from self-spreading vehicles equipped with automated grade-controlled equipment. Power graders or conventional self-spreading vehicles may be used only with prior written approval of the Engineer. Suitable watering devices shall be available at the source of supply and on the project for use as directed by the engineer to prevent segregation in transit and during spreading and to obtain the proper density and stability of the mixture. The specified density of the Dense Graded Crushed Stone shall be maintained by determining the number of passes of a roller are required to produce a constant and uniform density, after conducting a series of tests either using the sand/volume method or the nuclear device.

METHOD OF MEASUREMENT

Item 402.12 will be measured for payment by the CUBIC YARD, in place, to the limits specified on the plans or as directed by the Engineer, with no percentage added.

BASIS OF PAYMENT

Item 402.12 will be paid at the Contract unit price per cubic yard, complete in place.

<u>ITEM 657.</u>	<u>TEMPORARY FENCE</u>	<u>FOOT</u>
<u>ITEM 657.5</u>	<u>TEMPORARY FENCE REMOVED AND RESET</u>	<u>FOOT</u>

Work done under these items consists of the furnishing, installing, maintaining, removing, resetting and final removal and transportation of the temporary chain link fence and gates around the work site, to secure the work area as shown on the Plans or directed by the Engineer and in accordance with Subsection 644 of the Standard Specifications.

The fence shall extend at least six feet above the ground and can be any type acceptable in Subsection 644 of the Standard Specifications. The cost for all end, corner, padlock, and intermediate posts as well as gates and all other incidental material, labor and equipment required for the installation, and final removal shall be included under the contract unit price bid per foot. Any relocation of the fence around the work site shall be included in Item 657.5 Temporary Fence Removed and Reset.

METHOD OF MEASUREMENT

Item 657, Temporary Fence, will be measured for payment by the FOOT of temporary fence installed.

Item 657.5, Temporary Fence Removed and Reset will be measured for payment by the FOOT of temporary fence removed and reset.

BASIS OF PAYMENT

Items 657 and 657.5 will be paid at the respective Contract unit prices by the FOOT, which prices shall include furnishing, installing, maintaining, removing, and resetting and removing during construction and final removal from the site once work containing the item is complete.

ITEM 698.31**GEOTEXTILE FABRIC FOR TEMPORARY
SOIL PROTECTION****SQUARE YARD**

The work under this item shall include furnishing and placement of geotextile fabric for temporary soil protection as shown on the plans and/or as required by the Engineer. All work shall be done in conformance with the applicable sections of the Standard Specifications.

Geotextile Fabric for Temporary Soil protection shall conform to the requirements of AASHTO M 288 and shall be listed on the Qualified Construction Material's List and be approved for Separation.

Six inches of crushed stone shall be placed over the fabric prior to placement of fill. Stone shall meet M2.01.1.

Following completion of construction work, fill, stone, and fabric shall be removed and properly disposed off-site or as required by the Engineer.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 698.31 will be measured for payment by the SQUARE YARD.

Item 698.31 will be paid at the Contract unit price per SQUARE YARD, which price shall include the fabric, all labor, tools, materials, stone, any necessary incidental items to provide complete in place installation, and removal and disposal of stone and fill. Overlapped matting will not be measured for payment.

Crushed stone and removal of stone will be incidental to this item.

Schedule of Payment shall be as follows:

- 50% upon approval of installation
- 50% upon removal of fabric and stone as required by the Engineer.

<u>ITEM 698.4</u>	<u>GEOTEXTILE FABRIC FOR PERMANENT EROSION CONTROL</u>	<u>SQUARE YARD</u>
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The work under this item shall conform to the requirements of Section M9.50.0 of the Standard Specifications, AASHTO M 288 for the intended application and the following:

The work shall include furnishing and installing geotextile fabric for separation, at work locations noted on the plans and as required by the Engineer.

The fabric shall be installed without puckers on a smoothly graded surface approved by the resident engineer and held in place to prevent excessive movement when backfill is placed against it. The fabric shall be laid to allow some movement so that placement of overlaying material does not stretch or tear it. Fabric shall overlap in accordance with details shown on the plans, but in no case less than three (3) inches, with upslope fabric overlapping downslope fabric, and installed in accordance to the manufacturer's recommendations. After placement the fabric shall not be left uncovered for more than two weeks and traffic, including construction equipment, shall not be permitted directly on the fabric. Fabric shall be completely covered with backfill material of the type required at each installation. Backfill material shall be dropped on to the fabric from a height no greater than three feet. Excess fabric shall be removed from the project.

The geotextile fabric shall be on the MassDOT Qualified Construction Material List (QCML).

METHOD OF MEASUREMENT

Item 698.4 will be measured for payment by the SQUARE YARD, complete in place; any overlaps shall be measured as a single layer of cloth.

BASIS OF PAYMENT

Item 698.4 will be paid for at the contract unit price per SQUARE YARD, which price shall include all labor, materials, equipment, and incidental costs required to complete the work.

ITEM 734.52**SIGN POST REMOVED AND STACKED****EACH**

The work under this Item shall conform to the relevant provisions of Subsection 828 of the Standard Specifications and the following.

The work to be done under this Item shall consist of the dismantling, removing, and stacking of all existing sign posts as noted on the plans and/or as required by the Engineer. The signs shall be stacked at 179 Petersham Road, Hardwick, Massachusetts, 01031 or 110 W Brookfield Road Suite B, New Braintree, MA, 01531. If the Engineer determines that these sign posts are not to be stacked, the Contractor shall dispose of these sign posts at no additional cost to the Town.

Also included is the excavation of the existing foundations. If, in the opinion of the Engineer, the existing foundation will not interfere with new construction, it may be removed to a depth of 12 inches below the existing ground in sidewalks and 3 feet below the existing ground within the roadway, the hole backfilled with gravel and compacted, and the existing surfaces restored or replaced in kind. The existing sign panels and supports, under this Item, not needed on the project, shall be discarded at the Contractor's cost, or as approved by the Engineer.

The existing sign posts shall not be removed until the new signs and structures replacing them are ready for traffic unless otherwise directed by the Engineer.

METHOD OF MEASUREMENT

Item 734.52 will be measured for payment per EACH, Sign Post Removed and Stacked.

BASIS OF PAYMENT

Item 734.52 will be paid at the Contract unit price per EACH, which price shall include all labor, materials, equipment, dismantling, removing, and stacking of the sign posts, excavation and disposal of the existing foundation, supplying and placing of gravel backfill and compaction, and the restoration or replacement in kind of disturbed surfaces and incidental costs required to complete the work.

ITEM 740. ENGINEERS FIELD OFFICE AND EQUIPMENT (TYPE A) MONTH

The work under this Item shall conform to the relevant provisions of Subsection 740 of the Standard Specifications and the following:

Two computer systems and printer system meeting minimum requirements set forth below including installation, maintenance, power, paper, disks, and other supplies shall be provided at the Resident Engineer's Office:

All equipment shall be UL approved and Energy Star compliant.

The Computer System shall meet the following minimum criteria or better:

Processor:	Intel, 3.5 GHz
System Memory (RAM):	12 GB
Hard Drive:	500 GB
Optical Drive:	DVD-RW/DVD+RW/CD-RW/CD+RW
Graphics Card:	8 GB
Network Adapter:	10/100 Mbit/s
USB Ports:	6 USB 3.0 ports
Keyboard:	Generic
Mouse:	Optical mouse with scroll, MS-Mouse compliant

Video/Audio the computer system shall be capable of allow video calling and recording:

Video camera shall be High Definition 1080p widescreen capable video calling and recording with built in microphone. The microphone system shall capture natural audio while filtering out background noise.

Audio shall be stereo multimedia speaker system delivering premium sound.

OS: Latest Windows Professional with all security updates

Web Browser: Latest Internet Explorer with all security updates

Applications: Latest MS Office Professional with all security updates

Latest Adobe Acrobat Professional with all security updates

Latest Autodesk AutoCAD LT

Antivirus software with all current security updates maintained through the life of the contract.

Monitors: Two 27" LED with Full HD resolution.

Max. resolution 1920 x 1080

Flash drives: 2 (two) - 128GB USB 3.0

Internet access: High Speed (min. 24 mbps) internet access with wireless router.

ITEM 740. (Continued)

The Multifunction Printer System shall meet the following minimum criteria or better:

Color laser printer, fax, scanner, email and copier all in one with the following minimum capabilities:

- Estimated volume 8,000 pages per month
- LCD touch panel display
- 50 page reversing automatic document feeder
- Reduction/enlargement capability
- Ability to copy and print 11" x 17" paper size
- email and network pc connectivity
- Microsoft and Apple compatibility
- ability to overwrite latent images on hard drive
- 600 x 600 dpi capability
- 30 pages per minute print speed (color),
- 4 Paper Trays Standard (RADF) (not including the bypass tray)
- Automatic duplexing
- Finisher with staple functions
- Standard Ethernet. Print Controller
- Scan documents to PDF, PC and USB
- ability to print with authenticated access protection

The Contractor shall supply a maintenance contract for next day service, and all supplies (toner, staples, paper) necessary to meet estimated monthly usage.

The Engineer's Field Office and the equipment included herein including the computer system, and printer shall remain the property of the Contractor at the completion of the project. Disks, flash drives, and card readers with cards shall become the property of the Department.

Compensation for this work will be made at the contract unit price per month which price includes full compensation for all services and equipment, and incidentals necessary to provide equipment, maintenance, insurance as specified and as directed by the Engineer.

ITEM 751.73**COMPOST BLANKET****CUBIC YARD**

The work under this Item shall conform to the relevant provisions of Subsection 751 and M1.06.0 Organic Soil Additives of the Standard Specifications and the following:

Work shall consist of furnishing and pneumatically applying compost as a thin mulch blanket (2 inch depth) over prepared soil to provide temporary soil stabilization and organic matter for plant growth.

SUBMITTALS AND MATERIALS

No materials shall be delivered until the required submittals have been approved by the Engineer. Delivered materials shall match the approved samples. Approval of test results does not constitute final acceptance.

Contractor shall submit to the Engineer samples and certified test results no sooner than 60 days prior to application of compost. Vendor certification that material delivered meets the test results shall be submitted if requested.

Compost may be a blended product of compost and fine wood chips. No kiln-dried wood, construction debris or ground palette is allowed. Material shall meet the following criteria:

- Organic matter content shall be minimum 30 percent (dry weight basis)
- Moisture content shall be 30-60 percent (wet weight basis)
- Bulk Density <1000 lb/cy
- pH shall be 5.5-7.5
- Conductivity shall be a maximum of 4 mmhos
- Stability test shall produce a maximum of 8mg CO₂-C/gram of organic material per day
- Particle size shall not exceed ¾ inch
- Compost may be a blended product of compost and fine wood chips.

Compost testing shall be by a laboratory approved by the US Compost Council using the Testing Method for the Examination of Compost and Composting (TMECC) protocols.

The Engineer shall approve the Contractor's equipment for application.

CONSTRUCTION METHODS

Application of compost material shall not begin until the Engineer has approved the site and soil conditions. Soil preparation shall be as specified under the applicable item for soil placement or for seeding. The Contractor shall notify the Engineer when areas are ready for inspection and application of compost.

Compost blanket shall be pneumatically applied (blown on) to a minimum depth of one half to one inch. Where shown on the plans or when directed by the Engineer depth may be increased to provide berms for sediment control or to otherwise prevent slope erosion.

ITEM 751.73 (Continued)

When compost topdressing is proposed with seeding, seed shall be broadcast and shall occur in conjunction with compost topdressing, as specified under the relevant item for seeding.

When compost topdressing is proposed for areas with planting, compost (and seed if applicable) shall be applied after planting. If compost and seed occur prior to planting, areas shall be regraded, and compost and seed reapplied to the satisfaction of the Engineer and at the Contractor's expense.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 751.73 will be measured for payment by the CUBIC YARD.

Item 751.73 will be paid at the Contract unit price per CUBIC YARD, which price shall include all labor, materials, equipment, and all incidental costs required to complete the work of pneumatically applying compost.

Surface preparation of substrate receiving compost blanket shall be compensated under the applicable item for placement of loam, sand, ordinary borrow, wetland soil, topsoil rehandled and spread, tilled existing soil, or other specified substrate.

Seeding will be compensated for under the appropriate seeding item.

ITEM 755.35**INLAND WETLAND REPLICATION AREA****LUMP SUM**

The work under this item shall conform to the relevant provisions of Subsections 120, 770, 771 of the Standard Specifications and the following:

Work under this item shall include furnishing material and the construction and maintenance of inland wetland replication areas as shown on the drawings and as required by the Engineer. Inland Wetland Replication Area shall hereafter be referred to as Replication Area. All work shall be in coordination with an approved Wetland Specialist as specified under that item.

Wetland Restoration work shall be as specified and compensated under that item. Construction of tidal wetlands shall be as specified under the appropriate item for tidal wetland mitigation.

The Replication Area shall be constructed prior to wetland impacts unless otherwise approved by the Engineer, specified herein, or specified in permit conditions and approvals. Construction schedule shall be appropriate to planting and seeding season (see below). Changes to this schedule will require written approval from the Engineer.

DESCRIPTION OF WORK

Construction of the Replication Area shall be completed as shown on the drawings at the following location(s):

Area A at Station: 2+35 – 2+55 North

Area = 650 sf.

Replication Area shall be constructed to meet the requirements of all associated permits and certifications, including relevant performance standards of the Massachusetts Wetlands Protection Act (MGL C. 131, s40), Section 401 Water Quality Certification, and Section 404, U.S. Army Corps of Engineers Permit.

The Contractor is responsible for protection and preservation of natural areas adjacent to the Replication Area both within and outside the project limits and for the duration of the Contract; including but not limited to damage to soils or vegetation due to erosion, sedimentation, compaction, trampling, vehicles, storage of materials, or other negligence shall be repaired to the satisfaction of the Engineer and at the Contractor's expense.

The Wetland Specialist overseeing the Wetland Replication construction work shall not be from the same company as that which is performing planting, seeding, or participating in any aspect of the Wetland Replication construction.

SUBMITTALS - DOCUMENTS

Request for Conditional Acceptance: As specified below, a letter requesting Conditional Acceptance of the work and the site conditions shall be submitted to the Engineer.

Request for Final Acceptance: As specified below, a letter requesting Final Acceptance of the work and the site conditions shall be submitted to the Engineer.

ITEM 755.35 (Continued)

Monitoring Reports: Reports shall be submitted to the Engineer as specified below. Reports shall be compensated under Item 755.75 and 755.76.

SUBMITTALS - MATERIAL**Soil and Amendments**

No soil, compost, or other soil amendment imported to the work site shall contain seeds, roots, stems, or other viable parts of invasive plants or other noxious plants.

At least sixty (60) days prior to installation and prior to ordering, the Contractor shall submit for approval sources of soil, compost, and amendments. Submittal shall include the supplier and location of the source. Off-site sources shall be identified and available for inspection by the Wetland Specialist prior to transport of material to the site to verify that they are likely to be free of invasive plant species, including all viable plant parts.

Samples of tested and approved wetland soil and soil amendments for soil texture, organic carbon content or other routine soil analysis parameters (e.g., pH, Cation Exchange Capacity, Percent Base Saturation) and Soil Organic Matter Analysis will be required if requested by the Engineer. The grab samples shall be collected by the Contractor or Wetland Specialist from multiple representative locations in the wetland topsoil mix following the "Umass Soil and Plant Tissue Testing Laboratory Sampling and Collection Protocols" (or equivalent certification paperwork provided by the soil supplier). The lab analysis shall be provided to the Engineer along with written certification from the Contractor or Wetland Specialist that the wetland topsoil was collected per the referenced protocol and meets the desired specification. The analysis and written certification of same shall be provided to the Engineer prior to placing the wetland topsoil in the Replication Area.

Seed Mix

Certificate of Materials from the supplier shall be submitted 30 days prior to seeding and must be approved prior to ordering materials. Seed species listed on the certificate shall include ecotype region (i.e., *Asclepias incarnata*, PA Ecotype).

Seed tag from the bag of seed used shall be submitted to the Engineer at the time of seeding. Seed tag shall include ecotype region and species, guaranteed percentages of purity, weed content and germination of the seed, and the net weight. Seed tag shall match the Certificate of Materials, include the name of the supplier, and date material was sent.

Bill of lading or notarized Certificate of Compliance from the Supplier serving as proof of purchase shall be submitted if requested by the Engineer. Document shall include date of sale, quantity, lot number, and address of Supplier. This shall match the seed tag. Notary shall not work for either the contractor or seed supplier.

ITEM 755.35 (Continued)**Plant Certification**

Plant Certification shall be per the applicable requirements of Subsection 771, PLANTING TREES, SHRUBS AND GROUNDCOVER, of the Standard Specifications. The nursery source shall certify the provenance or origin of all plants.

Other Material: Submittals shall be per the respective item.

MATERIALS**Sediment Control Barrier and Erosion Prevention Measures**

Coir logs shall be used in lieu of sediment control barrier if there is saturated soil or the potential for standing water in the proposed location.

Erosion prevention measures for disturbed areas adjacent to the Replication Area shall include but not necessarily be limited to compost blankets, jute mesh, seeding, and/or combinations thereof as approved by the Engineer.

Sediment controls and erosion prevention devices and measures shall be compensated under the respective items.

Wetland Soil

Soil appropriate for the Replication Area may be either hydric soil excavated from the impacted wetland, a manufactured mix of compost and on-site borrow, or a combination thereof, as approved by the Engineer.

Hydric soil from the impacted wetland area may be spread on the surface of the constructed Replication Area as an inoculant or can be placed in a bulk fashion in a roughly 1:1 ratio of area and depth. Soil shall be handled such that the original soil structure is preserved and shall not be compacted, screened, or otherwise processed.

Hydric soil from the impacted wetland that is infested with invasive plant species identified on the Massachusetts Invasive Plant Advisory Group (MIPAG) shall not be used in the Replication Area unless approved by the Wetland Specialist and Engineer. To the extent possible, infested soil shall be disposed of within the project limits in an upland area outside of regulated areas and as approved by the Invasive Plant Management Strategy item (if in the contract) or by the Engineer.

A manufactured mix suitable for wetlands shall consist of on-site borrow from the proposed Replication Area (if approved by the Wetland Specialist and Engineer) thoroughly mixed with compost to achieve a target organic carbon content of 10-12% (up to 21% percent organic matter) by dry weight. The organic material used for mixing shall be well or partially decomposed.

ITEM 755.35 (Continued)

Clean leaf compost is the preferred soil amendment to achieve these standards though other materials may be used if approved by the Wetland Specialist and Engineer. Note that “clean” refers both to a negligible amount (<1%) of physical contaminants such as plastic and to the lack of chemical contaminants that might pose a hazard to plants or animals. Off-site borrow may be used for mixing if approved in advance by the Engineer.

No soil or soil amendment shall be brought on site without approval of the material source by the Wetland Specialist and the Engineer. Soils used in the replacement area shall be free of rocks greater than 4 inches in diameter.

Seed Mix

Seeding shall conform to 765.635 NATIVE SEEDING AND ESTABLISHMENT.
Fertilizers shall not be used.

Wetland Mix**765.551– FACW Meadow Mix**

Botanical Name	Common Name	% PLS by Weight
Grass		
Carex vulpinoidea	Fox Sedge	26.00%
Elymus riparius	Riverbank Wild Rye	23.00%
Carex lurida	Shallow Sedge	17.00%
Carex lupulina	Hop Sedge	8.00%
Scirpus atrovirens	Green Bulrush	3.00%
Juncus effusus	Soft Rush	2.50%
Cinna arundinacea	Sweet Woodreed	2.00%
Carex comosa	Bearded Sedge	2.00%
Glyceria canadensis	Manna Grass	1.00%
Scirpus cyperinus	Woolgrass	1.00%
Juncus tenuis	Path Rush	0.50%
		86.00%
Herb/Forb		
Verbena hastata	Blue Vervain	4.00%
Asclepias incarnata	Swamp Milkweed	2.00%
Aster prenanthoides	Zig Zag Aster	1.00%
Sisyrinchium angustifolium	Narrowleaf blue-eyed grass	1.00%
Eupatorium maculatum	Joe-pye Weed	1.00%
Aster puniceus	Aster -Swamp	1.00%
Aster novae-angliae	New England Aster	1.00%
Vernonia noveboracensis	New York Ironweed	1.00%
Eupatorium perfoliatum	Boneset	1.00%
Aster umbellatus	Flat Topped White Aster	0.50%
Mimulus ringens	Monkey Flower	0.50%
		14.00%
		100.00%

ITEM 755.35 (Continued)

Seeding Rate: Species ecotype shall be as native to New England region as possible. Apply this mix at 20 lbs PLS/acre.

Upland Mix**Water**

The Contractor shall provide water and all equipment required at no extra cost. Water shall be suitable for irrigation and free from ingredients harmful to plants and wildlife. Water from the adjacent water bodies or waterways shall not be utilized. It is the Contractor's responsibility to correct injury or damage due to the lack of water, too much water, or use of contaminated water.

Mulch/Compost Blanket for Seeding

Hydromulch shall be per the manufacturer's recommendations and shall be wood fiber or straw mulch only. Mulch shall be incidental to seeding.

Compost Blanket may be used in lieu of mulch for seeding. Compost Blanket shall meet the material and submittal requirements of that Item 751.73 and shall be applied as specified below. Compost Blanket shall be compensated under that item.

CONSTRUCTION METHODS & SEQUENCE**SITE PROTECTION MEASURES****Minimizing Damage**

The Contractor shall plan and execute operations in a manner minimizing the amount of excavated and exposed fill or other foreign materials that could be washed or otherwise carried into Replication Area and nearby resource areas.

Construction of and access to the Replication Area shall minimize damage to existing vegetation and soils as specified herein. Damage to soils or vegetation shall be repaired to the satisfaction of the Engineer and at the Contractor's expense. If required for soil remediation, tilling and the addition of compost shall be at the Contractor's expense.

Wetland topsoil shall be deposited and graded in the Replication Area in a manner that minimizes travel and subsequent compaction of the subgrade (including any specified pit and mound topography) to the extent practicable, including use of track mounted excavators as appropriate. Should soils be compacted, they shall be loosened by a method such as disking, spring-tooth harrowing and/or rototilling. The Contractor shall use boards, timber or composite mats, or other approved materials as necessary, to protect existing and/or new wetlands from compaction due to heavy foot traffic or if equipment is required to travel over wetland soil. All labor and materials required for protection and preservation of site shall be incidental to this item.

ITEM 755.35 (Continued)**Stockpiling of Soil**

Stockpiling of soil, including hydric soil for replication, shall be at least 100 feet from the edge of the bordering and isolated vegetated wetlands and inland banks, unless approved otherwise by the Engineer. Stockpiled soils shall be securely stabilized and contained. Any areas of exposed soil or stockpiles within and adjacent to the Replication Area that will remain inactive for more than 7 calendar days shall be sown with a mix of rapid germinating annual grasses (e.g., annual rye) covered with a layer of straw mulch applied at a rate of 90 pounds per 1,000 square feet. As necessary, the mulch shall be anchored with a tacking coat (non-tar) applied by a hydro seeder or other method recommended by the Wetland Specialist in consultation with the Engineer. In the event that there is excess borrow, it shall be disposed of under Excavation, Item 120.1.

Sediment Barriers

Placement: Sediment barriers shall be installed along the downslope perimeter of the Replication Area beginning and ending in the surrounding upland so that no excavated material or disturbed soil can enter adjacent wetlands or waters. Where construction work is immediately upgradient of the wetland, barriers shall be located so as to protect the Replication Area until slopes are stabilized. Sediment barriers shall be in place and approved by the Engineer prior to excavation work. No work shall take place outside the barriers.

Maintenance: The Contractor shall ensure that all sediment barriers function as intended and at all times per the specifications of those respective items.

Existing Trees to Remain

Tree protection shall be per the relevant specifications and as shown on the plans or as required by the Engineer. To protect root systems of existing trees to remain, the limits of the Replication Area may be adjusted, but, the total area of replication required by the permits shall not be reduced. Access route may be adjusted as required.

Trees to be retained as snags (upright dead or dying trees left for wildlife habitat) within or adjacent to the Replication Area shall be as shown on the plans or as directed by the Wetland Specialist or Landscape Architect during the initial site walk. Trees to remain as snags shall be clearly marked prior to clearing. Trees that pose a potential fall hazard (i.e., are near a roadway) should have limbs and trunk cut such that the tree does not pose a fall hazard.

Coarse woody debris in the form of cut trees, stumps, logs, and brush shall be incorporated as shown on the plans or as directed by the Wetland Specialist or Landscape Architect. On site material shall be selected and marked by the Wetland Specialist, retained on the project site, and placed as specified below under Incorporation of Coarse Woody Debris.

All trees, stumps, or brush not specified to remain shall be removed and shall not be stockpiled in the wetland resource areas while awaiting disposal.

ITEM 755.35 (Continued)

Work shall be coordinated with Clearing or Tree Removal Item and compensated under that Item.

PRE-WETLAND CONSTRUCTION SITE WALK

Delineating the Replication Area and Access Route. The Contractor shall stake out the Replication Area boundaries and the intended access route and set grade stakes for approval by the Wetland Specialist and Engineer. Following staking and demarcation of areas, the Engineer and Wetland Specialist shall approve or modify as necessary the limits of work, the access route, final location and configuration of replication, grade stake elevations, proposed location of sediment barriers, and review proposed construction methods.

As part of the delineation and approval process, the Wetland Specialist shall mark trees to be converted to snags, select course woody debris to be retained for re-use, and select rocks or other elements to be used for habitat features.

Invasive Plants: As part of the initial site walk, the wetland to be impacted and the proposed replication site shall be inspected for the presence of invasive plants. If invasive plants are found they shall be addressed as described herein under Invasive Plants.

SOIL WORK

Final grades in the Replication Area shall meet the target elevations as shown on the Plans or as adjusted by the Wetland Specialist to achieve the desired hydrology and micro-habitat. If adjustments are required, a Request for Information (RFI) shall be submitted to the Engineer for approval. Adjustments shall be documented and included in the As-Built plans (if required) and/or other applicable required documents.

Excavation & Grading

When required by permits, the Wetland Specialist shall notify MADEP and the ACOE (as applicable) at least 72 hours prior to excavation.

Soil in the proposed wetland areas that must be removed for grades to conform to the proposed elevations shall be stripped and disposed of, or, if suitable for reuse, be stockpiled in an approved location. Stockpiled soils shall be kept wet and not allowed to dry out. Procedures for maintaining appropriate moisture levels shall be documented by the Wetland Specialist and provided to the Engineer and the Contractor.

Replication area shall be excavated as shown on the drawings. Where replication area is adjacent to existing reference wetland, finish grade of replication shall generally match existing grades and micro-topography, notwithstanding any deviations that are necessary to achieve the desired hydrology and habitat in the Replication Area.

Prior to placement of backfill, scarify subgrade to a depth of 4 to 6 inches.

ITEM 755.35 (Continued)**Placement of Wetland Soil**

Following excavation, scarification, and grading of sub-grade, and after the sub-grade elevations are approved by the Wetland Specialist, suitable soil previously removed or an evenly mixed organic/mineral soil created on-site shall be spread to the design depth and thickness over the proposed wetland areas as shown on the plans and as directed by the Wetland Specialist.

Vehicles used to transport soil from offsite shall be washed or cleaned with air pressure to prevent exotic or invasive seeds or root fragments from contaminating the Replication Area.

Final Grading

The finished grade of the Replication Area shall be at an elevation that will provide an unrestricted hydrologic connection between the Replication Area and adjacent resource areas. The hydrologic connection should be in keeping with restoring the intended function of the replacement wetland relative to the impacted reference wetland. The Contractor shall verify that this elevation is not at a level that could negatively alter the hydrology of an adjacent wetland. Microtopography in the form of hummocks, pits and mounds shall be as shown on the plans or as adjusted by the Wetland Specialist. Final elevations and grading of wetland soil shall be approved by the Wetland Specialist and the Engineer.

To avoid compaction once soil has been placed, no heavy equipment shall travel across placed soil and no work shall occur in wet or moist soil. Soil that is compacted due to construction activities shall be replaced with soil as specified herein and at the Contractor's expense.

RESTORING VEGETATION**Incorporation of Coarse Woody Material**

If specified within this Contract or if directed by the Wetland Specialist or Landscape Architect during the initial site walk, woody debris shall be incorporated into the Replication Area and/or adjacent upland buffer. Material shall be placed as shown on the plans or as directed following placement of wetland soil and prior to application of compost and/or seed. Woody material shall cover a minimum of 5-20 percent of the Replication Area, depending on whether it is a meadow or woodland wetland and how much wood is available from construction clearing. Where trees are cut for construction purposes, logs of a minimum length of 8 feet must comprise a minimum of 50% of the woody material left on site. Brush shall be included along with logs and stumps as directed. Woody material shall be placed in a deliberate and naturalistic manner.

ITEM 755.35 (Continued)Seeding

Following placement of wetland soil and planting (if included), the Replication Area shall be seeded using one of the following methods:

- Broadcast by hand or with a hand-held spreader followed by application of straw mulch. If necessary, seed shall be lightly raked to insure good seed-to-soil contact.
- Hand broadcast seed with Compost Blanket pneumatically applied at the same time to ensure light cover of soil topdressing over seed.

If spring conditions are drier than usual, supplemental watering may be required. If sowing during the summer months, supplemental watering will likely be required until germination.

If required, seeding limits for different seed mixes shall be determined by the Wetland Specialist.

SEED ESTABLISHMENT AND INVASIVE MANAGEMENT

Seed establishment shall conform to 765.635 NATIVE SEEDING AND ESTABLISHMENT

Seeding that fails to established according to the conditions of acceptance below shall be over-seeded as required by the Engineer. Washouts and channels shall be repaired and stabilized prior to overseeding. Excessive weed growth shall be pulled out by the roots or, with approval from the Engineer, cut prior to over-seeding. Soil repair and weed control are incidental to this item.

Invasive Plants: Corrective measures shall be taken to remove or treat invasive plant species in the Replication Areas. Invasive plants shall include those listed as invasive by Massachusetts Invasive Plant Advisory Group (MIPAG) and the US Army Corp of Engineer's New England District's Compensatory Mitigation Guidance

The strategy for chemical and/or manual removal shall be as directed by the Wetland Specialist, shall continue for the duration of the monitoring period, and shall be incidental to this item.

CONDITIONAL ACCEPTANCE OF WORK

Conditional Acceptance shall indicate approval of the wetland construction work and agreement that work has been done according to plan or modified as approved.

Upon completion of construction, the Contractor shall submit a Request for Conditional Acceptance that includes a brief narrative from the Wetland Specialist demonstrating that the wetland replication construction work was done according to plans (or how modified) and meets required permit conditions. The narrative shall include, photo-documentation of pre-construction conditions as well as soil work, planting, and seeding. Seed tags shall be submitted as part of the Request for Conditional Acceptance.

ITEM 755.35 (Continued)

Upon receipt of a Request for Conditional Acceptance, the Engineer, the Wetland Specialist, and regulatory representative (if required) shall assess the Replication Area and surrounding areas. At a minimum, the following conditions shall be included in the narrative and reviewed as part of the on-site assessment of whether:

- The final finished target elevations have been met and maintained relative to the approved plans and reference wetland. Areas that are too high or too low should be identified along with suggested corrective measures.
- Hydrology meets performance standards.
- Specified seed mix has been seeded. If inspected 30 or more days after seeding, seeded species in the wetland and adjacent upland shall show signs of good germination and healthy growth.
- Planted woody and herbaceous species meet specifications and are establishing well.
- Soils are stabilized and there is no sediment in the wetland and no channeling of slopes.
- There are no invasive plants visible in the replication area.

Upon approval that the work meets the above conditions, MassDOT will issue a letter of Conditional Acceptance. If the Wetland Replication work is not approved, MassDOT will issue a rejection letter requiring corrective actions. The Wetland Specialist shall recommend corrective actions. Work not approved shall be addressed by the Contractor at no extra cost.

Wetland Specialist shall be compensated under Item 755.75.

Erosion of adjacent slopes or the flow of sediments into the wetland between Conditional and Final Acceptance shall be immediately addressed by the Contractor.

FINAL ACCEPTANCE OF WORK

Following one full growing season, the Contractor shall submit a Request for Final Acceptance. Submittal shall include a brief narrative of conditions. Upon receiving the Request, the Engineer, Contractor, Wetland Specialist and regulatory representative (if required) shall assess the Replication Area. Final Acceptance will initiate the start of the Wetland Monitoring Period.

The following conditions shall be inspected and approved for acceptance and payment.

- Hydrology is functioning as intended.
- The desired seeded species are establishing well and cover at least 95 percent of the Replication Area, excluding areas of open water areas or planned bare soil.
- No sediments have entered the wetland.
- Adjacent slopes are stabilized with desirable vegetation.
- There are no visible invasive plants.
- Silt fence and non-biodegradable sediment barrier materials have been removed.

ITEM 755.35 (Continued)

If the mitigation work does not meet the above condition and is not approved, MassDOT will issue a rejection letter requiring corrective action. The Wetland Specialist shall recommend corrective actions. Work not approved will be addressed by the Contractor at no extra cost.

Wetland Specialist shall be compensated under Item 755.75.

MONITORING REPORTS FOR REGULATORY COMPLIANCE

Post wetland construction Monitoring Reports shall be completed and submitted by the Wetland Specialist as specified and compensated under Item 755.76 Wetland Monitoring Reports.

Generally, the following conditions shall be met upon each inspection:

- Hydrology is functioning as intended.
- The desired seeded species are establishing well and cover 95 percent of the area, excluding areas of open water areas or planned bare soil.
- No sediments have entered into wetland.
- Adjacent slopes are stabilized with desirable vegetation.
- There are no visible invasive plants.

If, at the end of the required monitoring period, the requirements have not been met and success of the wetland replication area has not been achieved as determined by the Monitoring Reports, the Contractor shall provide corrective measures. All costs associated with corrective measures and plant replacement shall be incidental to this item with no additional compensation.

BASIS OF PAYMENT

Item 755.35 will be paid at the Contract unit price per LUMP SUM, which price shall include all labor, materials, equipment, submittals, maintenance, all required soil, site preparation, grading, wetland seeding, planting, mulching, watering, monitoring wells, registered surveyor, as-built plans, and all incidental costs necessary to complete the work as required.

Payment shall be as follows:

- 60% upon Conditional Acceptance.
- 20% once all permit construction requirements have been met and approved.
- 20% upon Final Acceptance.

ITEM 755.35 (Continued)

Wetland seeding and establishment shall be incidental to Item 755.35

Wetland Restoration will be paid under 755.45

Excavation will be paid under Item 120.

Compost Blanket will be paid under Item 751.73

Sediment Barrier - Coir Fiber Roll will be paid under Item 767.12

Sediment Control Barrier will be paid under Item 767.121

Wetland Specialist will be paid under Item 755.75

Wetland Monitoring Reports for follow-up monitoring will be paid under Item 755.76

ITEM 755.45**WETLAND RESTORATION****SQUARE YARD****DESCRIPTION**

The work under this item shall conform to the relevant provisions of Subsections 120, 751, 765, 767, and 771 of the Standard Specifications and the following:

The work under this item shall include all labor and furnishing of materials to complete the work specified herein to protect and restore existing inland wetland areas that will be temporarily impacted as shown on the drawings and as required by the Engineer.

Inland Wetland Replication work shall be as specified and compensated under that item. Tidal wetland mitigation shall be as specified under the appropriate item for tidal wetlands.

Restoration Area shall be constructed to meet the requirements of all associated permits and certifications, including relevant performance standards of the Massachusetts Wetlands Protection Act (MGL C. 131, s40), Section 401 Water Quality Certification, and Section 404, U.S. Army Corps of Engineers General Permit.

All work shall be in coordination with an approved Wetland Specialist. Wetland Specialist qualifications and requirements shall be per Item 755.75, Wetland Specialist.

SUBMITTALS – DOCUMENTS

Request for Conditional Acceptance: As specified below, a letter requesting Conditional Acceptance of the work and the site conditions shall be submitted to the Engineer.

Request for Final Acceptance: As specified below, a letter requesting Final Acceptance of the work and the site conditions shall be submitted to the Engineer.

Monitoring Reports: Reports shall be submitted to the Engineer as specified below. Reports shall be compensated under Item 755.76 Wetland Monitoring Reports.

ASSOCIATED ITEMS AND MATERIALS

Geotextile Fabric for Temporary Soil Protection shall be as specified under that item.

Timber Mat shall be as specified under that item.

Compost shall be in accordance with Subsection 751 and M1.06.0 Compost of the Standard Specifications. Compost shall not contain seeds, roots, stems, or other viable parts of invasive plants or other noxious plants. Off-site sources shall be identified and available for inspection prior to transport of material to the site to verify that they are likely to be free of invasive plant species, including all viable plant parts.

ITEM 755.45 (Continued)

Compost Blanket shall be as specified under that item.

Seed Mix

Seeding shall conform to 765.635 NATIVE SEEDING AND ESTABLISHMENT.

Required submittals include:

- Certificate of Materials from the supplier shall be submitted and approved 30 days prior to ordering seed. Seed species listed on the certificate shall include ecotype region (i.e., *Asclepias incarnata*, PA Ecotype).
- Seed tag from the bag of seed used shall be submitted to the Engineer at the time of seeding. Seed tag shall include ecotype region and species, guaranteed percentages of purity, weed content and germination of the seed, and the net weight. Seed tag shall match the Certificate of Materials, include the name of the supplier, and date material was sent.
- Bill of lading or a notarized Certificate of Compliance from the Supplier serving as proof of purchase shall be submitted if requested by the Engineer. Document shall include date of sale, quantity, lot number, and address of Supplier. This shall match the seed tag. Notary shall not work for either the contractor or seed supplier.

Seed mix shall be:

Mix 765.551 Wetland Mix – FACW Meadow Mix

Botanical Name	Common Name	% PLS by Weight
Grass		
Carex vulpinoidea	Fox Sedge	26.00%
Elymus riparius	Riverbank Wild Rye	23.00%
Carex lurida	Shallow Sedge	17.00%
Carex lupulina	Hop Sedge	8.00%
Scirpus atrovirens	Green Bulrush	3.00%
Juncus effusus	Soft Rush	2.50%
Cinna arundinacea	Sweet Woodreed	2.00%
Carex comosa	Bearded Sedge	2.00%
Glyceria canadensis	Manna Grass	1.00%
Scirpus cyperinus	Woolgrass	1.00%
Juncus tenuis	Path Rush	0.50%
		86.00%

ITEM 755.45 (Continued)

Herb/Forb		
Verbena hastata	Blue Vervain	4.00%
Asclepias incarnata	Swamp Milkweed	2.00%
Aster prenanthoides	Zig Zag Aster	1.00%
Sisyrinchium angustifolium	Narrowleaf blue-eyed grass	1.00%
Eupatorium maculatum	Joe-pye Weed	1.00%
Aster puniceus	Aster -Swamp	1.00%
Aster novae-angliae	New England Aster	1.00%
Vernonia noveboracensis	New York Ironweed	1.00%
Eupatorium perfoliatum	Boneset	1.00%
Aster umbellatus	Flat Topped White Aster	0.50%
Mimulus ringens	Monkey Flower	0.50%
		14.00%
		100.00%

Seeding Rate: Species ecotype shall be as native to New England region as possible. Apply this mix at 20 lbs PLS/acre.

Fertilizers shall not be used.

Straw mulch or hydromulch shall be per Section M6 of the Standard Specifications.

Water

The Contractor shall provide water and all equipment required at no extra cost. Water shall be suitable for irrigation and free from ingredients harmful to plants and wildlife. Water from the adjacent water bodies or waterways shall not be utilized. It is the Contractor's responsibility to correct injury or damage due to the lack of water, too much water, or use of contaminated water.

CONSTRUCTION METHODS & SEQUENCE**Site Protection Prior to Impacts**

Prior to any land work, as part of the initial site-walk, the Wetland Specialist shall photo-document the site and provide a summary report of existing conditions as outlined under Item 755.75 Wetland Specialist.

Where and as required vegetation shall be cut flush and area surveyed to establish pre-construction elevations.

Following the cutting and surveying, temporary separation fabric or timber matting shall be placed as required to protect soil and vegetation from compaction, contamination, and/or other damages. Fabric and timber mats shall be placed as specified under the respective items and the Engineer shall approval placement.

ITEM 755.45 (Continued)**Restoration Upon Completion of Roadway Construction Work**Sediment Barriers

If required for sediment control during Restoration work (i.e, tilling is required to restore soil), sediment barriers shall be installed along the downslope perimeter of the Restoration Area beginning and ending in the surrounding upland so that no disturbed soil can enter adjacent wetlands or waters. Sediment barriers shall be in place and approved by the Engineer prior to any soil disturbance. No work shall take place outside the barriers.

Removal of Fill and Grading

Fill and temporary separation fabric or mats shall be removed and disposed of as specified under the respective items.

If required, grades shall be restored to pre-construction elevations as shown in the baseline survey or as required by the Engineer and Wetland Specialist to restore hydrologic functions. Final elevations shall be approved by the Engineer prior to soil preparation and seeding. Grading shall be incidental to this item.

Following approval of grading to elevations required, soil shall be prepared and seeded as follows.

Soil Tilling with Compost

Two inches of compost shall be applied over the impacted area and soil shall be tilled to a depth of 4 inches below the existing grade. Following tilling, soil shall be raked relatively smooth, or as directed. Upon approval of prepared soil, area shall be seeded and hydromulched.

Seeding with Mulch

Upon approval of prepared soil, area shall be seeded. Seeding may be hand broadcast with straw mulch applied or hydroseeded per the Standard Specifications and per the manufacturer's directions. Hydromulch shall be straw or wood fiber only and shall be per the manufacturer's recommendations.

Seed tags shall be submitted at time of seeding.

SEED ESTABLISHMENT

Seeding shall conform to 765.635 NATIVE SEEDING AND ESTABLISHMENT.

Seeding that fails to establish according to the conditions of acceptance below shall be over-seeded as required by the Engineer. Washouts and channels shall be repaired and stabilized prior to overseeding. Excessive weed growth shall be pulled out by the roots or, with approval from the Engineer, cut prior to over-seeding. Soil repair and weed control are incidental to this item.

ITEM 755.45 (Continued)**CONDITIONAL ACCEPTANCE OF WORK**

Conditional Acceptance shall indicate approval of the wetland restoration work and agreement that work has been done according to plan or modified as approved.

Upon completion of construction, the Contractor shall submit a Request for Conditional Acceptance that includes a brief narrative from the Wetland Specialist (if applicable to project) demonstrating that the wetland restoration work was done according to plans (or how modified) and meets required permit conditions (if applicable). The narrative shall include, photo-documentation of pre-construction conditions as well as soil work, planting, and seeding. Seed tags shall be submitted as part of the Request for Conditional Acceptance.

Upon receipt of a Request for Conditional Acceptance, the Engineer, the Wetland Specialist, and regulatory representative (if required) shall assess the Restoration Area and the surrounding areas. At a minimum, the following conditions shall be included in the narrative and reviewed as part of the on-site assessment of whether:

- The target elevations have been restored per the survey or adjusted per the Engineer. Areas that are too high or too low should be identified along with suggested corrective measures.
- Soil compaction has been mitigated.
- Soils are stabilized and there is no sediment in the wetland and no channeling of slopes.
- Hydrology meets performance standards and has been adequately restored.
- Specified seed mix has been seeded and seeded species in the wetland and adjacent upland show signs of good germination and healthy growth.
- There are no invasive plants visible in the restored wetland area.
- Silt fence and non-biodegradable sediment barrier materials have been removed.

Upon approval that the work meets the above conditions, MassDOT will issue a letter of Conditional Acceptance. If the Wetland Restoration work is not approved, MassDOT will issue a rejection letter requiring corrective actions. Work not approved shall be addressed by the Contractor at no extra cost.

Erosion of adjacent slopes or the flow of sediments into the wetland between Conditional and Final Acceptance shall be immediately addressed by the Contractor.

FINAL ACCEPTANCE OF WORK

Following one full growing season, the Contractor shall submit a Request for Final Acceptance. Submittal shall include a brief narrative of conditions. Upon receiving the Request, the Engineer, Wetland Specialist and regulatory representative (if required) shall assess the Restoration Area. Final Acceptance will initiate the start of the Monitoring Period (if required).

ITEM 755.45 (Continued)

The following conditions shall be inspected and approved for acceptance and payment:

- Hydrology is functioning as intended.
- The desired seeded species are establishing well and cover 100 percent of the restoration area, excluding areas of open water, large boulders or planned bare soil.
- No sediments have entered the wetland.
- Adjacent slopes are stabilized with desirable vegetation.
- There are no visible invasive plants.

If the restoration work is not approved, MassDOT will issue a rejection letter requiring corrective action. All costs associated with corrective measures and plant replacement shall be incidental to this item with no additional compensation. Work not approved shall be addressed by the Contractor at no extra cost.

MONITORING REPORTS FOR REGULATORY COMPLIANCE

Post wetland construction Monitoring Reports shall be completed and submitted by the Wetland Specialist as specified and compensated under Item 755.76 Wetland Monitoring Reports.

Generally, the following conditions shall be met upon each inspection:

- Hydrology is functioning as intended, relative to the preexisting condition of the restored wetland.
- Seeded species are establishing well and cover 100 percent of the area, excluding areas of open water areas or planned bare soil.
- No sediments have entered into wetland.
- Adjacent slopes are stabilized with desirable vegetation.
- There are no visible invasive plants.

If, at the end of the required monitoring period, the requirements have not been met and success of the wetland replication area has not been achieved as determined by the Monitoring Reports, the Contractor shall provide corrective measures. All costs associated with corrective measures and plant replacement shall be incidental to this item with no additional compensation.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 755.45 will be measured for payment per SQUARE YARD.

Item 755.45 will be paid at the Contract unit price per SQUARE YARD, which price shall include all labor, materials, compost and amendments, seed, mulch, equipment, submittals, maintenance, grading, and incidental costs necessary to complete the work as required.

ITEM 755.45 (Continued)

Payment shall be as follows:

- 50% upon completion of soil preparation and seeding
- 25% upon Conditional Acceptance
- 25% upon Final Acceptance or approval of the Engineer

Excavation of temporary fill will be paid under Item 120.1

Geotextile Fabric for Temporary Soil Protection will be paid under Item 698.31

Sediment Control Barrier will be paid under Item 767.121

Compost Blanket will be paid under Item 751.73

Timber Mat will be paid under Item 767.91

Wetland Specialist will be paid under Item 755.75

Wetland Monitoring Reports for follow-up monitoring will be paid under Item 755.76

ITEM 755.75**WETLAND SPECIALIST****HOURL**

Work under this Item shall be for services of a Wetland Scientist, Wetland Ecologist, Restoration Ecologist, or other professional with similar qualifications hereafter referred to as the “Wetland Specialist.”

“Wetland Mitigation” shall be used herein for applicable wetland work. For this project, applicable wetland work is for: Item 755.35 Inland Wetland Replication Area (creation of a new wetland) and/or Item 755.45 Wetland Restoration (restoration after temporary impacts).

The Wetland Specialist shall demonstrate knowledge and expertise to coordinate and oversee all work associated with the Wetland Mitigation as defined herein, as shown on the Plans, as required by permits, and as specified under the relevant Wetland Mitigation items.

Regulatory monitoring reports following Final Acceptance of the Wetland Mitigation shall be per Item 755.76, Wetland Monitoring Reports.

For all onsite work, the Wetland Specialist shall sign in and sign out with the Engineer.

The Wetland Specialist shall not be from the same company as the company responsible for planting, seeding, and/or maintaining the wetland.

QUALIFICATIONS

The Wetland Specialist shall have a minimum of five (5) years of experience with construction and monitoring of wetland mitigation areas similar in size, type, and complexity to the Contract mitigation. When required by permits, at least ten (10) years of experience may be required. The Wetland Specialist shall be thoroughly versed in the Commonwealth of Massachusetts Wetlands Protection Act (MGL C.131, s.40), U.S. Army Corps of Engineers New England District Compensatory Mitigation Guidance, and all other relevant regulations of the Massachusetts Department of Environmental Protection and the U.S. Army Corps of Engineers New England District.

QUALIFICATIONS

Within sixty (60) days following the Notice to Proceed, the Contractor shall provide proof of qualifications for the Wetland Specialist to the Engineer for approval. Submittals shall include, but not be limited to, the following:

- Resume of the individual on-site implementing the Wetland Specialist work. If the Wetland Specialist changes over the course of the project, the new individual shall submit resume and qualifications for approval 30 days prior to doing any work on-site.
- Resume of any personnel working on-site in place of the Wetland Specialist. Individual shall be approved prior to work on-site.
- Narrative describing the company, its expertise, technical qualifications and experience with wetland construction.

ITEM 755.75 (Continued)

- At least three (3) references from prior work of a similar nature completed in the last five (5) years and by the individuals who will perform the work. Provide contact information for each reference including address, phone number and email.
- A summary of each reference project including nature of the work, project size, dates, and period of construction and monitoring, methodologies used, and summary of success (or not) in terms of meeting performance objectives. Summary shall include a minimum of one before and one after photo for each project.

SUBMITTALS – DOCUMENTATION AND REPORTS**Wetland Construction Oversight**

Wetland Specialist shall provide documentation of pre-existing conditions and wetland construction as specified below and as part of fulfilling the Scope of Work described below. Documentation shall include photos that are clear and legible. Photos are incidental to this item.

- ***Site Walk Prior to Disturbance and Construction of Wetlands:*** Provide brief assessment with photos, including documentation of the existing wetlands to be impacted (both permanent and temporary), proposed wetland replication area, and reference/model wetland areas (typically an adjacent undisturbed wetland or the existing wetland to be impacted). Photos of existing wetlands that will be temporarily impacted shall include a view from at least 3 angles.
- ***Excavation and Grading:*** Documentation shall include minimum of two photos of the excavated wetland and two photos after final grading prior to planting and seeding. For restoration areas, photos shall show soil preparation (i.e, tilling and grading), if applicable.
- ***Approval of Subgrades:*** The Wetland Specialist shall inspect the sub-grade of the Replication Area to ensure that proper hydrology is likely to be established and shall provide the Engineer with written confirmation and photographs upon completion of subgrade excavation work. Written confirmation shall include recommended field adjustments, based on field observations, to achieve the desired hydrology and designed wetland system.
- ***Planting and Seeding:*** Provide assessment and photos of vegetation upon completion of planting and seeding work.

Wetland construction documentation and reports shall be submitted with Request for Conditional Acceptance and for Water Quality Certifications, and other regulatory permits as required.

Requests for Acceptance of Work & Regulatory Compliance

The Wetland Specialist shall submit the following documents if and as specified herein and under Item the relevant Wetland Mitigation items:

- Request for Conditional Acceptance.
- Request for Final Acceptance.

ITEM 755.75 (Continued)**SCOPE OF WORK**

In the event of discrepancies with the applicable permits, the Wetland Specialist shall submit a Request for Information (RFI) to the Engineer.

General

The Wetland Specialist shall be responsible for the following:

- Review and have a comprehensive knowledge of the environmental permits relevant to the specific mitigation work being done so as to ensure compliance throughout the duration of the contract.
- Identify and inform the Contractor and Engineer of unique site conditions which may require adjustments to the schedule, design, or construction methods. For example, wildlife nesting, illegal dumping, or rare species.
- Identify and inform the Contractor and Engineer of any sediment or erosion control problems observed within mitigation areas.
- Advise so as to avoid impacts to adjacent areas and regulated wetland resources.
- Participate in necessary meetings as required by permits and when requested by the Engineer.

Inspections & Construction Oversight

The Wetland Specialist shall be responsible for, but not limited to, the following:

- Pre-Construction Site Walk
 - Following surveying, flagging, and staking of all relevant boundaries and elevations by the Contractor, the Wetland Specialist shall walk the site with the Engineer and the Contractor to review existing and proposed conditions, recommend changes if necessary, and approve the following: location and boundaries of the Mitigation Area, target elevations and grades, location of tree protection associated with the Mitigation Area, and final layout and limits of clearing for access route.
 - Select and mark snags, logs, and woody material to be retained for incorporation into the Wetland Mitigation, as appropriate.
 - Note invasive plants in and adjacent to Wetland Mitigation.
 - Provide summary report if and as specified under Wetland Mitigation items.
- Excavation, Soil Placement, Grading for Replication Areas
 - Approve excavated depth and grading for appropriate wetland hydrology, subsoil preparation, and finished grade of placed wetland soil.
 - Adjust grades as required and approve microtopography. If grades need to be adjusted, submit an RFI to the Engineer.
 - If requested by the Engineer, the Wetland Specialist shall inspect stockpiled wetland soil for moisture content and signs of undesirable weeds.

ITEM 755.75 (Continued)

- Soil Protection and Restoration Measures for Restoration Areas
 - Review and approve methods of soil protection and restoration if required.
 - Confirm decompaction will adequately restore appropriate wetland hydrology. If decompaction measures need to be adjusted, submit an RFI to the Engineer.
- Re-vegetation of Mitigation Area
 - Locate woody material to be re-used.
 - Verify seed used complies with specifications and site conditions, determine limits for wetland seeding based on elevations, approve seeding and mulching methods, and collect seed tags to submit with Request for Conditional Acceptance.
 - Review planting methods (if applicable) prior to installation and oversee layout of wetland plants.

Conditional Acceptance

Upon completion of construction of the wetland, as part of the Request for Conditional Acceptance, the Wetland Specialist shall provide a brief narrative demonstrating that the wetland construction work was done according to plans (or how modified) and meets the conditions required for acceptance as specified under the Wetland Mitigation items. Submittal shall include a report and photo documentation of pre-construction conditions, construction work, seeding, planting, and other work as specified under the Wetland Mitigation items. Photos of completed Wetland Restoration areas shall include the same views as the pre-construction reference photos.

Upon receipt of a Request for Conditional Acceptance, the Engineer, the Wetland Specialist and regulatory representative (if required) shall assess the Wetland Mitigation and surrounding area to ensure that it meets the conditions specified under the Wetland Mitigation items.

Upon approval, MassDOT will issue a letter of Conditional Acceptance. If the Wetland Mitigation work is not approved, MassDOT will issue a rejection letter requiring corrective action. The Wetland Specialist shall recommend corrective actions.

Request for Final Acceptance

Following one full growing season, the Wetland Specialist shall provide a brief narrative of the status of the Wetland Mitigation to be submitted with the Request for Final Acceptance.

Upon receipt of the Request, the Engineer, the Wetland Specialist and regulatory representative (if required) shall assess the Wetland Mitigation and surrounding area to ensure that it meets the conditions specified under the relevant Wetland Mitigation items.

If the Wetland Mitigation is not approved, MassDOT will issue a rejection letter requiring corrective action. The Wetland Specialist shall recommend corrective actions.

ITEM 755.75 (Continued)**METHOD OF MEASUREMENT**

Item 755.75 Wetland Specialist shall be measured for payment by the HOUR for on-site service provided by the Wetland Specialist.

Work shall include all inspections, photos, submittals, and associated tasks for construction and restoration oversight, narratives for Conditional and Final Acceptance, documentation required for permits, and all other work specified above. Payment shall not include travel time or time spent off-site on reports. Decimal Pay Limits will be 0.25 hours.

BASIS OF PAYMENT

Item 755.75 Wetland Specialist shall be paid at the Contractor bid price for each HOUR, or fraction thereof, spent on-site to perform the work as described above. Reports and photo documentation are required for payment.

Post wetland construction reports shall be per Item 755.76, Wetland Monitoring Reports.

ITEM 755.76**WETLANDS MONITORING REPORTS****LUMP SUM**

Work under this item shall be for the submittal of Wetland Monitoring Reports following the completion of wetland construction and shall include all inspections, photos, and other work required to complete those reports as specified herein.

“Wetland Mitigation” shall be used herein for applicable wetland work, whether Wetland Replication (creation of a new wetland) and/or Wetland Restoration (restoration after temporary impacts).

The Contractor shall retain the services of a Wetland Scientist, Wetland Ecologist, Restoration Ecologist, or other professional with similar qualifications, hereafter referred to as the “Wetland Specialist,” to complete the Wetland Monitoring reports. Wetland Specialist shall meet requirements specified under Item 755.75 Wetland Specialist.

All on-site Wetland Specialist services required to complete the construction and revegetation of the wetland replication, including preparation and submission of monitoring reports during construction, shall be per Item 755.75 Wetland Specialist.

SCOPE OF WORK**Post-Construction Wetland Monitoring Reports**

Final Acceptance of the wetland construction work as specified under item 755.35 shall initiate the beginning of the Monitoring Period.

Inspections and reports shall be performed to ensure compliance with mitigation requirements defined under the relevant Wetland Mitigation items and with all applicable environmental permits. Monitoring reports shall cover the following:

- Identification of all plant species present
- Percent cover for each plant species and overall percent surface area cover by indigenous wetland plant species for replication area and upland
- Description of the viability, health, and vigor of installed plants as well as volunteer plant species within the replication areas
- Description of remedial measures taken to ensure criteria are met
- Depth to apparent water table and/or depth of surface inundation, both as measured from the soil surface and data loggers, as appropriate.
- A conclusion regarding the success of the wetland mitigation area relative to the performance standards at 310 CMR 10.55(4)(b) (unless varied), the design plans, and performance criteria established by MADEP in the variance conditions (when applicable), and the reference wetland.
- Recommendation for a corrective plan of action if needed.

ITEM 755.76 (Continued)

Reports shall be submitted to the Engineer as a digital copy in Portable Document Format (PDF) unless otherwise requested. Hard copies shall be provided as requested by the Engineer. All reports shall be marked with the applicable permit numbers and identifying information as required in the permits. Reports shall include photo documentation of the wetland/s being monitored and shall include a minimum of 3 views from different orientations. Views shall be labeled.

Spring Reports, when required, shall be submitted to the Engineer by July 1 for dispersal to the appropriate permitting agencies.

End of Year Reports (which may serve as the Fall Report) shall be based on inspections that occur prior to October 15th. Reports shall be submitted to the Engineer no later than November 1 of each year.

Monitoring Reports shall be as follows for 2 years:

MassDEP: WQC – 2 Reports: 1 spring inspection, 1 fall inspection

BASIS OF PAYMENT

Item 755.76 Wetland Monitoring Reports and associated inspections shall be at the Contract unit price per Lump Sum and shall include all labor, materials, equipment, and all incidental costs required to complete the work. Lump Sum will be paid in equal installments of the Lump Sum divided by the number of reports submitted. Payment shall be upon submittal and acceptance of each report, based on the following schedule:

- Year 1 = 2 Reports
- Year 2 = 2 Reports

ITEM 765.21 ANNUAL COVER CROP FOR NATIVE SEEDING POUND

Work under this item shall conform to the relevant provisions of Subsection 765 of the Standard Specifications and the following.

DESCRIPTION

Work consists of furnishing and applying the appropriate annual grass to be seeded as a cover crop in conjunction with upland native seeding and at the rate specified herein.

A cover crop shall be used for following conditions:

- when specified under Application Rate for the permanent native upland seed mix
- for slopes 2:1 or steeper and an annual is not already specified as part of the permanent mix
- when seeding out of season and the native seed mix does not already specify an annual
- as required to prevent erosion until the permanent seed establishes.

A cover crop is not necessary for wetland seeding and is not typically necessary for soil stabilization when seeding in conjunction with a compost blanket application.

Annual rye (*Lolium multiflorum*) will not be accepted as an annual cover crop.

Using annual rye or exceeding the application rate such that a dense stand of annual grasses prevents germination of the native grasses will require mowing of annual grasses. In this instance, mowing of cover crop will be incidental to this item.

Seed and Application Rate

Add 30 pounds/acre of the following seed based on seeding season:

<i>Avena sativa</i> (Grain Oats):	1 January to 31 July
<i>Cecale cereale</i> (Grain Rye):	1 August to 31 December

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Annual Cover Crop will be measured for payment per pound of seed per pound of seed, complete in place.

Annual Cover Crop will be paid at the contract unit price per pound upon approval of seed bag tags or other documentation of correct application rate and species, and upon acceptance of a satisfactory stand of annual grasses three weeks following seeding.

Application and care of cover crop will be paid for separately under Item 735.635 Native Seeding and Establishment.

ITEM 765.421 NATIVE SEED MIX MID-HEIGHT GRASSLAND MIX POUND

Work under this item shall consist of furnishing the mix(es) specified below in the required quantity.

SUBMITTALS

- 1) Pre-Verification of Seed Availability. Within 30 days after the Notice to Proceed, the Contractor shall submit to the Engineer the supplier's verification of availability of seed species in the required quantities and for the anticipated date of seeding. Verification shall be on the supplier's letterhead and notarized by the supplier's notary. Species not expected to be available should be noted and substitutions recommended.
- 2) Final Verification of Seed Availability. No earlier than 21 days prior to ordering, the Contractor shall submit to the Engineer the supplier's verification of availability of seed species and in the required quantities. Verification shall be on the supplier's letterhead and notarized by the supplier's notary. A copy of this submittal shall be forwarded to the MassDOT Landscape Design Section. Substitutions or changes in the mix at this time must be approved by MassDOT Landscape Design Section.
- 3) Seed Worksheet provided herein shall be submitted to the Engineer prior to ordering seed to determine the number of pounds of Pure Live Seed required.
- 4) Seed Tags. The contractor shall submit original seed tags from each bag of seed used on the project or ensure that each tag is photo documented by the Engineer while on the unopened bag.

Number of tags submitted must correspond to number of bags delivered.

Species listed on the seed tag shall match the Final Verification of Seed Availability (Submittal #2) unless approved otherwise. Tag must include: variety and species name; lot number; purity; percentage of inert matter; percentage of weeds, noxious seeds, and other crop seeds; germination, dormant or hard seed; total viability; origin of seed; germination test date, net weight, and name and address of seller. The origin of seed must be listed on the seed tag for all species in the mix to provide verification of original (generation 0) seed source. The smallest known geographic area (township, county, ecotype region, etc.) shall be listed. Ecotypes and cultivars shall be as close to Massachusetts as possible and appropriate to the site conditions.

A copy of this submittal shall be forwarded to the MassDOT Landscape Design Section.

- 5) Verification of Seed Delivery. Prior to payment, contractor shall submit the Seed Delivery Verification form contained within the contract or the Supplier's Verification on company letterhead or a bill of lading. Supplier verification must include all information requested on the Verification form within this contract. The bill of lading must include variety and species name, lot number, net weight shipped, date of sale, invoice, project or seeding location, and name and address of Supplier. All information must be filled in and complete for acceptance. Information must match the seed tags and quantity of seed used on the job. A copy of this submittal shall be forwarded to the MassDOT Landscape Design Section.

ITEM 765.421 (Continued)

- 6) Seed Sample. If requested or if seed is from a previously opened bag, the contractor may be asked to submit to the Engineer a sample of seed from the seed bag (1-2 cups) at the time of seeding.

SEEDING SEASON

The appropriate seeding seasons are:

Spring: April 1 - May 15

Fall: October 1 - December 1 for dormant seeding

PERMANENT SEED MIX(ES)Calculating Pure Live Seed (PLS)

Quantities specified are PURE LIVE SEED. Greater quantities of ordered seed may be required to achieve actual specified seeding rates.

Pure Live Seed (PLS) is defined as a percentage calculated by multiplying the percent of pure seed by the percent of viable seed (total germination, hard seed, and dormant seed). For example:

If a seed label indicates 90% purity, 78% germination, 10% hard seed, and 2% dormancy, it is calculated to be $90\% \times [78 + 10 + 2]\% = 81\%$ PLS.

Therefore, each pound of PLS would need $1 \text{ pound} / 0.81 = 1.2$ pounds of seed with a 90% purity and 90% total germination

Seed Mix(es) shall be as specified below. Ecotypes and cultivars shall be as close to Massachusetts as possible and appropriate to the site conditions.

765.421 Mid-Height Grassland Mix

	<u>Botanical Name</u>	<u>Common Name</u>	<u>% PLS by Weight</u>
Grass	Schizachyrium scoparium 'Albany	Little Bluestem 'Albany	48.00%
	Elymus virginicus	Virginia Wild Rye	20.00%
	Panicum virgatum	Switch Grass	10.00%
	Elymus canadensis	Canada Wild Rye	8.00%
	Dichanthelium clandestinum 'Tioga'	Deertongue grass 'Tioga'	3.00%
	Agrostis perennans	Upland Bentgrass	2.00%
			91.00%

ITEM 765.421 (Continued)

Herb/Forb

Chamaecrista fasciculata	Partridge Pea	3.00%
Penstemon digitalis	Beard-tongue	2.00%
Geum canadense	White Avena	1.00%
Liatris scariosa	Northern Blazing Star	0.50%
Baptisia tinctoria	Wild Indigo	0.30%
Monarda fistulosa	Wild Bergamot	0.30%
Aster laevis NY Ecotype	Smooth Aster NY Ecotype	0.20%
Aster lateriflorus	Calico Aster	0.20%
Asclepias syriaca	Common Milkweed	0.20%
Solidago nemoralis	Grey Goldenrod	0.20%
Aster prenanthoides	Zig Zag Aster	0.20%
Pycnanthemum tenuifolium	Slender Mountain Mint	0.20%
Asclepias incarnata	Swamp Milkweed	0.20%
Lespedeza capitata	Roundhead Bush Clover	0.20%
Solidago juncea	Early Goldenrod	0.10%
Aster pilosus	Heath Aster	0.10%
Solidago bicolor	White Goldenrod	0.10%
		9.00%
		100.00%

Seeding Rate: 18.0 lbs PLS/Acre

Seeding Rate: Species ecotype shall be as native to New England region as possible. Apply this mix at 18 lbs PLS/acre.

Application Rate

Mix 765.421: 18 lbs/acre PLS.

In addition, apply 30 pounds of cover crop (grain oats or grain rye) as appropriate to the season.

Any species substitutions shall be with a species having similar characteristics and function. Substitutions must be approved by MassDOT Landscape Design Section per the documentation submittal process.

50% Increase Adjustment for Field Conditions

Seeding under the following conditions requires a 50% increase in the permanent mix at the time of construction:

- Seeding out of season
OR
- Seeding after Compost Blanket has been applied (unless already increased for out of season).

ITEM 765.421 (Continued)**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Item 765.421 will be measured for payment by the POUND of Pure Live Seed delivered and complete in place.

Item 765.421 will be paid at the Contract unit price per POUND of Pure Live Seed delivered upon approval of all Seed Submittal Documentation. Overseeding required to correct poor germination or establishment shall be incidental to the item.

Cover crop not included as part of the permanent mix composition will be paid for under Item 765.21, Annual Cover Crop.

Application and care of native seed mix will be paid for separately under Item 735.635 Native Seeding and Establishment.

NATIVE SEED WORKSHEET

Project Description: _____ Project No: _____

Contractor: _____ Contract No: _____

Seed Mix Number & Description: _____

Contractor: Complete Prior To Ordering

Pounds of Seed Required Per Contract:

_____ lbs./acre for _____ Acre(s) OR _____ SY

Additional 50% increase if required (out of season or seeding over compost blanket):

_____ **lbs. Total Seed Required**Calculated Quantity for **Pure Live Seed (PLS¹)**:_____ **Total Pounds PLS****Engineer: Verification at Time of Application**Number pounds delivered to site²: _____ Date(s): _____

Actual Seed Bag Tag/s Received or photo documented by Engineer: _____

¹ *PLS=% pure seed x % viable seed (total germination, hard seed, and dormant seed).*² *Quantity delivered should match pounds **Total Pounds PLS** and **Verification of Seed Delivery**. Pounds should be shown on each Seed Tag.*

SUPPLIER VERIFICATION OF SEED DELIVERY FOR MASSDOT PROJECTS

Date _____

We hereby certify that (*Seed Supplier*): _____Furnished to (*Contractor*): _____For use on: (*Project Description*) _____

Project #: _____ Contract #: _____

Pounds of Pure Live Seed: _____

Of Mix (*Description*): _____

Lot Number _____

The material was delivered on (*Date*) _____.

The labels and contents meet all State and Federal regulations. The mixture consists of the following species, including cultivars (as applicable) and ecotype region, and at the following percentages (may be attached separately):

Name (print): _____ Title: _____

Supplier: _____

Signature and Seal: _____

ITEM 765.635**NATIVE SEEDING AND ESTABLISHMENT****SQUARE YARD**

Work shall conform to the relevant provisions of Subsections 765 and 767 of the Standard Specifications and the following:

The work under this item shall consist of seeding, mowing, and other care to establish a stand of grass in the areas shown on the plans or as required by the Engineer. For the purposes of these specifications, the term “grass” shall apply to all the forbs, grasses, sedges, and rushes included in the materials.

QUALIFICATIONS

Seeding shall be done by a company having a minimum of five years of experience with native seed establishment. Prior to beginning work, the seeding Contractor shall furnish proof of qualifications to the Engineer for approval. Proof of qualifications shall include providing documentation (photos and contacts) to demonstrate knowledge and expertise with native seeding and establishment and proof of having completed successful native seeding projects.

SEEDING SEASON

Seeding seasons for native mixes is April 1 - May 15 and October 1 - December 1 for dormant seeding. Written approval must be obtained for seeding outside the seeding season and, if approved, the permanent seed rate shall be increased by 50%.

Seeding season for cover crops shall be grain oats January 1 – July 31 and grain rye August 1 – December 1.

MATERIAL AND SUBMITTALS

Seed Mixes and Submittals shall be per the item(s) for permanent and annual (cover crop) seed mixes.

Compost Blanket, if used, shall meet the material and submittal requirements for that item.

Hydromulch shall be wood fiber or straw applied per the Standard Specifications and at the rates specified below and per the manufacturer.

A certified statement shall be furnished, prior to start of work, to the Engineer by the Contractor as to the number of pounds of hydromulch, tackifier, and seed, per 100 gallons of water and as applicable to products used. This statement should also specify the number of square yards of seeding that can be covered with the solution specified above.

Fertilizer

No fertilizers shall be applied.

ITEM 765.635 (Continued)**Water**

Water, including hose and all other watering equipment required for the work, shall be furnished by the Contractor to the site at no additional cost. Water shall be suitable for irrigation and free from ingredients harmful to plant life. All plants injured or work damaged due to the lack of water or the use of too much water shall be the Contractor's responsibility to correct.

SEEDING

Hand broadcast method shall be used for all areas smaller than half an acre and when specified on the plans for areas over half an acre.

Seeding shall occur within 72 hours of placement of loam and final grading or the Contractor shall propose a reasonable, alternative schedule that shall be approved by the Engineer.

Surface Preparation

No seeding or soil preparation shall be done if soils are muddy or dry and compacted. Bare soils shall be raked to remove large stiff clods, lumps, brush, roots, stumps, litter and other foreign matter. Ruts and depressions shall be filled with additional loam or compost and the soil shall be re-graded to a relatively smooth finish corresponding to the required grades.

When seeding over existing or compacted soil or soil that has sat bare for more than 30 days, surface will be prepared by tilling or raking to a minimum depth of 2 inches prior to seeding and prior to Compost Blanket application (when applied).

Surface preparation shall be compensated for under for loam placement or topsoil rehandled and spread as appropriate to the project.

Jute or coir mesh, when specified in the contract, shall be placed after seeding and per the Standard Specifications and the manufacturer's instruction.

Surface preparation shall be approved by the Engineer prior to seeding.

Seeding over Various Substrates

Loam: Seeding shall occur within 72 hours of loam placement to prevent loss of topsoil. Seed shall be manually broadcast for areas less than half an acre (each area, not cumulative area) and when specified on the plans. Broadcasting shall be immediately followed by hydromulching as specified below. When not specified on the plans, larger areas may be hydroseeded as specified below.

Compost Blanket: Compost Blanket shall be applied as specified under that item. Seed should be hand broadcast at the same time as compost application to ensure a thin cover of compost over seed.

ITEM 765.635 (Continued)

When seeding is done after application of Compost Blanket the rate shall be increased by 50%. If the Compost Blanket is applied after December 1, seed shall be broadcast or hydroseeding over the compost in the Spring and the rate increased by 50% specified under Seed Application.

Compost Mulch over Modified Rock: Compost Mulch and seed shall be applied as specified under that item. No hydromulch is required.

Cover Crop

Cover crop shall be used when seeding out of season, when specified with the permanent native seed mix under that item, and as required to prevent erosion until the permanent seed establishes. A cover crop should not be used with a steep slope mix or other permanent mix which already contains either cereal rye or oats in the composition of the mix. A cover crop is not necessary for wetland seeding and is not typically necessary for soil stabilization when seeding in conjunction with a compost blanket application.

Seed Application

All seed shall be mulched as specified herein.

Seed application shall be by broadcast seeding or by hydroseeding as described below.

Broadcast Seeding

Seed shall be broadcast spread using a cyclone or whirlwind seeder or hand broadcast. Small or light-seeded species such as bluestem may be mixed with approved filler to achieve an even distribution. Seed shall not be broadcast when wind velocities are greater than 15 mph.

Broadcast seeding shall be undertaken in two separate passes at ninety degrees to each other. One-half the seeding rate shall be applied in each direction (horizontally and vertically). To ensure seed to soil contact with broadcasting of seed, seeding shall be followed by rolling or tracking with equipment approved by the Engineer.

Broadcast seed shall be mulched with weed-free straw mulch unless seeding is done as part of Compost Blanket in which case it shall be as specified above under seeding with Compost Blanket application. Hydromulching shall be as specified under Hydromulching.

Hydroseeding and Hydromulching

Hydroseed and mulching shall be per the manufacturer's directions and as follows.

Hydroseeding shall only be used for sites over half an acre in size or with permission of the Engineer.

ITEM 765.635 (Continued)

Tank and hoses shall be cleaned from all previous hydroseeding and hydromulching projects. Seed shall be mixed into the slurry immediately before application and slurry applied within 30 minutes after seeds have been placed in the tank. Once seed has been placed in the tank, tank shall be agitated only enough to mix the seeds and keep slurry from separating.

A 2-step process shall be used for seeding in conjunction with hydromulch. Seed shall be applied with 500 lbs/acre of hydromulch in the first pass. A second pass with 1,000 lbs/ acre of hydromulch shall be applied in a second pass. Each pass shall be applied in a different direction.

Once the seed has been added to the tank mixture a one-hour time limit is set for spreading the mixture on the soil. Once the one hour has passed the excess mixture must be discarded.

For broadcast seeding, hydromulch shall be applied immediately following seeding at a rate of 1,000 lbs/acre. Tank shall be cleaned from any previous hydroseeding.

CARE DURING GERMINATION AND ESTABLISHMENT

Contractor shall care for seeded areas as necessary for successful germination. Care will include watering and weed control as necessary to achieve establishment of the specified seeded species after one growing season as specified below.

The contractor shall maintain the stand of grasses to ensure healthy growth of the seeded species. Work shall include mowing or weed-whacking for weed control, watering if necessary, and removal of invasive plants.

Watering shall be sufficient to achieve soil moisture to a depth of 2 inches or more and such moisture is uniform. Method of watering shall not erode or damage soil or grassed surfaces.

General Weed Control: Unless otherwise directed, mowing shall be as specified under Mowing for Weed Control for seed establishment. Weeds shall be mowed prior to weeds setting seed (by the end of July unless otherwise approved).

Control of Invasive and Aggressive Weeds: Invasive and aggressive weeds, including but not limited to mugwort, ragweed, knapweed, foxtail, crabgrass, and chicory must be cut or treated prior to going to seed. Herbicide treatment must be coordinated with MassDOT. Undesired species (such as chicory) introduced due to use of incorrect seed mix shall be removed at the Contractor's expense.

MOWING FOR WEED CONTROL

Mowing for weed control shall be completed after weeds have sprouted and show leaf and bud growth, but prior to setting seed, generally between July 7th and August 1st, unless directed otherwise by the MassDOT Landscape Architect and the Engineer.

ITEM 765.635 (Continued)

Mowing height shall be as needed for weed control, generally to a height of 8 inches and not below 4 inches, unless directed otherwise. Mowing shall be with a brush hog mower or string trimmer other approved equipment. Conventional lawn mowers which cannot achieve the appropriate cut shall not be used.

Contractor shall give 48-hour notice prior to mowing work. Mowing shall only occur in dry sunny weather. Litter pickup should occur prior to mowing in all areas. If required, cut grass shall be raked and removed. Litter pickup and raking and removal of grass shall be incidental to the work.

Mowing equipment shall be approved by the Engineer prior to work.

OVER-SEEDING

Areas of bare ground greater than 2-3 feet in diameter shall be over-seeded with the specified mix during the appropriate season for seeding. Where required for overseeding mowing shall be as close to the soil as possible. Soil that is compacted shall be raked or otherwise roughened prior to over-seeding.

Over-seeding rates and methods shall those specified above under Materials and Methods. Following over-seeding, soil shall be lightly tamped to ensure seed to soil contact and areas shall be mulched with straw mulch and watered with a fine mist to moisten soil to a depth of at least 2 inches.

Over-seeding, mulch, watering, and all work for over-seeding shall be incidental.

DETERMINING SATISFACTORY GRASS ESTABLISHMENT

A well-established stand of the specified seeded species as determined by the Engineer and the MassDOT Landscape Architect will be required for Final Acceptance. The expectation is that an acceptable number and variety of the desired permanent seeded species (not the cover crop) will be visible. Generally:

- A minimum of 75% coverage by the specified permanent seeded species after one growing season. Of that percentage, generally, depending on the mix species:
 - At least 3 types of the permanent seeded grass species shall be visible.
 - At least 3 species of wildflowers shall be visible.
- There will be no significant gaps or bare soil (generally 2-3 feet in diameter or greater).
- There will be no more than 25% coverage by weed species.
- All soil shall be stabilized and there shall be no channeling or erosion.
- There will be no invasive or aggressive species within the stand at the time of acceptance.
- There shall be no evidence of seed from non-native mixes (i.e., clover) due to failure to clean the hydroseeding tank or using incorrect mix.

Invasive and aggressive weeds (such as mugwort, ragweed, knapweed, and chicory) must be cut or treated prior to going to seed for Interim Acceptance. Herbicide treatment must be coordinated with MassDOT.

ITEM 765.635 (Continued)

A warm-season grass mix with perennials will not have uniform growth. A uniform stand of grass may indicate use of an incorrect mix.

ACCEPTANCE OF SEEDING AND ESTABLISHMENT WORK

Conditional Acceptance shall be based on proper application of seed as specified herein.

Interim Acceptance of Care. Seeding will be inspected by mid-July to assess germination and Establishment conditions as described above. When necessary for Interim Acceptance, areas shall be mowed prior to weed species producing seed and as specified above under Weed Control. ***Areas requiring weed control that are not mowed prior to weed seed dispersal will not be approved for Interim Acceptance.*** Seeding that shows good germination and is determined by the Engineer and Landscape Architect to not require weed control at time of inspection shall be accepted for Interim Acceptance payment.

Final Acceptance of Establishment shall be given upon satisfactory Establishment as described above.

If the seeded area fails to meet the requirements of Establishment by the end of the growing season, contractor shall propose and implement remediations and site shall be inspected during the following growing season after July 1st. All remediation shall be at the contractor's expense.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 765.635, Native Seeding and Establishment, will be measured for payment by the square yard, complete in place.

Item 765.635, Native Seeding and Establishment, will be paid at the Contract unit price by the square yard upon Conditional, Interim, and Final Acceptances as described above. This price shall include all submittals, seeding, rolling to ensure seed-to-soil contact, weed control other than mowing, water, over-seeding, labor, materials, equipment, and all incidental costs required to complete the work of establishing a satisfactory stand of grass.

Native seed and cover crop mixes shall be compensated under the respective items.

Site preparation, including raking, tilling, removal of debris and stones, and other work to the prepare site for seeding shall be compensated under loam placement or topsoil rehandled and spread as relevant to the project. If used, Compost Blanket shall be compensated under the respective item.

Mowing for weed control will be incidental to this item.

Seeding and Establishment for 755.35 Inland Wetland Replication and 755.45 Wetland Restoration shall be paid for under those items.

ITEM 765.635 (Continued)

Schedule of payment shall be as follows:

30% upon Conditional Acceptance

20% upon Interim Acceptance of Care, except this amount will be reduced to zero and final payment will be reduced accordingly when areas requiring weed control are not mowed as specified in the Interim Acceptance criteria.

50% upon Final Acceptance of Establishment

ITEM 767.12**SEDIMENT BARRIER - COIR LOG****FOOT**

The work under this item shall conform to the relevant provisions of Subsections 101, 120, 170, and 751 of the Standard Specifications and the following:

Sediment Barrier - Coir Log shall be used in wet locations where the barrier will not require removal; when barrier is placed immediately adjacent to existing wetlands; as a check dam in swales; in locations as shown on the Drawings; and/or in locations required by the Engineer.

Permits, Codes and Regulations: The Contractor shall comply with all rules, regulations, laws and ordinances of the City/Town and State, and all other authorities having jurisdiction over the Project site. All labor, materials, equipment, and services necessary to make the work comply with such requirements shall be provided by the Contractor without additional cost to the Department.

MATERIALS

Coir Log: Coir Log shall be biodegradable coir fiber cylindrical bundles. Inner core shall be 100 percent unsorted, well-cleaned, coir fiber uniformly distributed along the length of the log. The stuffed density of the coir fiber shall be a minimum of 9 pounds per cubic foot.

Outer netting shall be constructed from a minimum 3-ply high strength coir bristle twine. The netting shall have 2-inch by 2-inch rhombic openings with hand-knotted junctions. The average breaking strength of the coir twine shall be a minimum of 80 pounds. Production tolerance for all the above parameters shall not exceed plus or minus 10 percent.

Coir log diameter shall be sized as shown on the drawings. Typical lengths are supplied in 10 foot or 20-foot increments. Coir logs or coir netting may not be cut to decrease length and shall maintain the physical properties as supplied by the Manufacturer.

Notched Wood Stakes: Stakes shall be oak or southern pine with dimensions as shown on the Drawings. Stakes shall be free from knots and other defects which would cause splitting and shall have a downward-angled notch as shown in the drawing.

Coconut Fiber Cord: Coconut fiber cord shall be two-ply braided cord with a breaking strength of 80 pounds, minimum 0.25-inch diameter.

Delivery, Storage and Handling: Protect materials from deterioration during delivery and while stored at site.

CONSTRUCTION METHODS

General: Prior to initial placement of the coir log sediment barrier, the Contractor and the Engineer shall review locations specified on the plans and adjust placement, if required, to ensure that the coir log positioning and configuration will provide maximum sediment capture. Coir log sediment barrier(s) shall be in place prior to excavation work and no work shall take place outside the coir log barrier(s).

ITEM 767.12 (Continued)

Installation: Coir logs shall be staked and secured as shown on the Drawings, as specified herein, and/or as recommended by the Manufacturer. The Contractor shall remove all underlying vegetation or debris to ensure that each coir log is securely in contact with soil, such that there is no flow beneath the log.

When used as a check dam barrier in a swale, the coir log shall be centered in the low point of the swale, perpendicular to the flow, with ends extending upslope. The log check dam barrier shall extend such that the log top elevation at the center of the swale is lower than the lowest elevation at the end log, to ensure that sediment-laden runoff will flow either through or over the coir log but not around it. The coir log check dam barrier shall have length such that no seams occur in the swale.

Notched wood stakes shall be driven parallel on both sides of the coir log at a typical spacing of 5 feet on center, unless site conditions warrant a closer spacing distance to ensure logs are firmly secured to the underlying soil. Stakes shall not extend more than 1 foot beyond the top of the log. Coir twine shall lash the logs to notched stakes in a cross-lashing fashion between stakes, throughout the length of the log barrier.

When utilizing multiple logs for sediment control, each coir log shall be laced together end-to-end (creating a seam) with coir twine to create a continuous length. End-to-end lacing may be completed before or after placement, to facilitate handling.

Maintenance: Maintenance of the coir log sediment barrier shall be per the Stormwater Pollution Prevention Plan (SWPPP).

The contractor shall inspect the sediment barrier in accordance with relevant permits. At a minimum, barriers shall be inspected at least once every 7 calendar days and after a rain event resulting in 0.25 inches or more of rainfall. The Contractor shall be responsible for ensuring that an effective barrier is in place and working effectively for all phases of the Contract. Under no condition shall sediment be allowed to accumulate more than 4 inches above the original ground line.

If a breach or other failure of the barrier occurs, the barrier shall be immediately restored. Repair shall include replacement of entire defective segments or for short breaches, revetment with additional coir logs, set directly adjacent to the downslope side of the breach. Revetment coir logs must overlap breach by a minimum of 2 feet on each side. The Engineer must approve breach repair means and methods as well as outcome.

If the coir log sediment barrier is damaged by equipment or undergoes a significant washout or other major failure, the Contractor shall replace the component in its entirety, at the discretion and approval of the Engineer. Any delay in maintaining the barrier shall be cause to immediately suspend the work as provided for in Subsection 8.09: Delay and Suspension of Work.

Disposition/Removal: For naturalized areas, coir logs and wooden stakes may be left in place to decompose on-site. For areas where, in the determination of the Engineer, aesthetics are a concern, logs, errant coir fiber material, and stakes may require removal.

ITEM 767.12 (Continued)**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Item 767.12, Sediment Barrier - Coir Log, will be measured for payment by the FOOT, complete in place.

Item 767.12, Sediment Barrier - Coir Log, will be paid for at the Contract unit price per FOOT, which price shall include all labor, materials, equipment, and incidental costs required to complete the work.

No separate payment will be made for coir log(s) follow-up maintenance and repairs, or disposal (if required), but all costs in connection therewith shall be included in the Contract unit price bid.

ITEM 767.121**SEDIMENT CONTROL BARRIER****FOOT**

The work under this item shall conform to the relevant provisions of Subsections 670, 751 and 767 of the Standard Specifications and shall include the furnishing and placement of a sediment control barrier. Sediment control barrier shall be installed prior to disturbing upslope soil.

The purpose of the sediment control barrier is to slow runoff velocity and filter suspended sediments from storm water flow. Sediment barrier may be used to contain stockpile sediments, to break slope length, and to slow or prevent upgradient water or water off road surfaces from flowing into a work zone. Contractor shall be responsible for ensuring that barriers fulfill the intent of adequately controlling siltation and runoff.

Twelve-inch diameter (after installation) compost filter tubes with biodegradable natural fabric (i.e., cotton, jute, burlap) are intended to be the primary sedimentation control barrier.

For small areas of disturbance with minimal slope and slope length, the Engineer may approve the following sediment control methods:

- 9-inch compost filter tubes
- Straw bales which shall be trenched

No straw wattles may be used. Additional compost filter tubes (adding depth or height) shall be used at specific locations of concentrated flow such as at gully points, steep slopes, or identified failure points in the sediment capture line.

When required by permits, additional sediment barrier shall be stored on-site for emergency use and replacement for the duration of the contract.

Where shown on the plans or when required by permits, silt fence shall be used in addition to compost filter tubes and straw bales and shall be incidental to the item.

Sediment control barriers shall be installed in the approximate location as shown on the plans and as required so that no excavated or disturbed soil can enter mitigation areas or adjacent wetlands or waterways. Barriers shall be in place prior to excavation work. No work shall take place outside the barriers.

MATERIALS AND CONSTRUCTION

Prior to initial placement of barriers, the Contractor and the Engineer shall review locations specified on the plans and adjust placement to ensure that the placement will provide maximum effectiveness.

Barriers shall be staked, trenched, and/or wedged as specified herein and according to the Manufacturer's instructions. Barriers shall be securely in contact with existing soil such that there is no flow beneath the barrier.

ITEM 767.121 (Continued)**Compost Filter Tube**

Compost material inside the filter tube shall meet M1.06.0, except for the following: no peat, manure or bio-solids shall be used; no kiln-dried wood or construction debris shall be allowed; material shall pass through a 2-inch sieve; and the C:N ratio shall be disregarded.

Outer tube fabric shall be made of 100% biodegradable materials (i.e., cotton, hemp or jute) and shall have a knitted mesh with openings that allow for sufficient water flow and effective sediment capture.

Tubes shall be tamped, but not trenched, to ensure good contact with soil. When reinforcement is necessary, tubes shall be stacked as shown on the detail plans.

Straw Bales

Straw bales shall be used if shown on the plans or when specified by Orders of Condition or other permit requirements.

Bales should be placed in a single row, lengthwise on the contour, with ends of adjacent bales tightly abutting one another. All bales should be either wire-bound or string-tied. Straw bales should be installed so that bindings are oriented around the sides (rather than along the tops and bottoms) of the bales in order to prevent deterioration of the bindings.

The barrier should be entrenched and backfilled. A trench should be excavated the width of a bale and the length of the proposed barrier to a minimum depth of 4 inches. The trench must be deep enough to remove all grass and other material which might allow underflow. After the bales are staked and chinked (filled by wedging), the excavated soil should be backfilled against the barrier. Backfill soil should conform to the ground level on the downhill side and should be built up to 4 inches against the uphill side of the barrier.

Each bale should be securely anchored by at least 2 stakes or re-bars driven through the bale. The first stake in each bale should be driven toward the previously laid bale to force the bales together. Stakes or re-bars should be driven deep enough into the ground to securely anchor the bales. For safety reasons, stakes should not extend above the bales but should be driven in flush with the top of the bale.

The gaps between the bales should be chinked (filled by wedging) with straw to prevent water from escaping between the bales. Loose straw scattered over the area immediately uphill from a straw bale barrier tends to increase barrier efficiency. Wedging must be done carefully in order not to separate the bales.

When used in a swale, the barrier should be extended to such a length that the bottoms of the end bales are higher in elevation than the top of the lowest middle bale to assure that sediment-laden runoff will flow either through or over the barrier but not around it.

ITEM 767.121 (Continued)**Silt Fence**

Materials and Installation shall be per Subsection 670.40 and 670.60 of the Standard Specifications and the following:

Silt fence shall only be used if shown on the plans or when specified by Orders of Condition or other permit requirements.

When used with compost filter tubes, the tube shall be placed on a minimum of 8 inches of folded fabric on the upslope side of the fence. Fabric does not need to be trenched.

When used with straw bales, an 8-inch deep and 4-inch wide trench or V-trench shall be dug on the upslope side of the fence line. One foot of fabric shall be placed in the bottom of the trench followed by backfilling with compacted earth or gravel. Stakes shall be on the down slope side of the trench and shall be spaced such that the fence remains vertical and effective.

Width of fabric shall be sufficient to provide a 36-inch high barrier after fabric is folded or trenched. Sagging fabric will require additional staking or other anchoring.

MAINTENANCE

Maintenance of the sediment control barrier shall be per Subsection 670.60 of the Standard Specifications or per the Stormwater Pollution Prevention Plan (SWPPP), whichever is more restrictive.

The contractor shall inspect the sediment barrier in accordance with relevant permits. At a minimum, barriers shall be inspected at least once every 7 calendar days and after a rain event resulting in 0.25 inches or more of rainfall. Contractor shall be responsible for ensuring that an effective barrier is in place and working effectively for all phases of the Contract.

Barriers that decompose such that they no longer provide the function required shall be repaired or replaced as directed. If the resulting berm of compost within the fabric tube is sufficiently intact and continues to provide effective water and sediment control, barrier does not necessarily require replacement.

DISMANTLING & REMOVING

Barriers shall be dismantled and/or removed, as required, when construction work is complete and upslope areas have been permanently stabilized and after receiving permission to do so from the Engineer.

Regardless of site context, nonbiodegradable material and components of the sediment barriers, including photo-biodegradable fabric, plastic netting, nylon twine, and silt fence, shall be removed and disposed off-site by the Contractor.

For naturalized areas, biodegradable, natural fabric and material may be left in place to decompose on-site. In urban, residential, or other locations where aesthetics is a concern, the following shall apply:

ITEM 767.121 (Continued)

- Compost filter tube fabric shall be cut and removed, and compost shall be raked to blend evenly (as would be done with a soil amendment or mulch). No more than a 2-inch depth shall be left on soil substrate.
- Straw bales shall be removed and disposed off-site by the Contractor. Areas of trenching shall be raked smooth and disturbed soils stabilized with a seed mix matching adjacent seeding or existing grasses (i.e., lawn or native grassmix).
- Silt fence, stakes, and other debris shall be removed and disposed off-site. Site shall be restored to a neat and clean condition.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 767.121 will be measured and paid for at the contract unit price per foot of sediment control barrier which price shall include all labor, equipment, materials, maintenance, dismantling, removal, restoration of soil, and all incidental costs required to complete the work.

Silt fence, when used in conjunction with compost filter tubes or straw bales, will be incidental to this item.

Additional barrier, such as double or triple stacking of compost filter tubes, will be paid for per foot of tube installed.

Barriers that have been driven over or otherwise damaged by construction activities shall be repaired or replaced as directed by the Engineer at the Contractor's expense.

ITEM 767.9**JUTE MESH****SQUARE YARD**

The work under this item shall conform to the relevant provisions of Section 700 of the Standard Specifications and the following.

The work under this item shall consist of furnishing and installing jute mesh fabric to prevent soil erosion. Jute mesh shall be placed over all areas of exposed soil in locations shown on the plans or as required by the Engineer.

MATERIALS

Jute netting or similar material shall be new, unused, undyed, and unbleached 100% biodegradable yarn (no polypropylene) and of uniform plain weave. The materials should weigh approximately 1.0 (+/- 5%) pounds per linear yard (assuming a 4-foot width).

Shall meet the following minimum requirements:

Open Area:	70-75%
Mesh Size:	approximately 1/2 inch with an open area of 60-65%.
Roll Weight:	approximately 1.0 (+/- 5%) pounds per linear yard
Warp Ends:	78 per linear yard
Weft Ends:	41 per linear yard
Recommended flow:	6 fps (1.8 m/s)
Functional Longevity:	6-9 months

Anchoring devices shall be 11-gauge steel staples 6-inch minimum length. In loose soils the length of the staples shall be 9-inches.

For areas that will be routinely mowed anchoring devices shall consist of minimum 8" wooden stakes. Longer stakes shall be used where loose soils or other conditions obligate, as required by the Engineer.

CONSTRUCTION METHODS

Area shall be seeded prior to installation of jute netting.

Installation shall be such as to ensure continuous contact with soil without folds or wrinkles. Jute netting shall be laid such that upslope fabric is placed over lower slope fabric by a minimum of 3 feet. Adjoining rolls shall be overlapped a minimum 6 inches. The netting shall extend beyond at least 1 foot beyond the edge of the seeded area.

The Contractor shall bury the ends of the jute netting 6-8 inches in anchor trenches at top and bottom of slopes.

ITEM 767.9 (Continued)

Jute netting shall be anchored in place with vertically driven metal staples. The staples shall be driven in until their tops are flush with the soil. Staples shall be placed at 12-inch intervals along the top of a slope and in staggered courses along the face of the slope to achieve a minimum of 3 staples per square yard, or at manufacturer's recommendations for the given site conditions.

Contractor shall reseed all trenched and otherwise disturbed areas with specified seed mix. The Contractor shall maintain the jute netting and make satisfactory repairs of any areas damaged until acceptance of seed establishment.

METHOD OF MEASUREMENT

Jute Mesh will be measured by the number of Square Yards complete in place, including anchoring, as measured across the surface of grade and does not include buried or overlapped portions. The quantity measured for payment shall not exceed that shown on the plans or as directed by the Engineer.

Mesh that becomes loose or that is not otherwise functioning to stabilize soil shall be repaired and new or additional jute matting installed as required at the Contractor's expense. Soil erosion shall be repaired, and area shall be raked and reseeded with the original specified mix as required by the Engineer at the Contractors expense.

BASIS OF PAYMENT

Item 767.9 will be paid for at the contract unit price per Square Yard, which price shall include all labor, materials, equipment, trenching, placing, and stapling of jute fabric, reseeded of trenched and disturbed areas, and all incidental costs required to complete the work.

ITEM 767.91**TIMBER MATTING****SQUARE YARD**

Work under this item shall conform to the plans and the relevant provisions of Subsection 767 and the following:

Timber Mats shall be used to support construction equipment when operating in wetlands. This item consists of furnishing, placing, maintaining, and removing Timber Matting as specified herein, as shown on the plans, and as required to protect existing soils during construction. Mats shall be within the area shown on the plans as necessary for construction access and staging. Existing soils shall be protected to the extent feasible.

At a minimum, material and methods shall follow Army Corp of Engineers Best Management Practices: <https://www.nae.usace.army.mil/Portals/74/docs/regulatory/StateGeneralPermits/MA/ConstructionMatBMPs.pdf>

Relevant permit conditions and approvals shall also be followed.

MATERIALS & SUBMITTALS

Material and methods shall be submitted to the Engineer for approval. Submittal shall include a plan to show the proposed extent of matting, methods of preventing soil or other material from entering the wetland through gaps in the timber, procedure for inspections, method of removal and cleaning, and location of cleaning.

The timber construction mats shall be composed of heavy timbers joined together to form stable platforms installed over the surface of wetlands. Mats shall have all timber and rods intact.

Depending on site specific field conditions at the time of construction, multiple layers of Timber Mats and stringers may be necessary to support heavy equipment and to protect the underlying wetland.

As necessary, sediment control devices such as compost filter tubes shall be placed along edge of the Timber Mats to protect wetlands from sedimentation caused by construction vehicle traffic.

Mats shall be certified clean by the vendor prior to installation. The vendor shall submit proof of compliance. Clean is defined as being free of plant matter (stems, flowers, roots, etc.), soil, or other deleterious materials prior to being brought to the project site.

METHOD OF WORK

Prior to placement of mats, existing wetland limits and topography shall be assessed. Vegetation shall be cut flush. Care shall be taken to avoid removal of plant roots and to avoid soil disturbance.

ITEM 767.91 (Continued)

Mats shall be spread evenly and smoothly to ensure direct contact with the soil at all points and placed parallel to the drainage flow direction. To the extent possible, mats shall be placed along the travel area so that individual boards are perpendicular to the direction of traffic. There shall be no gaps between the mats. Mats shall be placed on either side of wetland area to rest on firm ground.

For situations where the Contractor determines that stones or boulders shall be removed or relocated within wetland areas in order to install safe and level structure work pads or access roads, the boulders shall be moved in a manner which does not result in significant soil disturbance (i.e., pushing with a bulldozer is not allowed). When there is a significant number of boulders that shall be removed, the Contractor shall consult with the Engineer prior to undertaking the work.

The stockpiling of stone, drill spoils, and other unconsolidated material on construction mats shall be avoided unless determined necessary due to access and work pad constraints. Under this scenario, composite mats and/or other approved methods and materials shall be placed on top of the timber mats to prevent spoils from migrating through the gaps between timbers or spilling over the sides of the matting. The stockpiled spoil shall be removed from the work zone and properly disposed of in uplands approved by the Engineer or hauled off site for proper disposal. Material that falls into or otherwise enters the wetlands shall be removed by hand following removal of the mats.

Sediment controls and stone or wood chip ramps may be installed to promote a smooth transition to and minimize sediment tracking onto the timber mats. Geotextile may be added beneath stone or wood chip transitions to facilitate removal, as necessitated by site or permit conditions.

Mats shall be placed per the manufacturer's instruction. If requested by the Engineer, method of installation and final placement of mats shall be approved by the Wetland Specialist.

MAINTENANCE

Mats shall be monitored to assure that they are functioning correctly and shall be inspected for any defects or structural problems. Mats covered with soils or construction debris shall be cleaned and the materials removed and disposed of in an upland location. The material should not be scraped and shoveled into the resource area. Mats that become imbedded must be reset or layered to prevent mud from covering them or water passing over them. Worn timber or plywood used as a wearing surface shall be replaced as required and to the satisfaction of the Engineer.

REMOVAL OF MATS

Clean mats after use to remove any invasive plant species seed stock. Cleaning methods may include but are not limited to, shaking or dropping mats in a controlled manner with a piece of machinery to knock off attached soil and debris, spraying with water or air, sweeping, or exposing the mats to high temperatures. The location and method of cleaning shall be approved by the Engineer.

ITEM 767.91 (Continued)

Upon completion of construction, mats shall be removed. Matting should be removed by “backing” out of the site, removing mats one at a time.

If rutting or soil compaction following construction mat removal is observed, the area shall be returned to pre-existing conditions consistent with the surrounding area, by light hand raking or by back-blading with machinery. Deeper ruts shall be graded using available, loose soil from the work area.

Care shall be taken to inspect wetland crossings as each mat is removed to ensure any undesirable materials are properly removed and disposed of off-site.

If determined necessary by the Engineer, to enhance the functions of an altered wetland, a wetland seed mix shall be sown throughout the disturbed areas. In most instances, natural re-vegetation is an appropriate means to re-establish the wetland plant community in lieu of seeding.

Proper snow removal on construction mats shall avoid the formation of ice. To avoid the formation of ice, snow shall be removed from construction mats before applying sand. Prior to their removal from wetlands, sand shall be collected from the construction mats and disposed of in an upland area. A round street sweeping brush mounted on the front of a truck may be an effective way to remove snow from construction mats. Propane heaters may also be suitable solutions for snow removal and/or de-icing of swamp mats. Once construction mats are removed, wetlands shall be inspected for build-up of sand that may have fallen through swamp mats, therefore care shall be taken to inspect wetland crossings carefully as each mat is removed to ensure sand is properly removed and disposed of off-site.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Timber matting will be measured for payment by the square yard, complete in place, maintained and removed. Overlapped matting will not be measured for payment.

Timber matting will be paid for at the Contract unit price per square yard, which price shall include all labor, materials, equipment, sediment barriers specific to matting, geotextile, stone, wood chips, cutting of existing vegetation, and incidental costs required to complete the work of installation, maintenance, removal, and restoration of soil and vegetation, if required.

<u>ITEM 859.1</u>	<u>REFLECTORIZED DRUMS WITH SEQUENTIAL FLASHING WARNING LIGHTS</u>	<u>DAY</u>
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The work under this Item shall conform the relevant provisions of Subsection 850 of the Standard Specifications and the following:

Work under this item consists of furnishing, installing, maintaining in proper operating conditions, and removing reflectorized drums, and any necessary ballast, equipped with sequential flashing warning lights.

MATERIALS

Reflectorized drums shall be listed on the MassDOT Qualified Traffic Control Equipment List. Reflective sheeting on drums shall meet or exceed ASTM D4956 Type VIII. All drums shall be maintained in a satisfactory manner including the removal of oils, dirt, and debris that may cause reduced retroreflectivity.

The Contractor shall use one of the following sequential flashing warning light systems unless otherwise approved by the Engineer:

1. Empco-Lite LWCS.
2. pi-Lit® Sequential Barricade-Style Lamp; or
3. Unipart Dorman SynchroGUIDE.

Sequential flashing warning lights shall be secured to reflectorized drums per the light manufacturer's specifications.

CONSTRUCTION METHODS

The first ten (10) drums in any merging or shifting taper as designated in the Temporary Traffic Control Plan shall be equipped with sequential flashing warning lights. These lights shall be operating, at a minimum, between dusk and dawn when the taper is deployed.

The successive flashing of the sequential warning lights shall occur from the upstream end of the merging or shifting taper to the downstream end of the taper in order to identify the desired vehicle path. Each warning light in the sequence shall be flashed at a rate of not less than 55, nor more than 75 times per minute.

Warning lights shall be powered off when drums are not deployed in a taper.

METHOD OF MEASUREMENT

A group of ten (10) reflectorized drums with sequential flashing warning lights is considered one (1) unit and will be measured by the day. Each period of up to 24 hours during which this unit is in use will be measured as one day regardless of the number of times that the drums are positioned, repositioned, removed, or returned to service.

ITEM 859.1 (Continued)

BASIS OF PAYMENT

Reflectorized Drums with Sequential Flashing Warning Lights will be paid for at the contract unit price per day, which shall include full compensation for furnishing, positioning, repositioning, and removing the group of ten (10) drums as directed by the Engineer.

ITEM 874.4**TRAFFIC SIGN REMOVED AND STACKED****EACH**

The work under this Item shall conform to the relevant provisions of Subsection 828 of the Standard Specifications and the following.

The work to be done under this Item shall consist of the dismantling, removing, and disposal of all existing signs and their supports as noted on the plans and/or as required by the Engineer. For signs located in Hardwick, MA, the signs shall be stacked at the Hardwick Highway Department yard at 179 Petersham Road, Hardwick, MA 01037. For signs located in New Braintree, MA, the signs shall be stacked at the New Braintree Highway Department (Town Garage) yard at 110 West Brookfield Road, New Braintree, MA 01531. If the Engineer determines that these signs are not to be stacked, the Contractor shall dispose of these signs at no additional cost to the Town of Hardwick or Town of New Braintree.

Also included is the excavation of the existing foundations. If, in the opinion of the Engineer, the existing foundation will not interfere with new construction, it may be removed to a depth of 12 inches below the existing ground in sidewalks and 3 feet below existing ground within the roadway, the hole backfilled with gravel and compacted, and the existing surfaces restored or replaced in kind. The existing sign panels and supports, under this Item, not needed on the project, shall be discarded at the Contractor's cost, or as approved by the engineer.

The existing signs shall not be removed until the new signs and structures replacing them are ready for traffic unless otherwise directed by the Engineer.

METHOD OF MEASUREMENT

Item 874.4 will be measured for payment by Each, Traffic Sign Removed and Stacked.

BASIS OF PAYMENT

Item 874.4 will be paid for at the Contract unit price per Each, which price shall include all labor, materials, equipment, dismantling, removing, and discarding of the signs and their supports, excavation and disposal of the existing foundation, supplying and placing of gravel backfill and compaction, and the restoration or replacement in kind of disturbed surfaces and incidental costs required to complete the work.

ITEM 942.124**STEEL PILE HP 12 X 84****FOOT**

The work under this item shall conform to the relevant provisions of Subsection 940 of the Standard Specifications, the Plans, and the following:

The Contractor is advised of the potential existence of natural obstructions within the glacial till at the site. Based on the test borings, the glacial till likely contains cobbles and boulders. Pre-drilling at each integral abutment pile location is required in accordance with Item 944.2.

The minimum tip elevation shall be either the depth required to satisfy fixity requirements or the depth required to achieve the total nominal geotechnical resistance, whichever is deeper. See plans for elevations associated with fixity requirements and total geotechnical resistance. If an obstruction is encountered prior to reaching the minimum tip elevation, then the piles shall be removed and Drilling for Pile Obstructions in accordance with Item 944.3 shall be used, as necessary, to drill through obstructions down to minimum tip elevation.

A re-strike test with a PDA and CAPWAP analysis is required on previously tested piles a minimum of 48 hours after installation to verify that piles have been driven to the required nominal geotechnical driving resistance.

The Contractor shall submit for approval all pertinent details of the necessary procedures for extracting the obstructed piles, drilling the holes, removing the obstructions, maintaining the diameter of the holes, and filling the holes with fine gravel prior to redriving.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 942.124 will be measured and paid for at the contract unit price per foot, complete in place, which price shall include all labor, materials, equipment, and any incidentals required to complete the work.

ITEM 944.2**PRE-DRILLING FOR PILES****FOOT**

The work under this item shall conform to the relevant provisions of Subsections 940 and 150 of the Standard Specifications, the Plans, and the following:

CONSTRUCTION METHODS

The work under this item consists of pre-drilling at each integral abutment pile location. The Contractor shall ensure that each hole is drilled vertically within the horizontal tolerances specified in Subsection 940.65. The Contractor is advised of the potential existence of obstructions (boulders, etc.) at this site. Pre-Drilling for Piles may be used to drill from the proposed pile cap bottom elevations down to the minimum pile tip elevations.

The Contractor shall include in his/her submittal under this Item all pertinent details of the necessary procedures for drilling the holes, removing obstructions, and maintaining the diameter of the holes for review by the Engineer.

It is anticipated that Pre-Drilling will be performed with a 4-inch diameter casing similar to that used during geotechnical boring operations. During the pre-drilling, the Contractor shall keep a record of the start and end elevations of any obstructions encountered. These obstructions will be drilled through with Item 944.3. If obstructions are not encountered at the end of the pre-drilling, the hole shall be filled with fine gravel consisting of 1/4-inch stone (M.1.01.6); see Item 944.3 for details.

Material resulting from drilling holes shall be disposed of in accordance with Section 120.

The Contractor is permitted to drive piles without pre-drilling. However, per Section 942.124, the integral abutment piles are required to be driven to a minimum tip elevation. The minimum tip elevation shall be either the depth required to satisfy fixity requirements or the depth required to achieve the total nominal geotechnical resistance, whichever is deeper. See plans for elevations associated with fixity requirements and total geotechnical resistance. If obstructions are encountered prior to achieving the minimum depth, then the Contractor will be required to extract the pile, drill through the obstruction, replace damaged portions of the pile, and re-drive the pile at their own expense.

METHOD OF MEASUREMENT

Item 944.2 will be measured for payment per FOOT. Measurement will be made along the centerline of each pre-drilled hole from a point located at the intersection of the hole and the bottom of the proposed pile cap to the bottom of the pre-drilled hole.

BASIS OF PAYMENT

Item 944.2, Pre-Drilling For Piles, will be made at the Contract unit price per FOOT, which shall constitute full compensation for all labor, tools, equipment, materials, and temporary casing installation and removal necessary to complete the work to the satisfaction of the Engineer and disposal of the drilling cutting.

ITEM 944.3**DRILLING FOR PILE OBSTRUCTIONS****FOOT**

The work under this item shall conform to the relevant provisions of Subsections 940, 150, M1.04.0 Type b, Item 942.124, and the following:

CONSTRUCTION METHODS

The work under this item shall consist of drilling a hole where obstructions were encountered at each predrill hole in Item 944.2. The hole drilled for this item shall be no greater than the diagonal width of the pile (i.e., 17 inches for a HP 12x84) unless otherwise approved by the Engineer. The Contractor shall drill through to the bottom of obstructions to the minimum pile tip depth. The Contractor shall ensure that each hole is drilled vertically within the horizontal tolerances specified in Subsection 940.65, and that the specified diameter of the hole is continuously maintained for the full depth, regardless of the characteristics of the material being penetrated. The purpose of drilling for pile obstructions is to drill through the extents of the obstructions, to a maximum depth below bottom of pile cap elevation (i.e., depth of pile fixity), to allow piles to be driven without damage and within alignment tolerances.

The Contractor shall submit for approval all pertinent details of the necessary procedures for extracting the obstructed piles, drilling the holes, removing obstructions, maintaining the diameter of the holes, and filling the holes with Fine Gravel prior to re-driving.

If required by field conditions or directed by the Engineer, the Contractor shall simultaneously install at each hole a temporary steel casing to the bottom of the drilled hole having the required strength and size to maintain the specified diameter and location. Unless specifically authorized in writing by the Engineer, the Contractor shall carefully extract the full length of each temporary steel casing while the hole is simultaneously being filled with Fine Gravel and without allowing the penetrated soil materials to collapse, or otherwise reduce the specified diameter of the hole. If the Fine Gravel settles in any hole during subsequent pile driving, the hole shall be refilled with Fine Gravel.

The procedures for re-driving the piles shall conform to the relevant provision outlined in Item 942.124. The pile shall be re-driven to the required total nominal geotechnical resistance. The Contractor shall perform a wave equations analysis to determine the capacity of the re-driven pile. If directed by the Engineer, additional dynamic load test shall be performed on the re-driven pile to verify its capacity. The additional dynamic load test will be paid for under Item 948.41.

METHOD OF MEASUREMENT

Item 944.3 will be measured for payment by the FOOT. Measurements will be made for linear feet of obstruction.

BASIS OF PAYMENT

Item 944.3, Drilling for Pile Obstructions, will be paid at the Contract unit price per foot, which shall constitute full compensation for all labor, tools, equipment, materials, and temporary casing installation and removal necessary to complete the work to the satisfaction of the Engineer and disposal of the drilling cutting.

ITEM 983.5**STREAMBED/BANK RESTORATION****TON****DESCRIPTION**

This work shall consist of removing, stockpiling, and replacing river bed material in the proposed bridge replacement and the upstream and downstream approaches in the limits of work. The streambed restoration shall replicate the existing natural channel bed outside the work area in terms of material, roughness, shape, profile, and appearance. The ultimate product will, to the extent possible, replicate the function and appearance of the natural stream channel, as illustrated by photo-documentation herein (Figures A).

The Contractor shall coordinate with his/her sub-contractors to ensure all required equipment is available on-site to complete the work in this manner. The streambed restoration is required to comply with environmental permits issued for the project. MassDOT Environmental Services will provide a Fluvial Geomorphologist (Geomorphologist) to provide a pre-construction meeting, on-site oversight during construction, and assistance during streambed restoration construction to ensure the restoration is constructed as shown on the Plans, as required by these Special Provisions and in accordance with permit requirements.

At least 30 days prior to the commencement of construction, the Contractor shall coordinate with David Paulson (MassDOT Wetlands & Wildlife Unit Supervisor, (508) 389-6366 / david.j.paulson@state.ma.us) to set up an initial (virtual or in person) meeting with MassDOT's Geomorphologist, Contractor, and Resident Engineer. At this meeting, the Geomorphologist will provide an overview of the restoration work. The Contractor should be prepared to discuss the anticipated means, methods, and schedule.

Process Approval:

In lieu of a mockup, the Contractor shall schedule an onsite meeting to discuss the streambed restoration with the Geomorphologist and respective parties from MassDOT. The Geomorphologist shall be onsite during initial streambed restoration. The Contractor shall provide the Geomorphologist adequate access to observe, direct, and inspect the channel restoration work throughout the duration of the removal, stockpile, and reinstallation of the existing streambed material. If material is being brought to the site for streambed restoration, the Contractor shall provide the Geomorphologist with photographs to see the material.

MATERIAL

The top 1.5 feet of streambed material excavated from the existing streambed shall be removed and stockpiled to facilitate reinstallation and replication of the natural streambed. The excavated streambed material below the top 2 feet shall be stockpiled and reused to fill the voids in the proposed riprap placed below the top streambed restoration layer.

ITEM 983.5 (Continued)

In the event that the excavated material is not suitable or there is not enough available suitable material, additional streambed restoration material shall be locally sourced that matches the composition of the existing native river bed. Initial observations at the site revealed that the streambed material generally consists of sand, gravel, and small cobble. Around the bridge, angular boulders with 6- to 18-inch diameter exist intermittently within the streambed, yet these are likely associated with past armoring.

The streambed material must be approved by the Resident Engineer and Geomorphologist prior to use.

Related Items

Crushed Stone. Shall conform to the requirements of Item 156. Crushed Stone and shall be paid for under that item.

Riprap Stone shall conform to the requirements of Item 983. Dumped Riprap and shall be paid for under that item.

CONSTRUCTION**Channel**

The streambed material shall be reinstalled over riprap (MassDOT Item 983.), as depicted on the plans, to an average thickness of 1.5 feet, with variations in thickness as necessary to replicate existing channel conditions. The initial placement of streambed material shall fill / choke the voids in the underlying riprap. Fill voids by shaking stone with the teeth of an excavator bucket, hand tamping with metal tamping rods, and by spraying water to settle fines between large stones. Plate compactors shall not be used. The purpose of filling the voids is to prevent subsurface flow where surface water disappears into large voids between the stone fill below the channel bed surface during low flow conditions. The final streambed shape and appearance shall be finalized in the field as directed by the Geomorphologist.

Reinstallation of the stockpiled streambed material shall be placed on top of the riprap to restore streambed habitat and fish passage. The streambed materials shall be installed during normal low water conditions behind cofferdams in accordance with the environmental permits.

Completion

Once all material has been placed in the stream channel and approved by the Geomorphologist and Resident Engineer, the Contractor shall remove the cofferdams in such a way as to slowly wet the stream to minimize the initial sediment release. Every attempt shall be made to minimize the downstream movement of sediment.

ITEM 983.5 (Continued)

The final streambed shall maintain the general configuration of the existing streambed and there shall be minimal subsurface flow upon final inspection by the Resident Engineer and Geomorphologist. The project must be passable by fish and other aquatic organisms following construction.

The streambed restoration to be measured for payment will be the complete and accepted work for restoration of the streambed within the limits shown on the Plans as approved by the Resident Engineer and Geomorphologist.

BASIS OF PAYMENT

The accepted streambed restoration will be paid for on a lump sum basis. Payment will be full compensation for excavating, stockpiling, transporting, and placing the material specified and for furnishing all labor, tools, equipment, testing, and incidentals necessary to complete the work.

The Geomorphologist will be provided by MassDOT at no cost to the Contractor.

FIGURES





Figure A: Existing Streambed Material Near the Bridge

ITEM 991.1**CONTROL OF WATER - STRUCTURE**
NO. H-08-003=N-07-002**LUMP SUM**

The work under this item shall conform to the relevant provisions of Subsections 140 and 950 of the Standard Specifications and the following:

The work under this item includes all temporary control of water and dewatering measures necessary to accomplish the construction of the proposed abutment. The Contractor shall design, furnish, install, maintain, and cut and/or remove the water control structure as required based upon the actual site conditions. The Contractor shall be responsible for the design of the water control structure.

The water control system shall consist of sandbagging, soldier pile and lagging, or any other system that satisfies the design criteria herein and as shown on the plans. The water control structure must be capable of supporting excavations required for completion of work or shall be used in conjunction with temporary excavation support.

In general, groundwater was encountered above the bottom of the proposed abutments and wingwalls. Therefore, groundwater will likely be encountered in excavations for the proposed structures. If needed, temporary excavation dewatering should be performed so that the work conducted is completed in the dry. It is likely that dewatering may be accomplished by pumping from filtered sumps installed in low points of the excavation. A temporary earth support system with appropriate groundwater cutoff would help to minimize ground water flow into the excavation. Discharge water should be managed in accordance with local, state, and federal government requirements.

The Contractor shall take all steps to fulfill the requirements the Massachusetts DEP Erosion and Sedimentation Controls guidelines. Link to document:

<https://www.mass.gov/files/documents/2016/08/qz/esfull.pdf>

Dewatering of excavation areas shall be conducted to ensure that the proposed bridge substructure is placed in the dry.

The Contractor shall construct and maintain all necessary protective works, shall furnish all materials required and shall furnish, install, maintain, and operate all necessary equipment for the removal of water and control of water in the work area as required. The method of dewatering shall be chosen by the Contractor and approved by the Engineer.

The Contractor shall review the boring logs and site conditions to assess the bearing soils and determine the Contractor's methods for the control of water.

The Contractor should take precautions to reduce subgrade disturbance by diverting storm water run-off away from construction areas and maintaining effective dewatering.

ITEM 991.1 (Continued)

The work to be performed under this item shall include the design, installation, and removal of the water control structure, all pumping, sandbagging, earth operations, dewatering, detention basins, and other measures, required for maintaining sufficient water control, for retaining adjacent embankments, excavation within the channel, and for accomplishing the demolition of the existing structure, and the construction of the proposed structure.

SUBMITTALS

Plans and calculations for water control structures and dewatering methods shall be developed by the Contractor and designed and stamped by a Professional Engineer registered in the Commonwealth of Massachusetts. Prior to the start of construction, the design must be submitted for the approval of the Engineer.

Submittals shall include, but not be limited to, excavation support, if required.

The design for excavation support shall include all construction loads, including but not limited to, earth and water lateral pressures.

CONSTRUCTION METHODS

The Contractor is advised that the effectiveness of the water control method used will vary based on the field conditions and the time at which the actual excavation work is being performed. The Engineer has the right to order the Contractor to stop all excavation operations when in the Engineer's judgement, the Contractor's water control operations are failing to produce adequate results or are posing a threat to the environment.

Upon completion of work, all temporary cofferdams and other protective works shall be completely removed. The Contractor shall be responsible for complete and proper diversion of water during all stages of this project and shall repair, at no additional expense, any damage to the foundations, structures, or any other part of the work caused by floods, high water, or failure of any part of the diversion of protective works for any cause whatsoever. Contractor shall remove and legally dispose of all collected sediment.

BASIS OF PAYMENT

Item 991.1 will be paid for at the contract unit price Lump Sum. This price shall include compensation for the design, installation, removal, and all necessary equipment, pumps, materials, and labor for the control of water.

ITEM 995.01 BRIDGE STRUCTURE, BRIDGE NO.H-08-003=N-07-002 LUMP SUM

The work under this Item shall conform to the applicable provisions of Subsection 995 of the Standard Specifications and the specific requirements stipulated below for the component parts of this Item. For those component parts where no specific requirement is stipulated, the Standard Specifications shall apply except for payment.

Work under this Item shall include all materials, equipment and labor needed to construct the following: single span plate girder bridge with cast-in-place (CIP) reinforced concrete deck with bridge rail, abutments, wingwalls, diaphragms, joints, shear connectors, membrane waterproofing, damp-proofing end and all other items considered incidental to complete the work.

The work does not include any items listed separately in the proposal. Closed cell foam, joint fillers and joint sealers shall be considered as incidental to the work involved in the furnishing and placing of concrete. Payment for materials shown on the Plans as being part of this bridge structure or which may be incidental to its construction and are not specifically included for payment under another Item shall be considered incidental to the work performed under this Item and shall be included in the unit price of the component of which they are a part.

STRUCTURAL STEEL

All structural steel shall be AASHTO M270, Grade 50 and conform to Subsection 960. The plate girders shall be metallized. The metallizing coating system shall not be applied at the splice.

THERMAL SPRAYED COATING (METALIZING) SHOP APPLIED**PURPOSE**

This section provides the requirements for shop performed surface preparation; the application of a thermal spray coating (TSC/metallizing); the application of a coating system; and includes field application of coatings and repairs and touch up of all coatings after site erection of the coated structure.

GENERAL INFORMATION

1. All fabrication shall be completed prior to the application of a thermal sprayed coating. (TSC)
2. All surfaces to be coated shall be cleaned in accordance with SSPC SP-5.
3. All TSC shall be sealed with an approved sealer, except for faying surfaces.
4. After site erection of the structure, perform field touch-up of any damaged coating.
5. All fasteners shall be galvanized and coated with the intermediate and topcoat if applicable.
6. The products of only one thermal spray wire manufacturer and one coating manufacturer shall be used on the entire project.
7. All field painting shall be in accordance with applicable sections of Item 961 of the MassDOT Standards and Specifications.

ITEM 995.01 (Continued)**MATERIALS****Abrasives**

Provide abrasives that are clean, dry, and sized properly to provide the specified surface profile. The profile shall be dense, uniform and of sufficient angularity to be acceptable for the application of TSC.

Abrasives shall conform to the following as applicable:

- SSPC-AB 1 for mineral slag abrasives
- SSPC-AB 2 for recycles ferrous metal abrasives
- SSPC-AB 3 for new steel abrasives

Thermal Spray Feedstock

The contractor shall provide material certificates from the supplier that includes the chemical composition and lot number of the wire. MassDOT will perform random sampling of wire from lots provided. Wire shall conform to ASTM A833. See table below for application and selection of wire type, thickness, and coating system.

Environmental Zone 2 shall be used for this project.

ENVIRONMENTAL ZONE*	WIRE TYPE	THICKNESS (mils)**	COATING SYSTEM***
1	Zinc-Aluminum	6-9	Three Coat
	Zinc-Aluminum	6-9	Sealer Only
2	Zinc- Aluminum	8-11	Three Coat
	Zinc-Aluminum	9-12	Sealer Only
3	Zinc Aluminum	9-12	Three Coat
	Zinc Aluminum	12-15	Sealer Only

***Zone 1** – Bridges in rural environments, not over waterways, and not over high speed state or interstate highways with potential for salt spray and heavy salt use and de-icing chemical use.

***Zone 2** – Bridges in urban environments, near industrial and manufacturing plants, power plants, or warehouses, over heavy road traffic, or over waterways.

***Zone 3** – Bridges in marine environments, over or close to saltwater waterways, or over high speed state or interstate highways with potential for salt spray and heavy salt use and de-icing chemical use.

** Mil thickness on faying surfaces shall meet the requirements of the slip certificate.

*** Coating systems shall consist of a three coat paint system applied over the metalized surface or a clear sealer applied over the metalized surface.

ITEM 995.01 (Continued)**SUBMITTALS**

Submit the following information to the MassDOT - Highway for approval a minimum of thirty days prior to beginning any coating operations:

- A. Manufacturer's recommendation and field history for the coating system proposed. Include data sheets for all selected coatings to be applied.
- B. Procedures for shop surface preparation, the application of the TSC and application of coatings.
- C. Procedures for coating of field connections.
- D. Procedures for field touch-up surface preparation, application of TSC and application of coating.
- E. Proposed abrasive for use in the shop.
- F. Proposed thermal spray wire to be used and product data sheets. Provide certification of Class B slip coefficient.
- G. A copy of SSPC-QP3/AISC (SPE) certification. This certification must be in effect at the time of bid and must remain in effect throughout the duration of the project.
- H. Quality Systems Manual
- I. Work schedule. Contractor must notify the Engineer a minimum of seven days prior to starting work.

QUALITY CONTROL

- A. The shop performing the application of TSC and coating shall be certified by the American Institute of Steel Construction (AISC) Sophisticated Paint Endorsement (SPE) quality program, or under the Society for Protective Coatings (SSPC) QP3 program, "Standard Procedure for Evaluating Qualification of Shop Painting Applicators" and shall maintain certification throughout the project.
 - 1. The coating applicator shall have completed a minimum of three structural steel TSC projects that utilized the same coating system as that being specified on this project. Provide project locations, TSC/painting; name, e-mail address, and the telephone number of the owner or owner's representative.
- B. Provide an on-site Quality Control Specialist (QCS) who shall function as a TSC inspector with a minimum of five years of each TSC and coating application experience; and possess SSPC BCI Level 1 or NACE Certified Level 3 or other related certification as accepted by the MassDOT - Highway. The QCS shall not be a foreman or a member of the Contractor's production staff. The QCS's sole purpose shall be quality control testing, inspection and reporting.

PRE-APPLICATION MEETING

A pre-application meeting will be held prior to any steel fabrication that includes the application of thermal spray applied coatings. This meeting is separate from the pre-construction meeting for the entire project.

The following parties are required to attend this meeting: TSC/applicator, QCS, and MassDOT – Highway Representatives. Other project personnel should attend as may be needed.

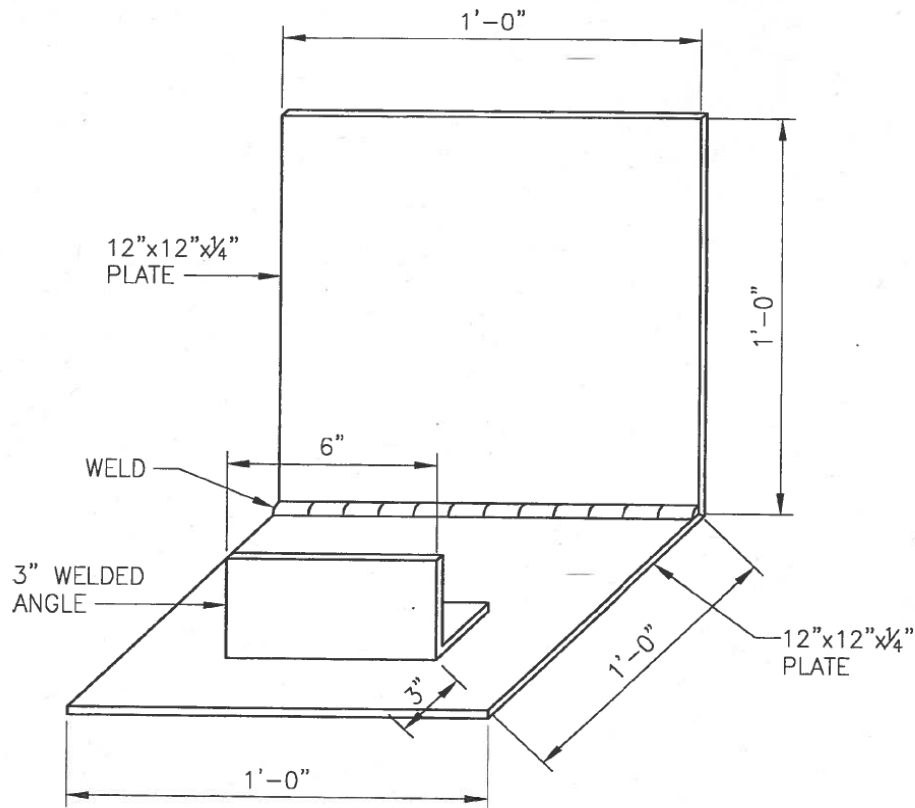
ITEM 995.01 (Continued)**PERSONNEL QUALIFICATION**

The applicators of the thermally applied material shall be individually qualified to apply the TSC as follows:

1. Each applicator must complete a practical test designed to demonstrate the ability to set up and operate the equipment to apply the material to the specified thicknesses to a minimum of 10 square feet of representative steel surfaces, and to successfully pass the surface preparation, bend, and cut tests specified herein. Administer the qualification testing, document the results in writing, and retain the bend test coupons for the duration of the project.
2. At the discretion of MassDOT - Highway, requalify the applicators at any time during the project to reconfirm the proficiency and the quality of the workmanship being provided. This may be required at any time due to unacceptable or failing results of the bend test, cut test, or poor workmanship.

SHOP QUALIFICATIONS

Prior to proceeding with the production blast cleaning operations prepare a minimum of five Job Reference Standards (JRS) test plates. Blast clean all surfaces of each test plate using the same equipment and abrasive that will be used for the production work. After acceptance of the surface cleanliness and profile, apply the TSC to all surfaces of each test plate. After acceptance of the TSC apply the sealer to be used with the three coat system to three test plates excluding the bottom surface of all test plates. After curing apply a coat of epoxy to two of the three test plates excluding the bottom surface. After curing apply a coat of the polyurethane topcoat to one test plates on all surfaces excluding the bottom surface. Apply the clear sealer to the last remaining TSC plate. Bottom surfaces of the prepared plates shall be used for cut testing as specified. Surface preparation and application shall be witnessed by a MassDOT representative. *See drawing below for dimensions and construction*

ITEM 995.01 (Continued)**Configuration of JRS Test Plates****SURFACE PREPARATION**

For cleaning that utilizes compressed air, utilize only clean, dry air. Conduct blotter test(s) in accordance with ASTM D4285 a minimum of one time each shift for each compressor system in use to verify that the air supply is free of moisture and oil contamination. Conduct the tests in the presence of the MassDOT – Highway Representative.

Weld Spatter, Sharp Edges, Flame-Cut Steel, Holes, Fins, and Silvers

Remove slag, flux deposits, fins, slivers, burrs, and weld spatter from the steel. Grind any sharp edges around holes. Break all flame-cut and sheared edges. If blast profile is degraded by grinding restore profile by abrasive blasting.

Solvent Cleaning

Where oil and grease are present on the bare steel, remove by solvent cleaning to SSPC-SP 1 prior to blast cleaning. If contamination remains after blast cleaning, reclean with solvent prior to application of the TSC.

ITEM 995.01 (Continued)

Cleaning of galvanized bolts prior to the application of paint to bolted connections in the shop or in the field all galvanized fasteners shall be cleaned of all lubricating wax. Cleaning shall be in accordance with SSPC-SP-1, Solvent Cleaning, method 4.1.1. The contractor is responsible to identify the solvent and method needed to remove all lubricant. Cleanliness will be determined by the use of a white cloth wipe test. The test will be performed by the engineer using a clean white cloth and the same solvent used by the Contractor for cleaning. The cloth shall be wetted and rung to a damp condition, placed on selected fasteners and rubbed with a twisting motion around the entire exposed surface of the previously waxed surfaces of the fastener. A minimum of 3 alternating rotations shall be done. Acceptance of cleanliness is with no color transfer to the cloth. A minimum of 10% of the bolts at each bolted connection shall be tested for cleanliness.

Abrasive Blasting

Blast clean all steel to, SSPC-SP5 "White Metal Surface Cleanliness." Determine the SP5 condition by use of SSPC-Vis 1. In the event of a conflict between the pictorial standard and the written definition the written definition shall prevail. Abrasive blast cleaned surfaces shall have a dense, uniform pattern of sharp, angular depressions and ridges, between 3.5-5.0 mils.

Surface preparation is defined as complete when all remedial repairs have been performed and the piece is accepted by both QC and MassDOT QA.

Verification of the profile height will be performed in accordance with ASTM D 4417 Method C.

Manual Blasting shall have a minimum of one profile depth measurement every 10 to 20 ft², of blasted surface.

Automated Blasting shall have a minimum of two profile depth measurements every 100 ft². When acceptable results are obtained on three consecutive days in which testing is conducted, the test frequency may be reduced to two spot readings for every 1,000 ft² providing the preparation method remains unchanged. If unacceptable results are encountered during testing or the preparation method has changed in any way, testing will revert back to a frequency of two tests per every 100 ft², until acceptable results are once again achieved over a three day period.

Profile replica tape shall be filed with the project inspection records. The Engineer with the use of a surface profile comparator will randomly inspect angularity of the profile.

The use of steel shot is not permitted.

TSC AND COATING APPLICATION**Storage, Testing and Sampling**

The Contractor shall provide protection from the elements and insure that the paint is not subjected to temperatures outside the manufacturer's recommended extremes.

ITEM 995.01 (Continued)

Before the Contractor will be permitted to use any paint, the material provided for application shall have been sampled, tested and approved in accordance with Section M7. MassDOT's Research and Materials Laboratory needs a minimum of fourteen days after the receipt of samples to test and approve.

Mixing and Thinning

Before the paint is applied, each component shall be mechanically mixed to ensure the pigment is completely dispersed. Mixing of components shall be accomplished by mechanical mixing, boxing or hand mixing of components will not be allowed. Any special precautions or requirements for mixing by the manufacturer shall be followed. Paint shall be kept thoroughly mixed in spray pots or containers during application. The pot life shall not be exceeded or attempts made to extend pot life with the addition of solvent.

If it is necessary for any reason to thin paint it will be done in the presence of the Engineer, in accordance with the manufacturer's recommendations. Thinning must be performed using a measuring cup marked in ounces or milliliters. Other methods, such as eyeballing, are not acceptable. Thinner shall be supplied from and recommended by the same manufacturer as the paint system.

For multi component paints, the mixing of half or partial kits is not allowed. If the need for small quantities of paint is anticipated, the contractor should order materials accordingly.

Application

Prior to the application of any coating material, the Engineer's approval must be obtained. All surfaces painted prior to the Engineer's approval, shall require the complete removal of the coating applied.

Thermal Sprayed Coating

Apply the TSC within six hours after the final abrasive blast cleaning is performed. If the steel is blast cleaned and remains unmetalized for longer than six hours, or if cleaned steel exhibits evidence of rustback, blast clean it again prior to metalizing. Remove abrasive residue and dust from the surface. Apply the metalizing only after the MassDOT – Highway Representative has accepted the prepared surface.

Bend Testing for Evaluation of the TSC

Conduct bend tests of applied TSC each day prior to production application. Unless otherwise directed by the MassDOT - Highway, each day that TSC will be applied, conduct bend testing before beginning the production work. For each TSC applicator, blast clean five carbon steel coupons measuring 0.05 inches in thickness, 2 inches width, and between 5 and 8 inches in length. Use the same equipment and abrasive used for the production work. Have each applicator apply the TSC to five coupons in accordance with the requirements of this Section to dry film thickness between 8 and 15 mils. Conduct 180° bend testing on all five coupons using the appropriate mandrel in accordance with the requirements and acceptance criteria of SSPC-CS 23. Minor cracks that cannot be lifted from the substrate with a knife blade are acceptable. If lifting on any of the coupons is possible, modify the surface preparation/TSC process until acceptable results are achieved before proceeding with the production work.

ITEM 995.01 (Continued)

Apply the TSC in accordance with the requirements of the material supplier, this specification, approved procedures and SSPC-CS 23.

The completion of TSC is defined as after the spraying of TSC is complete and all remedial repairs have been performed and the piece is accepted by both QC and MassDOT QA.

Touch-up of bare steel and/or TSC damage shall be done with organic zinc rich primer. The total area subject to repair shall be no more than .50 % of the total square foot of the piece requiring repair. The dry film thickness of the applied coating shall be a minimum of 5 mils. Surface preparation for all repair areas shall be as specified in, "Surface Preparation and Abrasives" paragraph 3. The maximum individual repair shall be limited to 1 square foot. Areas larger than 1 square foot shall be re-blasted and the TSC applied in accordance with this document.

Sealer Coat

Apply the seal coat to the TSC after the MassDOT – Highway Representative has accepted the TSC. The seal coat shall be thin enough when applied to penetrate into the body of the TSC and seal the porosity. Added thickness to porous TSC should not be measurable. Typically the seal coat is applied at a spreading rate resulting in a theoretical 1.5 mils dry film thickness. Apply the seal coat in accordance with the manufacturer's instructions as soon as possible after the application of the TSC but in no case greater than 6 hours. Verify that the TSC surface is clean and dry prior to the application of the sealer. If grease, oil, or similar contaminants become deposited on the TSC, remove them in accordance with SSPC-SP 1 prior to the application of the seal coat.

Paint

Applied coatings shall not exhibit, runs, sags, holidays, wrinkling, pinholes, nap hair, topcoat gloss or color variations, or other film discontinuities.

Repair of unacceptable areas that involve removal of the coating system or part of it, shall require surface preparation and coating equal to that specified. Repair procedures used for any unacceptable coating shall be those supplied by the contractor and approved by the Engineer.

Application of full coats of paint shall be accomplished by spray equipment. Spray equipment shall meet the requirements of the coating manufacturer and be in proper working order.

Application by brush and roller will be allowed for limited access areas. Brushes and roller covers recommended by the coating manufacturer shall be used. Areas brushed and rolled will have a uniform thickness and be free of defects and excessive coating thickness.

All coating shall be applied according to the latest manufacturer's data sheet or approved recommendations. The maximum recoat times of the primer, intermediate and finish coats shall not be exceeded.

Application of coatings shall not be done when the relative humidity is above 85% or when the surface temperature of the steel is less than 5°F above the Dew Point. Paint shall not be applied when the surface temperature is below 50°F or when the surface temperature is above 110°F.

ITEM 995.01 (Continued)

If requested by the Engineer the Contractor shall provide written instructions from the coating manufacturer indicating the length of time that each coat must be protected from cold or inclement weather (e.g., exposure to rain) during its curing or drying period.

Paint shall not be applied when, in the Engineer's judgment, conditions are or will become unsatisfactory for application and proper cure. All changes as to the application parameters other than specified must be the manufacturer's and presented in writing and approved by the Engineer. Ambient conditions should be closely monitored so that proper cure/drying is achieved prior to recoat. In no case shall a succeeding coat of paint be applied before the previous coat has cured/dried sufficiently for recoat as per manufactured data sheet.

If required, contaminated surfaces shall be cleaned in accordance with SSPC- SP 1 Solvent Cleaning method 4.1.1.

Measurement of the ambient conditions shall be done in accordance with ASTM, E 337 Test Method for "Measuring Humidity with a Psychrometer" (the Measurement of Wet and Dry bulb Temperatures).

When the primer has cured sufficiently for recoat, all bridge components to be painted shall receive a full intermediate coat.

When the intermediate coat has cured sufficiently for recoat, all bridge components to be painted shall receive the finish coat.

Coating Thickness

Apply the shop and field coats to the dry film thicknesses as specified.

1. Determine the cumulative dry film thickness of each coat using a magnetic dry film thickness gage in accordance with SSPC-CS 23 and SSPC-PA 2 with the following exceptions:
 - a. Take readings on each 100 square-foot increment of the surface.
 - b. The minimum specified thickness of the TSC must be achieved at each individual spot measurement location (i.e., the 20 percent under run allowed by SSPC-PA 2 is not permitted for the metalizing).
2. If the thickness of any coat (TSC, seal coat, intermediate coat or top coat) is less than specified, apply additional material in accordance with the manufacturer's instructions and this Section before applying the next coat. Before applying additional TSC, visually confirm that there is no evidence of oxidation or contamination on the surface.
3. Thickness of applied TSC greater than the contract specified shall be reported to the MassDOT-Highway QA inspector in writing prior to the end of the shift. The thickness of the applied TSC shall not be more than 120% of the specified range for the zone specified.
4. Application of TSC to faying surfaces that require a slip rating shall not be more than the maximum thickness specified in the environmental zone chart for each zone included in the materials section of this specification.

ITEM 995.01 (Continued)

5. The minimum adhesion value of the unsealed TSC shall be the average of 3 spot reading resulting in an average of 700psi for each 500 sq/ft.

Access for MassDOT - Highway Inspection

Provide safe access and sufficient time for MassDOT - Highway inspections for any and all phases of the work, including but not limited to surface preparation, the application of each coat (including field coat), and for an inspection of the completed system.

Quality Control Documentation

Copies of Quality Control daily inspection and testing documents will be provided to the MassDOT – Highway Representative within 24 hours.

CONCRETE MIX:

The following Special Provisions shall apply to items included in Item 995.01:

5000 PSI, 3/4 INCH, 685 HP CEMENT CONCRETE

5000 psi, 3/4 inch, 685 HP cement concrete shall conform to subsection 901 and be used for the deck, cast-in-place diaphragms, abutment stems, pedestals, wingwall stems, approach slabs, and precast highway guardrail transitions.

5000 PSI, 3/8 INCH, 710 HP CEMENT CONCRETE

5000 psi, 3/8 inch, 710 HP cement concrete shall conform to subsection 901 and be used for the CT-TL2 barrier.

PRECAST HIGHWAY GUARDRAIL TRANSITIONS**General.**

The work under this Heading consists of fabricating, transporting and installing *precast highway guardrail transitions* and includes all necessary labor, materials, and equipment to complete the work as shown on the Plans. The work shall conform with the MassDOT Standard, Supplemental, and Interim Specifications and the requirements of the current AASHTO LRFD Bridge Construction Specifications, supplemented by the current relevant provisions of the latest edition of PCI MNL-116 (The Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products), except as noted herein.

ITEM 995.01 (Continued)**QUALITY ASSURANCE****A. General.**

Quality Assurance includes all the planned and systematic actions necessary to provide confidence that a product or facility will perform satisfactorily in service. It is an all-encompassing term that includes Quality Control (performed by the Fabricator) and Acceptance (performed by MassDOT). Quality Control is the system used by the Contractor and Fabricator to monitor and assess their production processes at the plant facility and installation activities at the project site to ensure that the final product will meet the specified level of quality. Acceptance includes all factors used by MassDOT to determine the corresponding value for the product. MassDOT Acceptance inspection at the plant facility is intended as a means of evaluation of compliance with contract requirements. Contractor and Fabricator Quality Control activities and MassDOT Acceptance activities shall remain independent from one another. MassDOT Acceptance activities shall not replace Fabricator Quality Control activities.

B. Fabricator Quality Control.

Quality Control shall be performed by the Fabricator to ensure that the product is fabricated in conformance with the specifications herein. The Fabricator shall maintain a Quality Control system to monitor, assess, and adjust placement and fabrication processes to ensure the Precast Concrete Bridge Element(s) meet the specified level of quality, through sufficient Quality Control sampling, testing, inspection, and corrective action (where required). The Fabricator's Quality Control system shall address all key activities during the placement and fabrication and shall be performed in conformance with the Fabricator's NPCA or PCI Certification. Quality Control documentation shall meet the requirements of the *Fabricator Quality Control – Documentation* section below. Upon request, Fabricator Quality Control documentation shall be provided to the MassDOT Plant Inspector.

Plant.

Prior to the fabrication of Precast Concrete Bridge Elements, the Fabricator's precast concrete plant shall obtain the following:

- (a) Certification by the National Precast Concrete Association (NPCA) Plant Certification Program or Precast/Prestressed Concrete Institute (PCI) Plant Certification Program, for the applicable types of Precast Concrete Bridge Element(s) being fabricated
- (b) MassDOT Prequalification
- (c) MassDOT Mix Design Approval

All concrete for a given Precast Concrete Bridge Element shall be produced by a single company and plant, unless otherwise approved by the Engineer.

Personnel.

The Fabricator shall provide adequate training for all QC personnel in accordance with NPCA or PCI certification. There shall be sufficient personnel trained and certified to perform the tests listed under Subsection M4.02.13, Part D. At a minimum, the Fabricator's Quality Control Personnel shall maintain the following qualifications and certifications:

ITEM 995.01 (Continued)

- (a) QC Manager with an active NETTCP Field Technician or ACI Concrete Field Testing Technician – Grade I certification or higher, and a minimum of 4 years continuous experience in the manufacture of Precast Concrete Bridge Elements for state transportation departments. The QC Manager shall be on site while the batch plant is producing and placing concrete for MassDOT projects.
- (b) A Technician/Inspector having the Precast/Prestressed Concrete Institute (PCI) Technician/Inspector Level I or NorthEast Transportation Training and Certification Program (NETTCP) Precast Concrete Inspector, or higher.

The Contractor shall submit to the Engineer a copy of the Fabricator's Quality Control Personnel required qualifications, as specified above.

Laboratory.

The Fabricator shall provide a room of sufficient size to house all equipment and to adequately perform all testing. The room shall have either a separate moisture storage room or curing box for concrete cylinders, and it shall be thermostatically controlled to maintain temperatures consistent with AASHTO T 23. It shall include a desk and file cabinet for proper record keeping, and have good lighting and ventilation. This room shall be kept for testing and quality control and not used for any other purpose. An additional desk and file cabinet shall be provided for exclusive use of the Engineer. No exception from these requirements will be allowed without the express written permission of the Engineer.

Testing Equipment.

At a minimum, the Fabricator's plant facility shall have the following testing equipment:

- (a) Air Content Meter Type A or B: AASHTO T 152
- (b) Air Content Meter Volumetric Method: AASHTO T 196 (Required for Lightweight Concrete)
- (c) Slump Cone: AASHTO T 119
- (d) Cylinder Molds AASHTO M 205
- (e) Concrete Testing Machine: AASHTO T 22
- (f) Screening Sieve: AASHTO T 27, AASHTO T 11
- (g) Curing Box: AASHTO T 23
- (h) Spread Test Base Plate for Self-Consolidating Concrete (SCC): ASTM C1611
- (i) All other equipment prescribed by AASHTO and ASTM standards for the tests to be performed by the Fabricator as specified

Inspection.

Quality Control personnel shall monitor and inspect the fabrication of each Precast Concrete Bridge Element. Quality Control personnel shall report all inspection activities on Quality Control Inspection Reports and non-conformances on Non-Conformance Reports (NCRs) throughout the entire fabrication process, as specified herein.

Temperature Monitoring.

At a minimum, the Fabricator shall monitor, record, and report the temperatures of the form, ambient temperatures surrounding the concrete, and temperatures of the concrete continuously, without interruption as specified below:

ITEM 995.01 (Continued)

- (a) Prior to placement of concrete to verify that $T_i \geq 50^\circ\text{F}$.
- (b) Immediately after placement to verify that $T_i \geq 50^\circ\text{F}$ is maintained.
- (c) Throughout the entire duration of the curing cycle, at regular intervals not to exceed one hour until 100% Design Strength (f'_c) is attained and concrete has cooled to within 40°F of the ambient temperature surrounding the Precast Concrete Bridge Element.

At a minimum, the temperature measuring devices shall record and report the temperature of the concrete to the nearest 2°F . At least two temperature sensors (thermocouples) shall be positioned to record the maximum and minimum anticipated concrete temperatures. The anticipated minimum temperature shall be measured with one or more thermocouples at a distance no greater than 2 inches from the surface of the thinnest section. The anticipated maximum temperature shall be measured with one or more thermocouples at the center of the thickest section. Proposed temperature measurement locations shall be submitted to the Engineer for approval. Temperature recording devices shall be located within the curing enclosure and calibrated as required by PCI MNL-116 Section 4.18.4. Maximum heat increase and cool down rates shall comply with PCI MNL-116, Section 4.19. The Contractor shall furnish temperature logs recorded at a minimum frequency of once per hour to the Inspector as required, with each post-pour QC inspection report.

Sampling and Testing.

At a minimum, the Fabricator shall perform random Quality Control sampling and testing as specified in *Table 1: Quality Control Sampling and Testing*. The Fabricator shall perform additional Quality Control sampling and testing on concrete that has been retempered with admixtures or hold-back water during fabrication. Test Specimens shall conform to the requirements of Section M4.02.13 of the MassDOT Standard and Supplemental Specifications and AASHTO R 60, with the exception of the Stripping (80% f'_c) set of cylinders. Stripping (80 % f'_c) cylinders shall be cured in the same location and environment as the Precast Bridge Elements they represent. If approved by the Engineer, compressive strength cylinder match curing equipment, that maintains the same concrete conditions that the corresponding Precast Bridge Element is exposed to, may be utilized in lieu of Stripping (80 % f'_c) field cured cylinders, with the use of thermocouples, controllers, and heaters.

Table 1: Quality Control Sampling and Testing

Quality Characteristic	Test Method	Sample Size	Specification Limit	Lot Size (c)	Sublot Size (d)	Frequency	Point of Sampling
Slump (in.) ^(a)	AASHTO T 119	Per AASHTO	≤ 8 in. or as approved by the Engineer	Total Quantity of Concrete (cy) produced on a Contract, per Type of Element fabricated, per Mix Design	20 cy	One (1) per Sublot or fraction thereof	Point of Discharge
Air Content (%)	AASHTO T 152	Per AASHTO	$5\% \leq \% \leq 8\%$				
Temperature (°F)	AASHTO T 309	Per AASHTO	$50^{\circ}\text{F} \leq ^{\circ}\text{F} \leq 90^{\circ}\text{F}$				
Compressive Strength (psi)	AASHTO T 22 AASHTO T 23	Stripping Cylinders: One (1) set of Three (3) 4 x 8 in.	$\geq 80\% f'_c$ at Stripping				
		7-day Cylinders: One (1) set of Three (3) 4 x 8 in.	For Information at 7 days				
		28-day Cylinders: One (1) set of Three (3) 4 x 8 in.	$\geq 100\% f'_c$ at 28 days				
		56-day Cylinders: One (1) set of Three (3) 4 x 8 in.	$\geq 100\% f'_c$ at 56 days ^(b)				

Notes:

- (a) Self-consolidating concrete (SCC) shall meet the requirements of M4.02.17.
- (b) 56-day Compressive Strength test specimens shall require testing only when 28-day Compressive Strength test specimens have failed to meet Design Strength (f'_c).
- (c) Lot shall be defined as a specific quantity of material from a single source, produced or placed by the same controlled process.
- (d) Sublot shall be defined as an equal division or part of a Lot from which a sample of material is obtained in order to assess the Quality Characteristics of the Lot.

ITEM 995.01 (Continued)**Certificate of Compliance.**

The Fabricator shall provide a Certificate of Compliance in accordance with Standard Specifications, Division I, Section 6.01, stating that QC test cylinders have achieved the design strength, f'_c . A Certificate of Compliance shall accompany each shipment and shall be presented to the MassDOT Resident Engineer or designee upon delivery to the site.

Documentation.

At a minimum, the Fabricator shall maintain a filing system for the following QC records and documentation. All QC records and documentation shall be made available to MassDOT upon the request of the Department.

- (a) Current MassDOT Approved Mix Design Sheet(s) and Approval Letter(s)
- (b) PCI or NPCA Certification
- (c) Current Qualifications and Certifications for QC Manager(s) and QC Technician(s)
- (d) Most current set of Approved Shop Drawings
- (e) Approved Placement, Finishing and Curing Plan
- (f) Approved Dunnage Plan
- (g) Fabricator Certificate of Compliance for each fabricated Precast Concrete Bridge Element
- (h) Admixture Manufacturer's Certification of Compliance for each approved Admixture
- (i) Completed QC Inspection Report for each fabricated Precast Concrete Bridge Element
- (j) Identification Number for each fabricated Precast Concrete Bridge Element
- (k) Time and date of casting of each fabricated Precast Concrete Bridge Element
- (l) Date of stripping of each fabricated Precast Concrete Bridge Element
- (m) Batch Ticket Printout reporting the quantity of concrete produced for each batch of concrete produced
- (n) Concrete temperature records for each Precast Concrete Bridge Element fabricated
- (o) QC Test Report Forms for each subplot of concrete produced
- (p) Non-Conformance Reports (NCRs)
- (q) Documentation of Repairs (if applicable)

Acceptance.

MassDOT will perform Acceptance inspection, sampling, and testing during fabrication and installation, to evaluate the quality and degree of compliance of the fabricated Precast Concrete Bridge Element to MassDOT specifications. Additionally, MassDOT Inspectors will monitor the Fabricator's Quality Control activities to ensure the Fabricator is properly administering Quality Control in conformance with the Fabricator's NPCA or PCI Certification. Acceptance inspection and test results not meeting MassDOT specifications will result in Non-conformance Reports (NCR) being issued by MassDOT to the Fabricator or Contractor for corrective action. Final Acceptance for the fabricated Precast Concrete Bridge Elements shall be determined by MassDOT.

ITEM 995.01 (Continued)**1. Inspection.**

A MassDOT MassDOT Inspector will be assigned to perform Acceptance activities during fabrication, which includes the inspection of the materials, work procedures, and Precast Concrete Bridge Elements. At least seven (7) days prior to the scheduled start of fabrication, the Fabricator shall contact the MassDOT Research and Materials Section (RMS) to provide notice of the scheduled fabrication start date. The Fabricator shall complete the following activities prior to notifying MassDOT RMS of the scheduled start date:

- (a) Receive approval for all submitted Fabricator cement concrete mix designs from the MassDOT Research and Materials Section for the current year, as specified under the *Mix Design* section and *Table 3: Trial Batch Sampling Testing for New Mix Designs*. Self-consolidating concrete shall meet the requirements of M4.02.17.
- (b) Receive approval for the submitted Fabricator Placement, Finishing, and Curing Plan from the MassDOT Research and Materials Section, as specified under the *Placement, Finishing, and Curing Plan* section.
- (c) Receive Engineer of Record approved shop drawings from the MassDOT Research and Materials Section as specified under the *Shop Drawings* section.
- (d) Participate in the pre-production meeting, as described under the *Pre-Production Meeting* section (if required).

Prior to the start of fabrication, the Fabricator shall review the fabrication schedule with the MassDOT Inspector. Fabrication shall only proceed when:

- (a) The QC Inspector and MassDOT Inspector are present to inspect the Precast Concrete Bridge Element(s) being fabricated.
- (b) The QC Manager is present at the Fabricator's plant.

The Fabricator shall grant access to all required areas of the Fabricator's plant to the MassDOT Inspector, during the hours of fabrication. Fabrication without MassDOT Inspector access to required areas is prohibited, and will result in the rejection of the fabricated Precast Concrete Bridge Element(s).

Additionally, the MassDOT Inspector will monitor the adequacy of the Fabricator's Quality Control activities. MassDOT Inspector Acceptance activities performed at the Fabricator's plant shall remain independent from the Fabricator, and does not replace the Fabricator's required Quality Control activities.

2. Sampling and Testing.

At a minimum, the MassDOT Inspector will perform random Acceptance sampling and testing for each Sublot of concrete produced as specified in *Table 2: Acceptance Sampling and Testing*. The MassDOT Inspector will also perform Acceptance sampling and testing on concrete that has been retempered with admixtures or hold-back water during production. Test Specimens will conform to the requirements of Section M4.02.13 of the MassDOT Standard and Supplemental Specifications and AASHTO R 60.

ITEM 995.01 (Continued)**Table 2: Acceptance Sampling and Testing**

Quality Characteristic	Test Method	Sample Size	Specification Limit	Lot Size (c)	Sublot Size (d)	Frequency	Point of Sampling
Slump (in.) ^(a)	AASHTO T 119	Per AASHTO	≤ 8 in. or as approved by the Engineer	Total Quantity of Concrete (cy) produced on a Contract, per Type of Element fabricated, per Mix Design	20 cy	One (1) per Sublot or fraction thereof	Point of Discharge
Air Content (%)	AASHTO T 152	Per AASHTO	$5\% \leq \% \leq 8\%$				
Temperature (°F)	AASHTO T 309	Per AASHTO	$50^{\circ}\text{F} \leq ^{\circ}\text{F} \leq 90^{\circ}\text{F}$				
Compressive Strength (psi)	AASHTO T 22 AASHTO T 23	7-day Cylinders: One (1) set of Three (3) 4 x 8 in.	For Information at 7 days				
		28-day Cylinders: One (1) set of Three (3) 4 x 8 in.	$\geq 100\% f'_c$ at 28 days				
		56-day Cylinders: One (1) set of Three (3) 4 x 8 in.	$\geq 100\% f'_c$ at 56 days ^(b)				

Notes:

- (a) Self-consolidating concrete (SCC) shall meet the requirements of M4.02.17.
- (b) 56-day Compressive Strength test specimens shall require testing only when 28-day Compressive Strength test specimens have failed to meet Design Strength (f'_c).
- (c) Lot shall be defined as a specific quantity of material from a single source, produced or placed by the same controlled process.
- (d) Sublot shall be defined as an equal division or part of a Lot from which a sample of material is obtained in order to assess the Quality Characteristics of the Lot.

ITEM 995.01 (Continued)**MATERIALS****A. Materials.**

Materials shall meet the following specifications (if applicable):

General	M4.00.00
Portland Cement	M4.01.0
Blended Hydraulic Cements	M4.01.1
Fly Ash	M4.01.2
Cement Concrete	M4.02.00
Cement	M4.02.01
Cement Mortar	M4.02.15
Aggregates	M4.02.02
Lightweight Aggregates	M4.02.03
Water	M4.02.04
Cement Concrete Additives	M4.02.05
Proportioning	M4.02.06
Mixing and Delivery	M4.02.10
Test Specimens	M4.02.13
Mortar for Filling Keyways	M4.04.0
Slag	AASHTO M 302
High Performance Concrete	M4.06.1
Self-Consolidating Concrete (SCC)	M4.02.17
Controlled Low-Strength Materials	M4.08.0
Reinforcing Bars	M8.01.0
Epoxy Coated Reinforcing Bars	M8.01.7
Galvanized Reinforcing Bars	M8.01.8
Welded Wire Reinforcement	M8.01.2
Mechanical Reinforcing Bar Splicer	M8.01.9
Lifting Devices	PCI MNL-116
Corrugated Metal Pipe	AASHTO M 36

1. Cement Concrete Mix Design.

The cement concrete shall be comprised of specified proportions of water and MassDOT approved aggregates, cement, supplementary cementitious materials (SCMs), and admixtures to form a homogenous composition. Cement concrete for Precast Concrete Bridge Elements shall meet the requirements of M4.06.1 High Performance Cement Concrete, with the exception that the "Total Cementitious Content" specified shall be considered the "Maximum Allowable Cementitious Content". When used, self-consolidating concrete (SCC) shall meet the requirements of M4.02.17.

Prior to production of cement concrete, the Fabricator shall report and submit all proposed mix design formulations and its constituent materials onto the MassDOT Cement Concrete Mix Design Sheet to the MassDOT Research and Materials Section for review and approval. All mix design yields shall be designed for 1.0 cubic yards of concrete, with an allowable tolerance of +/- 1.0 %. All liquids incorporated into the proposed mix design(s) shall include both water and admixtures in the liquid mass calculation.

ITEM 995.01 (Continued)

During production of cement concrete, the Fabricator shall not alter the previously approved mix design formulation or its constituent materials. Proposed alterations in source, type, batch quantity, or gradation to any of the constituent materials of the previously approved mix design formulation shall require a new MassDOT Mix Design Sheet submission to the MassDOT Research and materials Section for review and approval. Fabrication shall not occur without prior MassDOT mix design approval.

The Fabricator shall notify MassDOT RMS to schedule trial batch testing for the new mix design(s). Trial batch testing shall meet the following requirements:

- (a) Performed by a qualified laboratory and/or AASHTO accredited laboratory.
- (b) Performed and/or sampled in the presence of a MassDOT Inspector.
- (c) Meet the requirements as specified in *Table 3: Trial Batch Sampling Testing for New Mix Designs*. Self-consolidating concrete (SCC) shall meet M4.02.17.

Failure to perform all of the required trial batch testing or provide MassDOT RMS trial batch test results within the Specification Limits (as specified in Table 3) will result in the disqualification of the Fabricator's proposed mix design(s).

Table 3: Trial Batch Sampling and Testing for New Mix Designs

Quality Characteristic	Test Method	Sample Size	Specification Limit	Performed By
Slump ^(a)	AASHTO T 119	Per AASHTO	Max. 8 inches or as approved by the Engineer	Quality Control
Air Content (AC)	AASHTO T 152	Per AASHTO	$5\% \leq AC \leq 8\%$	Quality Control
Temperature (°F)	AASHTO T 309	Per AASHTO	$50^{\circ}\text{F} \leq ^{\circ}\text{F} \leq 90^{\circ}\text{F}$	Quality Control
Compressive Strength ^(b)	AASHTO T 22 AASHTO T 23	28-day Cylinders: One (1) set of Three (3) 4 x 8 in.	Lab Mixed $f'_{cr} = 1.3 f'_c$ at 28 days Batch Mixed $f'_{cr} = 1.2 f'_c$ at 28 days	MassDOT
Alkali-Silica Reaction (ASR) ^(d)	ASTM C 1567	Per ASTM	M4.02.00	Quality Control
Resistance to Chloride Ion Penetration Chloride Ion Penetration ^(e)	AASHTO T 358 ^(f)	28-day Cylinders: One (1) set of Three (3) 4 x 8 in.	Resistivity $\geq 21 \text{ k}\Omega\text{-cm}$ at 28 days	MassDOT
Freeze/Thaw Durability ^(c)	AASHTO T 161 (Procedure A)	Per AASHTO	Relative Dynamic Modulus of Elasticity after 300 cycles $\geq 80\%$	Quality Control

ITEM 995.01 (Continued)**Notes:**

- (a) Self-consolidating concrete (SCC) shall meet the requirements of M4.02.17.
- (b) Trial batch compressive strength testing shall be performed by MassDOT. Laboratory mixed trial batch compressive strength results shall achieve 130% Design Strength (f'_c). Batch-mixed trial batch compressive results shall achieve 120% f'_c . Acceptance will be based on compressive strength testing performed by MassDOT.
- (c) If an AASHTO accredited laboratory is preparing the trial batch test specimens, MassDOT Acceptance presence is not required. If the Fabricator is preparing the trial batch test specimens, MassDOT Acceptance presence is required during trial batch test specimen preparation.
- (d) Alkali Silica Reaction (ASR) testing shall meet the requirements of M4.02.00. Independent laboratories performing ASR testing shall be listed on the MassDOT Quality Construction Materials List (QCML).
- (e) Calcium nitrite shall be removed from mix designs containing the admixture and replaced by an equivalent quantity of water when preparing Chloride Ion Penetration resistance trial batch test specimens.
- (f) The Wenner probe tip spacing "a" shall be 1.5.

Vertical Adjustment Assembly.

Vertical Adjustment Assembly details and material requirements shall be as shown on the plans. Alternate devices may be used provided that they are adjustable and can support the anticipated loads. The design of the leveling devices, with necessary calculations, shall be submitted to the Engineer of Record for approval.

Grout.

Grout used for shear keys, vertical adjustment assembly voids, and hand holes shall be in accordance with M4.04.0.

Reinforcement.

All reinforcing steel shall be coated Grade 60 unless otherwise noted on the plans. Mechanical reinforcing bar splicers shall be epoxy coated.

Threaded Inserts.

Threaded inserts are permissible to facilitate forming the keyway pours. Threaded inserts shall be hot dip galvanized or made of stainless steel. The number of threaded inserts shall be minimized, and the inserts shall not come in contact with the reinforcing steel.

Corrugated Metal Pipe.

Corrugated Metal Pipe to be used for forming voids as specified on the plans shall be fabricated from steel and shall have a protective metallic coating of zinc (galvanizing).

ITEM 995.01 (Continued)**CONSTRUCTION METHODS – PLANT FABRICATION****A. Shop Drawings.**

Prior to performing any work under this Section, the Contractor shall receive approval for all shop drawings for the Precast Concrete Bridge Element being worked on and any special Contract requirements, provided that a complete shop drawing package is provided. The Contractor shall not order materials or begin work before receiving approved shop drawings. MassDOT will reject Precast Concrete Bridge Elements that deviate from the approved drawings or are fabricated prior to receiving written approval of the shop drawings. The Contractor shall bear full responsibility and costs for all materials ordered or work performed prior to the approval of the shop drawings or written authorization from MassDOT.

Contractor shall submit scaled shop drawings to the Engineer of Record for review and approval. Upon approval, the Engineer of Record will forward two (2) sets of scaled, full size (minimum 24x36") paper copies of the Approved (or Approved As Noted) shop drawings to the MassDOT Director of Research and Materials. Calculations are not to be included in any submittal to the Research and Materials Section. An approval stamp shall appear on every shop drawing sheet. Wet-stamping or wet-signing is not required, provided that the stamp and reviewer name are legible. The Fabricator's name and address shall appear on each sheet.

Resubmittal of "Approved as Noted" shop drawings is not necessary for minor revisions, provided that the correction can be clearly understood and is unambiguous without possibility of misinterpretation. Shop drawings with questions or comments that require a response and/or additional information from the Fabricator must be resubmitted.

Detailed shop drawings shall be prepared in accordance with the relevant provisions of Subsection 5.02 and shall, at a minimum, contain the following:

- (a) Number and type and/or piece mark of the precast concrete bridge element including overall length, width, and height.
- (b) Skew angle.
- (c) Location, size, and geometry of all steel reinforcement, including mechanical reinforcing bar splicers to be used for connecting Precast Concrete Bridge Elements together in the field.
- (d) Location and details of all inserts, anchors, Vertical Adjustment Assemblies, and any other items required to be cast into the Precast Concrete Bridge Elements (whether detailed on the plans by the Engineer of Record or provided for the Contractor's convenience). Precast Concrete Bridge Elements shall not be fired or drilled into for attachment purposes. All hardware shall be galvanized except as noted.
- (e) Locations and details of the lifting devices, including supporting calculations, type and amount of any additional reinforcing required for lifting. The Fabricator shall design all lifting devices based on the no cracking criteria in Chapter 8 of the PCI Design Handbook (7th edition).
- (f) The minimum compressive strength required prior to handling the precast concrete bridge element.

The shop drawings shall not include procedures for placement, finishing, and curing of concrete. These details shall be included in the Placement, Finishing and Curing Plan that is to be submitted to MassDOT Research and Materials Section as described under *Placement, Finishing, and Curing Plan*.

ITEM 995.01 (Continued)**B. Fabrication.**

All Precast Concrete Bridge Elements shall be fabricated in accordance with the latest edition of PCI MNL-116 as modified herein.

Placement, Finishing and Curing Plan.

At least 30 days prior to start of fabrication, the Contractor shall submit the Fabricator's proposed Placement, Finishing and Curing Plan to the Engineer for approval by MassDOT Research and Materials Section. This shall be an independent submittal, separate from the fabrication shop drawings. The Placement, Finishing and Curing Plan shall include the following:

- (a) Method of Mixing
- (b) Method of Placement
- (c) Method of Consolidation
- (d) Method of Finishing
- (e) Method of Initial Curing
- (f) Method of Intermediate Curing
- (g) Method of Final Curing
- (h) Moisture Retention Materials and Equipment (water spray equipment, saturated covers, sheet materials, liquid membrane-forming compounds, accelerated curing equipment, etc.)
- (i) Cylinder Curing Methods, Location, and Environmental Control (temperature, humidity, etc.)
- (j) Temperature Monitoring, Recording, and Reporting

Dunnage Plan Shop Drawings.

At least 30 days prior to the start of fabrication, the Contractor shall submit proposed Dunnage Plan Shop Drawings to the Engineer of Record for review and approval. This shall be an independent submittal, separate from the fabrication shop drawings. Upon approval, the Engineer of Record will forward two (2) sets of scaled, full size (minimum 24"x36") paper copies of the Approved (or Approved As Noted) Dunnage Plan to the MassDOT Director of Research and Materials. Calculations are not to be included in any submittal to the Research and Materials Section. The Dunnage Plan shall include the following:

- (a) Proposed layout of the Precast Concrete Bridge Elements for storage in yard and during shipping
- (b) Support and blocking point locations
- (c) Support and blocking materials

Pre-Production Meeting.

The Contractor shall notify the MassDOT Research and Materials Section to determine if a pre-production meeting will be required to review the specification, shop drawings, curing plan, schedule, and discuss any specific requirements. The meeting shall be held prior to scheduling a MassDOT Inspector (refer to Section *Quality Assurance – Precast Concrete, C. Acceptance, A. Inspection*), and at least seven (7) days prior to the scheduled casting of any Precast Concrete Bridge Element or control section. The Contractor shall schedule the meeting, which shall include representatives of the Fabricator and MassDOT.

ITEM 995.01 (Continued)**Reinforcement.**

The reinforcing bars shall be installed in accordance with Section 901.62 of the Supplemental Specifications, including tolerances for cover and horizontal spacing of bars. Components of mechanical reinforcing bar splicers shall be set with the tolerances shown on the plans. The reinforcing bars and mechanical reinforcing bar splicers shall be assembled into a rigid cage that will maintain its shape in the form and which will not allow individual reinforcing bars to move during the placement of concrete. This cage shall be secured in the form so that the clearances to all faces of the concrete, as shown on the plans, shall be maintained.

Where reinforcing bars are to protrude from one Precast Concrete Bridge Element in order to mate with reinforcing bar splicers in a second precast concrete element, the fabricator shall set the reinforcing bars and the reinforcing bar splicers with a template in order to ensure proper fit up within the tolerances specified on the plans.

Tolerances.

Fabrication shall comply with tolerances specified on the plans. Tolerances for steel reinforcement placement shall be in accordance with 901.62. In the absence of specifications on the plans, tolerances shall comply with the latest version of the PCI MNL 135, Precast Tolerance Manual.

Forms.

Concrete shall be cast in rigidly constructed forms, which will maintain the Precast Concrete Bridge Elements within specified tolerances to the shapes, lines and dimensions shown on the approved fabrication drawings. Forms shall be constructed from flat, smooth, non-absorbent material and shall be sufficiently tight to prevent the leakage of the plastic concrete. When wood forms are used, all faces in contact with the concrete shall be laminated or coated with a non-absorbent material. All worn or damaged forms, which cause irregularities on the concrete surface or damage to the concrete during form removal, shall be repaired or replaced before being reused. Any defects or damage of more than "Category 2, Minor Defects" made to the concrete, due to form work, stripping or handling, shall be subject to repair or rejection, as defined in the *Repairs and Replacement* section. If threaded inserts are cast into the elements for support of formwork, the inserts shall be recessed a minimum of 1 inch and shall be plugged after use with a grout of the same color as that of the precast cement concrete.

Mixing of Concrete.

The concrete shall be proportioned and mixed in conformance with the Fabricator's MassDOT approved mix design and M4.02.10 Mixing and Delivery. Fabrication shall not occur without prior MassDOT mix design approval. The Fabricator shall provide copies of batch tickets to the MassDOT Plant Inspector. The MassDOT Plant Inspector will verify if the batch ticket quantities are within the tolerances of the Fabricator's MassDOT approved mix design.

ITEM 995.01 (Continued)**Placement of Concrete.**

Prior to the placement of concrete, the temperature of the forms shall be greater than or equal to 50°F. Quality Control inspection shall be performed by the Fabricator as specified in the *Fabricator Quality Control* section. Placement of the concrete shall not proceed until the MassDOT Plant Inspector is present to perform inspection and begin monitoring Fabricator Quality Control inspection activities, and is in compliance with specifications. The MassDOT Plant Inspector shall inspect and accept the placement of the reinforcing steel prior to the placement of concrete into the forms. The Fabricator shall verify all materials and equipment required for protecting and curing the concrete are readily available and meet the requirements of the *Final Curing Methods* section below. All items encased in the concrete shall be accurately placed in the position shown on the Plans and firmly held during the placing and setting of the concrete. Clearance from the forms shall be maintained by supports, spacers, or hangers and shall be of approved shape and dimension.

During placement, the concrete shall maintain a concrete temperature range between 50°F and 90°F. The Fabricator shall minimize the time to concrete placement (measured from start of mixing to completion of placement). In no event shall time to placement exceed 90 minutes. The Fabricator shall perform additional Quality Control sampling and testing on concrete that has been retempered with admixtures or hold-back water during the placement of the concrete as specified in the *Fabricator Quality Control* section above. Delays or shutdowns of over 30 minutes shall not be allowed during the continuous filling of individual forms.

Consolidation of Concrete.

Suitable means shall be used for placing concrete to prevent segregation or displacement of reinforcing steel or forms. The concrete shall be thoroughly consolidated by external or internal vibrators or a combination of both. Vibrators shall not be used to move concrete within the forms. Vibrators shall be used as specified in 901.63C and as directed by the Engineer. Concrete shall be placed and consolidated in a way that minimizes the presence of surface voids or bug holes on the formed surfaces. When used, self-consolidating concrete (SCC) shall meet the requirements of M4.02.17.

Finishing of Concrete.

The finish of the Precast Concrete Bridge Elements shall be as indicated on the plans. Where Precast Concrete Bridge Elements have keyways for grout or closure pours, the surfaces of these shear keys shall be abrasive blasted prior to shipment. The Fabricator may utilize a surface retarder with water blast, sandblast, or a combination of both to achieve the desired keyway finish. At a minimum, the profile of the keyway surfaces shall be similar to that of 60 grit sand paper. The exposed reinforcing steel in the precast slab shall be protected from damage during the cleaning of the keyways. Damaged epoxy coating of steel reinforcement shall be repaired, and the reinforcing steel shall be cleaned as directed by the Engineer.

The Fabricator shall permanently mark each precast concrete bridge element with its type and/or piece mark, date of casting, and supplier identification either by stamp markings in fresh concrete, waterproof paint, or other approved means on a surface that will not be exposed after assembly.

Exposed Surfaces of Precast Concrete Bridge Elements.

As soon as conditions permit, before the concrete has fully hardened, all dirt, laitance, and loose aggregate shall be removed from the exposed concrete surfaces. Contractor shall not allow foot traffic on the uncured concrete until it has reached sufficient strength to prevent damage.

ITEM 995.01 (Continued)**Exposed Surfaces of Closure Pour Shear Keys.**

The closure pour shear key cast in the sides of the beam flanges shall have an exposed aggregate finish. The closure pour reinforcing steel and its coating shall not be damaged by the process for creating the exposed aggregate surface. Fabricator may utilize a surface retarder with water blast, abrasive blast, or a combination of both to achieve the desired shear key finish. The abrasive blast shall use oil free compressed air. The profile of the shear key surfaces shall be similar to that of 60 grit sand paper.

Initial Curing Methods.

After the placement of concrete and prior to concrete finishing, the Fabricator shall initiate initial curing methods when the concrete surface begins to dry, to reduce moisture loss from the surface. Application of one or more of the following initial curing methods shall occur immediately after the bleed water sheen has disappeared.

1. Fogging.

Fogging nozzles shall atomize water into a fog-like mist. The fog spray shall be directed and remain visibly suspended above the concrete surface, to increase the humidity of the air and reduce the rate of evaporation. Water from fogging shall not be worked into the surface during finishing operations and shall be removed or allowed to evaporate prior to finishing.

2. Liquid-applied Evaporation Reducers

Evaporation reducers shall be sprayed onto the freshly placed concrete surface to produce an effective monomolecular film that reduces the risk of plastic-shrinkage cracking and rate of evaporation of the bleed water from the concrete surface. Evaporation reducers shall be applied in accordance with manufacturer's recommendations.

Intermediate Curing Methods.

The Fabricator shall initiate intermediate curing methods if concrete finishing has taken place prior to the concrete reaching final set. The freshly finished concrete surface shall be protected from moisture loss, by the continuation of initial curing methods (fogging and evaporation reducers) until final curing methods are applied or by the use of liquid membrane-forming curing compounds (see *Liquid Membrane-Forming Compounds for Curing* section).

Final Curing Methods.

The Fabricator shall initiate and apply final curing methods to the concrete immediately after the following conditions are met:

- (a) Completion of concrete finishing
- (b) Final set of concrete
- (c) Concrete has hardened sufficiently enough to prevent surface damage

ITEM 995.01 (Continued)

During fabrication of Precast Concrete Bridge Elements, the Fabricator shall maintain the required concrete temperature ranges throughout the entire duration of the final curing method cycle as specified herein. Controlled and gradual termination of the final curing method shall occur after all specified conditions are met. The concrete temperature shall be reduced at a rate not to exceed 36°F per hour until the concrete temperature is within 20°F of the ambient temperature outside of the final curing method enclosure. The Fabricator shall maintain a minimum concrete temperature of 40°F until 100% f'_c is attained (see *Handling and Storage* section below).

1. Water Spray Curing.

All exposed concrete surfaces shall remain moist with a continuous fine spray of water throughout the entire duration of the final curing method cycle (see *Table 4: Final Curing Method Cycle for Water Spray*).

Table 4: Final Curing Method Cycle for Water Spray

Sustained Concrete Temperature	Final Curing Method Cycle Duration	Compressive Strength
50°F ≤ °F ≤ 90°F	≥ Five (5) days	≥ 80% f'_c

2. Saturated Covers for Curing.

All exposed concrete surfaces shall remain moist with a continuous application of saturated covers throughout the entire duration of the final curing method cycle (see *Table 5: Final Curing Method Cycle for Saturated Covers*). Saturated covers shall be allowed to dry thoroughly before removal to provide uniform, slow drying of the concrete surface.

Table 5: Final Curing Method Cycle for Saturated Covers

Sustained Concrete Temperature	Final Curing Method Cycle Duration	Compressive Strength
50°F ≤ °F ≤ 90°F	≥ Three (3) days	≥ 80% f'_c

Saturated covers, such as burlap, cotton mats, and other coverings of absorbent materials shall meet the requirements of AASHTO M 182, Class 3. Saturated covers shall be in good condition, free from holes, tears, or other defects that would render it unsuitable for curing concrete. Saturated covers shall be dried to prevent mildew when storing. Prior to application, saturated covers shall be thoroughly rinsed in water and free of harmful substances that are deleterious or cause discoloration to the concrete. Saturated covers shall have sufficient thickness and proper positioning onto the concrete surface to maximize moisture retention.

ITEM 995.01 (Continued)

Saturated covers shall contain a sufficient amount of moisture to prevent moisture loss from the surface of the concrete. Saturated covers shall be kept continuously moist so that a film of water remains on the concrete surface throughout the entire duration of the final curing method cycle. The Fabricator shall not permit the saturated covers to dry and absorb water from the concrete. Use of polyethylene film (see *Polyethylene Film* section) may be applied over the saturated cover to potentially decrease the need for continuous watering.

3. Sheet Materials for Curing.

All exposed concrete surfaces shall remain moist with a continuous application of curing sheet materials throughout the entire duration of the final curing method cycle (see *Table 6: Final Curing Method Cycle for Curing Sheet Materials*).

Table 6: Final Curing Method Cycle for Sheet Materials

Sustained Concrete Temperature	Final Curing Method Cycle Duration	Compressive Strength
50°F ≤ °F ≤ 90°F	≥ Three (3) days	≥ 80% f _c

Sheet Materials used for curing, such as polyethylene film, white burlap-polyethylene sheeting, and reinforced paper shall meet the requirements of ASTM C171 and the specifications herein. Sheet materials shall inhibit moisture loss and reduce temperature rise in concrete exposed to radiation from the sun during the final curing method cycle. Adjoining covers shall overlap not less than 12 inches. All edges of the covers shall be secured to maintain a moist environment.

Polyethylene Film.

Polyethylene film shall meet the requirements of ASTM C171, consist of a single sheet manufactured from polyethylene resins, be free of visible defects, and have a uniform appearance. Careful considerations shall be taken by the Fabricator to prevent the film from tearing during storage and application, so as to not disrupt the continuity of the film (polyethylene film reinforced with glass or other fibers is more durable and less likely to be torn). The Fabricator shall monitor the application of the film to prevent uneven spots from appearing (mottling) on the concrete surface, due to variations in temperature, moisture content, or both. The Fabricator shall prevent mottling from occurring on the concrete surface by applying additional water under the film or applying a combination of polyethylene film bonded to absorbent fabric to the concrete surface to retain and evenly distribute the moisture. Immediately following final finishing, polyethylene film shall be placed over the surface of the fresh concrete surface, so as to not damage the surface of the concrete and shall be placed and weighted so that it remains in contact with the concrete throughout the entire duration of the final curing method cycle. The film shall extend beyond the edges of the concrete surface. The film shall be placed flat on the concrete surface, avoiding wrinkles, to minimize mottling. Edges of adjacent polyethylene film shall overlap a minimum of 6 inches and be tightly sealed with the use of sand, wood planks, pressure-sensitive tape, mastic, or glue to maintain close contact with the concrete surface, retain moisture, and prevent the formation of air pockets throughout the entire duration of the final curing method cycle.

ITEM 995.01 (Continued)**White Burlap-Polyethylene Sheeting**

White burlap-polyethylene sheeting shall meet the requirements of ASTM C171, be securely bonded to the burlap so to avoid separation of the materials during handling and curing of the concrete, and be applied in the same manner as the polyethylene film.

Reinforced Impervious Paper.

Reinforced impervious paper shall meet the requirements of ASTM C171, consist of two sheets of kraft paper cemented together with a bituminous adhesive and reinforced with embedded cords or strands of fiber running in both directions, and be white in color. Reinforced impervious paper shall be treated to prevent tearing when wetted and dried.

Reinforced impervious paper can be reused so long as it is effective in retaining moisture on the concrete surface. The Fabricator shall visually inspect the reinforced impervious paper for all holes, tears, and pin holes from deterioration of the paper through repeated use by holding the paper up to the light. The paper shall be discarded and prohibited from use when the moisture is no longer retained.

After the concrete has hardened sufficiently to prevent surface damage, the concrete surface shall be thoroughly wetted prior to the application of the reinforced impervious paper, and be applied in the same manner as the polyethylene film.

4. Liquid Membrane-Forming Compounds for Curing.

All exposed concrete surfaces shall remain moist with a continuous application of liquid membrane-forming compounds throughout the entire duration of the final curing method cycle (see *Table 7: Final Curing Method Cycle for Liquid Membrane-Forming Compounds*).

Table 7: Final Curing Method Cycle for Liquid Membrane-Forming Compounds

Sustained Concrete Temperature	Final Curing Method Cycle Duration	Compressive Strength
50°F ≤ °F ≤ 90°F	≥ Seven (7) days	≥ 80% f _c

Liquid membrane-forming compounds shall meet the requirements of ASTM C 1315, Type I, Class A and shall exhibit specific properties, such as alkali resistance, acid resistance, adhesion-promoting quality, and resistance to degradation by ultraviolet light, in addition to moisture-retention capabilities. Liquid membrane-forming compounds shall consist of waxes, resins, chlorinated rubber, or other materials to reduce evaporation of moisture from concrete. Liquid membrane-forming compounds shall be applied in accordance with the manufacturer's recommendations.

Liquid membrane-forming compounds shall be applied immediately after the disappearance of the surface water sheen following final finishing. All exposed surfaces shall be wetted immediately after form removal and kept moist to prevent absorption of the compound, allowing the curing membrane to remain on the concrete surface for proper membrane moisture retention. The concrete shall reach a uniformly damp appearance with no free water on the surface prior to the application of the compound.

ITEM 995.01 (Continued)

If patching or finishing repairs are to be performed prior to the application of the compound, the Precast Concrete Bridge Element shall be covered temporarily with saturated covers until the repairs are completed and the compound is applied. Only areas being repaired shall be uncovered during this period. While the saturated covers are removed to facilitate the patching process, the work shall continue uninterrupted. If for any reason the work is interrupted, saturated covers shall be placed onto the uncovered concrete surface, until the work continues and is completed, at which time the curing compound shall be applied to the repaired area.

Careful considerations shall be made by the Fabricator to determine if the evaporation rate is exceeding the rate of bleeding, thus causing the surface to appear dry even though bleeding is still occurring. Under such conditions, the application of liquid membrane-forming compounds to the concrete surface shall be delayed, in order to prevent bleed water from being sealed below the concrete surface and avert map cracking of the membrane films, reduction in moisture-retention capability, and reapplication of the compound. To diagnose and prevent this condition, the Fabricator shall place a transparent plastic sheet over a test area of the uncured and unfinished concrete surface and shall determine if any bleed water accumulates under the plastic.

The compound shall be applied in two applications at right angles to each other to ensure uniform and more complete coverage. On very deeply textured surfaces, the surface area to be treated shall be at least twice the surface area of a troweled or floated surface. In such cases, two separate applications may be needed, each at 200 ft²/gal., with the first being allowed to become tacky before the second is applied.

The curing compound shall be applied by power sprayer, using appropriate wands and nozzles with pressures between 25 and 100 psi. For very small areas such as repairs, the compound shall be applied with a wide, soft-bristled brush or paint roller. The compound shall be stirred or agitated before use and applied uniformly in accordance with the manufacturer's recommended rate. The Fabricator shall verify the application rates are in accordance with the manufacturer's recommended rate.

When the concrete surface is to receive paint, finishes, or toppings that require positive bond to the concrete, it is critical that the curing procedures and subsequent coatings, finishes, or toppings be compatible to achieve the necessary bond.

After the termination of the final curing method cycle has occurred, liquid membrane-forming compounds shall be removed by blast-cleaning from any concrete surface that is to receive paint, finishes, plastic concrete from secondary pour, grout, or any other toppings that require bonding to the concrete surface. These surfaces shall be further blast-cleaned to remove the cement matrix down to exposed aggregate to ensure proper bonding to the material. The method used to remove the curing compound shall not damage the reinforcement and coating. Compounds are prohibited on any concrete surface that will have a penetrating or coating type treatment such as a sealer, stain, or waterproofing membrane applied to it.

5. Accelerated Curing.

Accelerated curing shall use live steam or radiant heat with moisture in accordance with PCI MNL-116 as modified herein. The concrete temperature shall meet the maximum heat increase and cool down rates as specified herein. Concrete temperature monitoring shall meet the requirements of the *Temperature Monitoring* section. Excessive and fluctuating rates of heating and cooling shall be prohibited. The concrete temperature shall not exceed 158°F at any time. The Fabricator shall meet the following accelerated curing sequencing and requirements.

ITEM 995.01 (Continued)**(a) Initial Delay Period.**

The initial delay period shall be defined as the duration immediately following the placement of the concrete and the attainment of initial set of the concrete. The Fabricator shall determine the time of initial set in accordance with AASHTO T 197 specifications. Throughout the entire duration of the preset period, initial curing shall be implemented. The temperature increase period (see *Temperature Increase Period* section) shall not occur until initial set of the concrete is attained. During the initial delay period, the concrete temperature shall meet the following requirements:

- i. Concrete temperature rate of increase shall not exceed 10°F per hour.
- ii. Total concrete temperature increase shall not exceed 40°F higher than the placement concrete temperature or 100°F, whichever is less

Temperature Increase Period.

The temperature increase period shall be defined as the duration immediately following the completion of the initial delay period (after initial set) and immediately prior to the start of the constant maximum temperature period. Application of steam to the enclosure shall not occur until the initial delay period is complete. After the initial delay period is complete, all exposed concrete surfaces shall be cured in a moist environment where the concrete temperature increases at a rate not to exceed 36°F per hour.

Constant Maximum Temperature Period.

The constant maximum temperature period shall be defined as the duration immediately following the completion of the temperature increase period and immediately prior to the start of the temperature decrease period. After the temperature increase period is complete, all exposed concrete surfaces shall be cured in a moist environment at a controlled and constant elevated temperature throughout the entire duration of the constant maximum temperature period. Termination of the constant maximum temperature period and the start of the termination decrease period shall occur after all specified conditions are met (see *Table 8: Constant Maximum Temperature Period*).

Table 8: Constant Maximum Temperature Period

Sustained Concrete Temperature	Constant Maximum Temperature Period	Compressive Strength
120°F ≤ °F ≤ 158°F	6 hrs ≤ Time ≤ 48 hrs	≥ 80% f _c

Temperature Decrease Period.

After the constant maximum temperature period is complete, the concrete temperature shall be cured in a moist environment at a controlled and reduced rate not to exceed 36°F per hour until the concrete temperature is within 20°F of the ambient temperature outside of the curing enclosure.

ITEM 995.01 (Continued)**Stripping.**

The Fabricator shall not strip forms or handle the Precast Concrete Bridge Element until Quality Control compressive strength cylinders attain a minimum compressive strength of 80% Design Strength (f'_c) or the value indicated on the approved drawings has been achieved. After removal from the form, all exposed concrete surfaces shall continue to be cured in conformance with the *Final Curing Methods* sections until completion.

Handling and Storage of Precast Concrete Bridge Elements.

Precast Concrete Bridge Elements may be exposed to temperatures below freezing (32°F) when the chosen curing cycle has been completed, provided that the following conditions are met:

- (a) Precast Concrete Bridge Elements are protected from precipitation with polyethylene curing covers until 100% f'_c is attained
- (b) Precast Concrete Bridge Elements maintain a minimum concrete temperature of 40°F until 100% f'_c is attained

Precast Concrete Bridge Elements damaged during handling and storage will be repaired or replaced at MassDOT's direction at no cost to MassDOT. Precast Concrete Bridge Elements shall be lifted at the designated points by approved lifting devices embedded in the concrete and in accordance with proper lifting and handling procedures. Storage areas shall be smooth and well compacted to prevent damage due to differential settlement. Precast Concrete Bridge Elements shall be supported on the ground by means of continuous blocking, in accordance with the approved dunnage plan.

Precast Concrete Bridge Elements shall be loaded on a trailer with blocking as described above, in accordance with the approved dunnage plan. Shock-absorbing cushioning material shall be used at all bearing points during transportation of the Precast Concrete Bridge Elements. Blocking shall be provided at all locations of tie-down straps. Precast Concrete Bridge Elements stored prior to shipment shall be inspected by the Contractor prior to being delivered to the site to identify damage that would be cause for repair or rejection.

Repairs and Replacement.

In the event defects are identified, they shall be classified in the following categories and a non-conformance report (NCR) shall be filed if required. The NCR shall be submitted to MassDOT for review. Defects in all categories shall be documented by plant Quality Control personnel and made available to MassDOT upon request. Any required repairs shall utilize materials listed on the MassDOT QCML.

Where noted, defects shall be repaired according to the PCI Northeast Region Guidelines for Resolution of Non-Conformances in Precast Concrete Bridge Elements, Report Number PCINE-18-RNPCBE. Please note that reference to PCINE-18-RNPCBE is made for repair details only. In the case of conflicts with this Special Provision, this Special Provision shall govern.

ITEM 995.01 (Continued)**1. Category 1, Surface Defects.**

Category 1 defects do not need to be repaired, and an NCR does not need to be filed. Surface defects are defined as the following:

- (a) Surface voids or bug holes that are less than 5/8-inch in diameter and less than 1/4-inch deep, except when classified as Category 4
- (b) Cracks less than or equal to 0.006 inches wide
- (c) Cracks less than or equal to 0.125 inches wide on surfaces that will receive a field-cast concrete overlay

2. Category 2, Minor Defects.

Category 2 defects shall be repaired, but an NCR does not need to be filed. Minor defects are defined as the following:

- (a) Spalls, honeycombing, surface voids that are less than 2 inches deep and have no dimension greater than 12 inches
- (b) Cracks less than or equal to 0.016 inches that will not receive a concrete overlay
- (c) Broken or spalled corners that will be covered by field-cast concrete

Minor defects shall be repaired according to PCINE-18-RNPCBE. Cracks shall be sealed according to the PCI Repair Procedure #14 in PCINE-18-RNPCBE.

3. Category 3, Major Defects.

For Category 3 defects, the Fabricator shall prepare an NCR that documents the defect and describes the proposed repair procedure. The NCR shall be submitted to MassDOT for approval prior to performing the repair. Major defects are defined as the following:

- (a) Spalls, honeycombing and surface voids that are deeper than 2 inches or have any dimension greater than 12 inches, when measured along a straight line
- (b) Concentrated area of defects consisting of four or more Category 2 Defects within a 4-square foot area.
- (c) Exposed reinforcing steel
- (d) Cracks greater than 0.016 inches and less than or equal to 0.060 inches in width that will not receive a concrete overlay
- (e) Bearing area spalls with dimensions not exceeding 3 inches
- (f) Cracks, spalls and honeycombing that will be encased in cast in place concrete need not be repaired, but the limits and location of the defects shall be documented with an NCR

Upon MassDOT approval, defects and cracks shall be repaired according to PCINE-18-RNPCBE and this specification. All repairs shall be completed at the expense of the Contractor.

4. Category 4, Rejectable Defects.

Rejectable defects as determined by the MassDOT Inspector, RMS, and Engineer may be cause for rejection. Fabricator may submit an NCR with a proposed repair procedure, requesting approval. Some rejectable defects are defined as the following:

ITEM 995.01 (Continued)

- (a) Surface defects on more than 5% of the surface area which will be exposed to view after installation
- (b) Minor defects that in total make up more than 5% of the surface area of the unit
- (c) Cracks greater than 0.060 inches in width except as noted in Category 1
- (d) Elements fabricated outside of the specified tolerances
- (e) MassDOT compressive strength testing that does not meet the specified Design Strength, f'_c .

Loading.

Prior to the Fabricator loading the Precast Bridge Element on to the truck for shipping, the Fabricator shall provide the MassDOT Plant Inspector and RMS a minimum seven (7) days' notice of the Fabricator's intent to load the Precast Bridge Element. Inspection by the MassDOT Plant Inspector shall take place while the element is still on dunnage in the yard. The element shall not be loaded onto the truck until the MassDOT Plant Inspector has performed the inspection.

Shipping.

Prior to shipment, the Fabricator shall perform the following actions and provide the required documentation to the MassDOT Plant Inspector:

- (a) Precast Concrete Bridge Elements shall remain at the Fabricator's plant for a minimum of 7 days after cast date.
- (b) QC Inspection Reports shall be signed by the Quality Control Manager and provided to the MassDOT Plant Inspector.
- (c) QC Compressive Strength Test Report Forms attaining Design Strength, f'_c for the Precast Concrete Bridge Element's representative Sublot shall be generated by the Fabricator and provided to the MassDOT Plant Inspector.
- (d) Certificate of Compliance shall be generated by the Fabricator as described under the Fabricator Quality Control section and provided to the MassDOT Plant Inspector.
- (e) All MassDOT RMS approved Corrective Actions submitted on the Non-Conformance Reports (NCR), shall be verified to have been completed by the MassDOT Plant Inspector and Quality Control Manager.
- (f) All NCRs shall be signed off by the Quality Control Manager, MassDOT Inspector and MassDOT RMS.

Delivery.

Upon Delivery, the following documentation shall be provided to the MassDOT Resident Engineer or designee:

- (a) QC Compressive Strength Test Report Forms attaining Design Strength, f'_c for the Precast Concrete Bridge Element's representative sublot.
- (b) Certificate of Compliance generated by the Fabricator as described under the Fabricator Quality Control section.
- (c) QC Inspection Reports signed by the Quality Control Manager.

The Contractor shall inspect Precast Concrete Bridge Elements upon receipt at the site. Precast Concrete Bridge Elements damaged during delivery shall be repaired or replaced at MassDOT's direction at no cost to MassDOT.

ITEM 995.01 (Continued)**CONSTRUCTION METHODS – FIELD CONSTRUCTION****A. General.**

All of the Contractor's field personnel involved in the erection and assembly of the Precast Concrete Bridge Elements shall have knowledge of and follow the approved Erection Procedure.

Prior to installation, the following documentation shall be reviewed and confirmed by the MassDOT Resident Engineer or designee:

- (a) QC Compressive Strength Test Report Forms attaining Design Strength, f'_c for the Precast Concrete Bridge Element's representative subplot.
- (b) Certificate of Compliance generated by the Fabricator as described under the Fabricator Quality Control section.
- (c) QC Inspection Reports signed by the Quality Control Manager.

Field construction staff shall verify that the Resident Engineer has accepted all Precast Concrete Bridge Elements prior to installation.

Erection Procedure

Prior to the erection, the Contractor shall submit an Erection Procedure for approval by the Engineer. This submittal shall include computations and drawings for the transport, hoisting, erection and handling of the Precast Concrete Bridge Elements. The Erection shall be prepared and stamped by a Professional Engineer registered in the Commonwealth of Massachusetts with working knowledge of the Contractor's equipment, approved shop drawings, and materials to build the bridge. The Erection Procedure shall, at a minimum, include the following:

1. Erection Procedure

The Erection Procedure shall be prepared to conform to the requirements of 960.61, Erection and the applicable sections in Chapter 8 of the PCI Design Handbook (seventh edition) for handling, erection, and bracing requirements. At a minimum, the Erection Procedure shall provide:

- (a) Minimum concrete compressive strength for handling the Precast Concrete Bridge Elements.
- (b) Concrete stresses during handling, transport, and erection.
- (c) Crane capacities, pick radii, sling geometry, and lifting hardware.
- (d) Verification that the equipment can handle all pick loads and weights with the required factor of safety.
- (e) Evaluation of construction sequence and evaluation of any geometric conflicts in the lifting of the Precast Concrete Bridge Elements and setting them as shown on the plans.
- (f) Design of crane supports including verification of subgrade for support.
- (g) Location and design of all temporary bracing that will be required during erection.

Non-shrink grout and concrete materials, approved by the Engineer, shall be placed as shown on the plans. Fill joints, keyways, and voids, in strict accordance with the specifications and manufacturer's recommendations and instructions.

ITEM 995.01 (Continued)

For footings, approach slabs and highway guardrail transitions, once these Precast Concrete Bridge Elements have been set to the correct horizontal and vertical alignment, the void between them and the supporting soil shall be filled with Controlled Density Fill – Non-Excavatable to the limits as shown on the plans. Add additional grout ports in the footings to facilitate the bedding process if required.

Joints shall be filled flush to the top with non-shrink grout, and any vertical misalignment between adjacent elements shall be feathered out on a slope of 1 to 12.

Curing of grout or concrete shall be performed in strict accordance with the specifications and manufacturer's recommendations. Filling shall not be completed in cold weather when either the ambient temperature or the precast member's temperature is below the manufacturer's recommendation. No localized heating of either the precast members or of the air surrounding the element will be permitted in an attempt to reach application temperatures.

If the joints or voids are not filled within five days after the Precast Bridge Elements are erected, the Contractor shall cover and protect the openings from weather and debris until they are filled.

Survey and Layout.

Working points, working lines, and benchmark elevations shall be established prior to placement of all elements. The Contractor is responsible for field survey as necessary to complete the work. MassDOT reserves the right to perform additional independent survey. If discrepancies are found, the Contractor may be required to verify previous survey data.

Preparation of Closure Pour Keyways.

Immediately prior to erecting the Precast Concrete Bridge Elements, the closure pour shear keys shall be cleaned at the job site of all dust, dirt, carbonation, laitance, and other potentially detrimental materials which may interfere with the bonding of the closure pour concrete and precast concrete using a high-pressure water blast. The exposed reinforcing steel in the precast concrete shall be protected from damage during the cleaning of the keyways. Damaged epoxy coating of steel reinforcement shall be repaired, and the reinforcing steel shall be cleaned as directed by the Engineer. The surfaces of the shear keys shall be wetted so that the surfaces shall have a Saturated Surface Dry (SSD) condition for at least 24 hours prior to the placement of the closure pour concrete.

Erection.

The elements shall be placed in the sequence and according to the methods outlined in the Erection Procedure. As the erection proceeds, the Contractor shall constantly monitor the assembly to ensure that the precast concrete bridge element is within proper horizontal and vertical location and tolerances prior to releasing it from the crane and setting the next unit. The Contractor may use shims to maintain proper setting tolerances.

The concrete elements shall be lifted only by the lifting devices, and the utmost care shall be taken to prevent distortion of the elements during handling, transportation or storage.

ITEM 995.01 (Continued)

Suitable spreaders shall be used during lifting so that only a vertical pull will be made on the lifting device. A non-vertical lifting force may be permitted if prior written approval is given by the Engineer. This approval will be contingent on the Contractor demonstrating by calculations, prepared by a Professional Engineer registered in Massachusetts, that the elements will not be damaged by the non-vertical lifting force and by documentation that the capacity of the lifting devices is adequate for the non-vertical lifting force.

Precast components shall be pre-bed with non-shrink grout thicker than shim stacks prior to placing other precast elements on top of them.

After all Precast Concrete Bridge Elements have been placed, the actual overall dimensions of the structure both horizontal and vertical, as laid out shall not deviate from the nominal dimensions shown on the plans beyond a tolerance of +0 inches and -1 inches. Once the layout of Precast Concrete Bridge Elements has been accepted by the Engineer, the Contractor shall cut all lifting devices off below the surfaces of the elements.

Filling of Blockouts for Lifting Devices and Threaded inserts.

If the blockouts in the Precast Concrete Bridge Elements where the lifting devices were located will be exposed and visible after assembly is complete, the Contractor shall fill these blockouts with Cement Mortar (M4.02.15) or grout.

After the formwork has been removed, all threaded inserts that have been cast into the precast concrete bridge deck for support of the formwork shall be filled with a grout of the same color as that of the precast concrete.

STEEL REINFORCEMENT FOR STRUCTURES

Materials used for reinforcement for reinforced concrete wingwall stems, abutment stems, and approach slabs, shall conform to the relevant provisions of M8.01.0 of the Standard Specifications.

STEEL REINFORCEMENT FOR STRUCTURES – EPOXY COATED

Materials used for epoxy-coated reinforcement for reinforced concrete structures, excluding wingwall stems, abutments stems, and approach slab, shall conform to the relevant provisions of M8.01.7 of the Standard Specifications.

SHEAR CONNECTORS

The shear connectors, as shown on the contract drawings, must conform to the requirement of M8.04.1.

ASPHALTIC BRIDGE JOINT SYSTEM**DESCRIPTION OF WORK**

The work under this item shall conform to the relevant provisions of Subsection 971 of the Standard Specifications and the following:

Add the following to section 971.20: Continue the joint through the barrier. The pre-compressed joint seal portion of the asphaltic bridge joint must accommodate the bridge movements as shown on the plans.

ITEM 995.01 (Continued)

The pre-compressed joint seal is to be continuous through the joints and up the parapet. Splicing of the joint seal is allowed as followed by the manufacturer's recommendation.

MATERIALS

Replace "BACKER ROD" in section 971.40 with:

Pre-Compressed Joint Seal: Use the following pre-compressed joint seals installed per the manufacturer's directions or approved similar.

Bridge Expansion Joint System (B.E.J.S.):

EMSEAL Joint Systems Ltd.

25 Bridle Lane,

Westborough, MA 01581

Tel: 508-836-0280

Wabo FS Bridge Seal:

Watson Bowman Acme Corp.

95 Pineview Drive,

Amherst, NY 14228

Tel: 716-691-9239

Hydrophobic Silicone Joint Expansion Joint System:

C.S. Behler Inc.

203 St Mary's Street,

Lancaster, NY 14086

Tel: 716-684-6060

SUBMITTAL

Submit the pre-compressed joint seal shop drawings and manufacturer's installation instructions.

SCHEDULE OF BASIS FOR PARTIAL PAYMENT

Within ten (10) days after the Notice to Proceed, the Contractor shall submit on his/her proposal form a schedule of unit prices for the major component Sub-Items that make up Item 995.01 as well as his/her total bridge structure Lump Sum cost for Bridge Structure No. H-08-003=N-07-002 (C7G). The bridge structure Lump Sum breakdown quantities provided in the proposal form are estimated and not guaranteed. The total of all partial payments to the Contractor shall equal the Lump Sum contract price regardless of the accuracy of the quantities furnished by the Engineer for the individual bridge components. The cost of labor and materials for any Item not listed but required to complete the work shall be considered incidental to Item 995.01 and no further compensation will be allowed.

ITEM 995.01 (Continued)

The Schedule on the proposal form applies only to Bridge Structure H-08-003=N-07-002 (C7G). Payment for similar materials and construction at locations other than at this bridge structure shall not be included under this Item. Sub-Item numbering is presented for information only in coordination with MassDOT Standard Nomenclature.

Sub-Item	Description	Quantity	Unit	Unit Price	Total
904.3	5000 PSI, 3/4 IN., 685 HP CEMENT CONCRETE	161	CY		
904.31	PRECAST HIGHWAY GUARDRAIL TRANSITION	4	EA		
905.2	5000 PSI, 3/8 IN., 710 HP CEMENT CONCRETE	30	CY		
910.	STEEL REINFORCEMENT FOR STRUCTURES	14,000	LB		
910.1	STEEL REINFORCEMENT FOR STRUCTURES - EPOXY COATED	22,500	LB		
911.1	SHEAR CONNECTORS	900	EA		
960.1	STRUCTURAL STEEL – COATED STEEL	107,220	LB		
965.	MEMBRANE WATERPROOFING FOR NEW BRIDGE DECKS	1,880	SF		
970.	DAMP-PROOFING	1,070	SF		
971.	ASPHALTIC BRIDGE JOINT SYSTEM	35	FT		
		Total Cost of Item 995.01 =			

ITEM 996.31 MECHANICALLY STABILIZED EARTH WALL SQUARE YARD**GENERAL**

This item shall conform to the requirements of all relevant Sections of the Standard Specifications and Supplemental Specifications.

The work under this Item shall consist of design, fabrication, furnishing, transportation, and erection of Mechanically Stabilized Earth (MSE) retaining wall system of the required type, including foundation excavation, leveling pad, drainage, backfill, and miscellaneous items necessary for a complete installation. The work under this Item shall also include the base for the fence mount, if necessary.

The work under this item shall also include the temporary support of excavation required to construct the MSE wall. The design, furnishing, placement and removal of the temporary support of excavation shall be included in this Item. The Contractor shall prepare and submit calculations and working drawings for all temporary support of excavation to the Engineer for approval. Calculations and working drawings shall be stamped by a Professional Engineer registered in the Commonwealth of Massachusetts.

The MSE retaining walls shall consist of reinforcing strips or reinforcing mesh earth wall systems utilizing architectural precast concrete facing panels supported on cast-in-place concrete leveling pads, or equivalent system as accepted by MassDOT. All reinforcing strips or mesh material shall consist of galvanized steel. The wall structures shall be dimensioned to achieve the design criteria shown on the Plans and specified herein.

MSE retaining walls shall be designed and constructed as specified herein. The design shall be subject to review and acceptance by the Engineer. The acceptability of a MSE retaining wall design shall be at the sole discretion of the Engineer. Any additional design, construction, or other costs arising as a result of rejection of a retaining wall design by the Engineer shall be borne by the Contractor.

Acceptable MSE retaining wall systems:

- “Reinforced Earth” by the Reinforced Earth Company, 133 Park Street, North Reading, Massachusetts 01864 – Ph: (978) 664-2830.
- “Retained Earth” by the Reinforced Earth Company (Formerly VSL Retained Earth by Foster Geotechnical/VSL Corporation), 133 Park Street, North Reading, Massachusetts 01864 – Ph: (978) 664-2830.
- Vist-A-Wall Systems LLC (Formerly T&B Structural Systems), 304-6800 Manhattan Blvd Fort Worth, TX 76120 – Ph: 1-888-280-9858.
- “Tricon Retained Soil Wall System” by the Tricon Precast, Ltd. Company.
- “RSE – Smooth Face” by Hilfiker Retaining Walls, 1902 Hilfiker Lane, Eureka, California, 95503 – Ph: 1-800-762-8962.

ITEM 996.31 (Continued)

Alternate MSE retaining wall systems shall be an accepted equal upon the approval of the Engineer.

An anti-graffiti coating shall be applied to all exposed concrete surfaces of the retaining walls that are abutting traffic.

Value engineering is not applicable to the work of this Item.

QUALITY ASSURANCE

Quality Assurance shall conform to the requirements of all relevant Sections of the Standard Specifications and Supplemental Specifications and the following.

Fabricator Quality Control

Precast concrete requirements regarding the precast concrete Fabricator's Quality Control (QC), the fabrication plan, personnel, laboratory, testing equipment, inspection, temperature monitoring of the concrete, sampling and testing of concrete, certificate of compliance, and QC documentation shall conform to Section M4.02.14, Precast Concrete Highway Units of the Standard Specifications.

Contractor Quality Control

The Contractor installing the PM retaining wall shall have a minimum of 5 years' experience construction the chosen prefabricated wall system and shall use personnel having demonstrated experience in the installation procedures recommended by the manufacturer and as specified herein.

A qualified representative (minimum 2 years demonstrated experience) from the wall design supplier shall be present during construction of the PM walls. The services of the qualified representative shall be at no additional cost to the project. The Contractor shall make the necessary arrangements with the wall supplier to have the technical representative on the project. The qualified experienced technical representative will advise the Contractor and Engineer concerning proper installation procedures. The services of a qualified technical representative shall be incidental to this item.

Quality control and testing shall comply with Section M4.02.14 of the Standard Specifications. The subplot size for MSE wall units shall comply with Section M4.02.14 of the Standard Specifications.

Acceptance

Final Acceptance for the prefabricated modular wall system shall be determined by MassDOT.

ITEM 996.31 (Continued)

MassDOT will perform Acceptance inspection and sampling and testing in accordance with Section M4.02.14.

MATERIALS

All materials used in the construction of the MSE retaining walls shall meet the requirements specified in the MassDOT Standard and Supplemental Specifications and as specified herein. Materials not conforming to this section of the specifications or from sources not listed in the contract documents shall not be used without written consent from the Engineer.

Reinforced Concrete Facing Panels

The panels shall be fabricated in accordance with Section M4, Section M4.02.14 Precast Concrete Highway Units and Section 901, with the following exceptions and additions:

The architectural facing panels shall be manufactured of 5,000 pounds per square inch (psi), 3/4 inch, 685 HP, air-entrained cement concrete, from a MassDOT approved precaster.

Finishing, Protection, and Curing of Precast Concrete

Unless otherwise indicated on the Plans, the concrete surfaces shall be finished in accordance with relevant requirements of Section M4.02.14 Precast Concrete Highway units and Section 901 of the Standard and Supplemental Specifications and as modified herein.

The panels shall be cast on a flat area. The coil embeds, tie strip guide, and other galvanized devices shall not contact or be attached to the face panel reinforcement steel. Each panel shall be cast as a unit. No horizontal joints are permitted in a panel.

Steel Reinforcement

Steel reinforcement for precast panels shall be epoxy coated reinforcing bars in accordance with Section M8 of the Standard and Supplemental Specifications.

Soil Reinforcing and Attachment Devices

All reinforcing and attachment devices, to be installed as shown on the Shop Drawings, shall be carefully inspected to insure they are true to size and free from defects that may impair their strength and durability.

- A. Ribbed Reinforcing Strips - Ribbed reinforcing strips shall be hot rolled from bars to the required shape and dimensions. Their physical and mechanical properties shall conform to either AASHTO M183 (ASTM A36) or AASHTO M223 Grade 65 (ASTM A572). Galvanization shall conform to the minimum requirements of AASHTO M111 (ASTM A123).

ITEM 996.31 (Continued)

- B. Reinforcing Mesh - shall be shop fabricated of cold drawn steel wire conforming to the minimum requirements of AASHTO M32 (ASTM A82) and shall be welded into the finished mesh fabric in accordance with AASHTO M55 (ASTM A185). Galvanization shall be applied after the mesh is fabricated and conform to the minimum requirements of AASHTO M111 (ASTM A123).
- C. Tie Strips - The tie strips shall be shop fabricated of hot rolled steel conforming to the minimum requirements of ASTM A570, Grade 50 or equivalent. Galvanization shall conform to AASHTO M111 (ASTM A123).
- D. Coil Embeds/Loop Embeds - Shall be fabricated of cold drawn steel wire conforming to ASTM 510, UNS G 10350 or AASHTO M32 (ASTM A82). Loop imbeds shall be welded in accordance with AASHTO M55 (ASTM A185). Both shall be galvanized in accordance with ASTM B633.
- E. Coil Embed Grease - The cavity of each coil embed shall be completely filled with no-oxide type grease.
- F. Coil Bolt - The coil bolts shall have two inches of thread. They shall be cast of 80-55-06 ductile iron conforming to ASTM A536. Galvanization shall conform to ASTM B633.
- G. Fasteners - Fasteners shall consist of hexagonal cap screw bolts and nuts, which are galvanized and conform to the requirements of AASHTO M164 (ASTM A325) or equivalent.
- H. Connector Pins - Connector pins and mat bars shall be fabricated from AASHTO M183 (ASTM A36) steel and welded to the soil reinforcement mats as shown on the Plans. Galvanization shall conform to AASHTO M111 (ASTM A123).

Joint Materials

Joint materials shall be either preformed EPDM rubber pads conforming to ASTM D2000 for 4AA, 812 rubbers or neoprene elastomeric pads having a Durometer Hardness of 55±5.

Backfill Material

All backfill materials used in the MSE Walls reinforced mass shall conform to Section 150 of the Standard Specifications. Backfill material used in the MSE walls shall also meet the quality of materials and gradation requirements of the MSE wall manufacturer. Additional backfill requirements:

Backfill below water – Crushed Stone M2.01.5

Backfill above water – Gravel Borrow M1.03.0(b)

ITEM 996.31 (Continued)

- A. Soundness - The material shall be substantially free of shale or other soft, poor durability particles. The materials shall have a magnesium sulfate soundness loss, as determined by AASHTO T104 (ASTM C88), of less than 30 percent after four cycles.
- B. Electrochemical Requirements - The backfill materials shall meet the following criteria:

REQUIREMENTS		TEST METHODS
Resistivity	> 3,000 ohm centimeters	AASHTO T288 (ASTM G57)
pH	Between: 5 and 10, inclusive	AASHTO T289 (ASTM G51)
Chlorides	< 100 parts per million	AASHTO T291 (ASTM D512)
Sulfates	< 200 parts per million	AASHTO T290 (ASTM D516)
Organic Content	< 1%	AASHTO T267-86

Subdrain

Walls shall be constructed with subsurface drainage measures as shown on the project plans and as specified herein. A subdrain system, at the back of the wall, shall be provided to collect and remove surface and subsurface water away from the embankment and backfill toward the outside limits of the wall. Open-graded gravel drains with a geotextile, geocomposite drains, and blanket drains can be used, in conformance with MassDOT requirements.

Leveling Pad

The leveling pad shall be constructed of a minimum of 5,000 psi, 3/4 inch, 685 HP cement concrete approved mix as specified in Section M4, or other foundation material as approved by the Engineer. Leveling pad shall have minimum dimensions of 6 inches thickness and 12 inches width and be placed at the design elevation shown on the plans within a 1/8 inch tolerance.

Base for the Fence Mount

The base for the fence mount shall be constructed of a minimum of 5,000 psi, 3/4 inch, 685 HP cement concrete approved mix as specified in Section M4, or other foundation material as approved by the Engineer.

Impervious Membrane

The impervious membrane shall be a polymer sheet suitable for retaining water with dissolved deicing salts. The membrane shall be composed of polyvinyl chloride or polyethylene and have a minimum thickness of 30 mil. Joints between sheets of membrane shall either be heat welded or glued in accordance with manufacturer's recommendations. The impervious membrane shall be placed such that it is above all soil reinforcement and completely covers all soil reinforcement below it.

ITEM 996.31 (Continued)**Crushed Stone for Drainage Layer**

Crushed stone for use in the drainage layer above the Impervious Membrane shall be 1/2 inch crushed stone conforming to the requirements of Section M2.01.5.

Anti-Graffiti Coating

For retaining walls that are abutting traffic, two coats of anti-graffiti coating shall be applied by airless spray, brush, or roller to all exposed concrete surfaces of the prefabricated retaining walls. The Contractor may not proceed with any production coating operations until the samples and mock-ups are approved. All manufacturer's recommendations and procedures shall be strictly adhered to. Approved manufacturer's authorized representatives shall provide additional job site training in the proper mixing and application procedures of the anti-graffiti coating. The cost for sufficient involvement of the authorized representatives shall be considered incidental to this Item. All State, Federal and local safety and environmental protection requirements shall be strictly adhered to.

The anti-graffiti coating shall be a clear, non-yellowing, chemical and scratch resistant, fast curing, water-based, one-component silicone elastomer specifically formulated to protect surfaces subject to repeated graffiti attacks. It shall have no effect on the color of the concrete.

ACCEPTANCE OF MATERIALS

The Contractor shall furnish to the Engineer a Certificate of Compliance certifying that the above materials comply with the applicable contract specifications. A copy of all test results performed by the Contractor necessary to assure contract compliance shall also be furnished to the Engineer. Acceptance will be based on the Certificate of Compliance, accompanying test reports, and visual inspection by the Engineer.

DESIGN REQUIREMENTS**Design Specifications**

The MSE retaining walls shall be designed to provide the grade separation shown on the Plans with a service life of not less than 75 years.

All calculations and Shop Drawings shall be signed and stamped by a Professional Engineer registered in the Commonwealth of Massachusetts and specializing in MSE wall design and construction.

ITEM 996.31 (Continued)

The MSE wall system shall be designed in accordance with:

1. The manufacturer's requirements.
2. The Contract Plans.
3. The requirements as specified herein.
4. AASHTO LRFD Bridge Design Specification, current edition.
5. AASHTO LRFD Bridge Construction Specifications, current edition.
6. FHWA-NHI-10-024, Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes – Volume I, November 2009, or the latest FHWA Publication.
7. FHWA-NHI-10-025, Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes – Volume II, November 2009, or the latest FHWA Publication.
8. FHWA-NHI-09-087, Corrosion/Degradation of Soil Reinforcements for Mechanically Stabilized Earth Walls and Reinforced Soil Slopes, November 2009, or the latest FHWA Publication.

Where conflicting requirements occur, the more stringent shall govern. Design shall consider Service, Strength, and Extreme Limit States, and external and internal stability.

The MSE wall shall be dimensioned so that the maximum bearing pressure does not exceed the factored bearing resistance of the foundation soils, as noted in the Plans.

The MSE walls shall be designed to account for drainage required for walls below established groundwater levels and seasonal levels.

The MSE wall design shall follow the general dimensions of the wall envelope shown on the Plans. Base of footing elevation shall be as shown on the Plans or may be lower. All wall elements shall be within the right-of-way limits shown on the Plans. The panels shall be placed so as not to interfere with drainage or other utilities, or other potential obstructions.

MSE Facing panels shall have tongue and groove, ship lap or similar approved connections along all joints, both vertical and horizontal.

MSE facing panels shall be installed on cast-in-place concrete leveling pads or other foundation material as approved by the Engineer. The top of the leveling pad shall be located at or below the theoretical leveling pad elevation. The minimum wall embedment shall be 4.0 feet as measured to the top of the leveling pad, or as shown on the Plans, whichever is greater. The leveling pads are incidental to this item.

All appurtenances behind, in front of, under, mounted upon, or passing through the wall such as drainage structures, utilities, fences, concrete parapet wall or other appurtenances shown on the Plans shall be accounted for in the stability design of the wall.

ITEM 996.31 (Continued)

Walls or wall sections which intersect at an angle of one hundred thirty (130) degrees or less shall include a special corner element to cover the joint formed by the abutting walls or wall sections and to permit relative movement. Corner elements shall not consist of connected standard facing panels.

Final design and detailing of wall coping shall be consistent with the final selected wall type.

SUBMITTALS

Design computations demonstrating compliance with the criteria specified herein and shown on the Plans, prepared and signed and stamped by a registered professional engineer licensed in the Commonwealth of Massachusetts and specializing in MSE wall design and construction with a minimum of 5 years of design experience.

A. The design calculations shall include:

1. Statement of all assumptions made and copies of all references used in the calculations.
2. The MSE wall design calculations shall include a complete and thorough set of hand calculations that are specific to this project to support any computer generated calculations. The calculations shall include all applicable references to the LRFD code, tables, graphs, sources of equations used and material properties. A detailed explanation of any symbols and computer programs used in the design shall be provided. The design calculations shall be provided for external stability (sliding, overturning, maximum bearing pressure, and global stability) of the final wall configuration, and internal stability within each layer of reinforcement (tensile stress, pullout resistance and tensile stress at the connection with the facing) for the applicable strength and extreme event limit states. Calculations shall be performed in English units, with the final calculation results shown in English units.
3. The design calculations and associated design parameters, including the pullout resistance of the tensile reinforcement shall account for the frictional, gradation and strength characteristics of the specific reinforced backfill materials that are provided by the Contractor for the project.
4. Analyses demonstrating compliance with all applicable earth, water, surcharges, seismic, or other loads, as specified herein and on the Plans, and as required by AASHTO and the latest Design of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes Reference Manual published by FHWA.
5. Analyses or studies demonstrating durability and corrosion resistance of retaining wall systems for the proposed location and environment. The designers shall provide all corrosion protection devices necessary for the retaining wall to have a minimum service life of 75 years in the proposed location and environment.
6. Analyses of reinforcement pull-out resistance.

ITEM 996.31 (Continued)

- B. A detailed resume of the wall designer listing similar projects and demonstrating necessary experience to perform the MSE retaining wall design, including a brief description of each project that is similar in scope. A reference shall be included for each project listed. As a minimum, the reference shall include an individual's name, address and current phone number.
- C. A detailed listing of MSE walls that the Contractor has constructed including a brief description of each project and a listing of personnel who will construct the walls demonstrating their experience in construction of MSE retaining walls. A reference shall be included for each project listed. As a minimum, the reference shall include an individual's name, address and current phone number.
- D. Manufacturer's product data for the MSE wall system, including material, manufacture and erection specifications, all specified erection equipment necessary, details of buried MSE wall elements, special details required of reinforcing layout around drainage structures and sign foundations, structures design properties, type of backfill and details for connections between facing panels.
- E. Concrete mix design in accordance with Section M4.
- F. Shop Drawing showing the configuration and all details, dimensions, quantities and cross-sections necessary to construct the MSE wall, including but not limited to the following:
 - 1. A plan view of the wall which shall include Contract limits, stations and offsets, and the face of wall line shown on the Plans.
 - 2. An elevation view of the wall which shall include the elevation at the top of the wall at all horizontal and vertical break points and at least every 50 feet along the face of the wall, all steps in the leveling pads, the designation as to the type of retaining wall system(s), and an indication of the final ground line and maximum calculated bearing pressures. The face of wall shown on the Plans shall be indicated.
 - 3. A typical cross section or cross sections showing the elevation relationship between existing ground conditions and proposed grades, and the proposed wall configuration, including details for the proposed methods for connecting to existing conditions. The sections shall also indicate the location of the face of wall shown on the Plans.
 - 4. General notes pertaining to design criteria and wall construction.
 - 5. A listing of the summary of material quantities for each wall.
 - 6. Details of sleeves and pipes and other embedded items to be installed through the walls.
 - 7. Clearly indicated details for construction of walls or reinforcing elements around drainage, foundations, utilities or any other potential obstructions.
 - 8. Details of the architectural treatment of facing panels.
 - 9. Drainage design detail.
 - 10. Location of utilities.
 - 11. Sequence and schedule of construction, including overall construction schedule.

ITEM 996.31 (Continued)

12. Methods of excavation and backfill.
13. Method of maintaining stability of excavated trenches.
14. Method of monitoring plumbness and deviation of wall.
15. Any acceptance testing and frequency.
16. Details and location of all necessary construction and expansion joints.
17. Connection details at the interface of the wall and any adjacent proposed cast in place retaining wall or abutment structure.
18. Details of impermeable membrane connection to facing panels and to runoff collection system.
19. Details of impermeable membrane connection to facing panels and to runoff collection system.
20. Details of maintaining the stability, rigidity and alignment of the wall during construction, prior to wall construction completion, and prior to backfilling behind the top of the wall and roadway/moment slab construction at the top of the wall.
21. Groundwater elevation.

CONSTRUCTION METHODS – PLANT FABRICATION**MSE Wall Panel Fabrication**

Reinforced Concrete Facing Panels shall nominally measure 5' high by 5' wide on the exterior exposed face without additional tabs or interlocking extensions adding to the overall dimension of the panel face. Panel dimensions and layout shall include a minimum design joint width of $\frac{3}{4}$ " in order to accommodate differential settlement without impairing the appearance of the facing or compromising the structural integrity of individual panels. Architecturally, panel joints should be maintained at $\frac{3}{4}$ " throughout the wall.

The date of manufacture, production lot number, and the piece mark shall be clearly scribed on an unexposed face of each panel.

MSE Wall Panel Fabrication Tolerance

Dimensions shall conform to the following tolerances:

1. Position of panel connection devices within 1", except for coil and loop imbeds which shall be $\frac{3}{16}$ ", with all other dimensions within $\frac{3}{16}$ ".
2. Panel squareness as determined by the difference between the two diagonals shall not exceed $\frac{1}{2}$ ".
3. Surface defects on smooth-formed surfaces measured over a length of five feet shall not exceed $\frac{1}{8}$ ". Surface defects on textured-finished surfaces measured over a length of 5' shall not exceed $\frac{5}{16}$ ".

If requirements for the precast facing panels are different from the standard panels from the above systems, alternate details shall be prepared by the Contractor.

ITEM 996.31 (Continued)**Lifting Devices and Threaded Inserts**

Lifting sleeves and inserts shall be provided for the purpose of handling and placing. Care shall be taken during storage, transporting, hoisting, and handling to prevent cracking or damaging the precast units.

Repairs and replacement of PM wall units shall be in accordance with Section M4.02.14, *Repairs and Replacement for Proprietary Retaining Wall Systems*. Variations in the exposed face that substantially deviate from the approved architectural model unit as to color, texture, and reveal will be considered a Category 3 Rejectable Defect.

Storage and Shipping

The precast units shall be supported as specified in Section M4.02.14 Precast Concrete Highway Units.

The precast units shall be shipped and installed as specified in M4.02.14 Precast Concrete Highway Units.

CONSTRUCTION METHODS

All MSE walls shall be built in accordance with the Plans and accepted Shop Drawings for the proposed wall systems.

The MSE retaining walls shall be constructed in accordance with these specifications and in conformity with the lines, grades, design criteria, and dimensions shown on the Plans or established by the Engineer.

Delivery, Storage and Handling

The Contractor shall check the material upon delivery to assure that the proper material has been received. A product certification shall be provided with each shipment.

All wall materials and facing panels shall be stored elevated from the ground and protected to prevent all mud, wet cement, and epoxy and like substances which may affix themselves to the panels or materials. The panels shall be supported during storage to prevent excessive bending stress.

Wall Excavation

Earth excavations for walls shall be in accordance with the requirements of Section 120 and in close conformity to the limits and construction stages shown on the Plans. Sections 120.80, 120.81, and 120.82 do not apply to the work covered in this section. Payment for excavation and incidentals to complete the excavation are included in the MSE Wall Item.

ITEM 996.31 (Continued)**Foundation Preparation**

The foundation for the structure shall be graded level for a width equal to the length of the reinforcement elements plus 1 foot, or as shown on the Plans. Where applicable, dewatering of the foundation area shall be in accordance with applicable MassDOT Standard Specifications. Prior to wall construction the foundation shall be compacted with at least 10 passes of a smooth wheel vibratory roller weighing at least 10,000 lbs. Any foundation soils found to be unsuitable shall be removed and replaced with Special Borrow Material as per Section 140 and Section 170.

In areas below the existing groundwater level, backfill shall consist of crushed stone for bridge foundations as per Section 150.

The foundation for the structure shall be approved by the Engineer before erection is started.

Wall Erection

Precast concrete panels shall be placed so that their final position is vertical or battered as shown on the Plans. For erection, panels are handled by means of lifting devices connected to the upper edge of the panel. Panels should be placed in successive horizontal lifts in the sequence shown on the approved Shop Drawings as backfill placement proceeds. As backfill material is placed behind the panels, the panels shall be maintained in position by means of temporary wedges or bracing according to the wall supplier's recommendations. Concrete facing vertical tolerances and horizontal alignment tolerances shall not exceed 3/4 inch when measured with a ten-foot straight edge. During construction, the maximum allowable offset in any panel joint shall be 3/4 inch. The overall vertical tolerance of the wall (top to bottom) shall not exceed 1/2 inch per ten feet of wall height.

Joints

Installed to the dimensions and thickness in accordance with the Plans or approved shop drawings.

Cover all joints between panels on the back side of the wall with a geotextile fabric. The geotextile fabric shall conform to the requirements of AASHTO M288 for the intended application. Slit film and multifilament woven geotextile fabrics are not allowed for this application. The minimum width of the fabric shall be 12 inches. Lap fabric at least 4 inches where splices are required.

Backfill Placement

Prior to backfilling, the Contractor shall install a subdrain as shown on the project plans and as specified in this special provision.

ITEM 996.31 (Continued)

Backfilling will not take place until concrete design strength of the panels is reached. Backfill placement shall closely follow erection of each course of panels. Backfill shall be placed in such a manner as to avoid any damage or disturbance of the wall materials or misalignment of the facing panels or reinforcing elements. Any wall materials which become damaged during backfill placement shall be removed and replaced. Any misalignment or distortion of the wall facing panels due to placement of backfill outside the limits of this specification shall be corrected. At each reinforcement level, the backfill elevation after compaction shall be 2 inches above the connection device from a point approximately 12 inches behind the back face of the panel to the free end of the reinforcement, unless otherwise shown on the plans. Backfill placement methods near the facing shall assure that no voids exist directly beneath the reinforcing elements.

Backfill shall be compacted to 95 percent of the maximum density as determined by AASHTO T-99, Method C or D (with oversize corrections as outlined in Note 7 of that test). For backfills containing more than 30 percent retained on the 3/4 inch sieve, a method of compaction consisting of at least 4 passes by a heavy roller shall be used.

The moisture content of the backfill material prior to and during compaction shall be uniformly distributed throughout each layer. Backfill materials shall have a placement moisture content less than or equal to the optimum moisture content. Backfill material with a placement moisture content in excess of the optimum moisture content shall be removed and reworked until the moisture content is uniformly acceptable throughout the entire lift.

The maximum lift thickness after compaction shall not exceed 12 inches, regardless of the vertical spacing between layers of tensile reinforcement. The Contractor shall decrease this lift thickness, if necessary, to obtain the specified density.

Compaction within three feet of the back face of the wall shall be achieved by at least three passes of lightweight mechanical tamper, roller, or vibratory system.

At the end of each day's operation, the Contractor shall slope the last lift of the backfill away from the wall facing to rapidly direct runoff away from the wall face. In addition, the Contractor shall not allow surface runoff from other areas to enter the wall construction site.

Construction sampling and testing procedures and frequency for backfill material shall conform to the project requirements.

Roadway Runoff Collection System

The Contractor shall place an impervious membrane and drainage layer to the lines and grades shown on the Plans. The impervious membrane shall be placed just below the drainage layer at the top lift of the MSE wall. The impervious membrane shall slope away from the wall panels towards the collection system located beyond the end of the soil reinforcement elements. If angular fill material is to be placed above or below the impervious membrane, a suitable thickness of sand shall be used to protect the membrane from puncture. The membrane shall be continuous throughout the limits shown on the Plans with watertight seams at any splices. Repair any holes created during installation according to the membrane manufacturer's recommendation before covering.

ITEM 996.31 (Continued)**COMPENSATION****Method of Measurement**

Mechanically Stabilized Earth Walls will be measured by the vertical square yard of retaining structure installed complete in place, according to the lines, grades, and dimensions shown on the Plans. The vertical area of retaining structure is defined as the area measured at the wall face, bounded by the top of the leveling pad, ends of wall, and top of coping.

Basis of Payment

Mechanically Stabilized Earth Walls will be paid for at the Contract unit price per vertical square yard for design, fabrication, transportation, and erection of MSE retaining walls to the satisfaction of the Engineer.

The unit price for Mechanically Stabilized Earth Wall shall include costs for:

- A. All design work, preparation of written submittals and plans, revision of submittals, sample submittals and any other necessary preliminary work prior to and after acceptance of the retaining wall by the Engineer.
- B. All materials, including transportation, for the MSE walls, including facing panels, MSE reinforcing elements, attachment devices, fasteners, bearing blocks and shims, joint materials, copings, impervious membrane, wall drainage, compacted select granular backfill, reinforced stone backfill, and crushed stone for bridge foundations when working below the groundwater table, geotextile fabric, concrete masonry and leveling pads, reinforcing steel, and incidentals.
- C. All labor and equipment required to excavate and prepare the wall foundation, form and cast the leveling pad, erect the MSE wall to the lines and grades shown on the Plans, place and connect attachment devices, install the joint materials, install wall drainage, place and compact backfill, and construct any other items necessary to complete the MSE wall.
- D. All temporary shoring.
- E. Anti-Graffiti Coating shall be incidental to this line item.
- F. MSE Wall Representative shall be incidental to this line item.

Excavation and replacement of any unsuitable materials below the proposed bottom of the MSE wall earth volume limits as shown on the Plans, or as directed by the Engineer, will be measured and paid for as defined in Sections 120, 140, and 150.

ITEM 996.31 (Continued)

Construction of reinforced concrete barriers and moment slabs will be paid for under Items 904.3 - 5000 PSI, $\frac{3}{4}$ in., 685 HP Cement Concrete and 901. - 4000 PSI, 1.5 in., 565 Cement Concrete, respectively. Reinforcing steel and damp-proofing for the moment slab and concrete barriers will be paid for under items 910.1 - Steel Reinforcement for Structures - Epoxy Coated and 970. - Bituminous Damp-Proofing, respectively.

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DETAIL SHEETS

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Proposal No. 608851-126586

PROJECT NO. 608851

PS&E SUBMISSION
DETAIL SHEETS

Prepared For



MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

HARDWICK/NEW BRAINTREE

CREAMERY ROAD BRIDGE REPLACEMENT OVER WARE RIVER



BRIDGE NO. H-08-003=N-07-002 (C7G)

June 18, 2024



220 Norwood Park South, Suite 201
Norwood, MA 02062
(781) 619-9500

**THE COMMONWEALTH OF MASSACHUSETTS
MASSDOT HIGHWAY DIVISION
10 PARK PLAZA – BOSTON, MA
– DETAIL SHEET –**

TOWN:	<u>Harwick/ New Braintree</u>	ROAD:	<u>Creamery Road</u>
STA.:	<u>Sta. 0+30 to Sta. 5+85</u>	YEAR:	<u>2024</u>
		CLASS:	<u>Rural Local Road</u>
PROJECT:	<u>Bridge Replacement</u>	DATE:	<u>2024</u>

Earth Excavation:	312 CY	Gravel Borrow:	400 CY
Reinforced Concrete Excavation:	0 CY	Gravel Borrow for Sidewalk:	0 CY
Bridge Excavation:	530 CY	Ordinary Borrow:	326 CY
Old Pavement Excavation:	0 SY	Loam Borrow:	0 CY

PROPOSED FULL DEPTH CONSTRUCTION**AREA = 590 SY**Surface: 1.5" Superpave Surface Course – 9.5 (SSC-9.5)Intermediate: 2.0" Superpave Intermediate Course – 12.5 (SIC-12.5)Base: 4.0" Superpave Base Course – 37.5 (SBC-37.5)Subbase: 4.0" Dense Graded Crushed Stone for Sub-Base Over 8.0" Gravel Borrow**PROPOSED FINE MILLING & RESURFACING****AREA = 188 SY**Surface: 1.5" Superpave Surface Course – 9.5 (SSC-9.5)Milling: 1.5" Pavement Fine Milling**PROPOSED BRIDGE DECK PAVEMENT****AREA = 209 SY**Surface: 1.5" Superpave Bridge Surface Course – 9.5 (SSC-B-9.5)Intermediate: 1.5" Superpave Bridge Protective Course – 9.5 (SPC-B-9.5)Waterproofing: Membrane Waterproofing for New Bridge Decks
(to be paid for under Item 995.01 Bridge Structure, Bridge No. H-08-003=N-07-002)

ITEM 101.**CLEARING AND GRUBBING**

To be used in the northwest, northeast, southeast and southwest quadrants of the project, for site preparation prior to construction of the new bridge, within the project limits. Includes the entire area between the edge of pavement and limit of disturbance.

ITEM 102.3**HERBICIDE TREATMENT OF INVASIVE PLANTS**

To be used within wetland replication area for site preparation prior to construction of new wetland.

ITEM 102.33**INVASIVE PLANT MANAGEMENT STRATEGY**

To be used within wetland replication area for site preparation prior to construction of new wetland.

ITEM 115.1**DEMOLITION OF BRIDGE NO. H-08-003=N-07-002**

To be used for the demolition of the existing superstructure and portions of the existing substructure.

ITEM 120.**EARTH EXCAVATION**

To be used for cross-section areas of cut and for areas of proposed full depth pavement beginning at the bridge joints along Creamery Road within the project limits and the wetland replication area.

East Approach: STA. 0+85 to STA. 2+78

West Approach: STA. 3+74 to STA. 5+60

Wetland Replication Area: Approx STA. 2+50, 100' LT

ITEM 121.**CLASS A ROCK EXCAVATION**

To be used for excavation of rock within the cross-section areas of cut within the project limits and the wetland replication area.

East Approach: STA. 0+85 to STA. 2+78

West Approach: STA. 3+74 to STA. 5+60

Wetland Replication Area: Approx STA. 2+50, 100' LT

ITEM 140.**BRIDGE EXCAVATION**

To be used for excavation of the bridge abutment footings and wingwall footings, including the pile trenches and the retaining wall.

ITEM 141.**CLASS A TRENCH EXCAVATION**

To be used for trench excavation to install new endwall within the project limits.

Endwall: Sta. 4+47, 25' LT

ITEM 144.**CLASS B ROCK EXCAVATION**

To be used for excavation of rock within the bridge excavation quantity, excluding water handling.

ITEM 150.**ORDINARY BORROW**

To be used for cross-section areas of fill along Creamery Road.

ITEM 151.**GRAVEL BORROW**

To be used for full depth construction of the roadway within the project limits and below the retaining wall.

Creamery Road- Full Depth Construction

ITEM 151.1**GRAVEL BORROW FOR BRIDGE FOUNDATION**

To be used to backfill the abutments.

ITEM 156.**CRUSHED STONE**

To be used as a component of the riprap at each abutment, and as directed by the Engineer.

ITEM 156.1**CRUSHED STONE FOR BRIDGE FOUNDATIONS**

To be used below the abutment stems.

ITEM 170.**FINE GRADING AND COMPACTING- SUBGRADE AREA**

To be used for full-depth construction along Creamery Road, up to and over approach slabs, within the project limits.

East Approach: STA. 0+85 to STA. 2+78

West Approach: STA. 3+93 to STA. 5+60

ITEM 184.1**DISPOSAL OF TREATED WOOD PRODUCTS**

To be used for the loading, transportation and final off-site disposal of all existing treated wood product.

East Barrier

West Barrier

ITEM 201.**CATCH BASIN**

To be used for proposed drainage structures within the project limits.

STA. 4+51, 10' LT

ITEM 222.1**FRAME AND GRATE – MASSDOT CASCADE TYPE**

To be used for proposed drainage structures within the project limits.

STA. 4+51, 10' LT

ITEM 224.12.**12 INCH HOOD**

To be used for proposed drainage structures within the project limits.

STA. 4+51, 10' LT

ITEM 230.212**12 INCH CORRUGATED METAL PIPE 14 GAGE**

To be used for proposed drainage pipes within the project limits.

STA. 4+51, 10' LT

ITEM 258.**STONE FOR PIPE ENDS**

To be used for proposed drainage pipes within the project limits.

STA. 4+51, 10' LT

ITEM 402.**DENSE GRADED CRUSHED STONE FOR SUB-BASE**

To be used for full-depth construction of Creamery Road within the project limits.

ITEM 402.12**DENSE GRADED CRUSHED STONE FOR SHOULDERS**

To be used for full-depth construction of Creamery Road within the project limits.

East Approach: STA. 0+86 to STA. 2+18 LT

STA. 1+20 to STA. 2+18 RT

West Approach: STA. 4+26 to STA. 5+60 LT and RT

ITEM 415.2**PAVEMENT FINE MILLING**

To be used for pavement fine milling of Creamery Road within the project limits

East Approach: STA. 0+31 to STA. 0+85

West Approach: STA. 5+60 to STA. 5+85

ITEM 440.**CALCIUM CHLORIDE FOR ROADWAY DUST CONTROL**

To be used for dust control on subgrade and pavement, and as directed by the Engineer.

STA. 0+31 to STA. 5+85

ITEM 443.**WATER FOR ROADWAY DUST CONTROL**

To be used for dust control on subgrade and pavement, and as directed by the Engineer.

STA. 0+31 to STA. 5+85

ITEM 450.22**SUPERPAVE SURFACE COURSE -9.5 (SSC -9.5)**

To be used within project locations for full-depth roadway construction and pavement fine milling of Creamery Road, excluding the surface of Bridge H-08-003=N-07-002 (C7G).

STA. 0+30 to STA. 2+59

STA. 3+93 to STA. 5+25

ITEM 450.31**SUPERPAVE INTERMEDIATE COURSE -12.5 (SIC-12.5)**

To be used within project locations for full-depth construction of Creamery Road, excluding Bridge H-08-003=N-07-002 (C7G).

STA. 0+85 to STA. 2+59

STA. 3+93 to STA. 5+25

ITEM 450.42**SUPERPAVE BASE COURSE – 37.5 (SBC-37.5)**

To be used within project locations for full-depth construction of Creamery Road, excluding Bridge H-08-003=N-07-002 (C7G).

STA. 0+85 to STA. 2+59

STA. 3+93 to STA. 5+25

ITEM 450.60**SUPERPAVE BRIDGE SURFACE COURSE – 9.5 (SSC-B-9.5)**

To be used as the surface course for Bridge H-08-003=N-07-002 (C7G), within the bridge limits.

ITEM 450.70**SUPERPAVE BRIDGE PROTECTIVE COURSE – 9.5 (SPC-B-9.5)**

To be used as the protective (base) course for Bridge H-08-003=N-07-002 (C7G), within the bridge limits.

ITEM 452.**ASPHALT EMULSION FOR TACK COAT**

Creamery Road – Full Depth Construction

Creamery Road – Fine Milling and Resurfacing

ITEM 620.12**GUARDRAIL, TL-2 (SINGLE FACED)**

East Approach:

STA. 1+06 to STA. 2+23 LT

STA. 1+39 to STA. 2+23 RT

West Approach:

STA. 4+27 to STA. 5+74 LT and RT

ITEM 627.82**GUARDRAIL TANGENT END TREATMENT, TL-2**East Approach:

STA. 1+00 LT

STA. 1+33 RT

West Approach:

STA. 5+80 LT and RT

ITEM 628.24**TRANSITION TO BRIDGE RAIL**East Approach:

STA. 2+57 LT and RT

West Approach:

STA. 3+93 LT and RT

ITEM 630.2**HIGHWAY GUARD REMOVED AND DISCARDED**

To be used for removing the existing guardrail along Creamery Road on the east and west approaches to the bridge, within the project limits.

ITEM 645.160**60 INCH CHAIN LINK FENCE (PIPE TOP RAIL) VINYL COATED
(LINE POST OPTION)**

To be used on top of the proposed retaining wall.

STA. 4+75 to STA. 5+60 LT

ITEM 657.**TEMPORARY FENCE**

To be used behind temporary barriers during construction phases and to prevent unprotected open access to pedestrians, within the project limits.

East Approach

West Approach

ITEM 657.5**TEMPORARY FENCE REMOVED AND RESET**

To be used for removing and resetting temporary barriers during construction phases, within the project limits.

ITEM 697.**SEDIMENTATION FENCE**

To be used at the toe of fill slopes to prevent sediment washout outside of anticipated project limits.

East Approach: STA. 1+00 to STA. 2+75 LT and RT

West Approach: STA. 3+75 to STA. 5+25 LT and RT

ITEM 698.31**GEOTEXTILE FABRIC FOR TEMPORARY SOIL PROTECTION**

To be used for erosion control at the proposed wetland replication area.

Wetland Replication Area: Approx STA. 2+50, 100' LT

ITEM 698.4**GEOTEXTILE FABRIC FOR PERMANENT EROSION CONTROL**

To be used for erosion control at proposed riprap areas around the east and west bridge abutments.

ITEM 711.**BOUND REMOVED AND RESET**

To be used for excavation and relocation of Right of Way boundary markers.

Sta. 1+55 RT

Sta. 2+47 RT

Sta. 4+60 RT

Sta. 5+05 RT

ITEM 734.52**SIGN POST REMOVED AND STACKED**

To be used to remove and stack existing signs within the project limits, and as directed by the Engineer.

East Approach: STA. 1+13, 31' RT

STA. 1+22, 19' RT

West Approach: STA. 4+68, 9' LT

ITEM 740.**ENGINEER'S FIELD OFFICE AND EQUIPMENT (TYPE A)**

To be used for the duration of the project.

ITEM 748.**MOBILIZATION**

To be used for the Contractor's mobilization to the project site.

ITEM 751.73**COMPOST BLANKET**

To be used within the wetland replication area (used in areas of upland seed mix).

Wetland Replication Area: Approx. STA. 2+50, 100' LT

ITEM 755.35**INLAND WETLAND REPLICATION AREA**

To be used to construct a new wetland outside of the project limits. Includes wetland soil, wetland FACW meadow mix, and upland mid-height grassland seed mix.

Wetland Replication Area: Approx. STA. 2+50, 100' LT

ITEM 755.45**WETLAND RESTORATION**

To be used to restore impacted wetlands within the project limits.

ITEM 755.75**WETLAND SPECIALIST**

To be used for the services of a Wetland Scientist, Wetland Ecologist, Restoration Ecologist, or other professional to coordinate and oversee all work associated with the Wetland Mitigation.

ITEM 755.76**WETLAND MONITORING REPORTS**

To be used to perform inspections and complete reports to ensure compliance with mitigation requirements and all applicable environmental permits.

ITEM 765.**SEEDING**

To be used within all areas of disturbance within the project limits, used primarily for site restoration.

ITEM 765.21**ANNUAL COVER CROP FOR NATIVE SEEDING**

To be used within wetland replication area.

ITEM 765.421**NATIVE SEEDING MIX MID-HEIGHT GRASSLAND MIX**

To be used within wetland replication area.

ITEM 765.635**NATIVE SEEDING AND ESTABLISHMENT**

To be used in the wetland replication area for site restoration.

Wetland Replication Area: Approx. STA. 2+50, 100' LT

ITEM 767.12**SEDIMENT BARRIER – COIR LOG**

To be installed as shown on the cross-sections and as directed by the Engineer to prevent erosion along the 2:1 fill slopes through the project limits.

Sta. 1+00 to Sta. 2+75

Sta. 3+75 to Sta. 5+60

ITEM 767.121**SEDIMENT CONTROL BARRIER**

To be used for erosion control within the project limits and as directed by the Engineer.

Sta. 1+00 to Sta. 2+75 LT and RT

Sta. 3+75 to Sta. 5+60 LT and RT

ITEM 767.9**JUTE MESH**

To be used only as directed by the Engineer as a contingency for erosion control in the wetland replication area.

Wetland Replication Area: Approx. STA. 2+50, 100' LT

ITEM 767.91**TIMBER MATTING**

To be used in the construction of the access road to the wetland replication area and to support construction equipment when operating in wetlands.

ITEM 824.20**FLASHING WARNING BEACON TYPE A**

To be used as required by the Temporary Traffic Control Plan, and as directed by the Engineer.

- ITEM 832.** **WARNING – REGULATORY AND ROUTE MARKER – ALUMINUM PANEL (TYPE A)**
- To be used as required by the Temporary Traffic Control Plan, and as directed by the Engineer.
- ITEM 833.7** **DELINEATION FOR GUARD RAIL TERMINI**
- To be used for guardrail terminals for all sections of guardrail along Creamery Road.
- ITEM 847.1** **SIGN SUP (N/GUIDE)+RTE MKR W/1 BRKWAY POST ASSEMBLY-STEEL**
- To be used for the installation of new signposts for specified warning/regulatory signs located within the project limits.
- ITEM 850.41** **ROADWAY FLAGGER**
- To be used as required by the Temporary Traffic Control Plan, and as directed by the Engineer.
- ITEM 851.1** **TRAFFIC CONES FOR TRAFFIC MANAGEMENT**
- To be used as required by the Temporary Traffic Control Plan, and as directed by the Engineer.
- ITEM 852.** **SAFETY SIGNING FOR TRAFFIC MANAGEMENT**
- To be used to provide traffic control signage as specified in the Temporary Traffic Control Plan, and as directed by the Engineer.
- ITEM 853.1** **PORTABLE BREAKAWAY BARRICADE TYPE III**
- To be used as specified in the Temporary Traffic Control Plan, and as directed by the Engineer.
- ITEM 853.2** **TEMPORARY BARRIER (TL-2)**
- To be used as required by the Temporary Traffic Control Plan, and as directed by the Engineer. Temporary barrier in Phase 1 is to be removed and reset for Phase 2 barrier.

ITEM 859.**REFLECTORIZED DRUM**

To be used as required by the Temporary Traffic Control Plan, and as directed by the Engineer.

ITEM 859.1**REFLECTORIZED DRUMS WITH SEQUENTIAL FLASHING WARNING LIGHTS**

To be used as required by the Temporary Traffic Control Plan, and as directed by the Engineer.

ITEM 874.4**TRAFFIC SIGN REMOVED AND STACKED**

To be used for the removal and stacking of specified traffic signals along Creamery Road within the project limits.

ITEM 904.**4000 PSI, ¾ INCH, 610 CEMENT CONCRETE**

To be used for the new endwall within the project limits.

ITEM 910.**STEEL REINFORCEMENT FOR STRUCTURES**

To be used for the steel reinforcing bars in the new endwall within the project limits.

ITEM 942.124**STEEL PILE HP 12 X 84**

To be used for steel piles at abutments.

ITEM 942.2**PRE-DRILLING FOR PILES**

To be used for pre-drilling for steel piles at abutments.

ITEM 944.3**DRILLING FOR PILE OBSTRUCTIONS**

To be used for drilling a hole where obstructions were encountered at each pre-drill hole.

ITEM 948.41**DYNAMIC LOAD TEST BY CONTRACTOR**

To be used to perform dynamic load tests of steel piles.

ITEM 948.5**PILE SHOES**

To be used to provide pile shoes for steel piles.

ITEM 983.**DUMPED RIPRAP**

To be used as a component of the riprap at each abutment.

ITEM 983.5**STREAMBED/BANK RESTORATION**

To be used as a component of the riprap at each abutment.

ITEM 991.1**CONTROL OF WATER – STRUCTURE NO. H-08-003=N-07-002**

To be used for the control of water, as necessary, to complete the proposed work.

ITEM 995.01**BRIDGE STRUCTURE, BRIDGE NO. H-08-003**

To be used for the Creamery Road bridge.

ITEM 996.31**MECHANICALLY STABILIZED EARTH WALL**

To be used to provide a retaining wall along the west approach of Creamery Road to prevent grading into the existing stream flowing into the Ware River.

DOCUMENT A00808

PROJECT UTILITY COORDINATION FORM

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Project Utilities Coordination (PUC) Form

CONTACTS AND GENERAL UTILITY INFORMATION

6/15/2023
Revision
Date:

City/Town: Hardwick/New Braintree	Project File #: 608851	PUC Completed by: Paul Kelly	Utility Pole Set: National Grid
Route/Street: Creamery Road	Resident Engineer:	Mass DOT PM: William F. Brown	Scheduled Ad Date: 11/2/2024
Total Poles Relocated:			1

[illegible]

Utility Relocation Notes for MassDOT Contractor

Unless otherwise noted by Contract, the MassDOT Contractor is to provide the District Construction Office with 7 Calendar Days advance notification in order to validate the current progress and provide the required 30 Days advance notice-to-proceed for the first Utility - and each subsequent Utility. These advance notifications are to be identified in the Contractor's Schedules (Pre-Construction, Baseline, Subnets, and Updated/Monthly Schedules) as specified in Subsection 8.02 (of DBB Contracts) and/or Section 9 (of DB Contracts). Note: The durations included below do not include these lead-times. See Additional 'Important Basis notes for Contractor' - on last PUC Form page.

Additional notes:

Suggested Sequence of Relocation (Based on Consultant proposed construction staging)

The sequence as detailed on the following pages is based on the consultants proposed staging plan. This information was compiled through meetings that included all of the utilities listed below along with the designer and the (Insert Municipality here). The information provided is the best available information prior to project advertisement.

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DOCUMENT A00810

MassDOT Herbicide Use Report

MassDOT Herbicide Use ReportDate Submitted: *Use multiple sheets for multiple application techniques or sites as needed.*Contractor
Performing Work:

Project or Contract No:

Town/s:

Associated Route:

Project
Description:Treatment
Description:**Area Treated (as applicable)**

Acres:

Sq Yds:

Miles:

Weeds
Targeted:

Gallons Formula Used:

Date/Time Began:

Application
Method:

Date/Time End:

Product Used:

Name: _____	Name: _____	Name: _____
EPA Reg. No: _____	EPA Reg. No: _____	EPA Reg. No: _____
% Active Ingredient	% Active Ingredient	% Active Ingredient
Dry: _____	Dry: _____	Dry: _____
Liquid: _____	Liquid: _____	Liquid: _____
Formulation (dilution rate): _____	Formulation (dilution rate): _____	Formulation (dilution rate): _____

Additional products used (surfactants, etc.) or other information:**Applicators:**

License Numbers:

Upon completion, please submit form to MassDOT District Engineer and Landscape Design Section in Boston office.
11-16-2017



WORK ZONE SAFETY

Temporary Traffic Control

*Typical Details and
Massachusetts Guidelines
for MassDOT, Municipalities,
Utilities, and Contractors*

SHEET INDEX (1 OF 3)**GENERAL****PAGE**

NOTES AND GUIDELINES.....	1-9
FIG. 1: TYPICAL TRAFFIC CONTROL DEVICES.....	10
FIG. 2: PAVEMENT EDGE DROP-OFF GUIDANCE.....	11
FIG. 3: TYPICAL DEVICE SPACING; (AT 30 MPH).....	12-13
FLAGGING GUIDANCE.....	14-15
FIG. 4-5: TYPICAL PEDESTRIAN DEVICES.....	16-17

STATIONARY OPERATIONS

FIG. 6: TWO LANE UNDIVIDED ROADWAY; HALF OF ROADWAY CLOSED; WORK NEAR CURVE.....	18-19
FIG. 7: TWO LANE UNDIVIDED ROADWAY; HALF OF ROADWAY CLOSED.....	20-21
FIG. 8: TWO LANE UNDIVIDED ROADWAY; SHOULDER CLOSED.....	22-23
FIG. 9: TWO LANE UNDIVIDED ROADWAY WITH TRAVERSABLE SHOULDER; HALF OF ROADWAY CLOSED; MAINTAIN TWO-WAY TRAFFIC.....	24-25
FIG. 10: FOUR LANE UNDIVIDED ROADWAY; RIGHT LANE CLOSED.....	26-27
FIG. 11: FOUR LANE UNDIVIDED ROADWAY; LEFT LANE CLOSED.....	28-29
FIG. 12: FOUR LANE UNDIVIDED ROADWAY; HALF OF ROADWAY CLOSED.....	30-31
FIG. 13: MULTILANE DIVIDED ROADWAY; RIGHT LANE CLOSED.....	32-33
FIG. 14: MULTILANE DIVIDED ROADWAY; LEFT LANE CLOSED.....	34-35
FIG. 15: MULTILANE DIVIDED ROADWAY; CENTER LANE OR RIGHT/CENTER LANES CLOSED.....	36-37
FIG. 16: MULTILANE DIVIDED ROADWAY; CENTER LANE OR LEFT/CENTER LANES CLOSED.....	38-39

SHEET INDEX (2 OF 3)

<u>STATIONARY OPERATIONS (CONT.)</u>	<u>PAGE</u>
FIG. 17: MULTILANE DIVIDED ROADWAY; RIGHT SIDE OF OFF RAMP CLOSED.....	40-41
FIG. 18: MULTILANE DIVIDED ROADWAY; LEFT SIDE OF OFF RAMP CLOSED.....	42-43
FIG. 19: MULTILANE DIVIDED ROADWAY; ROADWORK BEYOND ON RAMP.....	44-45
FIG. 20: MULTILANE DIVIDED ROADWAY; ROADWORK BEYOND OFF RAMP.....	46-47
FIG. 21: MULTILANE DIVIDED ROADWAY; TYPICAL RAMP CLOSURE.....	48-49
FIG. 22: MULTILANE DIVIDED ROADWAY; TYPICAL CLOVERLEAF RAMP CLOSURE.....	50-51
FIG. 23: MULTILANE DIVIDED ROADWAY; TYPICAL RAMP CLOSURE; ADVANCE SIGNING.....	52-53
FIG. 24: FOR MULTILANE DIVIDED ROADWAY; PLACEMENT OF TEMPORARY PORTABLE RUMBLE STRIPS.....	54-55
<u>MOBILE OPERATIONS</u>	
NOTES FOR MOBILE OPERATIONS.....	56
FIG. 25: ANY ROADWAY; BEYOND RIGHT SHOULDER.....	57
FIG. 26: ANY ROADWAY; SHOULDER.....	58
FIG. 27: DIVIDED ROADWAY; MEDIAN WORK.....	59
FIG. 28: UNDIVIDED TWO LANE ROADWAY; HALF OF ROADWAY CLOSED.....	60
FIG. 29: MULTILANE DIVIDED ROADWAY; LEFT LANE.....	61
FIG. 30: MULTILANE DIVIDED ROADWAY; RIGHT LANE.....	62
FIG. 31: MULTILANE DIVIDED ROADWAY; CENTER LANE.....	63
FIG. 32: POST-STORM CLEANUP OPERATION.....	64

SHEET INDEX (3 OF 3)**EMERGENCY RESPONSE****PAGE**

NOTES FOR TRAFFIC EMERGENCY/INCIDENT OPERATIONS... 65

FIG. 33: ANY ROADWAY; SHOULDER ENCROACHMENT..... 66

FIG. 34: TWO LANE ROADWAY; NO SHOULDER; TRAVEL
LANE ENCROACHMENT.....67FIG. 35: TWO LANE ROADWAY; TRAVERSABLE SHOULDER;
SINGLE LANE ENCROACHMENT..... 68FIG. 36: TWO LANE ROADWAY; TRAVERSABLE SHOULDER;
CENTER OF ROADWAY..... 69

FIG. 37: MULTILANE DIVIDED ROADWAY; RIGHT LANE..... 70

FIG. 38: MULTILANE DIVIDED ROADWAY; LEFT LANE.....71

FIG. 39: MULTILANE UNDIVIDED ROADWAY; LEFT LANE..... 72

FIG. 40: MULTILANE DIVIDED ROADWAY; MIDDLE LANE;
APPROACH FROM LEFT.....73FIG. 41: MULTILANE DIVIDED ROADWAY; MIDDLE LANE;
APPROACH FROM RIGHT.....74**TRAFFIC SIGNAL REPAIR WORK AT INTERSECTION**FIG. 42: MULTILANE UNDIVIDED ROADWAY; LEFTMOST OR
LEFT TURN LANE.....75FIG. 43: TWO LANE UNDIVIDED ROADWAY; ONE LEG OF
INTERSECTION..... 76FIG. 44: MULTILANE UNDIVIDED ROADWAY; CENTER OF
INTERSECTION..... 77**PEDESTRIAN DETAILS**

FIG. 45: PEDESTRIAN BYPASS.....78

FIG. 46: TEMPORARY SIDEWALK CLOSURE..... 79

BIKE LANE DETAILS

FIG. 47: BIKE LANE CLOSURE.....80-81

INTRODUCTION

This guide has been prepared to assist in the planning and installing of temporary traffic controls in maintenance, utility, or short-term construction work areas (work lasting 10 hours or less). This guide serves to assist with the many decisions that must be made for each work site. Special planning for traffic control is necessary on a case by case basis because conditions can vary widely among work locations. **Since this guide cannot cover every situation, representative illustrations covering typical short-term construction, maintenance, and utility operations are presented.**

All typical traffic control device setups illustrated should be considered as guides. The traffic control devices that are shown, the arrangement or position of the devices, and the distances prescribed in the tables are based on the Federal Highway Administration's (FHWA) Manual on Uniform Traffic Control Devices (MUTCD) and the Massachusetts Amendments to the MUTCD (MA Amendments), but these illustrations only present minimum standards. The provision of safe work zones for all roadway users and roadway workers affected by these activities is paramount. Traffic controls may be expanded or improved upon whenever deemed necessary. Traffic movement through the work site all traffic control devices shall be periodically observed and inspected at all locations.

If necessary, Part 6 of the MUTCD and the MA Amendments, Chapter 17 (Work Zone Management) of MassDOT's Project Development & Design Guide, and the "Traffic Engineering and Safety Section" of the MassDOT web site: (<https://www.massdot.state.ma.us/highway/Departments/TrafficandSafetyEngineering.aspx>), as well as MassDOT District offices can provide additional guidance, information, and suggestions for work zone setups.

RESPONSIBILITIES FOR TRAFFIC CONTROL

Short-term construction, maintenance, and utility work on or near the roadway creates a potentially hazardous situation, typically requiring the use of temporary traffic controls. These controls are important to protect both work crews and the road users. It is the responsibility of each maintenance foreman to establish and maintain safe and effective controls.

Usually the supervisor, working with the crew, plans the traffic control procedures for proposed work sites. The foreman is responsible for re-requesting, storing, and maintaining all traffic control devices necessary for their crews.

The foreman is responsible for placing the devices according to these guidelines. They must inspect each installation and observe traffic flow through the area. The foreman is generally authorized to make adjustments to the original installations that, in their judgment, are necessary to improve the control of traffic and establish greater safety.

All necessary traffic control devices must be installed before work begins and properly maintained during the work period. They must also be removed as soon as they are no longer relevant to the roadway conditions.

PAGE 2

In situations such as night time road or lane closures, detours, or other unusual conditions on state highways, the District Traffic Maintenance Engineer (DTME) should be advised. If the DTME is absent, the section foreman shall follow the instructions of the District Maintenance Engineer.

TRAFFIC CONTROL DEVICES

Traffic control devices regulate the movement of road users, warn of unexpected or unusual roadway conditions, and inform them how to maneuver safely through or around the work area. All signs, channelizing devices, barricades, and other miscellaneous traffic control devices should work together to guide traffic safely and efficiently. Common temporary traffic control devices are outlined and described below.

Signs

Temporary traffic control zone (TTCZ) signs are the primary means of providing information and directions to roadway users. All signs must be retroreflective per MassDOT's latest standard.

Warning signs call attention to unexpected conditions and to situations that might not be readily apparent to road users on or adjacent to a roadway. Warning signs alert road users to conditions that might call for a reduction of speed or an action in the interest of safety and efficient traffic operations. Nearly all warning signs for construction and work areas have black legends and borders on a fluorescent orange background.

Regulatory signs shall be used to inform road users of selected traffic laws or regulations and indicate the applicability of the legal requirements. Regulatory signs typically have black legends and borders on a white background.

Channelizing Devices

When used properly, traffic cones, reflectorized plastic drums, and barricades guide traffic through the work area along an appropriate travel path. It takes roadway users a certain distance along the roadway to safely move away from the upcoming active work site. These transition distances are based on the following taper length (L) formulas:

$L = WS^2/60$ for speeds of 40 mph or less; or

$L = WS$ for speeds of 45 mph or more; where

- L = minimum length of taper in feet,
- S = posted speed limit or typical travel speed in miles per hour prior to the work, and
- W = width of lane closure in feet.

The spacing of channelizing devices (in feet) is approximately equal to the existing speed of traffic (in mph).

Warning Lights

Rotating beacons and other flashing lights mounted on work vehicles, signs, or channelizing devices help alert roadway users to the work area. They may also be used to warn roadway users of hazards within the work area. The first 10 drums in any taper shall be equipped with sequential flashing lights.

Arrow Boards

Arrow boards are a special type of sign that are highly visible work zone warning devices. They are particularly effective on highways, where both speed and volume are high. Arrow boards in the non-directional, CAUTION, mode (four corner flashing) may be used to indicate that a shoulder is closed. Arrow boards in the arrow mode shall only be used when a travel lane is dropped on a multi-lane road and one lane of traffic must merge with another. All arrow boards should be located at the beginning of each lane or shoulder closure taper without extending outside of it. Arrow boards shall flash at a rate of 25 to 40 flashes per minute. Arrow boards shall not be used to indicate a lane shift.

BASIC REQUIREMENTS

In every work situation, the temporary traffic control setup must: Give roadway users sufficient advance warning of the work area; advise roadway users of the proper actions to take and travel paths to follow; and provide protection to roadway users, workers, and the work area. These three general requirements can be met as outlined below.

Provide Advance Warning

Warning devices along the approaches to a work area alert roadway Users to changes to road and operating conditions. Roadway users are usually alerted to these dangers via a sign or series of signs installed in the same order as the roadway user generally would expect to see them on long-term construction projects.

The initial project limit sign is usually a general warning such as "ROAD WORK 1500 FT". Other operational warning signs then provide the roadway user with more specific information about the situation. A minimum of three advance warning signs (the initial project limit sign and two operational warning signs) is recommended when work is located on the traveled way. Warning lights and flags can be used to attract attention to the signs. A highly visible work area helps reinforce the advance warnings.

Advise and Direct Travelers

Operational warning signs provide information to the road-way user such as the type of work being performed, special conditions to watch for, or actions to take. These include signs such as, SHOULDER WORK, RIGHT LANE CLOSED, DETOUR 500 FT, ROAD CLOSED to THRU TRAFFIC, POLICE OFFICER AHEAD, etc. All of these signs must be located far enough in advance of the work area that the roadway user has sufficient time to react to them appropriately. For projects in Urban Areas, see detail: Typical Device Spacing for minimum sign spacing.

Protect Travelers, Workers, and the Work Area

The primary protection of any work area is its own visibility. Traffic cones, reflectorized plastic drums, portable breakaway barricades, etc. are used to make the work area visible and separate workers from traffic.

PAGE 4

Other devices, such as flashing lights, flags, delineators, temporary lighting, and portable changeable message signs (PCMS) can be used to provide additional emphasis and visibility.

Workers must protect themselves by being alert to their work situation, wearing safety vests and hard hats, and by facing traffic whenever possible.

Work vehicles can also add protection when they are equipped with truck mounted attenuators, rotating beacons, flashing lights, flashing arrow boards, etc. and are parked between workers and oncoming traffic. However, workers should not position themselves between two closely parked vehicles. No private personal vehicles are allowed within the work site.

PLANNING GUIDELINES

Decisions regarding selection of work area traffic control devices require a knowledge and understanding of the specifics of each work zone. As there may be vast differences between situations, three main variables need to be considered prior to determining the need for, or the selection of, traffic control devices: 1) location of work, 2) type of roadway, and 3) speed of traffic.

Compiling information about these variables will help with planning a safe work area control. Each of these variables is explained below.

Location of Work

The choice of traffic controls needed for a short-term construction, maintenance, or utility operation depends upon the work zone's location. As a general rule, the closer the active work site is to the roadway, the more control devices are needed. Work can take place:

- Away from the shoulder or edge of pavement. No special devices are needed if work is confined to an area 15 or more feet from the edge of the shoulder. A general warning sign, such as ROAD WORK AHEAD, should be used if workers and equipment must occasionally move closer to the roadway.
- On or near the shoulder/ edge of pavement. This area should be signed as if work were on the road itself, since it is part of the roadway users' recovery area. Advance warning and operational signs are needed, as well as channelization devices to direct traffic and keep the work area visible to roadway users.
- On the median of a divided highway. Work in this location may require traffic control in both directions of traffic. Advance warning and channelization devices should be used if the median is narrow.
- On the roadway. This condition requires detailed protection for workers and sufficient warning to roadway users. Advance warning must provide a general message that work is taking place as well as information about specific hazards and specific actions the roadway user must take.

TYPE OF ROADWAY

The characteristics of the roadway also have an important influence on the selection of work area traffic control. The roadway, itself, may present special hazards. You should plan for maximum protection, using the worst hazard present as your guide to signing the work area. Some general considerations are described below for road conditions.

One-way roads: A one-way road requires signage on both sides of the road if it carries two or more lanes in one direction, ensuring roadway users in all lanes are alerted and informed.

Two-way roads:

- **Undivided:** Two-way, undivided roads will usually require controls for both directions of traffic. When the active work site is well off the roadway, controls for the opposite lane may be eliminated.
- **Divided:** Work on divided multi-lane roadways can often be handled as work along a one-way road (i.e. signs are provided along both sides of the roadway along the direction affected). If the work is in the median, both directions of traffic must be controlled, and both approaches should be double signed (i.e. have all 3 advance warning signs on both sides of each direction).

EFFECTS OF SPEED ON WORK ZONES

Speed is an important consideration in the use of work area traffic control devices. As a general rule, the greater the speed of traffic approaching a work area, the greater the size, number, and spacing of control devices.

Size. The standard size for most warning signs is 36 x 36 inches on conventional roadways and 48 x 48 inches on freeways and expressways. Signs larger than the standard 36 x 36 inches may be desirable on high-speed conventional roads.

Position. Install signs far enough in advance of the work area so the roadway users have time to react to them (see charts associated with diagrams for spacing).

OTHER FACTORS

Sight Obstructions. To ensure safety, work areas must be visible. Assess the placement of the temporary traffic control devices by driving through the area, and determine if the devices can be easily seen and provide sufficient time for roadway users to react in a safe manner. Extra precaution should be enacted in areas where horizontal or vertical curves may obstruct a roadway user's clear view of road activities ahead.

Police/Flaggers. It should be noted that the MUTCD does not require police/flaggers for stationary setups. If police/flaggers are used, a police/flagger ahead sign should be used in advance of any point where the police/flagger is stationed to control road users.

PROCEDURES FOR WORK AREA TRAFFIC CONTROL

1. PLAN YOUR WORK

Inspect location of work area and its surroundings.

Analyze:

- Location of work in relation to the traveled way, intersecting road-ways, driveways, and sight distances;
- Type of roadway and traffic involved; and
- Volume and speed of traffic.

Meet and discuss the work and necessary traffic control with the crew.

Study representative illustrations in this guide to develop a temporary traffic control plan (TTCP).

Other Considerations:

- Base your traffic control plan on the premise that all roadway users are unfamiliar with the area.
- The closer the work area location is to traffic, the more controls are needed.
- Plan for maximum protection.
- Select and inspect the temporary control devices needed (including all warning signs), if they are not in good condition, REPLACE THEM!
- Then collect and transport them to the work site.
- Determine their proper placement.
- Install signs and other traffic control devices prior to allowing personnel or equipment onto the roadway.
- Make sure signs are reflective, accurate, clean, and meet specifications. Completely cover any existing permanent signs that will conflict with the messages of the new work area control signs.

2. INSTALLING/REMOVING TEMP. TRAFFIC CONTROL DEVICES

Care must be exercised when installing and removing temporary traffic control (TTC) devices. The traffic control needed to perform the operation safely is dictated by the location on the roadway the operation will occur: in a shoulder or a lane, in the left lane or right, etc. In all cases, installing TTC begins and ends as a mobile operation.

A shadow vehicle with a truck mounted attenuator (TMA) shall be used to protect workers installing and removing TTC devices on all roadways with a posted speed limit of 45 MPH or greater as directed by the engineer. TTC devices shall not be installed or removed from a shadow vehicle with a TMA. TTC devices shall be installed or removed from a work operation vehicle only and a shadow vehicle with a TMA shall be used to protect the workers installing or removing the devices.

PROCEDURES FOR WORK AREA TRAFFIC CONTROL (CONT.)

3. INSTALL TRAFFIC CONTROL DEVICES AT WORK SITE FOR LOWER SPEED (≤ 40 MPH) ROADWAYS:

- 1) All devices shall be installed in order with the flow of traffic.
- 2) Where one direction of traffic is being affected, the first sign installed should be the sign farthest from the work site, and on the same side as the work.
- 3) Where two directions of traffic are affected, install signs for opposing traffic first, starting with the sign farthest from the work area. When signs for opposing traffic have been installed, install signs on the same side as the work area, again beginning with the sign farthest from the active work site.
- 4) Once signs are in place, other traffic control devices shall be installed in the same manner as the signs.

FOR HIGHER SPEED (≥ 45 MPH) ROADWAYS:

- 1) All devices shall be installed in order with the flow of traffic.
- 2) Install all advance warning signs, beginning with the ROAD WORK XXX (W20-1) sign and ending with the END ROAD WORK/DOUBLE FINES END (MA-R2-10E) sign.
- 3) Install all signs beginning with the opposite side which will be closed (for a right lane closure; first, install all signs on the left side (shoulder) and then install all signs on the right side (shoulder). No signs shall be erected on the roadway unless delineated by traffic control devices.
- 4) If required, install shoulder taper as the mobile operation advances.
- 5) Install arrow board on the shoulder prior to the merging taper or as close to the beginning of the merging taper as possible.
- 6) Install channelizing devices to form a merging taper. Use of a shadow vehicle with a TMA during installation is required on roads with speed limits of 45 MPH or greater or as directed by the Engineer.
- 7) Install traffic control devices along the buffer space at the appropriate spacing.
- 8) Continue placing devices along the work space at the appropriate spacing.
- 9) Install devices for the termination area as necessary.
- 10) Place the shadow vehicle with a TMA in advance of the first work crew or hazard approached by motorists. Multiple shadow vehicles may be required based on the number of lane and shoulder closures implemented.

4. INSPECT WORK AREA SIGNING AND CONTROL DEVICES

- 1) Assess the placement of the temporary traffic control devices by driving through the work area. All approaches to the work zone should be checked.
- 2) Ensure roadway users will have sufficient time to read signs and react in a safe manner.

PROCEDURES FOR WORK AREA TRAFFIC CONTROL (CONT.)

- 3) Check visibility of entire work area. If approaching roadway users can't see the work area well, or if they can't see ahead to traffic that may already be queued on the approach because of the work, additional traffic control devices should be deployed.
- 4) Check to ensure the proper temporary traffic control devices are positioned to protect workers from traffic (where possible).
- 5) Ensure all workers wear safety vests, hard hats, and all other necessary safety equipment. All worker safety gear should be in good condition. All reflective gear should be clean and highly visible in the dark.
- 6) Record in the log book the number and location of all signs and devices.

Considerations:

- Work area signs should never be blocked from view or obscured by vegetation, existing signs, or other obstructions.
- Flags, flashing lights, and edge line traffic cones can be used to improve visibility.

5. REMOVE TRAFFIC CONTROL DEVICES AT WORK SITE

All workers and equipment should be clear from work site BEFORE removing signs and other devices.

FOR LOWER SPEED (≤ 40 MPH) ROADWAYS:

- 1) Remove signs and other devices within the delineated area when work is complete.
- 2) Remove other traffic control devices in the reverse order in which they were installed
- 3) Remove signs in the reverse order in which they were installed (i.e. sign closest to the work area to be removed first).
- 4) When the operation is complete, uncover any existing permanent signs covered in Step 2.
- 5) Record in the log book the time at which the signs were removed.

FOR HIGHER SPEED (≥ 45 MPH) ROADWAYS:

All TTC devices for a stationary lane closure on a multi-lane roadway, except advance warning signs, should be removed against the flow of traffic in the following sequence:

- 1) Remove the channelizing devices starting from the end of the activity area working back to the widest part of the merging taper.
- 2) A shadow vehicle with TMA shall be positioned to protect workers removing devices and work backwards as the setup is removed from the roadway.

PROCEDURES FOR WORK AREA TRAFFIC CONTROL (CONT.)

- 3) Place the removal vehicle on the shoulder, and remove the channelizing devices from the merging taper by hand onto the work vehicle.
- 4) Remove the arrow board once traffic is clear and it is safe to do so.
- 5) Circle back and moving with the flow of traffic, remove the advance warning signs starting with the opposite side from previous lane closure first.
- 6) At no time shall workers run across the multilane roadway to remove signs on both sides of the road simultaneously.
- 7) Record in the log book the time at which the signs were removed

RAMP FACILITIES

At all times it is necessary to control the on and off-ramp traffic during the installation and breakdown of traffic control devices. Use of temporary traffic slow-downs or rolling roadblocks is recommended to allow for the safety of workers handing temporary traffic control devices on ramp facilities. A shadow vehicle with a TMA shall be used to protect the workers installing or removing the devices. At no time shall the work operation vehicle be used as the shadow vehicle with the TMA.

USE OF THIS GUIDE

Illustrations showing minimum standards for short-term construction, maintenance, and utility operations are arranged in this guide by type of operation. The users of this guide should compare all illustrated examples and examine their differences. After gathering information about the work zones using the general guidelines as outlined, proceed as follows:

- 1) Turn to the Index. Consider the type of operations and the type of roadway upon which work will occur.
- 2) Select the figure that most closely matches the conditions where you plan to work. Remember that all diagrams represent minimum standards.
- 3) Read the title of the illustration to ensure that it is appropriate to your location. Study the layout of traffic control devices and read all notes.
- 4) Consult the appropriate tables, as directed on each illustration to determine taper length and proper spacing of signs. Notice that distances change when speeds change. Also note that these are guidelines, only, and they must be adapted to your specific work area.
- 5) Use the **“PROCEDURES FOR WORK AREA TRAFFIC CONTROL”** for assistance in completing all necessary steps to provide effective and safe work area traffic control.



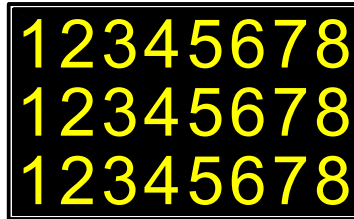
PAGE 10

Work Zone Safety
Standard Details
and Drawings

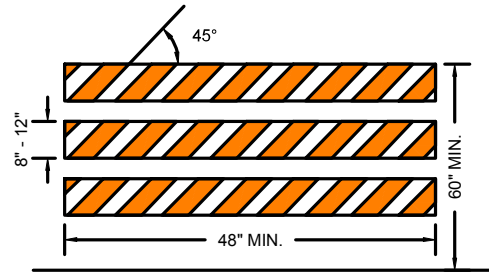
FIGURE 1
TYPICAL TRAFFIC CONTROL DEVICES
NOT TO SCALE



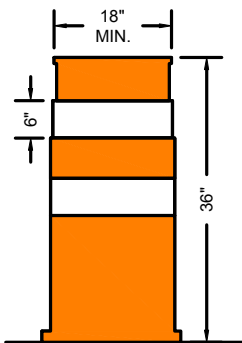
SIGN



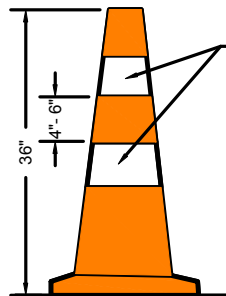
**PORTABLE CHANGEABLE
MESSAGE SIGN (PCMS)**



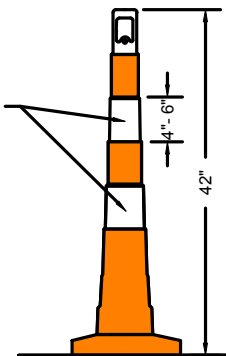
TYPE III BARRICADE



DRUM

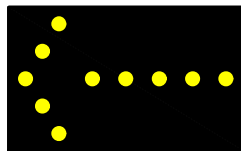


RETROFLECTIVE
BANDS

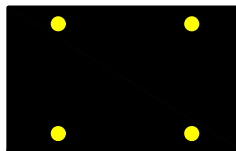


CONES

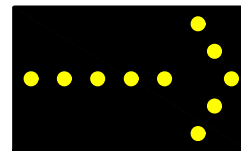
Cones may be used for all daytime operations. For night work, drums should be used to form the taper(s) and cones can be used along the tangent section of the work setup.



LEFT

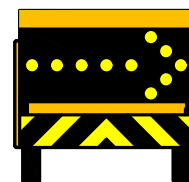


CAUTION



RIGHT

ARROW BOARD (WITH MODE)



TRUCK MOUNTED ATTENUATORS

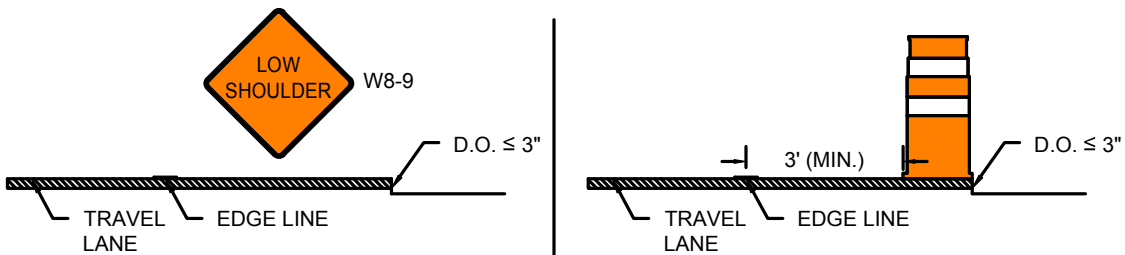
Truck Mounted Attenuators (TMA) shall be positioned between the start of the work area and the end of the designated buffer zone. The TMAs are to be positioned in each temporarily closed lane. This includes shoulders (≥ 8 feet) whether combined with a travel lane closure or being closed alone. These TMA conditions are required on roadways with speeds of 45 MPH or greater. TMAs can be used on other roadways at the discretion of the engineer. TMAs shall be used for the deployment and removal of all traffic control devices, including all advance warning signs.

SHORT-TERM PAVEMENT EDGE DROP-OFFS

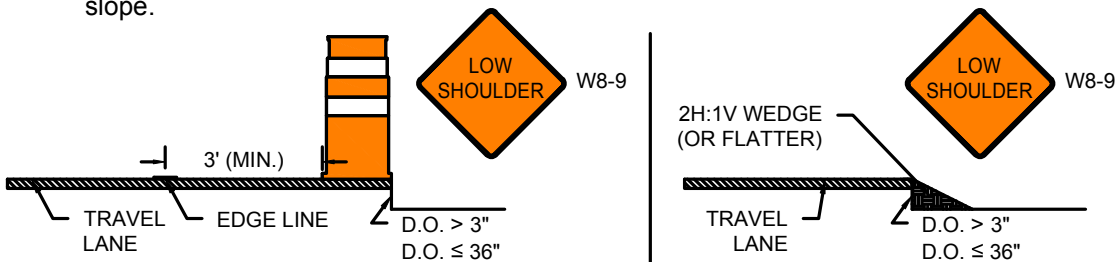
Note that this guidance is adopted from the Roadside Design Guide, 4th Edition.

Pavement drop-offs may occur during paving, excavation, and other construction activities. Drop-offs create hazards for vehicles if not properly mitigated. The following applies for all roads with speed limits greater than 30 mph; for roads with speed limits of 30 mph or less, treatments for pavement edge drop-offs are at the discretion of the Engineer. Drop-offs between adjacent, open travel lanes should not exceed 2", and any drop-off in excess of 3" should not be left unattended without one of these mitigation measures applied.

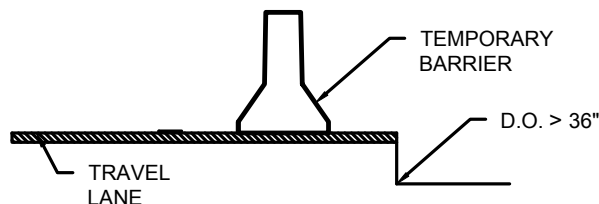
- Shoulder drop-offs 3" or less adjacent to a shoulder or active travel lane should be mitigated by:
 - ✓ A W8-9 (LOW SHOULDER) sign in advance of and at regular intervals throughout the treatment; or
 - ✓ The placement of drums on the traffic side of the drop-off.



- Shoulder drop-offs greater than 3" but less than or equal to 36" should be mitigated by:
 - ✓ A W8-9 (LOW SHOULDER) sign in advance of and at regular intervals throughout the treatment and the placement of drums on the traffic side off the drop-off, offset at least 3' from the travel lane; or
 - ✓ A W8-9 (LOW SHOULDER) sign in advance of and at regular intervals throughout the treatment and the placement of a temporary wedge of material along the face of the drop-off. The wedge should consist of stable material placed on a 2H:1V or flatter slope.



- Shoulder drop-offs greater than 36" must be protected by temporary barrier.





PAGE 12

Work Zone Safety Standard Details and Drawings

TYPICAL DEVICE SPACING

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)	CHANNELIZATION DEVICES (DRUMS OR CONES)			
		TRAVEL LANE CLOSURE LENGTH (L) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	500 / 500 / 500	320	305	20	55
45-55	500 / 1000 / 1000	660	495	40	40
60-65	1000 / 1600 / 2600	780	645	40	50

* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

MINIMUM SPACING OF ADVANCE WARNING SIGNS FOR URBAN ROADWAYS	
ROAD TYPE	DISTANCE BETWEEN SIGNS
URBAN (LOW SPEED)	100 FT
URBAN (HIGH SPEED)	350 FT

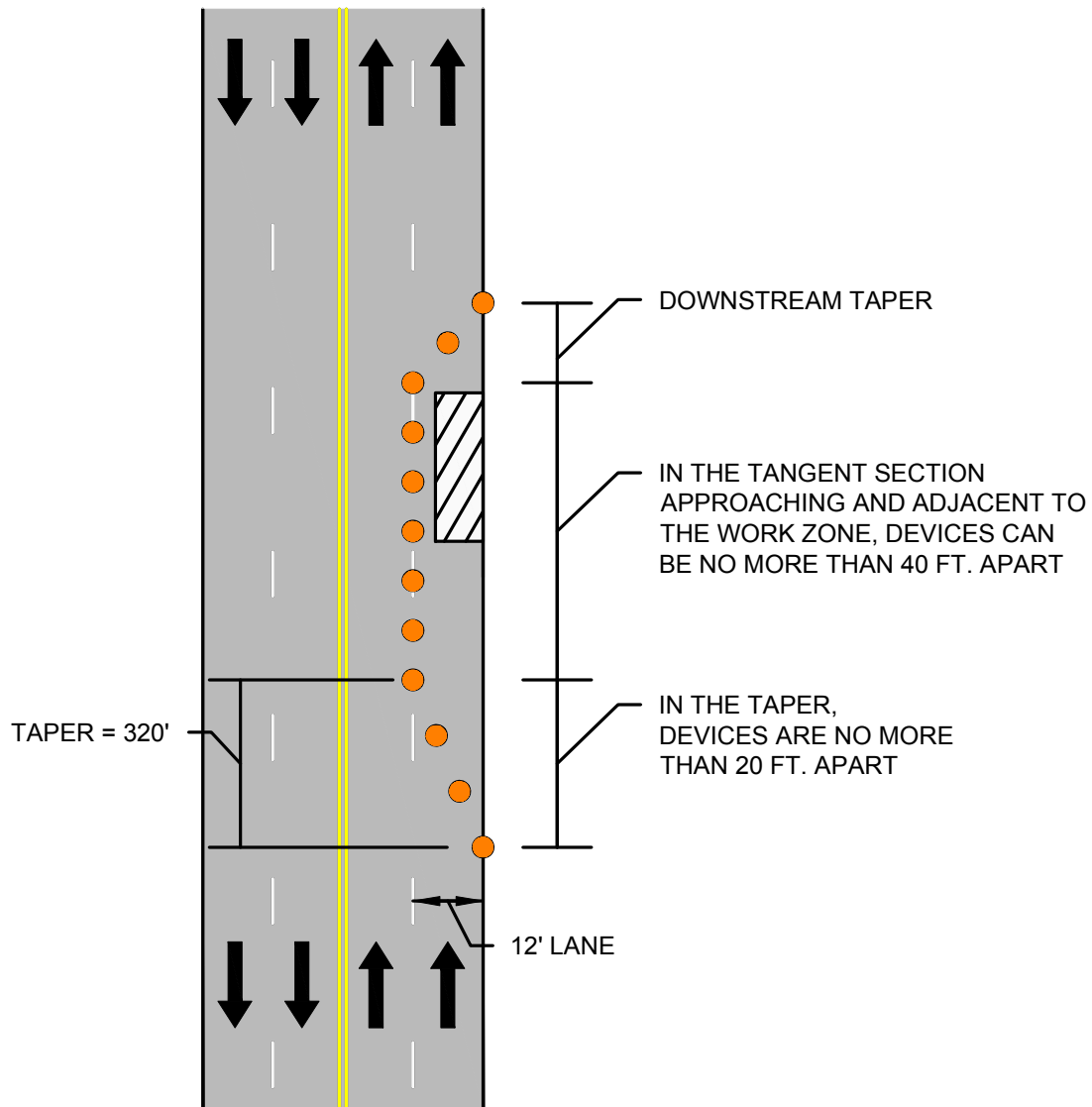
NOTES

1. 40 FT = 10 FT PAVEMENT MARKING + 30 FT SKIP

LEGEND

	WORK ZONE
	CHANNELIZATION DEVICE
	FLASHING ARROW BOARD
	PORTABLE CHANGEABLE MESSAGE SIGN
	TRUCK MOUNTED ATTENUATOR
	RADAR SPEED FEEDBACK BOARD
	POLICE DETAIL OR UNIFORMED FLAGGER
	TEMPORARY PORTABLE RUMBLE STRIP
	TYPE III BARRICADE

NOT TO SCALE





PAGE 14

Work Zone Safety
Standard Details
and Drawings

FLAGGING GUIDANCE

Guidance for Flagging Operations

NOTE:

A flagger shall always be aware of their surroundings and have a good escape route. A flagger shall never be positioned directly beside or against construction equipment. When a flagger is required to direct traffic in an area where the escape route is partially blocked by a traversable obstruction such as a guardrail, the flagger shall be physically capable of traversing that obstruction. Prior to commencing a project, the supervisor in charge shall review the project, including guardrail areas, for safe flagging stations. The supervisor in charge shall clearly communicate with the flagger(s), indicating any locations where they cannot safely perform their duties.

Each flagger shall be equipped with the following high visibility clothing, signaling, and safety devices:

- 1) A white protective hard hat with a minimum level of reflectivity per the requirements of ANSI, Type I, Class E&G;
- 2) A clean, unfaded, untorn lime/yellow reflective safety vest and pants meeting the requirements of ANSI 107 Class 3 with the words "Traffic Control" on the front and rear panels in minimum two (2) inch (50 millimeter) high letters;
- 3) A 24 inch "STOP/SLOW" traffic paddle conforming to the requirements of Part 6E.03 of the Manual on Uniform Traffic Control Devices (MUTCD), a weighted, reflectorized red flag, flagger station advance warning signage, and two-way radios capable of providing clear communication within the work zone between flaggers, the Contractor, and the Engineer. The traffic paddle shall be mounted on a pole of sufficient length to be seven feet above the ground as measured from the bottom of the paddle;
- 4) A working flashlight with a minimum of 15,000 candlepower and a six inch red attachable wand, a whistle with a working lanyard, and a First Aid kit that complies with the requirements of ANSI Z308.1; and
- 5) An industrial/safety type portable air horn that complies with the requirements of the U.S. Coast Guard.

A "STOP/SLOW" paddle should be the primary hand-signaling device. It shall have an octagonal shape on a rigid handle. Flag use should be limited to emergency situations.

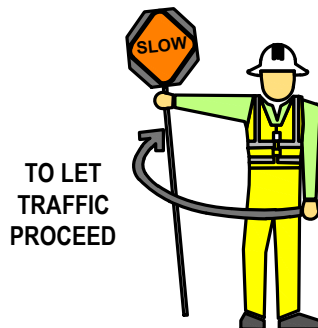


Properly Trained Flaggers

- Give clear messages to drivers.
- Allow distance for drivers to react.
- Coordinate with other flaggers.
- Use standard signaling methods.

Properly Equipped Flaggers

- Use approved stop/slow paddles.
- Use approved safety apparel.
- Use retroreflective equipment.
- Use hand held radios, as needed.
- All flaggers shall wear safety apparel that meets ANSI Class 3 requirements. The combination of vest and pants is required.



Proper Flagging Stations

- Good approach sight distance.
- Highly visible to traffic.
- Stand alone away from other machinery and people.
- Stand on right edge of pavement or shoulder- proceed to centerline only when first vehicle has come to stop.
- Have a good escape route.



Proper Advance Warning Signs

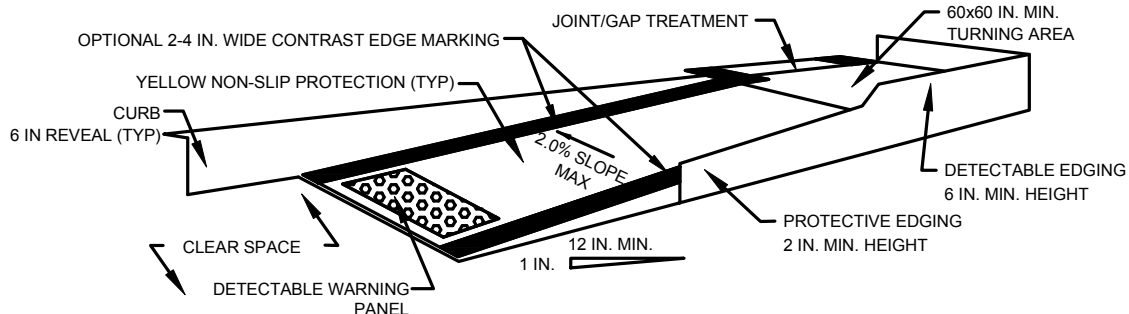
- Always use warning signs.
- Allow for reaction distance from signs.
- Remove signs if no longer necessary or not flagging.
- Use free hand in up-and-down motion to help slow traffic.



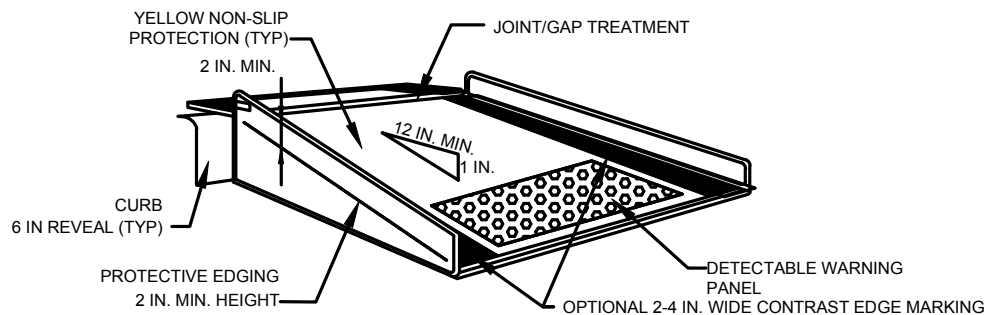
PAGE 16

Work Zone Safety Standard Details and Drawings

FIGURE 4
TYPICAL PEDESTRIAN DEVICES
(1 OF 2)
NOT TO SCALE



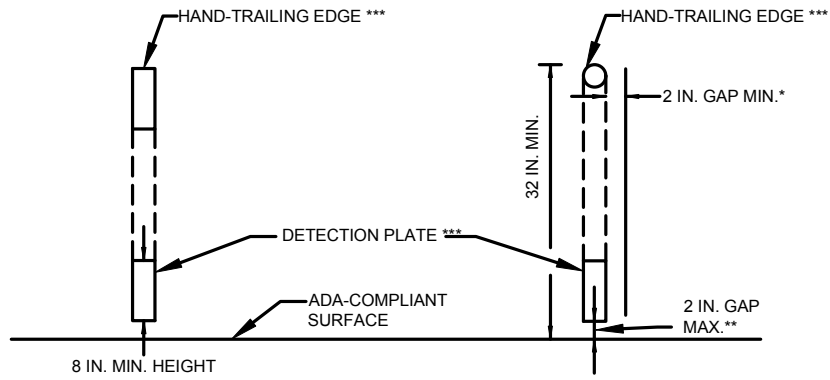
TEMPORARY CURB RAMP-PARALLEL TO CURB



TEMPORARY CURB RAMP-PERPENDICULAR TO CURB

NOTES:

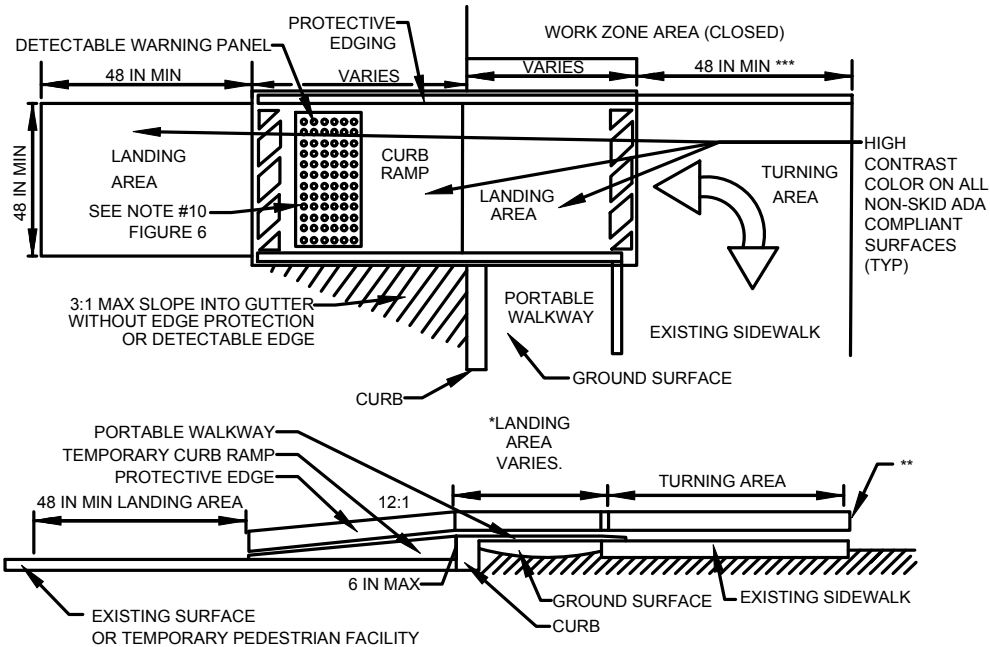
1. CURB RAMPS SHALL BE 60 IN. MINIMUM WIDTH WITH A FIRM, STABLE, AND NON-SLIP SURFACE.
2. PROTECTIVE EDGING WITH A 2 IN. MINIMUM HEIGHT SHALL BE INSTALLED WHEN THE CURB RAMP OR LANDING PLATFORM HAS A VERTICAL DROP OF 6 IN. OR GREATER OR HAS A SIDE APRON SLOP STEEPER THAN 1:3 (33%). PROTECTIVE EDGING SHOULD BE CONSIDERED WHEN THE CURB RAMPS OR LANDING PLATFORMS HAVE A VERTICAL DROP OF 3 IN. OR MORE.
3. PROTECTABLE EDGING WITH 6 IN. MINIMUM HEIGHT AND CONTRASTING COLOR SHALL BE INSTALLED ON ALL CURB RAMP LANDINGS WHERE THE WALKWAY CHANGES DIRECTION (TURNS).
4. THE CURB RAMP WALKWAY AND LANDING AREA SURFACE SHALL BE OF A SOLID CONTINUOUS CONTRASTING COLOR ABUTTING UP TO THE EXISTING SIDEWALK.
5. CURB RAMPS AND LANDINGS SHOULD HAVE A 1:50 (2%) MAX CROSS-SLOPE.
6. CLEAR SPACE OF 48x48 IN. MINIMUM SHALL BE PROVIDED ABOVE AND BELOW THE CURB RAMP.
7. WATER FLOW IN THE GUTTER SYSTEM SHALL HAVE MINIMAL RESTRICTION.
8. LATERAL JOINTS OR GAPS BETWEEN SURFACES SHALL BE LESS THAN 0.5 IN. WIDTH.
9. CHANGES BETWEEN SURFACE HEIGHTS SHOULD NOT EXCEED 0.5 IN. LATERAL EDGES SHOULD BE VERTICAL UP TO 0.25 IN. HIGH, AND BEVELED AT 1:2 BETWEEN 0.25 IN. AND 0.5 IN. HEIGHT.
10. IF A TEMPORARY PEDESTRIAN RAMP LEADS TO A CROSSWALK, THEN A DETECTABLE WARNING PAD MUST BE ADHERED TO THE BASE OF THE RAMP. IF IT LEADS TO A PROTECTED PEDESTRIAN BYPASS THAT DOES NOT CONFLICT WITH VEHICULAR TRAFFIC, THEN A PAD SHALL NOT BE INSTALLED ON THE RAMP.



CROSS SECTION VIEW

PEDESTRIAN CHANNELIZING DEVICE

- * THERE SHALL BE A 2 INCH GAP BETWEEN THE HAND-TRAILING EDGE AND ITS SUPPORT.
- ** A MAXIMUM 2 INCH GAP BETWEEN THE BOTTOM OF THE BOTTOM RAIL AND THE SURFACE MAY BE USED TO PROVIDE DRAINAGE.
- *** THE HAND-TRAILING EDGE AND DETECTION PLATE SHALL BE CONTINUOUS THROUGHOUT THE LENGTH OF THE PATH SUCH THAT A PEDESTRIAN USER WITH A LONG CANE CAN FOLLOW IT.



TEMPORARY CURB RAMP

- * LANDING AREA USED TO OVERLAP NON-ADA COMPLIANT SURFACES.
- ** DETECTABLE EDGE REMOVED IF A CONTINUOUS SIDEWALK.
- *** 60 IN. IF AN OBSTRUCTION IS AT BACK OF SIDEWALK.



PAGE 18

Work Zone Safety
Standard Details
and Drawings

STATIONARY OPERATIONS
TWO LANE UNDIVIDED ROADWAY
HALF OF ROADWAY CLOSED
WORK NEAR CURVE

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)	CHANNELIZATION DEVICES (DRUMS OR CONES)			
		TRAVEL LANE CLOSURE LENGTH (L) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	500 / 500 / 500	50	100	20	30
45-55	500 / 1000 / 1000	100	150	40	20

* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

NOTES

1. IF POLICE DETAIL/UNIFORMED FLAGGER SUPPORT IS REQUIRED, PROVIDE TWO UNITS.
2. MA-R2-10a LOCATED AT C/2.
3. ** = EXTEND ENOUGH SO TAPER IS BEFORE CURVE

LEGEND



WORK ZONE



CHANNELIZATION DEVICE



FLASHING ARROW BOARD



PORTABLE CHANGEABLE MESSAGE SIGN



TRUCK MOUNTED ATTENUATOR



RADAR SPEED FEEDBACK BOARD



POLICE DETAIL OR UNIFORMED FLAGGER

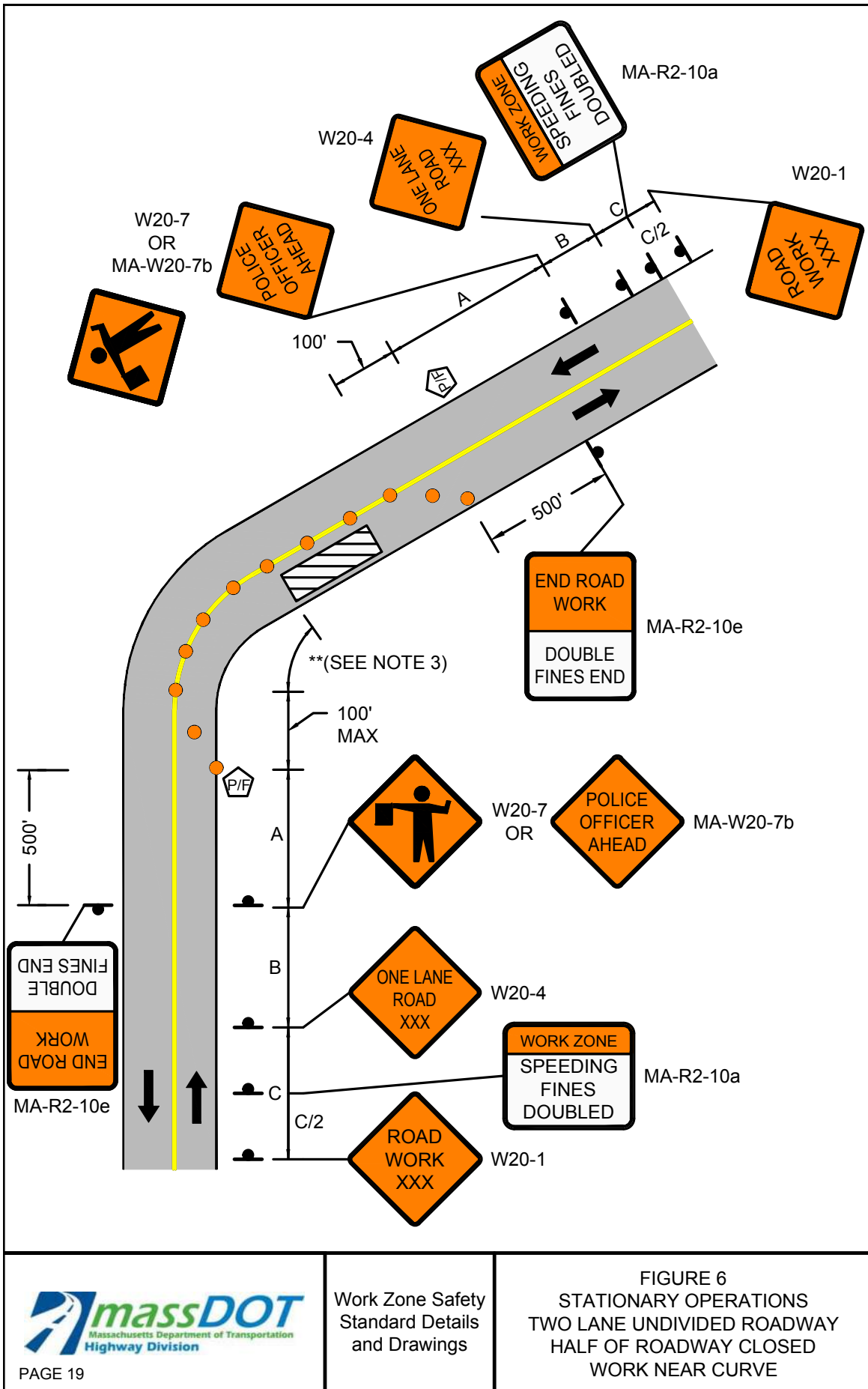


TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE





PAGE 20

Work Zone Safety
Standard Details
and Drawings

STATIONARY OPERATIONS
TWO LANE UNDIVIDED ROADWAY
HALF OF ROADWAY CLOSED

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)	CHANNELIZATION DEVICES (DRUMS OR CONES)			
		TRAVEL LANE CLOSURE LENGTH (L) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	500 / 500 / 500	50	100	20	30
45-55	500 / 1000 / 1000	100	150	40	20

* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

POSTED REGULATORY OR WORK ZONE SPEED	SEPARATION BETWEEN RUMBLE STRIPS
36-mph to 55-mph	15-feet
35-mph and under	10-feet

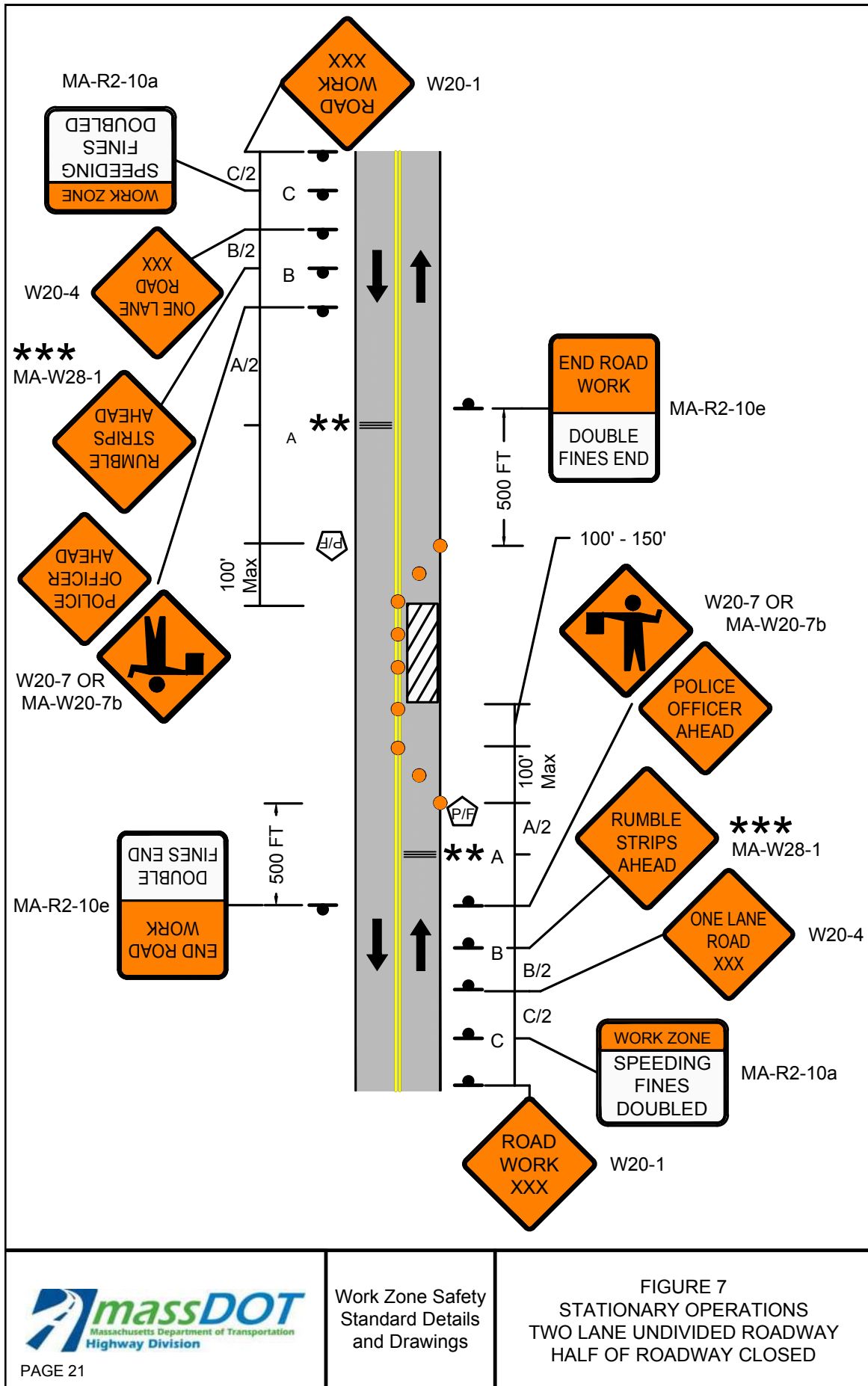
NOTES

1. IF POLICE DETAIL/UNIFORMED FLAGGER SUPPORT IS REQUIRED, PROVIDE TWO UNITS.
2. MA-R2-10a LOCATED AT C/2.
3. ** OPTIONAL AT THE ENGINEER'S DISCRETION.
4. *** SHALL BE DEPLOYED IF RUMBLE STRIPS ARE PRESENT.

LEGEND

	WORK ZONE
	CHANNELIZATION DEVICE
	FLASHING ARROW BOARD
	PORTABLE CHANGEABLE MESSAGE SIGN
	TRUCK MOUNTED ATTENUATOR
	RADAR SPEED FEEDBACK BOARD
	POLICE DETAIL OR UNIFORMED FLAGGER
	TEMPORARY PORTABLE RUMBLE STRIP
	TYPE III BARRICADE

NOT TO SCALE





PAGE 22

Work Zone Safety
Standard Details
and Drawings

STATIONARY OPERATIONS
TWO LANE UNDIVIDED ROADWAY
SHOULDER CLOSED

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)	CHANNELIZATION DEVICES (DRUMS OR CONES)			
		SHOULDER TAPER LENGTH (L/3) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	500 / 500 / 500	110	305	20	45
45-55	500 / 1000 / 1000	220	495	40	30
60-65	1000 / 1600 / 2600	260	645	40	35

* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

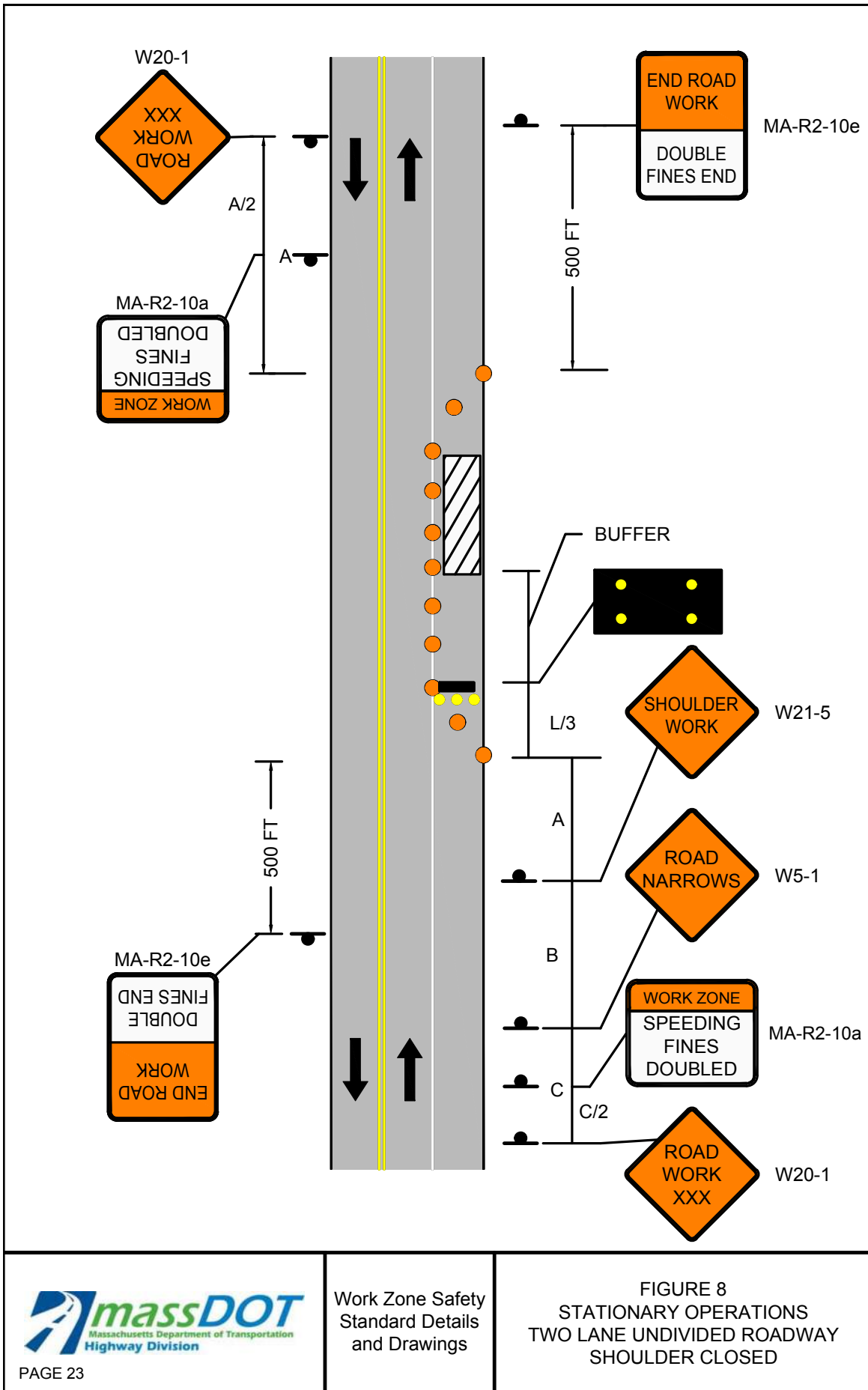
NOTES

1. MA-R2-10a at C/2 and A/2.

LEGEND

	WORK ZONE
	CHANNELIZATION DEVICE
	FLASHING ARROW BOARD
	PORTABLE CHANGEABLE MESSAGE SIGN
	TRUCK MOUNTED ATTENUATOR
	RADAR SPEED FEEDBACK BOARD
	POLICE DETAIL OR UNIFORMED FLAGGER
	TEMPORARY PORTABLE RUMBLE STRIP
	TYPE III BARRICADE

NOT TO SCALE





PAGE 24

Work Zone Safety
Standard Details
and Drawings

STATIONARY OPERATIONS
TWO LANE UNDIVIDED ROADWAY
WITH TRAVERSABLE SHOULDER
HALF OF ROADWAY CLOSED
MAINTAIN TWO-WAY TRAFFIC

POSTED SPEED LIMIT (MPH)	CHANNELIZATION DEVICES (DRUMS OR CONES)				
	SHOULDER TAPER LENGTH (L/3) (FT)	TRAVEL LANE SHIFT LENGTH (L/2) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	110	160	305	20	125
45-55	220	330	495	40	100
60-65	260	390	645	40	115

* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)
25-40	500 / 500 / 500
45-55	500 / 1000 / 1000
60-65	1000 / 1600 / 2600

NOTES

1. MA-R2-10a LOCATED AT C/2.

LEGEND



WORK ZONE



CHANNELIZATION DEVICE



FLASHING ARROW BOARD



PORTABLE CHANGEABLE MESSAGE SIGN



TRUCK MOUNTED ATTENUATOR



RADAR SPEED FEEDBACK BOARD



POLICE DETAIL OR UNIFORMED FLAGGER

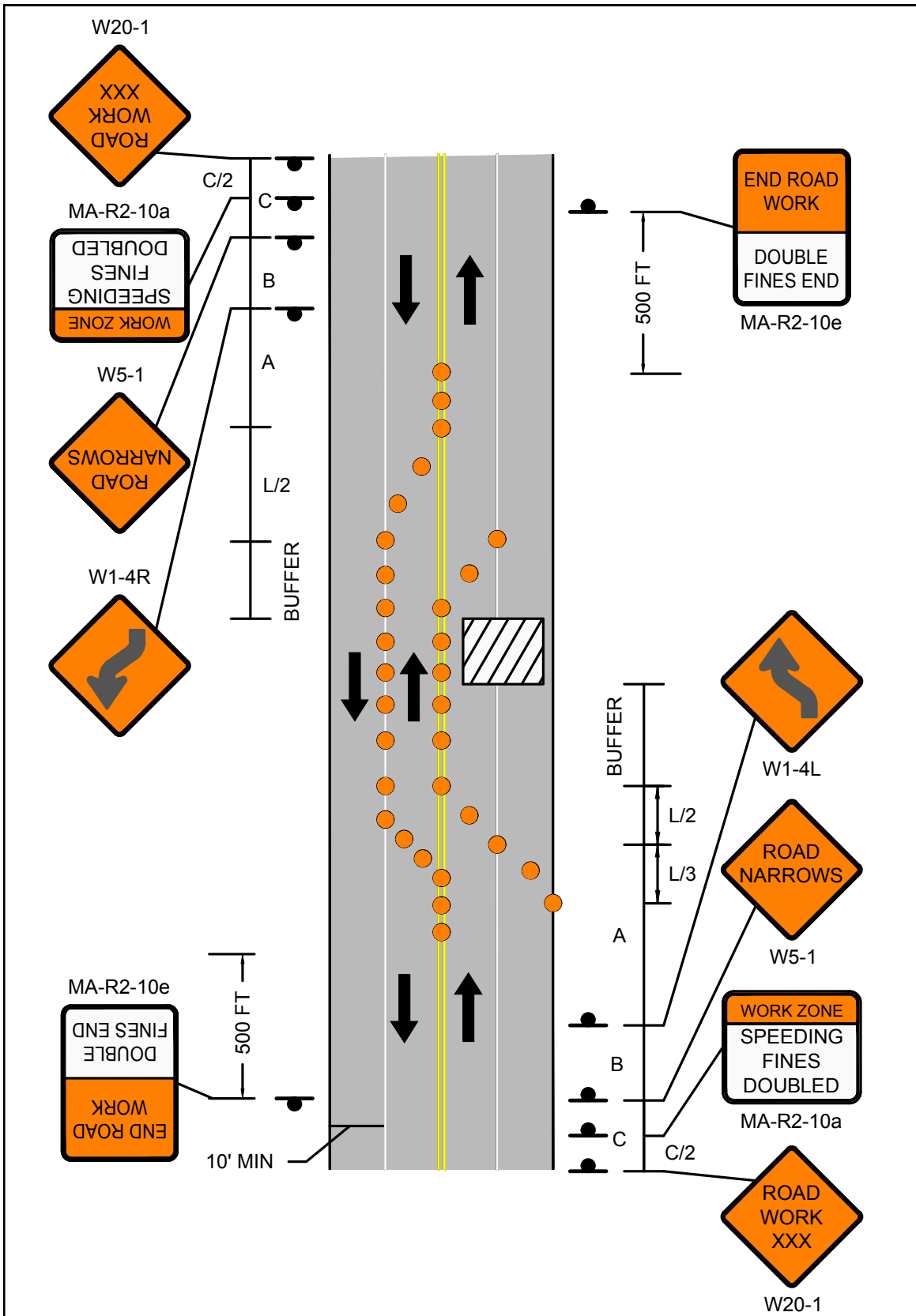


TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE





PAGE 26

Work Zone Safety
Standard Details
and Drawings

STATIONARY OPERATIONS
FOUR LANE UNDIVIDED ROADWAY
RIGHT LANE CLOSED

POSTED SPEED LIMIT (MPH)	CHANNELATION DEVICES (DRUMS OR CONES)				
	SHOULDER TAPER LENGTH (L/3) (FT)	TRAVEL LANE CLOSURE LENGTH (L) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	110	320	305	20	60
45-55	220	660	495	40	50
60-65	260	780	645	40	55

* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)
25-40	500 / 500 / 500
45-55	500 / 1000 / 1000
60-65	1000 / 1600 / 2600

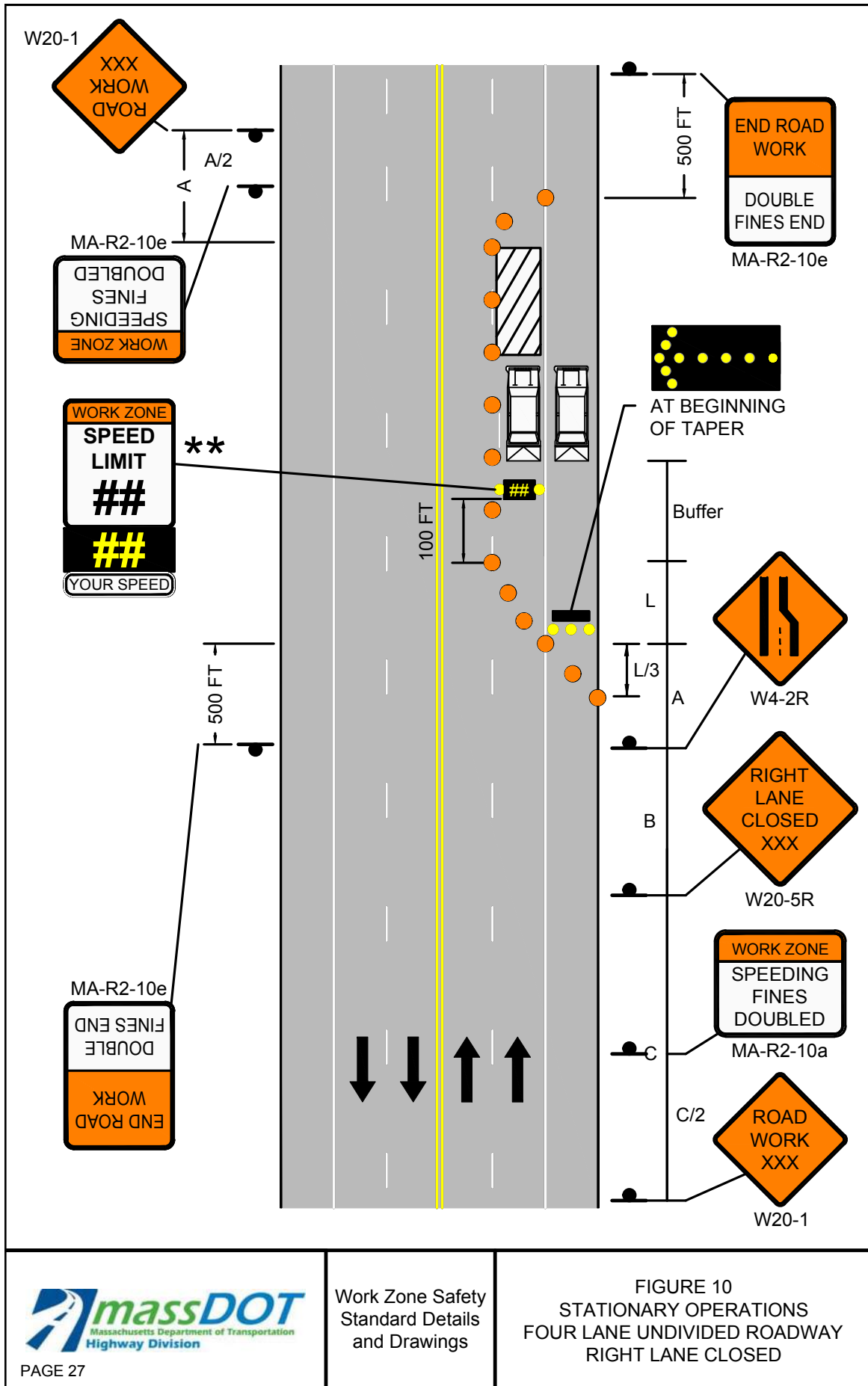
NOTES

1. MA-R2-10a LOCATED AT A/2 AND C/2.
2. **OPTIONAL AT THE ENGINEER'S DISCRETION.

LEGEND

	WORK ZONE
	CHANNELIZATION DEVICE
	FLASHING ARROW BOARD
	PORTABLE CHANGEABLE MESSAGE SIGN
	TRUCK MOUNTED ATTENUATOR
	RADAR SPEED FEEDBACK BOARD
	POLICE DETAIL OR UNIFORMED FLAGGER
	TEMPORARY PORTABLE RUMBLE STRIP
	TYPE III BARRICADE

NOT TO SCALE





PAGE 28

Work Zone Safety
Standard Details
and Drawings

STATIONARY OPERATIONS
FOUR LANE UNDIVIDED ROADWAY
LEFT LANE CLOSED

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)	CHANNELIZATION DEVICES (DRUMS OR CONES)			
		TRAVEL LANE CLOSURE LENGTH (L) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	500 / 500 / 500	320	305	20	105
45-55	500 / 1000 / 1000	660	495	40	80
60-65	1000 / 1600 / 2600	780	645	40	100

* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

NOTES

1. MA-R2-10a LOCATED AT A/2 AND C/2.
2. **OPTIONAL AT THE ENGINEER'S DISCRETION. 2' OFFSET FROM EDGE OF TRAVEL LANE TO RADAR SPEED FEEDBACK BOARD IS REQUIRED. BOARD MAY BE MOVED FULLY OR PARTIALLY OFF PAVED SHOULDER, IF REQUIRED.

LEGEND



WORK ZONE



CHANNELIZATION DEVICE



FLASHING ARROW BOARD



PORTABLE CHANGEABLE MESSAGE SIGN



TRUCK MOUNTED ATTENUATOR



RADAR SPEED FEEDBACK BOARD



POLICE DETAIL OR UNIFORMED FLAGGER

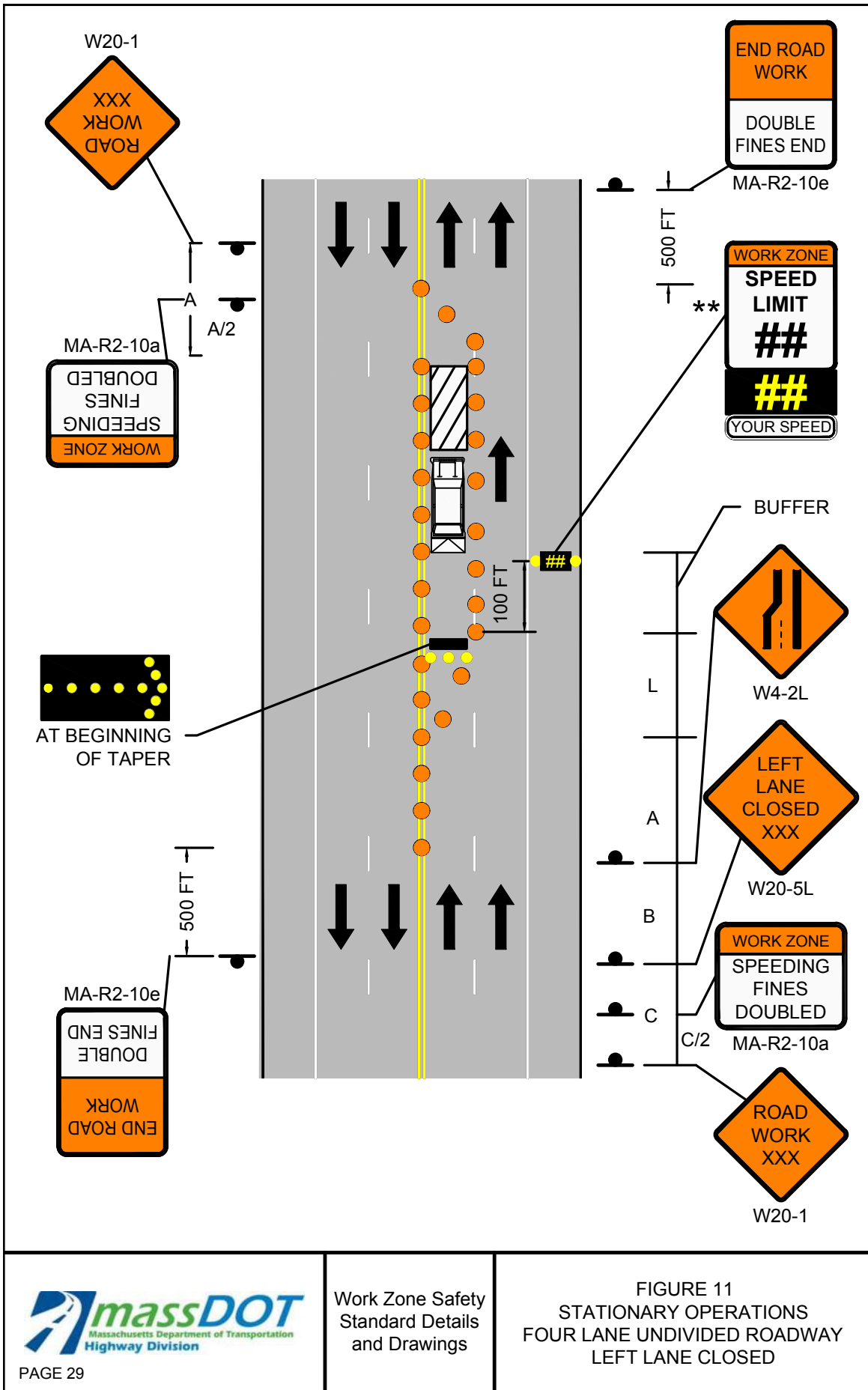


TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE





PAGE 30

Work Zone Safety
Standard Details
and Drawings

STATIONARY OPERATIONS
FOUR LANE UNDIVIDED ROADWAY
HALF OF ROADWAY CLOSED

POSTED SPEED LIMIT (MPH)	CHANNELIZATION DEVICES (DRUMS OR CONES)					
	SHOULDER TAPER LENGTH (L/3) (FT)	TRAVEL LANE CLOSURE LENGTH (L) (FT)	TRAVEL LANE SHIFT LENGTH (L/2) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	110	320	160	305	20	140
45-55	220	660	330	495	40	120
60-65	260	780	390	645	40	140

* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)
25-40	500 / 500 / 500
45-55	500 / 1000 / 1000
60-65	1000 / 1600 / 2600

NOTES

1. MA-R2-10a LOCATED AT C/2.
2. **OPTIONAL AT THE ENGINEER'S DISCRETION.
3. W1-4L SHALL BE PLACED AT THE MIDDLE OF THE TANGENT.

LEGEND



WORK ZONE



CHANNELIZATION DEVICE



FLASHING ARROW BOARD



PORTABLE CHANGEABLE MESSAGE SIGN



TRUCK MOUNTED ATTENUATOR



RADAR SPEED FEEDBACK BOARD



POLICE DETAIL OR UNIFORMED FLAGGER

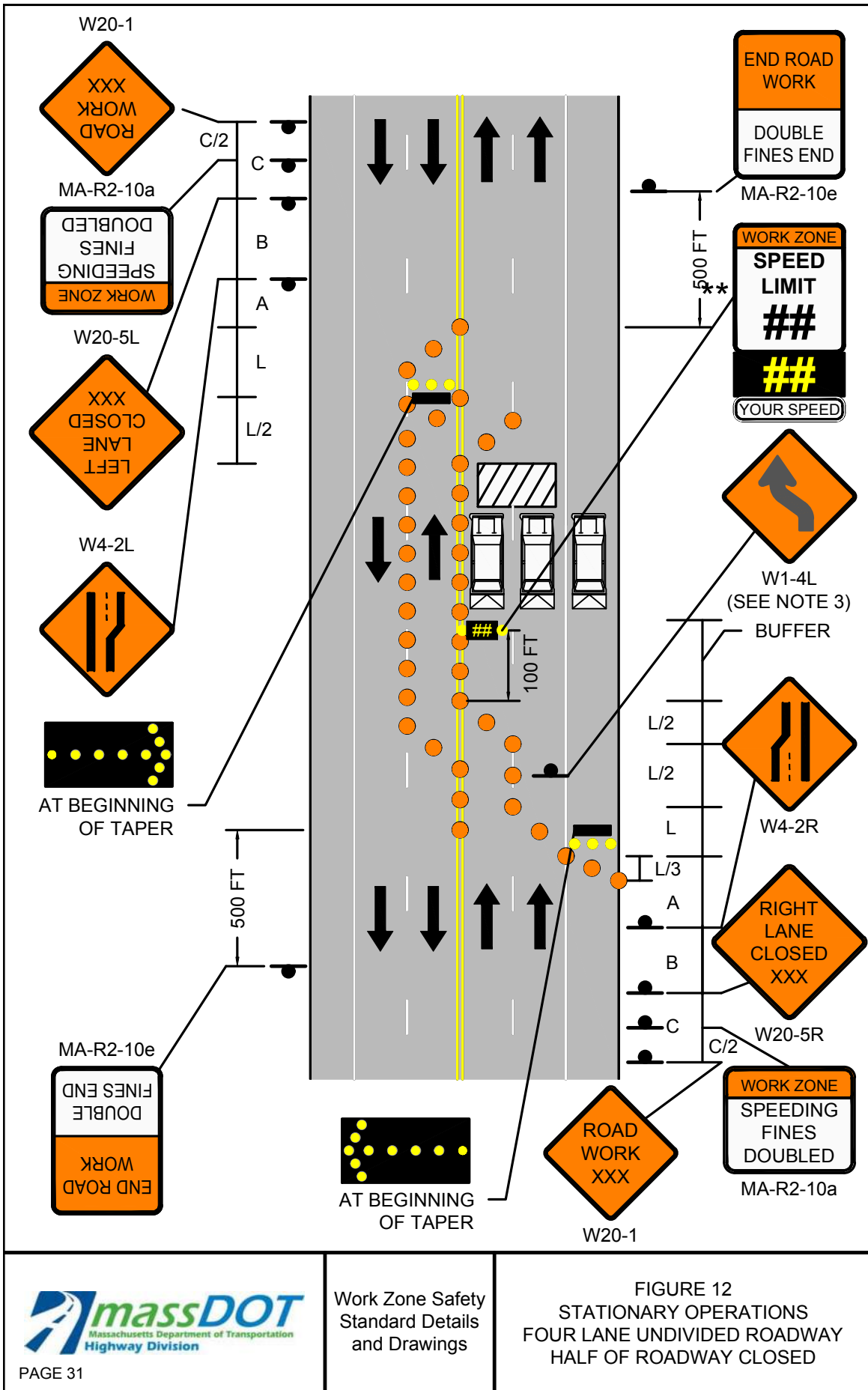


TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE





PAGE 32

Work Zone Safety
Standard Details
and Drawings

STATIONARY OPERATIONS
MULTILANE DIVIDED ROADWAY
RIGHT LANE CLOSED

POSTED SPEED LIMIT (MPH)	CHANNELIZATION DEVICES (DRUMS OR CONES)				
	SHOULDER TAPER LENGTH (L/3) (FT)	TRAVEL LANE CLOSURE LENGTH (L) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	110	320	305	20	60
45-55	220	660	495	40	50
60-65	260	780	645	40	55

* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)
25-40	500 / 500 / 500
45-55	500 / 1000 / 1000
60-65	1000 / 1600 / 2600

NOTES

1. MA-R2-10a LOCATED AT C/2.
2. **OPTIONAL AT THE ENGINEER'S DISCRETION.

LEGEND

	WORK ZONE
	CHANNELIZATION DEVICE
	FLASHING ARROW BOARD
	PORTABLE CHANGEABLE MESSAGE SIGN
	TRUCK MOUNTED ATTENUATOR
	RADAR SPEED FEEDBACK BOARD
	POLICE DETAIL OR UNIFORMED FLAGGER
	TEMPORARY PORTABLE RUMBLE STRIP
	TYPE III BARRICADE

NOT TO SCALE



PAGE 34

Work Zone Safety
Standard Details
and Drawings

STATIONARY OPERATIONS
MULTILANE DIVIDED ROADWAY
LEFT LANE CLOSED

POSTED SPEED LIMIT (MPH)	CHANNELIZATION DEVICES (DRUMS OR CONES)				
	SHOULDER TAPER LENGTH (L/3) (FT)	TRAVEL LANE CLOSURE LENGTH (L) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	110	320	305	20	60
45-55	220	660	495	40	50
60-65	260	780	645	40	55

* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)
25-40	500 / 500 / 500
45-55	500 / 1000 / 1000
60-65	1000 / 1600 / 2600

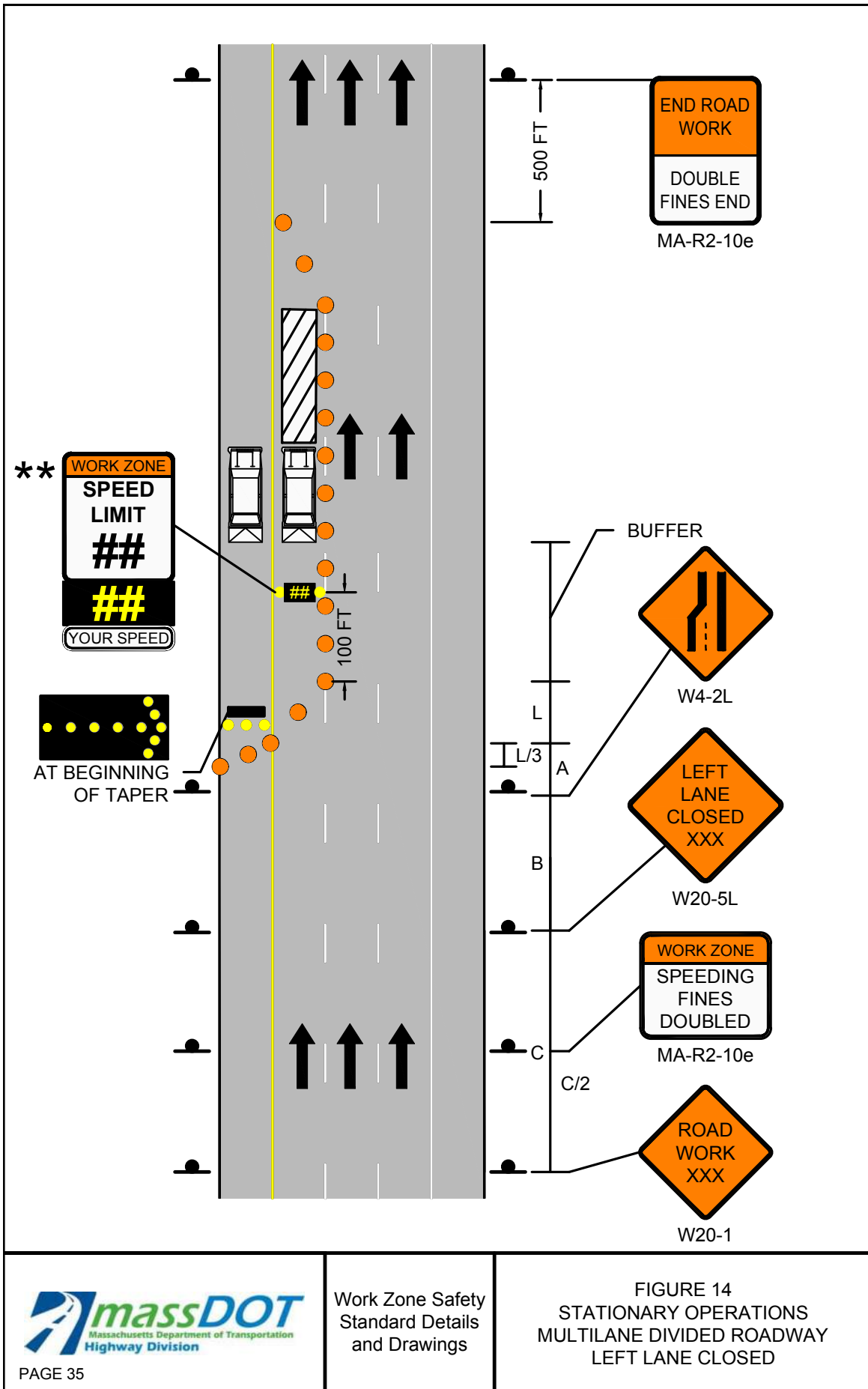
NOTES

1. MA-R2-10a LOCATED AT C/2.
2. **OPTIONAL AT THE ENGINEER'S DISCRETION.

LEGEND

	WORK ZONE
	CHANNELIZATION DEVICE
	FLASHING ARROW BOARD
	PORTABLE CHANGEABLE MESSAGE SIGN
	TRUCK MOUNTED ATTENUATOR
	RADAR SPEED FEEDBACK BOARD
	POLICE DETAIL OR UNIFORMED FLAGGER
	TEMPORARY PORTABLE RUMBLE STRIP
	TYPE III BARRICADE

NOT TO SCALE





PAGE 36

Work Zone Safety
Standard Details
and Drawings

STATIONARY OPERATIONS
MULTILANE DIVIDED ROADWAY
CENTER LANE OR RIGHT/CENTER
LANES CLOSED

POSTED SPEED LIMIT (MPH)	CHANNELIZATION DEVICES (DRUMS OR CONES)					
	SHOULDER TAPER LENGTH (L/3) (FT)	TRAVEL LANE CLOSURE LENGTH (L) (FT)	TANGENT LENGTH BETWEEN TAPERS T (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	110	320	640	305	20	110
45-55	220	660	1320	495	40	100
60-65	260	780	1560	645	40	115

* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)
25-40	500 / 500 / 500
45-55	500 / 1000 / 1000
60-65	1000 / 1600 / 2600

NOTES

1. MA-R2-10a LOCATED AT C/2.
2. ***OPTIONAL AT THE ENGINEER'S DISCRETION.
3. ***THIS SET OF SIGNS SHALL BE LOCATED AT T/2.

LEGEND

	WORK ZONE
	CHANNELIZATION DEVICE
	FLASHING ARROW BOARD
	PORTABLE CHANGEABLE MESSAGE SIGN
	TRUCK MOUNTED ATTENUATOR
	RADAR SPEED FEEDBACK BOARD
	POLICE DETAIL OR UNIFORMED FLAGGER
	TEMPORARY PORTABLE RUMBLE STRIP
	TYPE III BARRICADE

NOT TO SCALE



PAGE 38

Work Zone Safety
Standard Details
and Drawings

STATIONARY OPERATIONS
MULTILANE DIVIDED ROADWAY
CENTER LANE OR LEFT/CENTER LANES
CLOSED

POSTED SPEED LIMIT (MPH)	CHANNELIZATION DEVICES (DRUMS OR CONES)					
	SHOULDER TAPER LENGTH (L/3) (FT)	TRAVEL LANE CLOSURE LENGTH (L) (FT)	TANGENT LENGTH BETWEEN TAPERS T (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	110	320	640	305	20	110
45-55	220	660	1320	495	40	100
60-65	260	780	1560	645	40	115

* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)
25-40	500 / 500 / 500
45-55	500 / 1000 / 1000
60-65	1000 / 1600 / 2600

NOTES

1. MA-R2-10a LOCATED AT C/2.
2. ***OPTIONAL AT THE ENGINEER'S DISCRETION.
3. ***THIS SET OF SIGNS SHALL BE LOCATED AT T/2.

LEGEND



WORK ZONE



CHANNELIZATION DEVICE



FLASHING ARROW BOARD



PORTABLE CHANGEABLE MESSAGE SIGN



TRUCK MOUNTED ATTENUATOR



RADAR SPEED FEEDBACK BOARD



POLICE DETAIL OR UNIFORMED FLAGGER

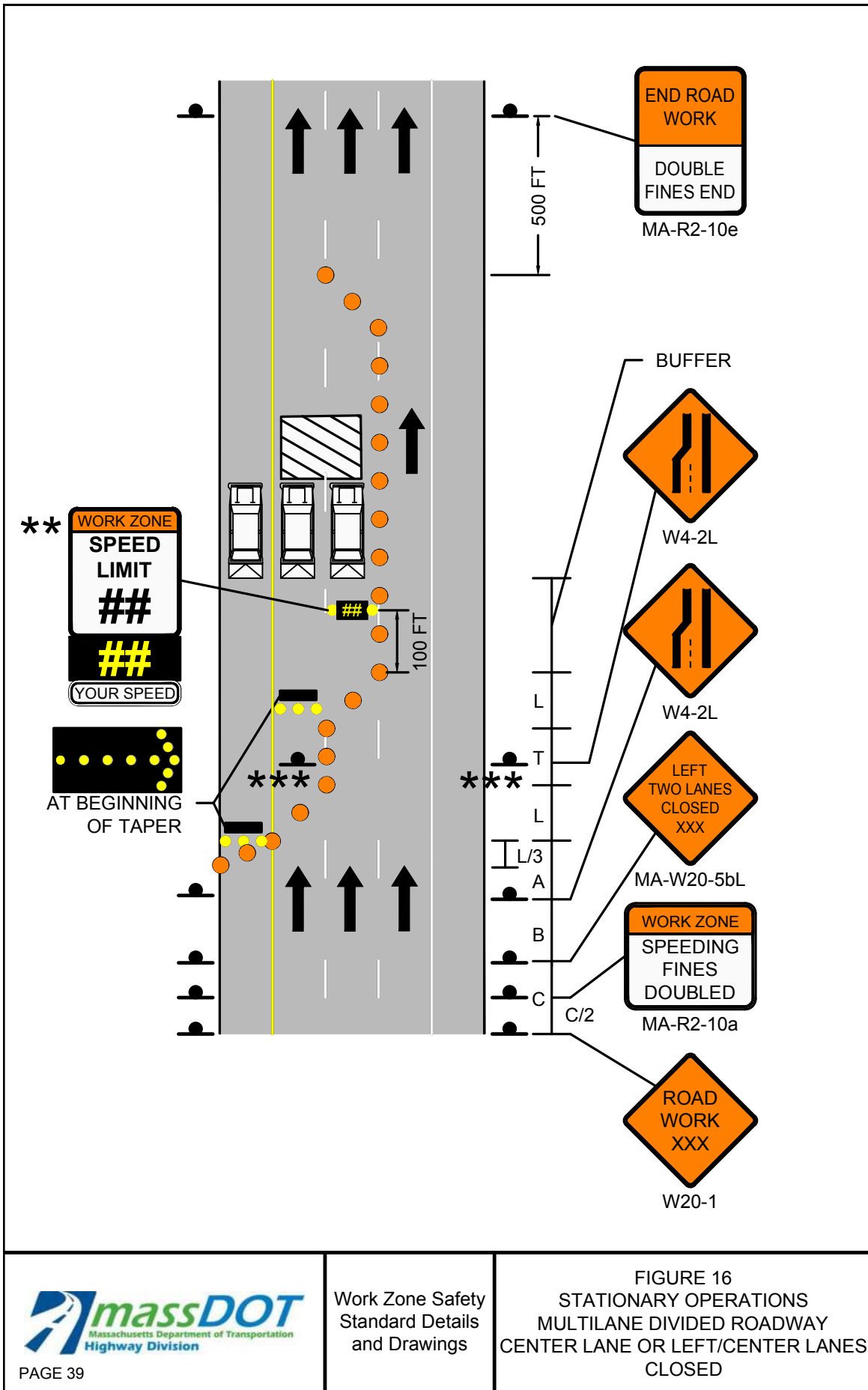


TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE





PAGE 40

Work Zone Safety
Standard Details
and Drawings

STATIONARY OPERATIONS
MULTILANE DIVIDED ROADWAY
RIGHT SIDE OF OFF RAMP CLOSED

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)	CHANNELIZATION DEVICES (DRUMS OR CONES)			
		TRAVEL LANE SHIFT LENGTH (L/2) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	500 / 500 / 500	160	305	20	45
45-55	500 / 1000 / 1000	330	495	40	35

* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

NOTES

1. MA-R2-10a LOCATED AT C/2.

LEGEND



WORK ZONE



CHANNELIZATION DEVICE



FLASHING ARROW BOARD



PORTABLE CHANGEABLE MESSAGE SIGN



TRUCK MOUNTED ATTENUATOR



RADAR SPEED FEEDBACK BOARD



POLICE DETAIL OR UNIFORMED FLAGGER

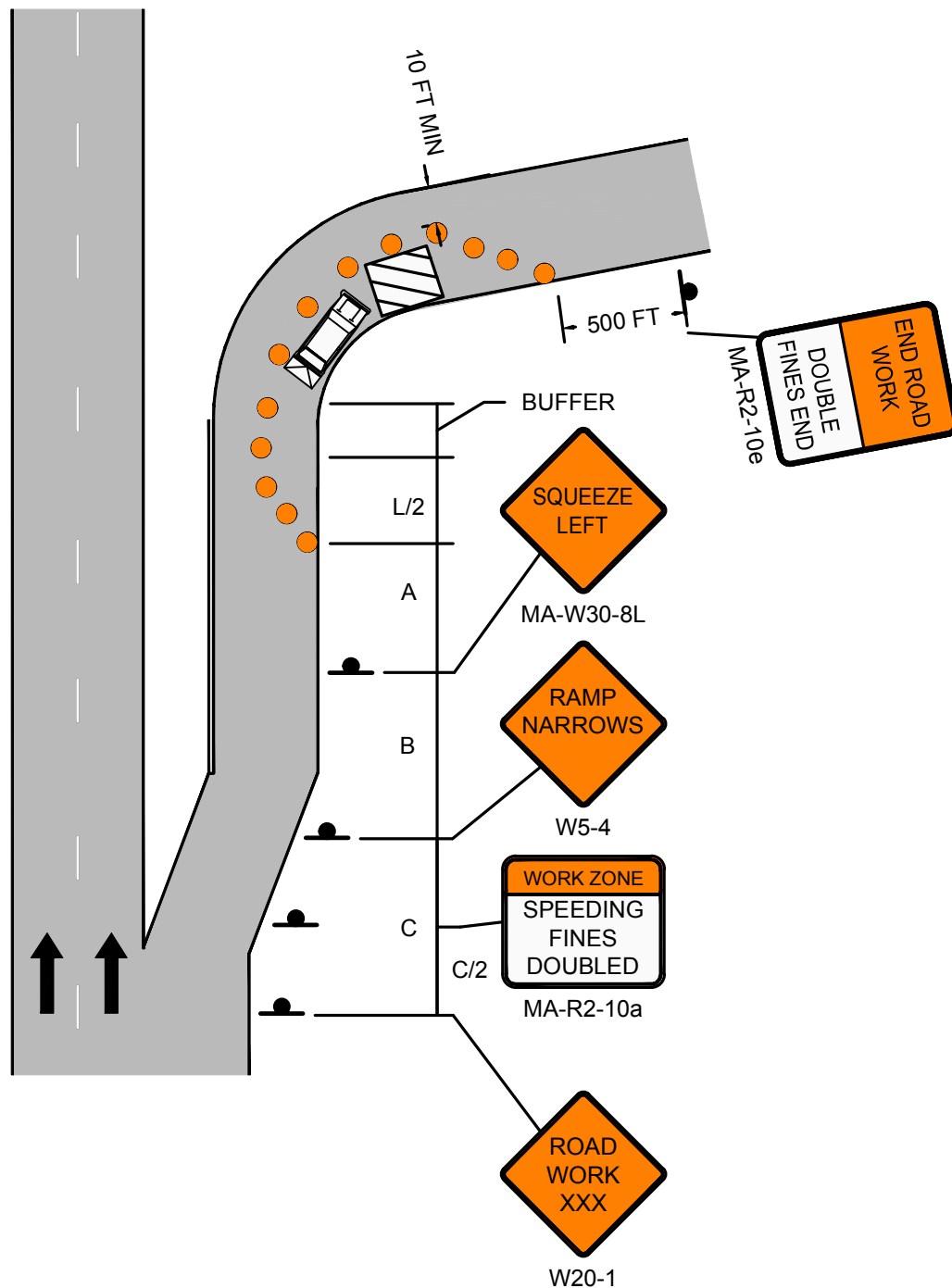


TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE





PAGE 42

Work Zone Safety
Standard Details
and Drawings

STATIONARY OPERATIONS
MULTILANE DIVIDED ROADWAY
LEFT SIDE OF OFF RAMP CLOSED

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)	CHANNELIZATION DEVICES (DRUMS OR CONES)			
		TRAVEL LANE SHIFT LENGTH (L/2) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	500 / 500 / 500	160	305	20	45
45-55	500 / 1000 / 1000	330	495	40	35

* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

NOTES

1. MA-R2-10a LOCATED AT C/2.

LEGEND



WORK ZONE



CHANNELIZATION DEVICE



FLASHING ARROW BOARD



PORTABLE CHANGEABLE MESSAGE SIGN



TRUCK MOUNTED ATTENUATOR



RADAR SPEED FEEDBACK BOARD



POLICE DETAIL OR UNIFORMED FLAGGER

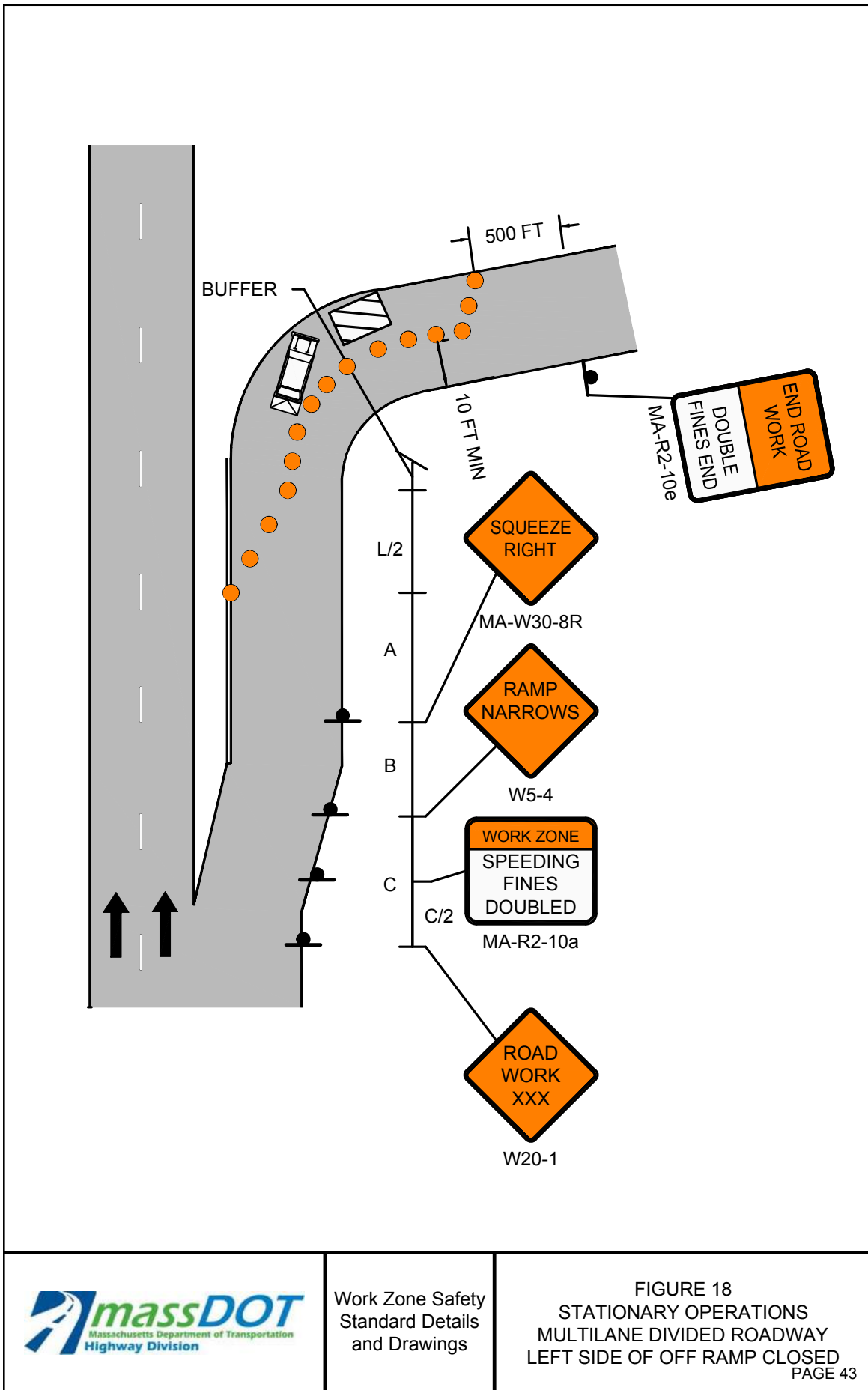


TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE





PAGE 44

Work Zone Safety
Standard Details
and Drawings

STATIONARY OPERATIONS
MULTILANE DIVIDED ROADWAY
ROADWORK BEYOND ON RAMP

POSTED SPEED LIMIT (MPH)	CHANNELIZATION DEVICES (DRUMS OR CONES)				
	SHOULDER TAPER LENGTH (L/3) (FT)	TRAVEL LANE CLOSURE LENGTH (L) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	110	320	305	20	175
45-55	220	660	495	40	135
60-65	260	780	645	40	155

* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)
25-40	500 / 500 / 500
45-55	500 / 1000 / 1000
60-65	1000 / 1600 / 2600

NOTES

1. MA-R2-10a LOCATED AT C/2.

LEGEND



WORK ZONE



CHANNELIZATION DEVICE



FLASHING ARROW BOARD



PORTABLE CHANGEABLE MESSAGE SIGN



TRUCK MOUNTED ATTENUATOR



RADAR SPEED FEEDBACK BOARD



POLICE DETAIL OR UNIFORMED FLAGGER

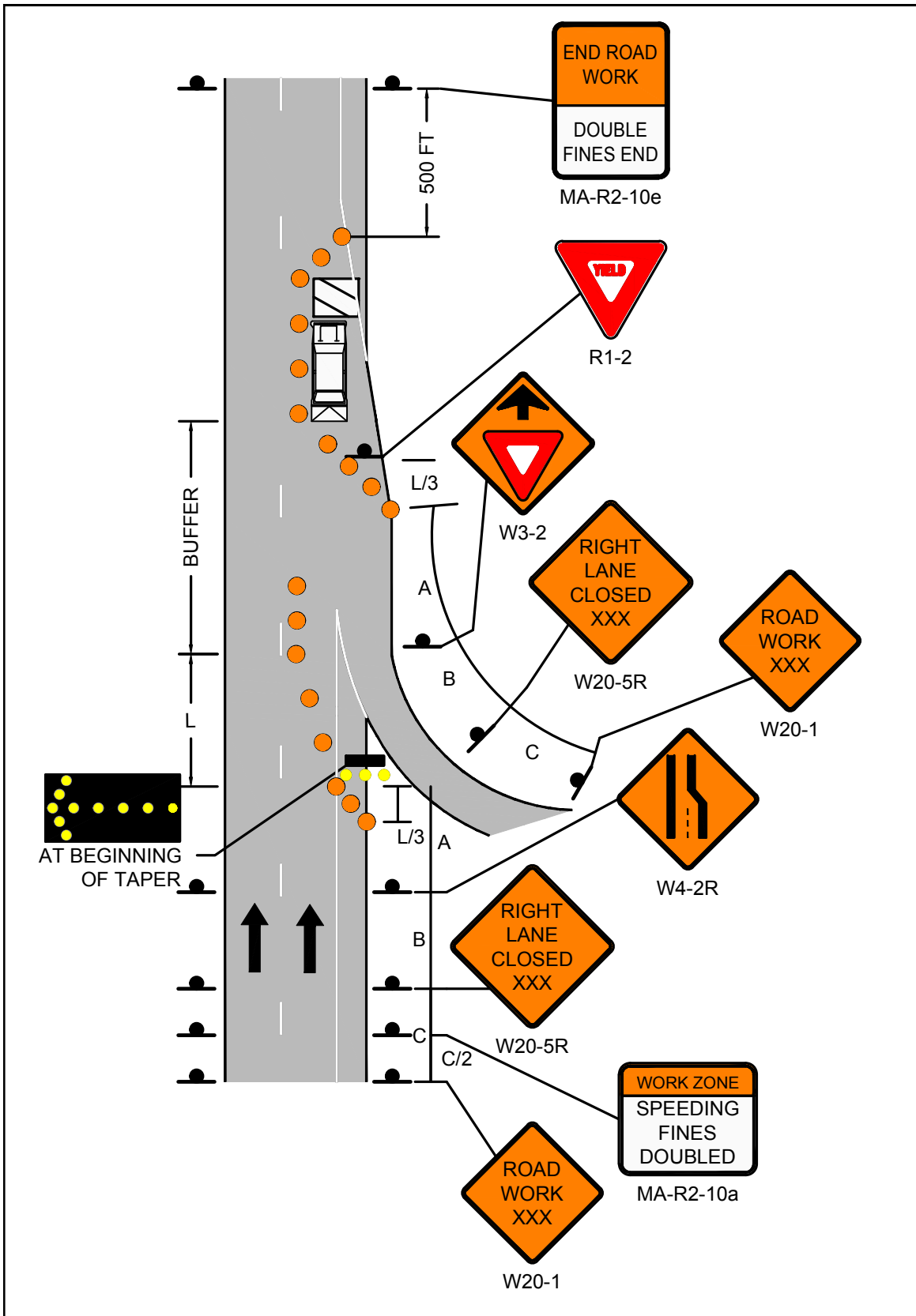


TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE





PAGE 46

Work Zone Safety
Standard Details
and Drawings

STATIONARY OPERATIONS
MULTILANE DIVIDED ROADWAY
ROADWORK BEYOND OFF RAMP

POSTED SPEED LIMIT (MPH)	CHANNELIZATION DEVICES (DRUMS OR CONES)					
	SHOULDER TAPER LENGTH (L/3) (FT)	TRAVEL LANE CLOSURE LENGTH (L) (FT)	TRAVEL LANE SHIFT LENGTH (L/2) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	110	320	160	305	20	70
45-55	220	660	330	495	40	55
60-65	260	780	390	645	40	65

* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)
25-40	500 / 500 / 500
45-55	500 / 1000 / 1000
60-65	1000 / 1600 / 2600

NOTES

1. MA-R2-10a LOCATED AT C/2.

LEGEND



WORK ZONE



CHANNELIZATION DEVICE



FLASHING ARROW BOARD



PORTABLE CHANGEABLE MESSAGE SIGN



TRUCK MOUNTED ATTENUATOR



RADAR SPEED FEEDBACK BOARD



POLICE DETAIL OR UNIFORMED FLAGGER

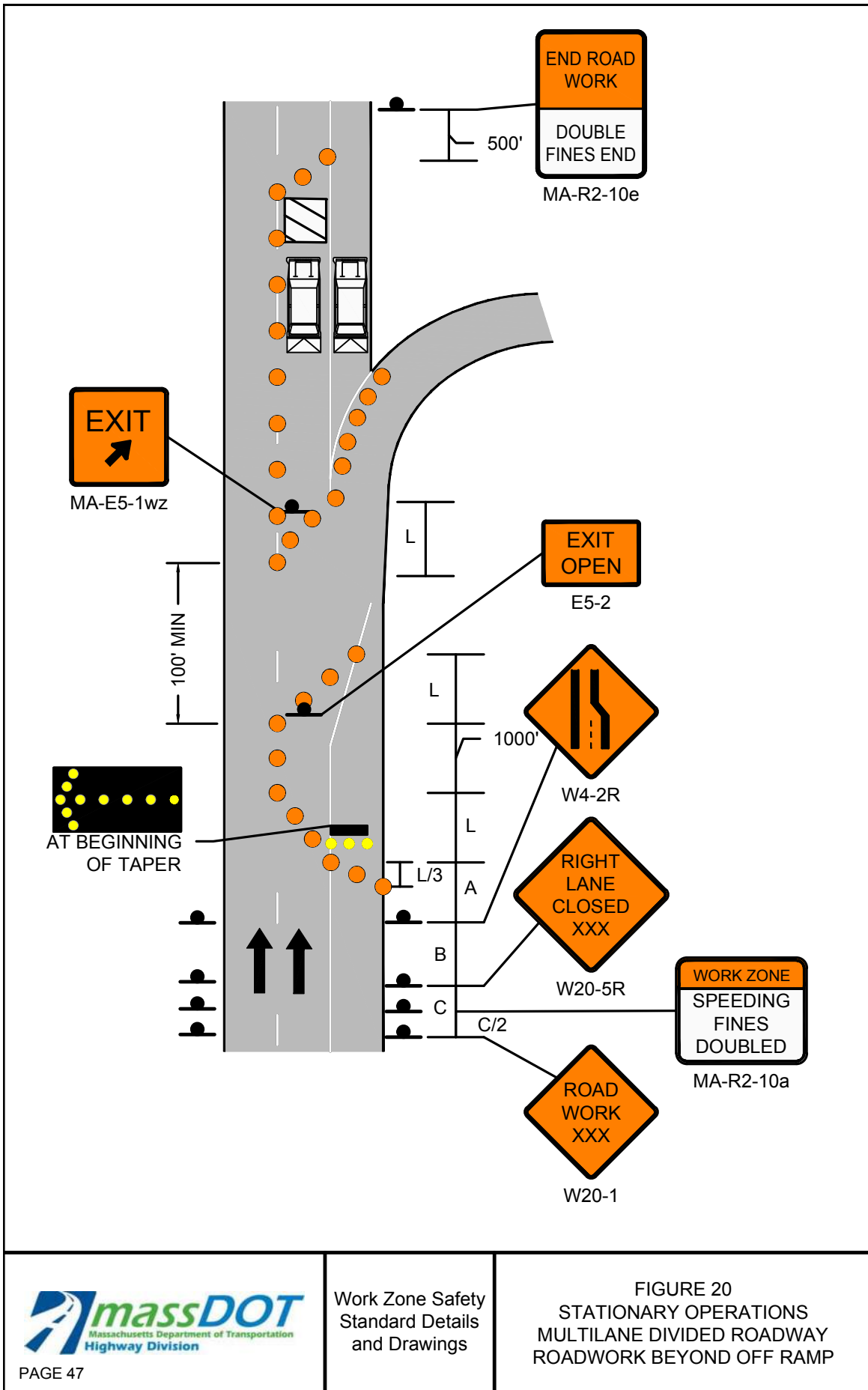


TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE





PAGE 48

Work Zone Safety
Standard Details
and Drawings

MULTILANE DIVIDED ROADWAY
TYPICAL RAMP CLOSURE

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)	CHANNELIZATION DEVICES (DRUMS OR CONES)			
		SHOULDER TAPER LENGTH (L/3) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES
25-40	500 / 500 / 500	110	305	20	45
45-55	500 / 1000 / 1000	220	495	40	30
60-65	1000 / 1600 / 2600	260	645	40	35

NOTES

1. MA-R2-10a LOCATED AT C/2.
2. * NOT REQUIRED IF RIGHT LANE IS CLOSED IN ADVANCE OF EXIT.
3. ** OPTIONAL AT ENGINEER'S DISCRETION.

LEGEND



WORK ZONE



CHANNELIZATION DEVICE



FLASHING ARROW BOARD



PORTABLE CHANGEABLE MESSAGE SIGN



TRUCK MOUNTED ATTENUATOR



RADAR SPEED FEEDBACK BOARD



POLICE DETAIL OR UNIFORMED FLAGGER

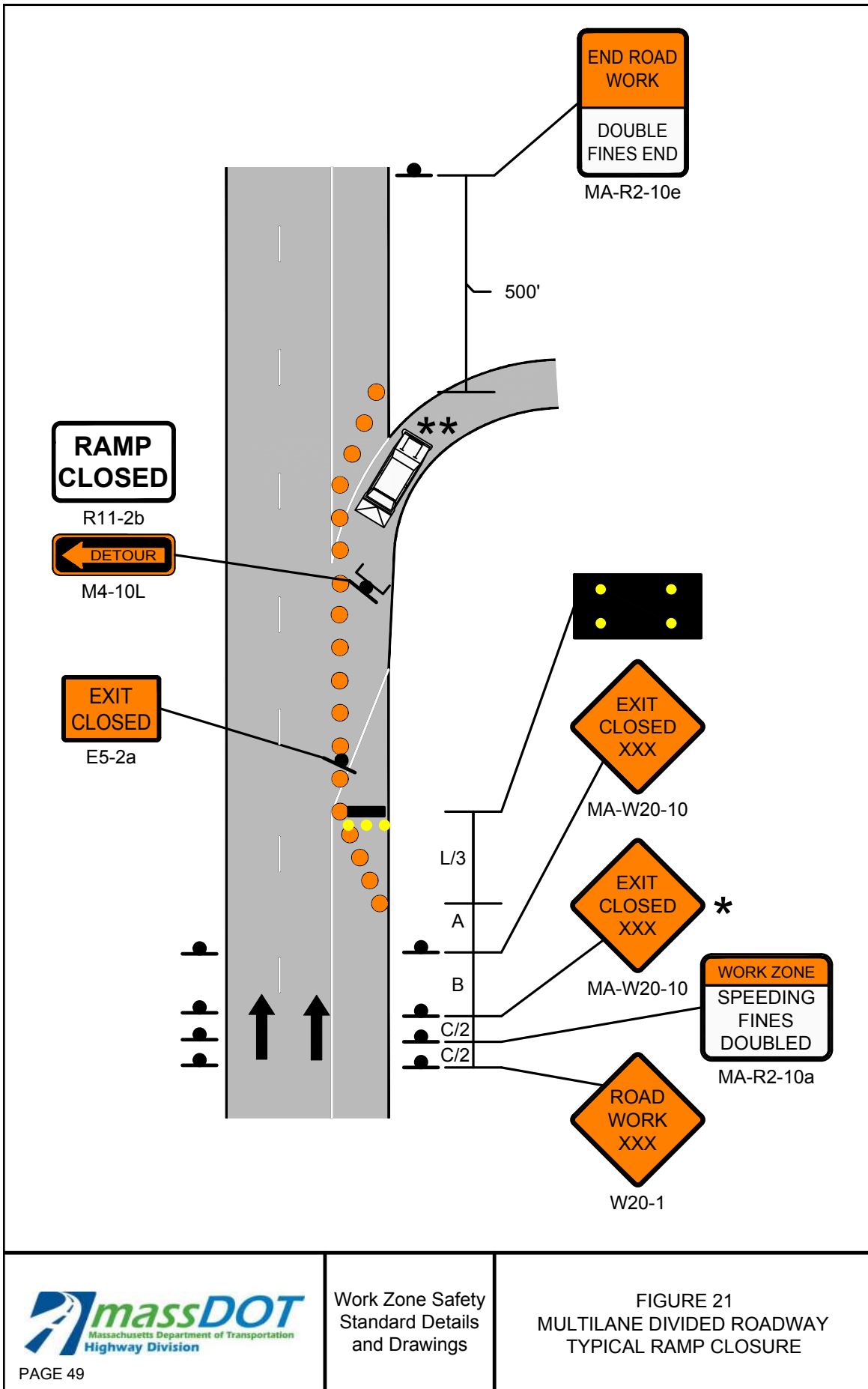


TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE





PAGE 50

Work Zone Safety
Standard Details
and Drawings

MULTILANE DIVIDED ROADWAY
TYPICAL CLOVERLEAF RAMP CLOSURE

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)	CHANNELIZATION DEVICES (DRUMS OR CONES)			
		SHOULDER TAPER LENGTH (L/3) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES
25-40	500 / 500 / 500	110	305	20	45
45-55	500 / 1000 / 1000	220	495	40	30
60-65	1000 / 1600 / 2600	260	645	40	35

NOTES

1. MA-R2-10a LOCATED AT C/2.
2. * NOT REQUIRED IF RIGHT LANE IS CLOSED IN ADVANCE OF EXIT.
3. ** OPTIONAL AT ENGINEER'S DISCRETION.

LEGEND



WORK ZONE



CHANNELIZATION DEVICE



FLASHING ARROW BOARD



PORTABLE CHANGEABLE MESSAGE SIGN



TRUCK MOUNTED ATTENUATOR



RADAR SPEED FEEDBACK BOARD



POLICE DETAIL OR UNIFORMED FLAGGER

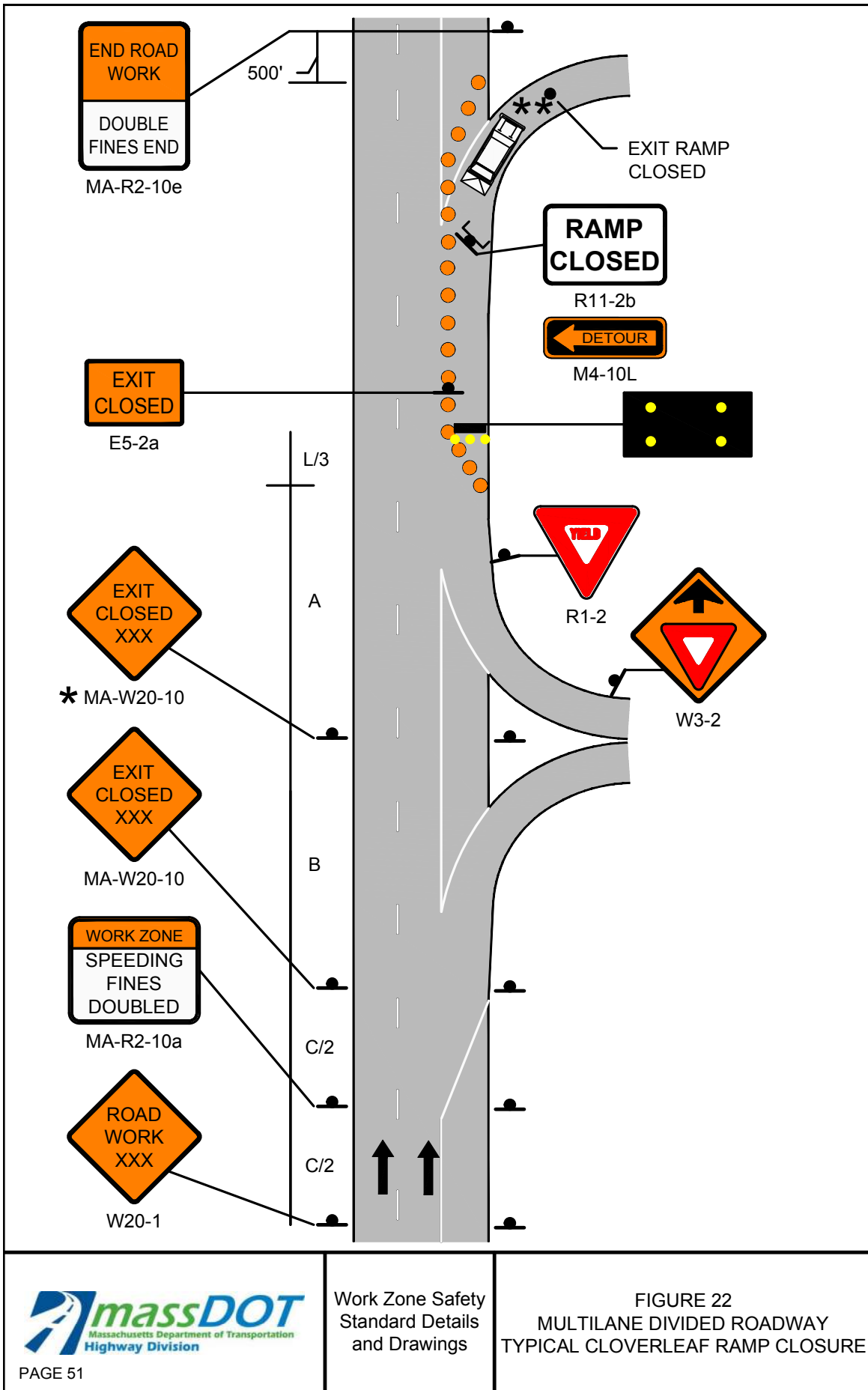


TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE





PAGE 52

Work Zone Safety
Standard Details
and Drawings

MULTILANE DIVIDED ROADWAY
TYPICAL RAMP CLOSURE
ADVANCE SIGNING

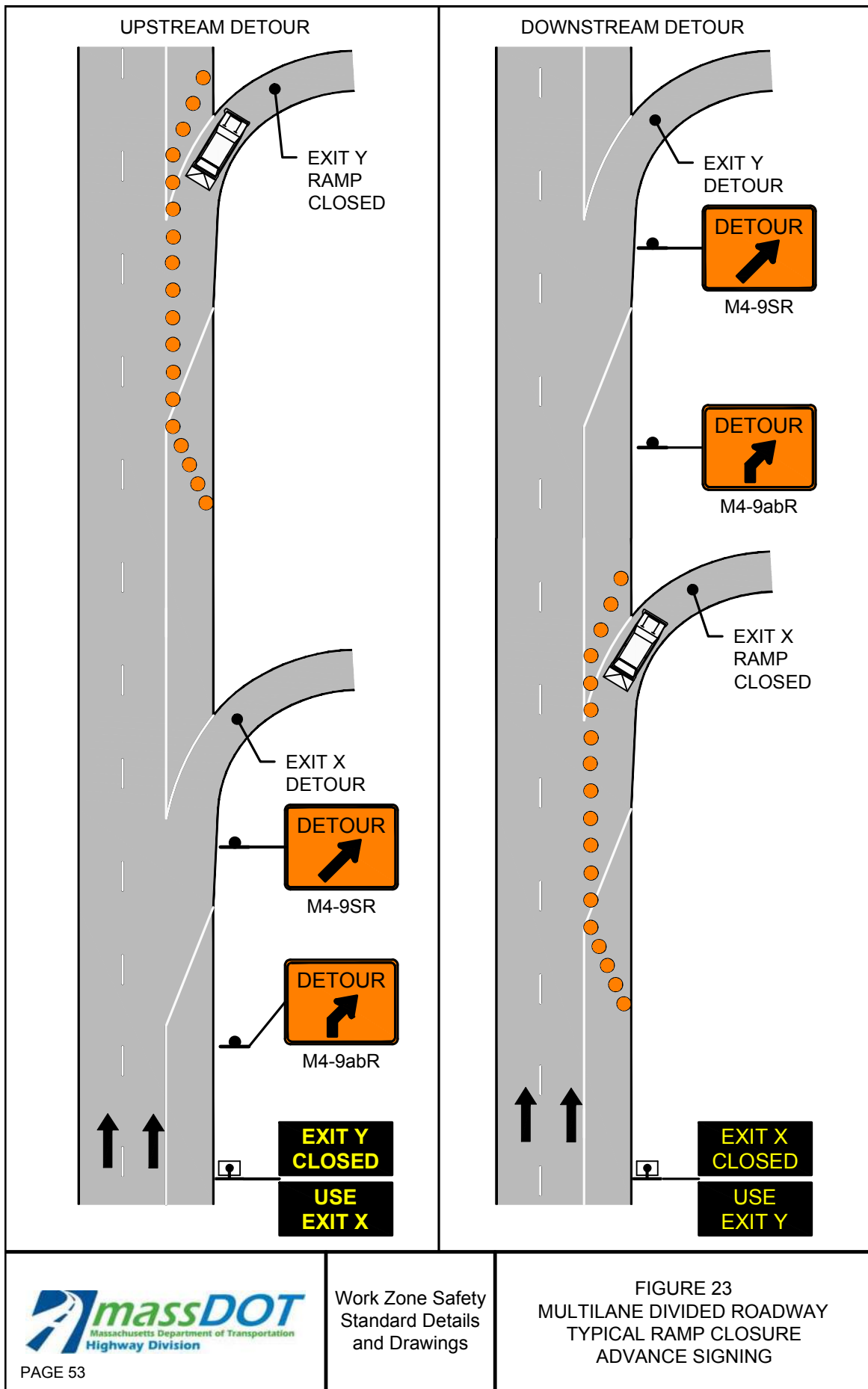
NOTES

1. IF THE CLOSED RAMP IS LOCATED DOWNSTREAM FROM THE PROPOSED DETOUR ROUTE/RAMP, A PCMS SHALL BE POSITIONED AT A SUFFICIENT DISTANCE IN ADVANCE OF THE DETOUR ROUTE/RAMP AND SHOULD STATE WHICH RAMP IS CLOSED AND WHICH SHALL BE USED FOR THE DETOUR.
2. IF THE CLOSED RAMP IS LOCATED UPSTREAM FROM THE PROPOSED DETOUR ROUTE/RAMP, A PCMS SHALL BE POSITIONED PRIOR TO THE CLOSED RAMP AND SHOULD STATE WHICH RAMP IS CLOSED AND WHICH SHALL BE USED FOR THE DETOUR.
3. A SUFFICIENT NUMBER OF DETOUR SIGNS (M4-9 SERIES) SHOULD BE DEPLOYED TO PROPERLY DIRECT DETOURED TRAFFIC. SIGN SPACING SHALL BE AT THE DIRECTION OF THE ENGINEER.

LEGEND

	WORK ZONE
	CHANNELIZATION DEVICE
	FLASHING ARROW BOARD
	PORTABLE CHANGEABLE MESSAGE SIGN
	TRUCK MOUNTED ATTENUATOR
	RADAR SPEED FEEDBACK BOARD
	POLICE DETAIL OR UNIFORMED FLAGGER
	TEMPORARY PORTABLE RUMBLE STRIP
	TYPE III BARRICADE

NOT TO SCALE





PAGE 54

Work Zone Safety
Standard Details
and DrawingsFIGURE 24-1
MULTILANE DIVIDED ROADWAY
PLACEMENT OF TEMPORARY
PORTABLE RUMBLE STRIPS
SHEET 1 OF 2


POSTED REGULATORY OR WORK ZONE SPEED	SEPARATION BETWEEN RUMBLE STRIPS
Above 55-mph	20-feet
36-mph to 55-mph	15-feet
35-mph and under	10-feet

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)	TANGENT LENGTH BETWEEN TAPERS (T) (FT)
25-40	500 / 500 / 500	640
45-55	500 / 1000 / 1000	1320
60-65	1000 / 1600 / 2600	1560

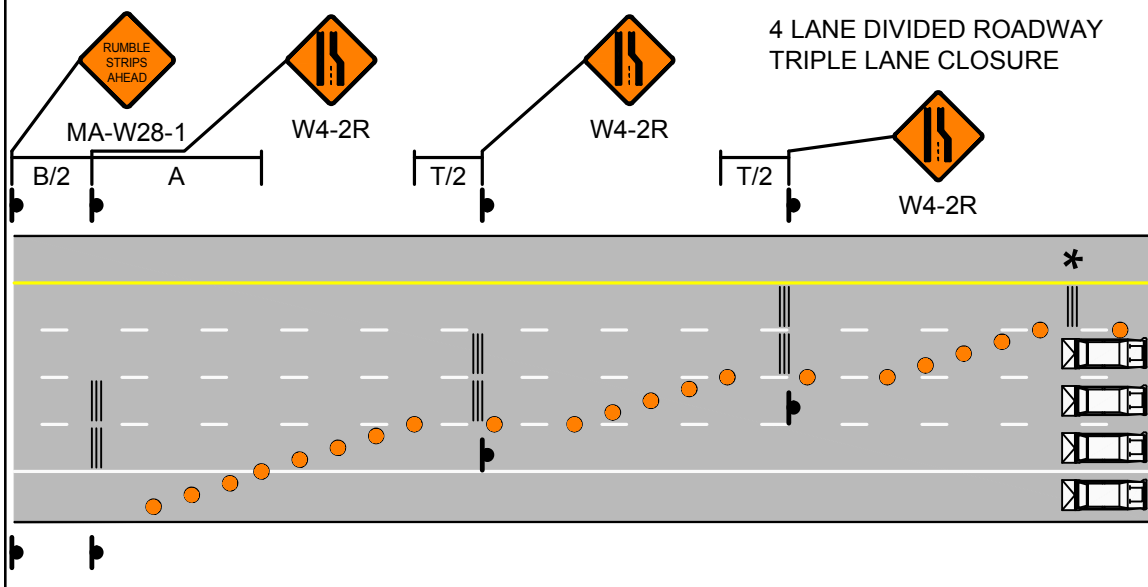
NOTES

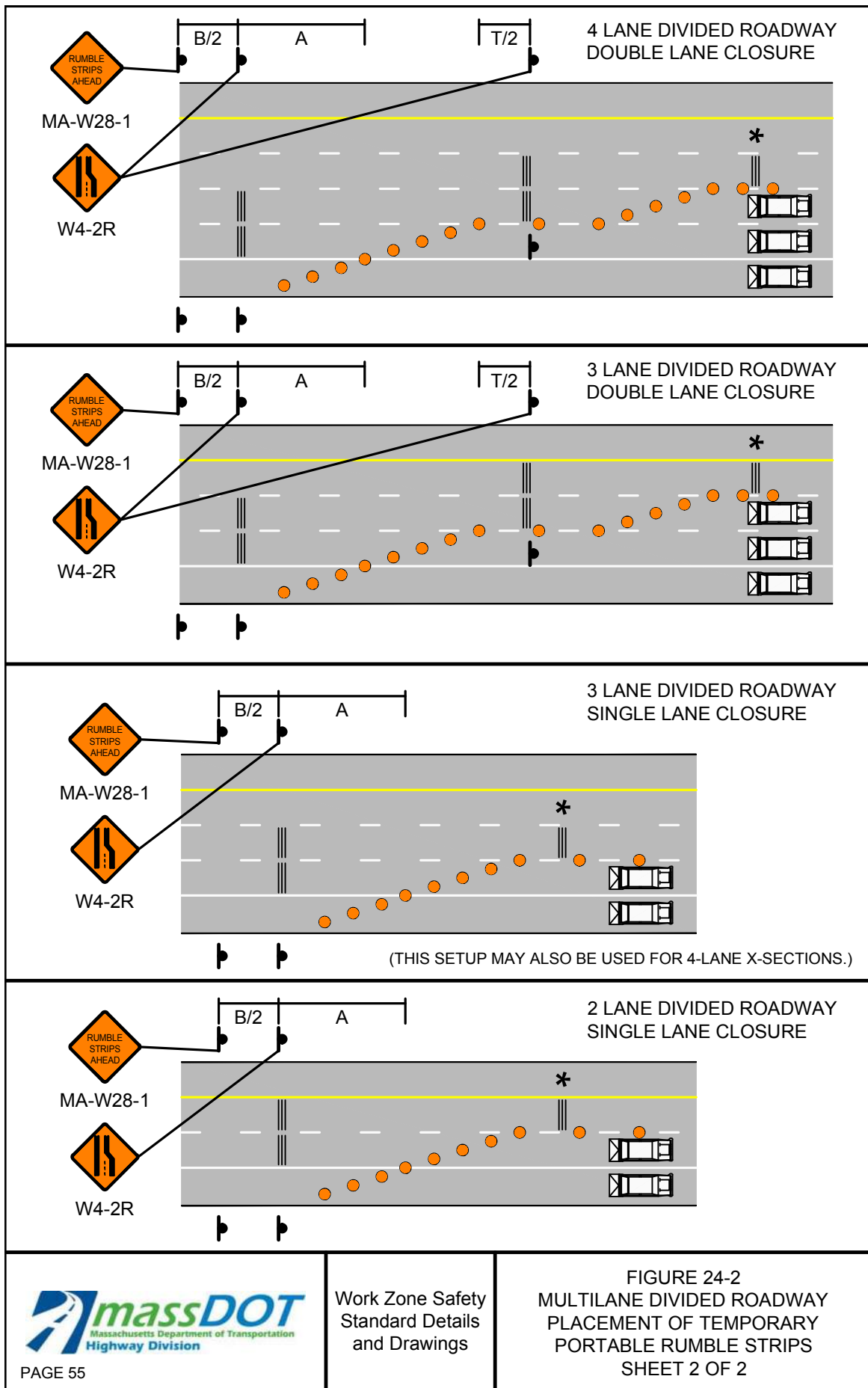
1. THE INTENTION OF THESE DETAILS IS ONLY TO DEPICT THE PLACEMENT OF TEMPORARY PORTABLE RUMBLE STRIPS (TPRS) IN RELATIONSHIP TO THE TAPER AND THE BUFFER OF A SINGLE- OR MULTI-LANE CLOSURE. THE DEPICTION OF THE NUMBER AND SPACING OF ALL OTHER TRAFFIC CONTROL DEVICES IS NOT TO SCALE. REFER TO OTHER DETAILS FOR LANE CLOSURES FOR THE PLACEMENT AND NUMBER OF ALL OTHER TRAFFIC CONTROL DEVICES.
2. THESE DETAILS ONLY DEPICT RIGHT LANE CLOSURES. LEFT LANE CLOSURES SHOULD UTILIZE A MIRROR IMAGE OF THESE SETUPS, STARTING WITH CLOSURE OF THE LEFTMOST LANE.
3. ★ THIS TPRS ARRAY IS OPTIONAL AT THE ENGINEER'S DISCRETION. IF USED, IT SHOULD BE PLACED ADJACENT TO THE BUFFER.
4. DETAILS SHOW THE MINIMUM NUMBER OF TPRS REQUIRED. ADDITIONAL MAY BE USED IF CONDITIONS WARRANT.


LEGEND

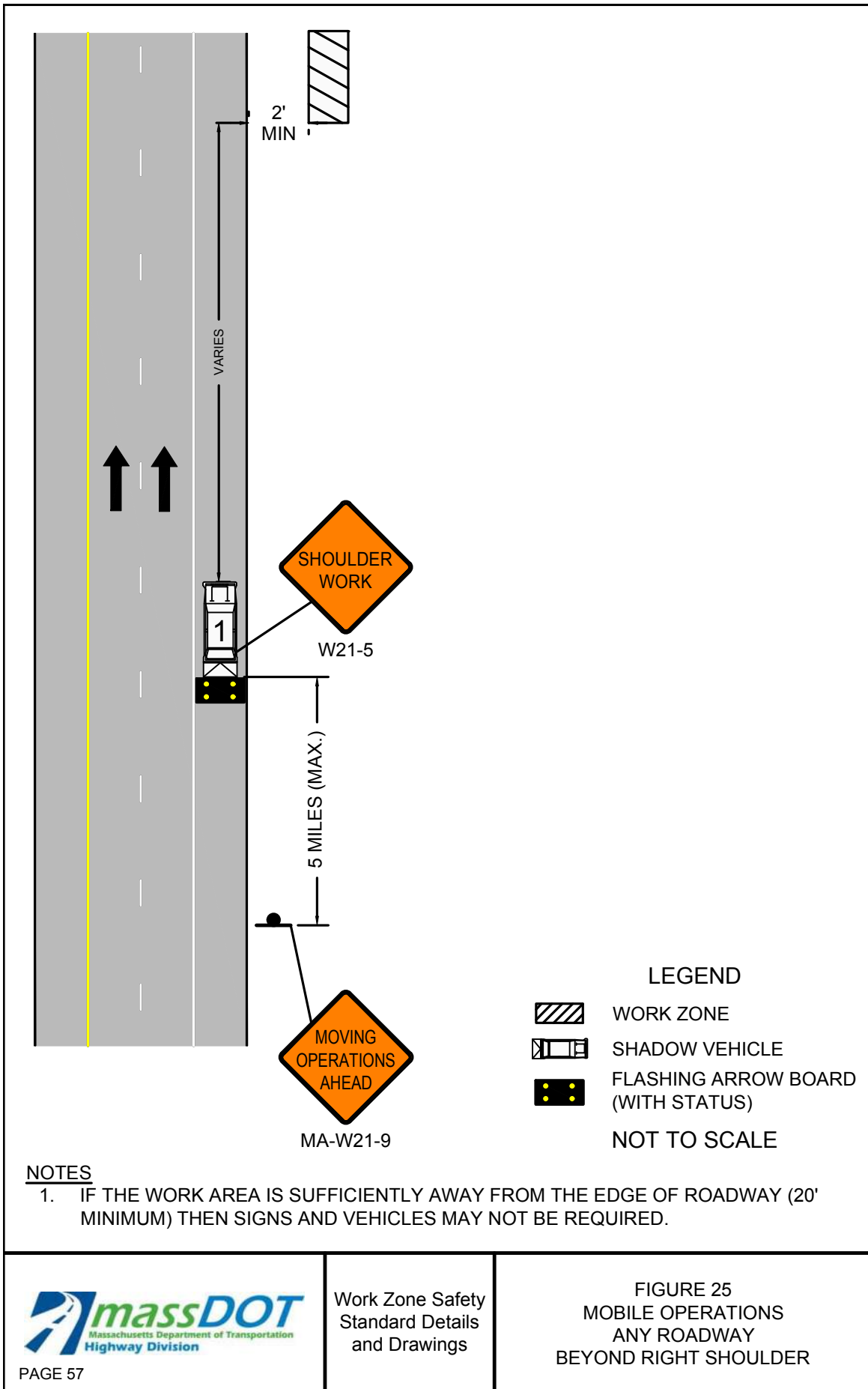
- CHANNELIZATION DEVICE
-  TRUCK MOUNTED ATTENUATOR
- ≡≡≡ TEMPORARY PORTABLE RUMBLE STRIP

NOT TO SCALE





 PAGE 56	Work Zone Safety Standard Details and Drawings	NOTES FOR MOBILE OPERATIONS
<p style="text-align: center;">Notes for Mobile Operations</p> <ul style="list-style-type: none"> • Unless otherwise stated, these notes shall apply to all Mobile Operation setups. • Additional, setup-specific notes may be found on individual sheets. <ol style="list-style-type: none"> 1. The Supervisor shall travel the designated roadway prior to scheduling the work to ensure that sufficient and appropriate traffic control devices will be available. Special consideration shall be exercised to ensure that appropriate traffic controls be placed in areas that will have limited visibility of the work areas or any associated traffic queues. 2. Vehicles used for these operations shall be made highly visible with appropriate equipment such as flashing lights, rotating beacons, flags, signs, flashing arrow boards, and/or portable changeable message signs. Any signs mounted to these vehicles shall not obscure the visibility of other devices. 3. All vehicles shown may not be required based upon roadway conditions. However, when needed and practical, additional shadow vehicles and equipment to warn and protect motorists and workers should be used. Based upon roadway conditions, the addition of a police detail with cruiser may be used for additional protection or warning for the traveling public. 4. The distance between the work and shadow vehicle(s) may vary according to the terrain and other factors. Shadow vehicles are used to warn traffic of the operations ahead. Whenever adequate sight distance exists, the shadow vehicle(s) should maintain the minimum appropriate distance and maintain the same speed to prevent non-work related vehicles from entering the work convoy. If this formation cannot be maintained then additional traffic control devices should be deployed in advance of any vertical or horizontal curves that may restrict the sight distance of an oncoming vehicle to either the work vehicle or associated traffic queue. 5. All shadow vehicles shall be equipped with a truck or trailer mounted attenuator (TMA) and a flashing arrow board. 6. Signs should be covered or turned from view when work is not in progress. 7. Portable changeable message signs may be used in lieu of MA-W21-9 signs and any signs mounted directly to a shadow vehicle. 		

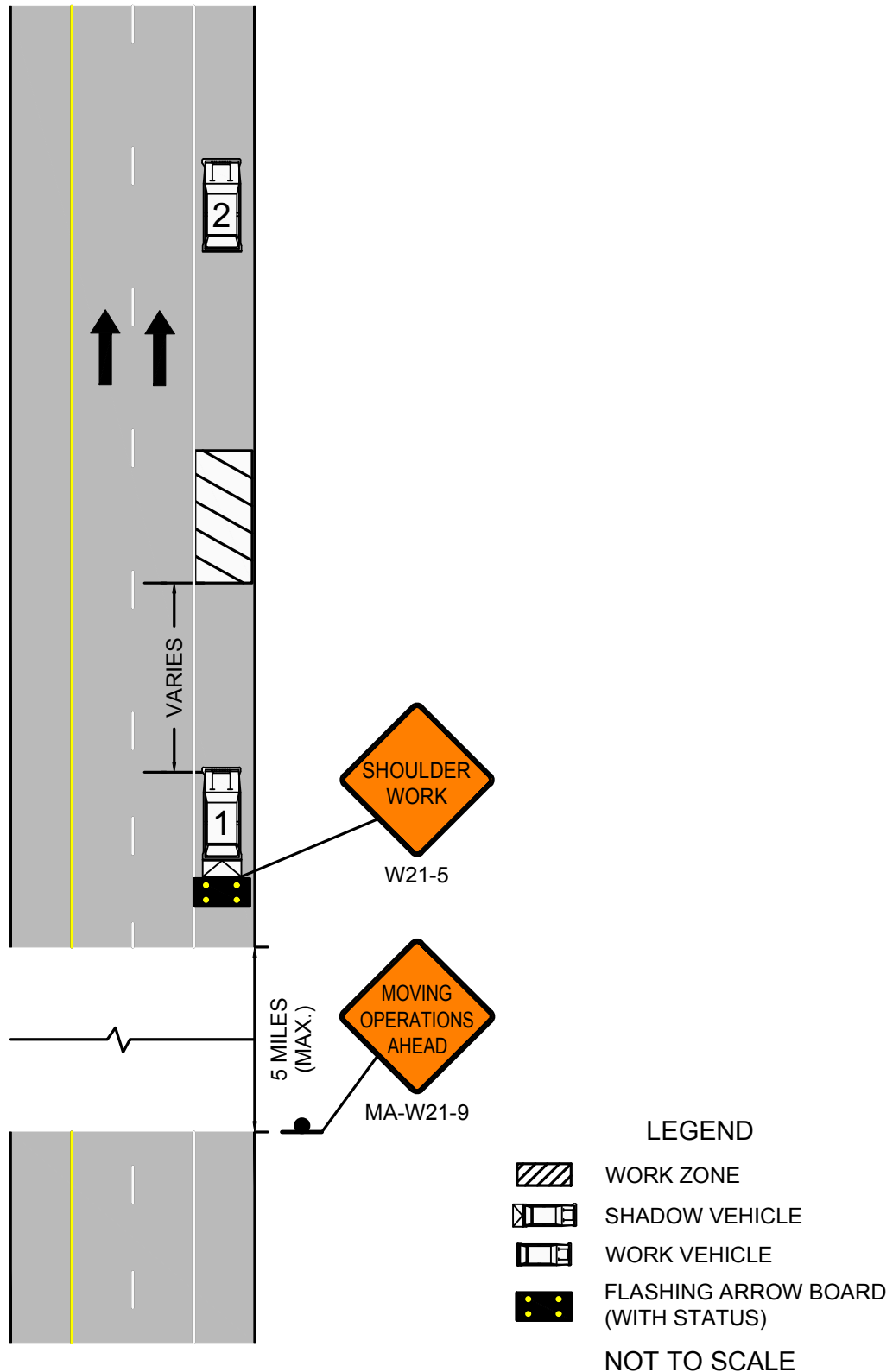


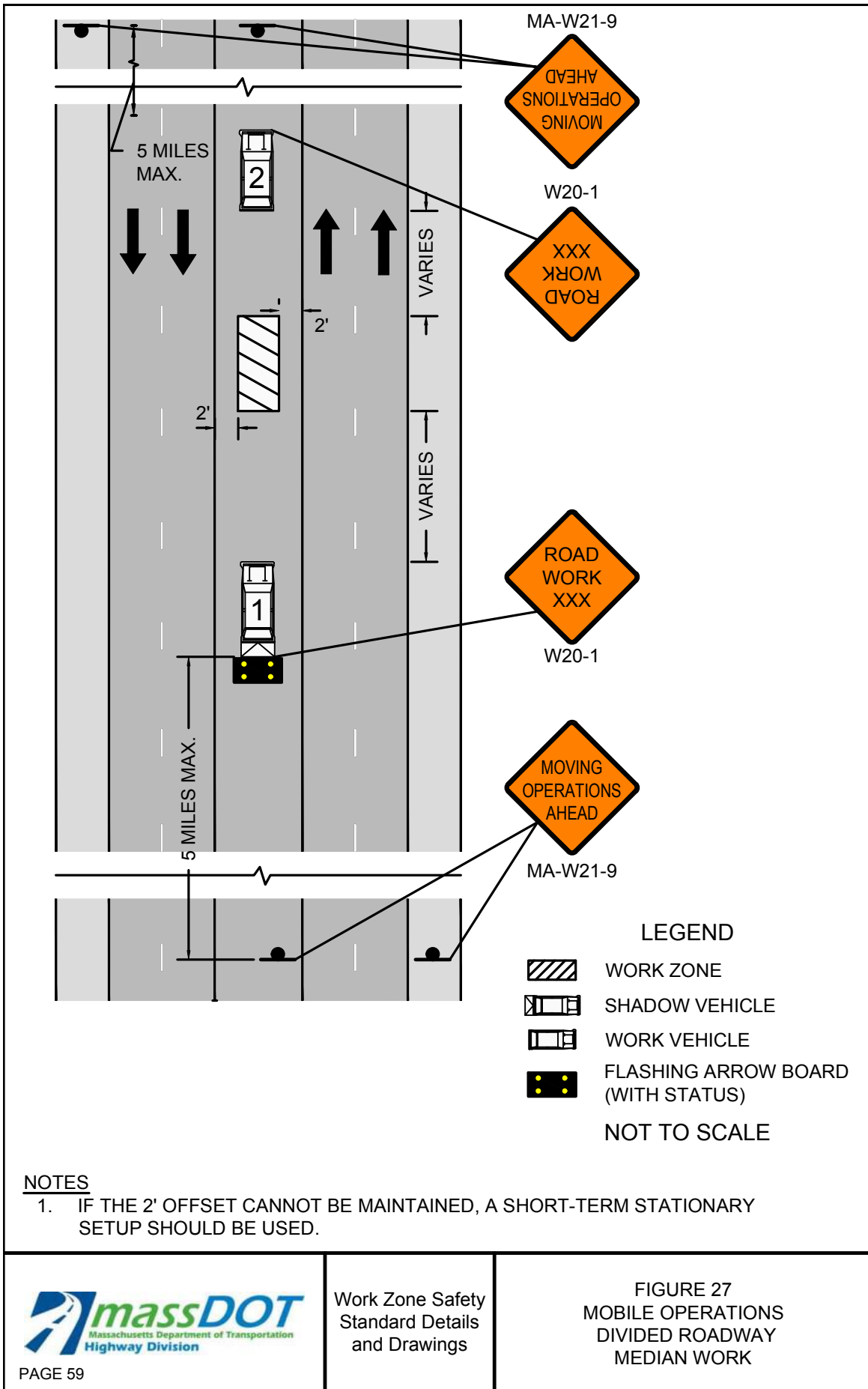


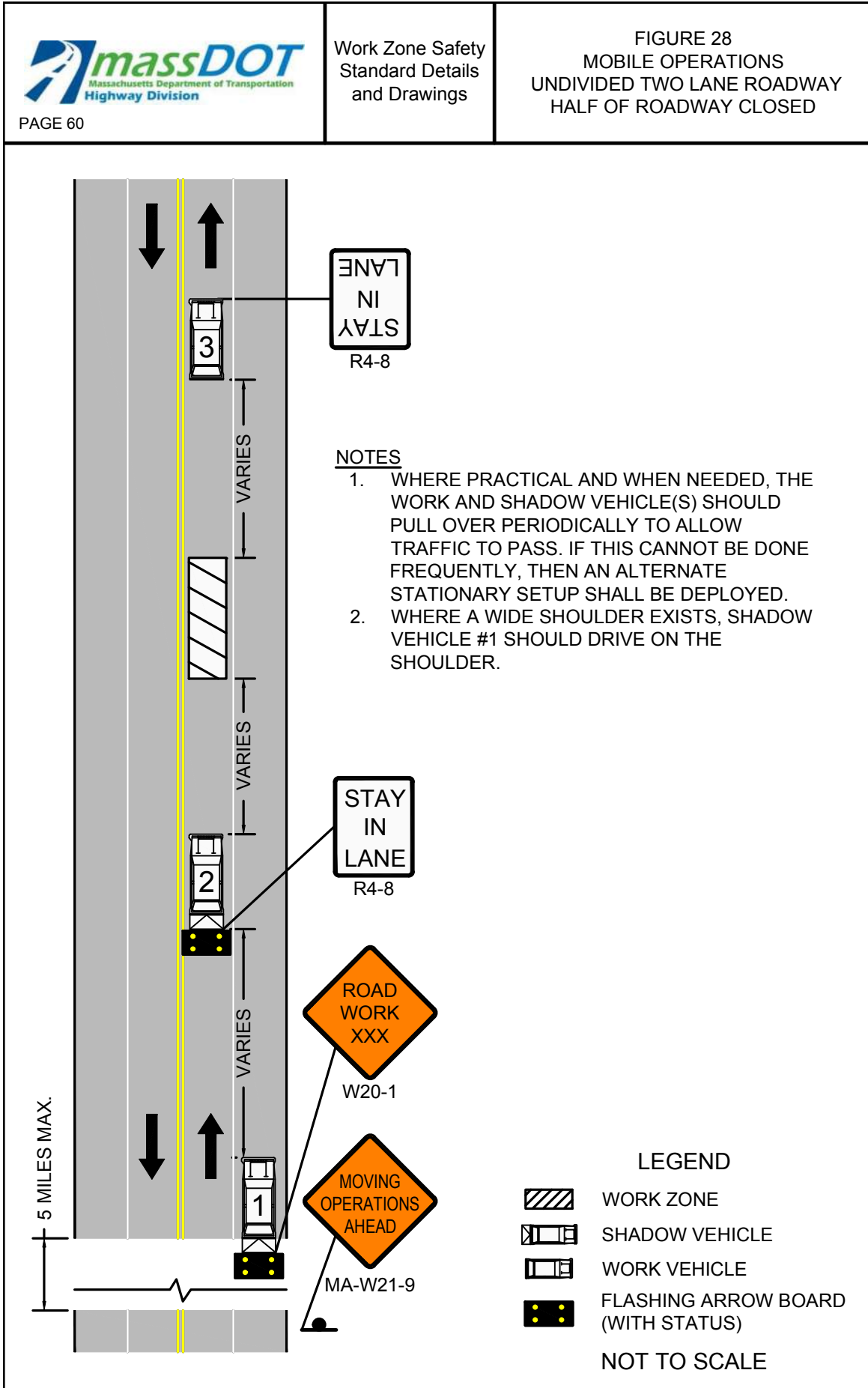
PAGE 58

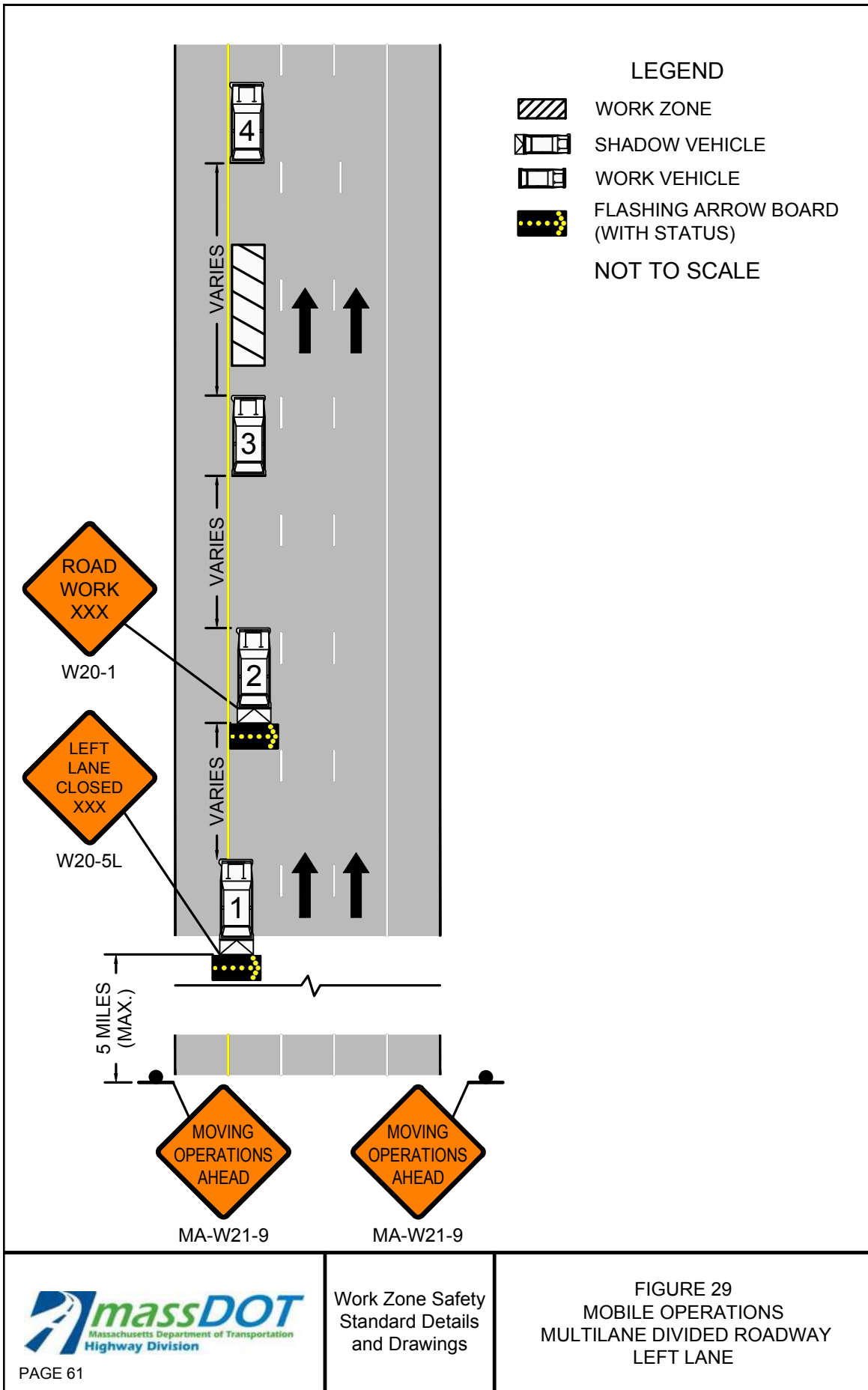
Work Zone Safety
Standard Details
and Drawings

FIGURE 26
MOBILE OPERATIONS
ANY ROADWAY SHOULDER







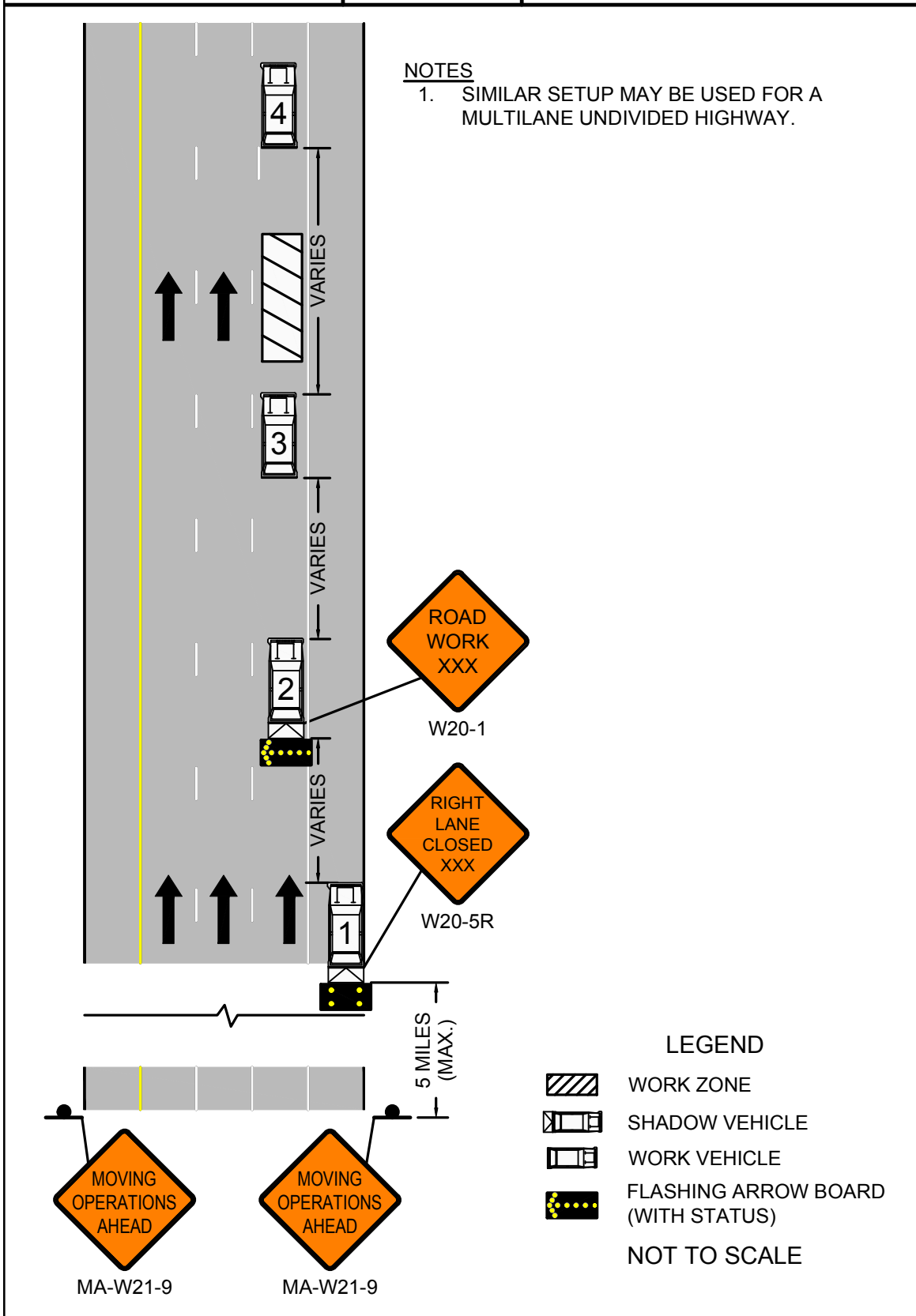


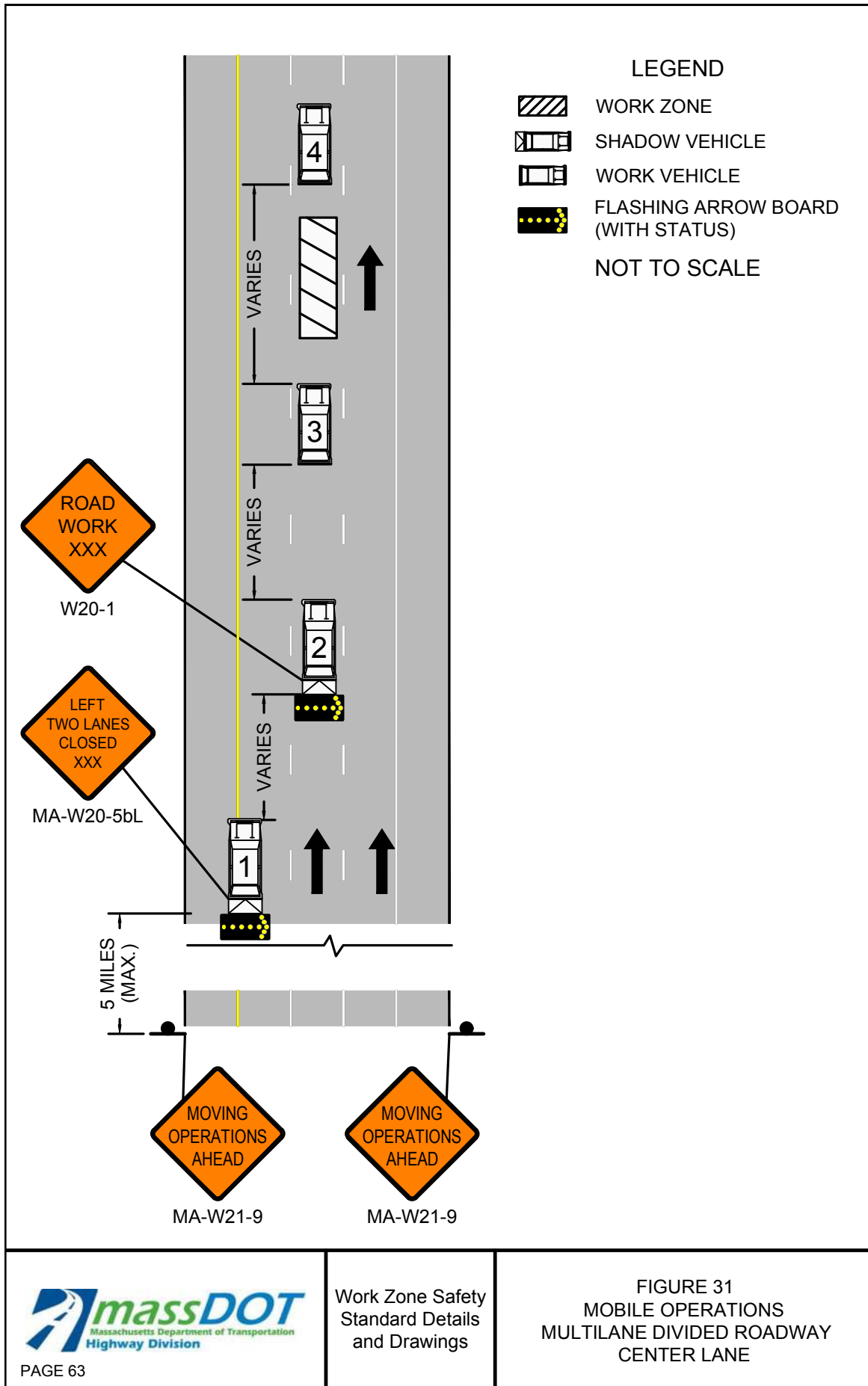


PAGE 62

Work Zone Safety
Standard Details
and Drawings

FIGURE 30
MOBILE OPERATIONS
MULTILANE DIVIDED ROADWAY
RIGHT LANE



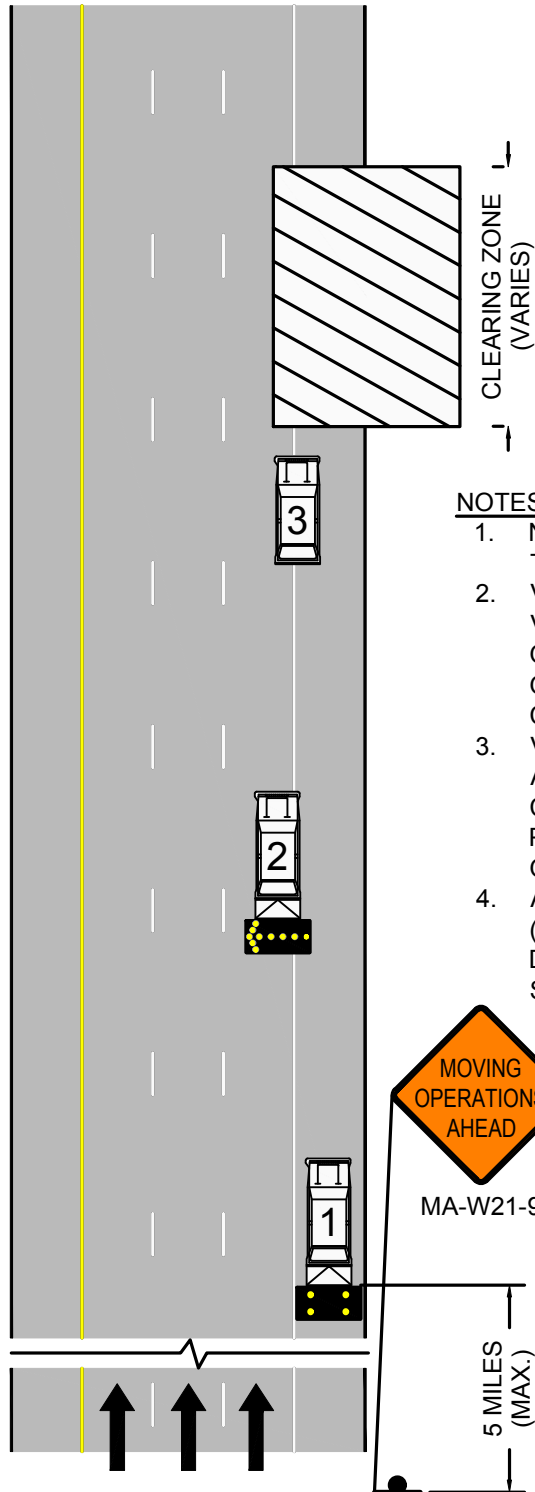




PAGE 64

Work Zone Safety
Standard Details
and Drawings





FIGURE 32
MOBILE OPERATIONS
POST-STORM CLEANUP OPERATION



NOTES

1. NO OTHER NOTES ARE APPLICABLE TO THIS DETAIL.
2. VEHICLE #3 IS A SNOW/DEBRIS REMOVAL VEHICLE AND SHALL ALWAYS BE AWARE OF THE SURROUNDINGS. MORE THAN ONE VEHICLE MAY BE USED IN THE CLEARING ZONE.
3. VEHICLE #1 SHOULD BE EQUIPPED WITH A PCMS, A TMA, AND STAY IN VISUAL CONTACT WITH VEHICLE #3 WHILE PROVIDING AMPLE WARNING TO ONCOMING TRAFFIC.
4. A POLICE DETAIL WITH BLUE LIGHTS (OPTIONAL) SHALL REMAIN DOWNSTREAM OF VEHICLE #1 IN THE SHOULDER.

LEGEND

-  WORK ZONE
-  SHADOW VEHICLE
-  WORK VEHICLE
-  FLASHING ARROW BOARD (WITH STATUS)

NOT TO SCALE

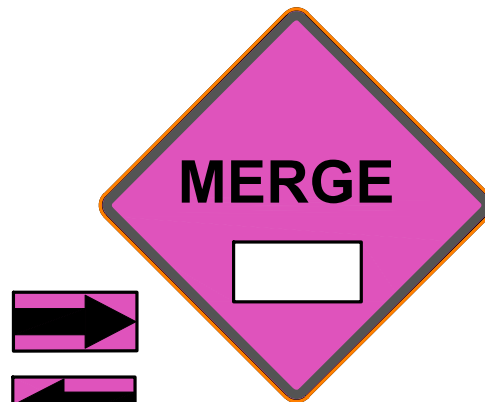
Notes for Traffic Emergency or Incident Operations

- The goal is to increase awareness of during traffic emergencies or incidents.
- These signs are to be used to differentiate from the traditional construction work zone and an emergency or incident.
- Upon arrival MassDOT First Responders shall assess the magnitude of the scene to determine if the incident is likely to last an hour or more in duration which would trigger the requirement to use these signs.
- Place the "Emergency Ahead" sign on the same side of the road as the incident, if possible, for up to an hour. Emergency response signs should be put up for all incidents and emergencies as soon as possible.
- Place the emergency sign 500 to 1000 feet before the first channelization devices.
- As an incident evolves this sign would be used as a secondary sign with all other emergency controls put in place.
- Only use "MERGE" signs where applicable (Not on 2 lane roads).
- Use MERGE signs on Multi-lane Roads to move traffic away from the incident and keep them in a safe lane.
- Place the MERGE sign about 500 feet before the closure.
- If additional signs are available, they should be placed accordingly as a sign informing people coming in the other direction or on the opposite side of the roadway.
- Use 12 emergency cones spaced 40 to 80 feet apart to form a taper and protect the scene.
- Sequential flashing lights/flares may be used in lieu of or to supplement cones.
- During a major incident that will last for a long duration, the EMERGENCY AHEAD sign should be moved back before an intersecting road or ramp to alert travelers and give them an option of using an alternate route. (Be sure all other devices are in place before moving this sign).

Standard Emergency Signs (36"x36" or 48"x48")



MA-W20-9



MA-W4-2aR/L





PAGE 66

Work Zone Safety
Standard Details
and Drawings

FIGURE 33
EMERGENCY RESPONSE
ANY ROADWAY
SHOULDER ENCROACHMENT

LEGEND



EMERGENCY AREA

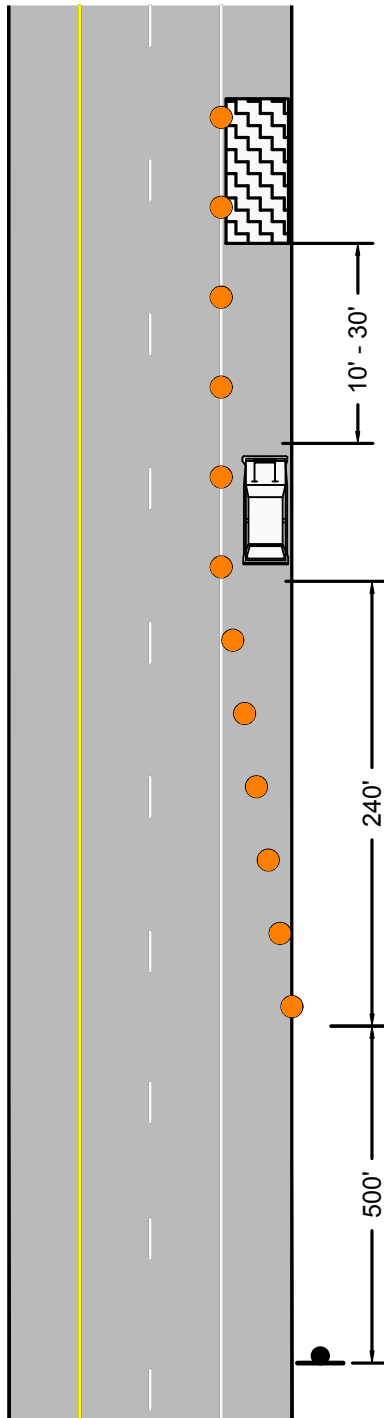


CHANNELIZATION DEVICE



EMERGENCY RESPONSE
VEHICLE

NOT TO SCALE



ORDER OF RESPONSE ACTIVITIES

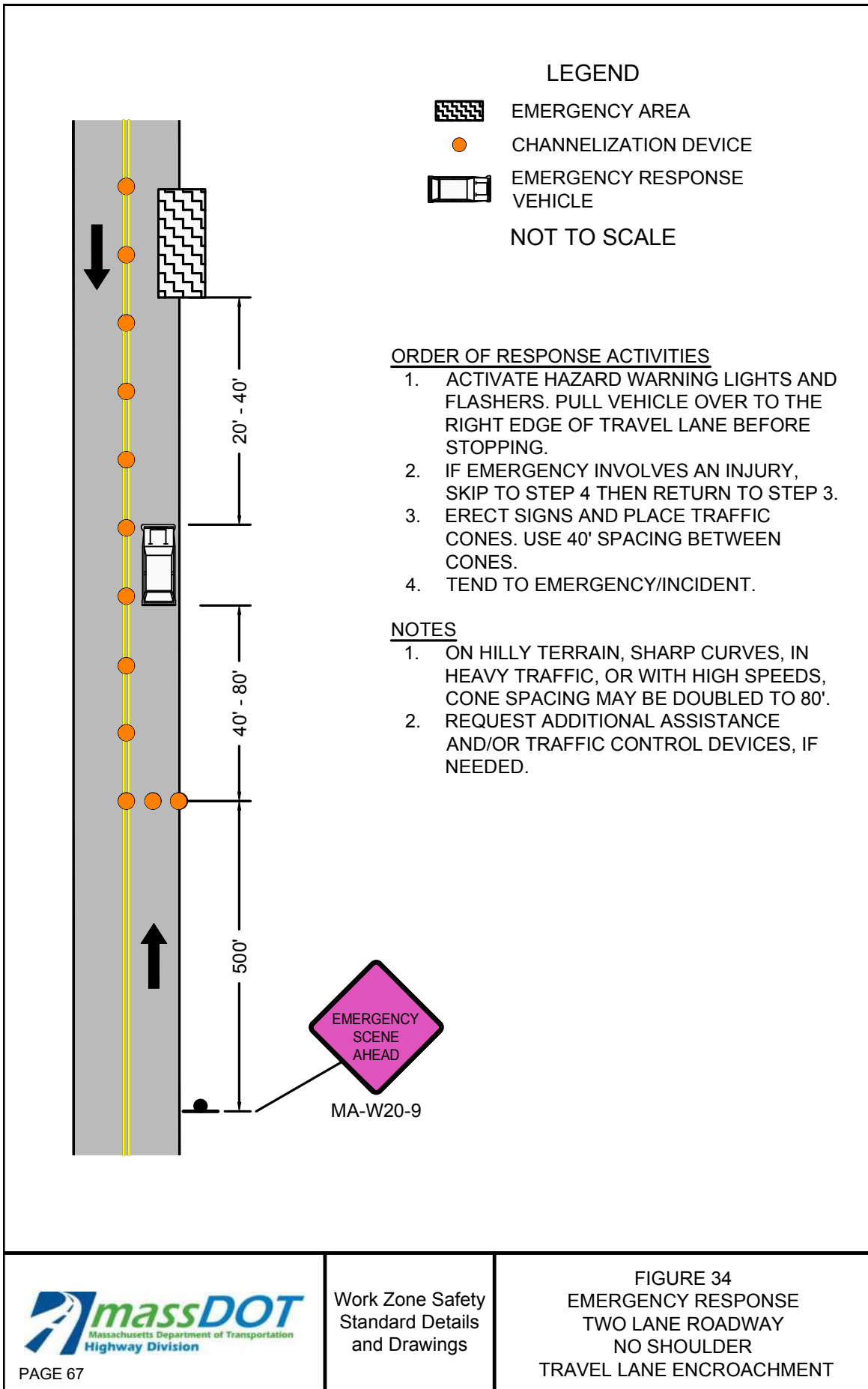
1. ACTIVATE HAZARD WARNING LIGHTS AND FLASHERS. PULL VEHICLE OVER TO THE RIGHT EDGE OF TRAVEL LANE BEFORE STOPPING.
2. IF EMERGENCY INVOLVES AN INJURY, SKIP TO STEP 4 THEN RETURN TO STEP 3.
3. ERECT SIGNS AND PLACE TRAFFIC CONES. USE 40' SPACING BETWEEN CONES.
4. TEND TO EMERGENCY/INCIDENT.

NOTES

1. ON HILLY TERRAIN, SHARP CURVES, IN HEAVY TRAFFIC, OR WITH HIGH SPEEDS, CONE SPACING MAY BE DOUBLED TO 80'.
2. REQUEST ADDITIONAL ASSISTANCE AND/OR TRAFFIC CONTROL DEVICES, IF NEEDED.



MA-W20-9





PAGE 68

Work Zone Safety
Standard Details
and Drawings

FIGURE 35
EMERGENCY RESPONSE
TWO LANE ROADWAY
TRAVERSABLE SHOULDER
SINGLE LANE ENCROACHMENT

LEGEND



EMERGENCY AREA

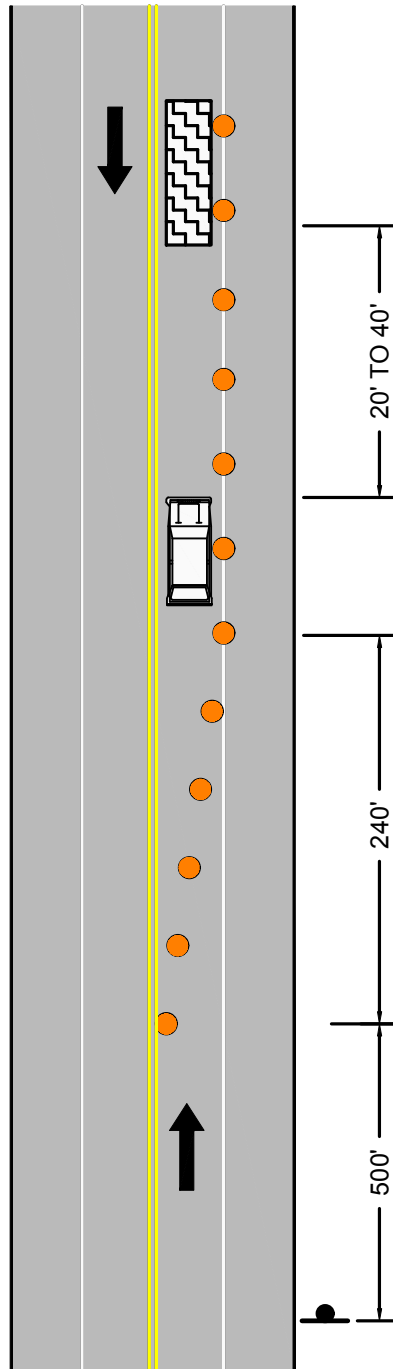


CHANNELIZATION DEVICE



EMERGENCY RESPONSE
VEHICLE

NOT TO SCALE

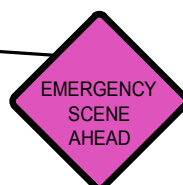


ORDER OF RESPONSE ACTIVITIES

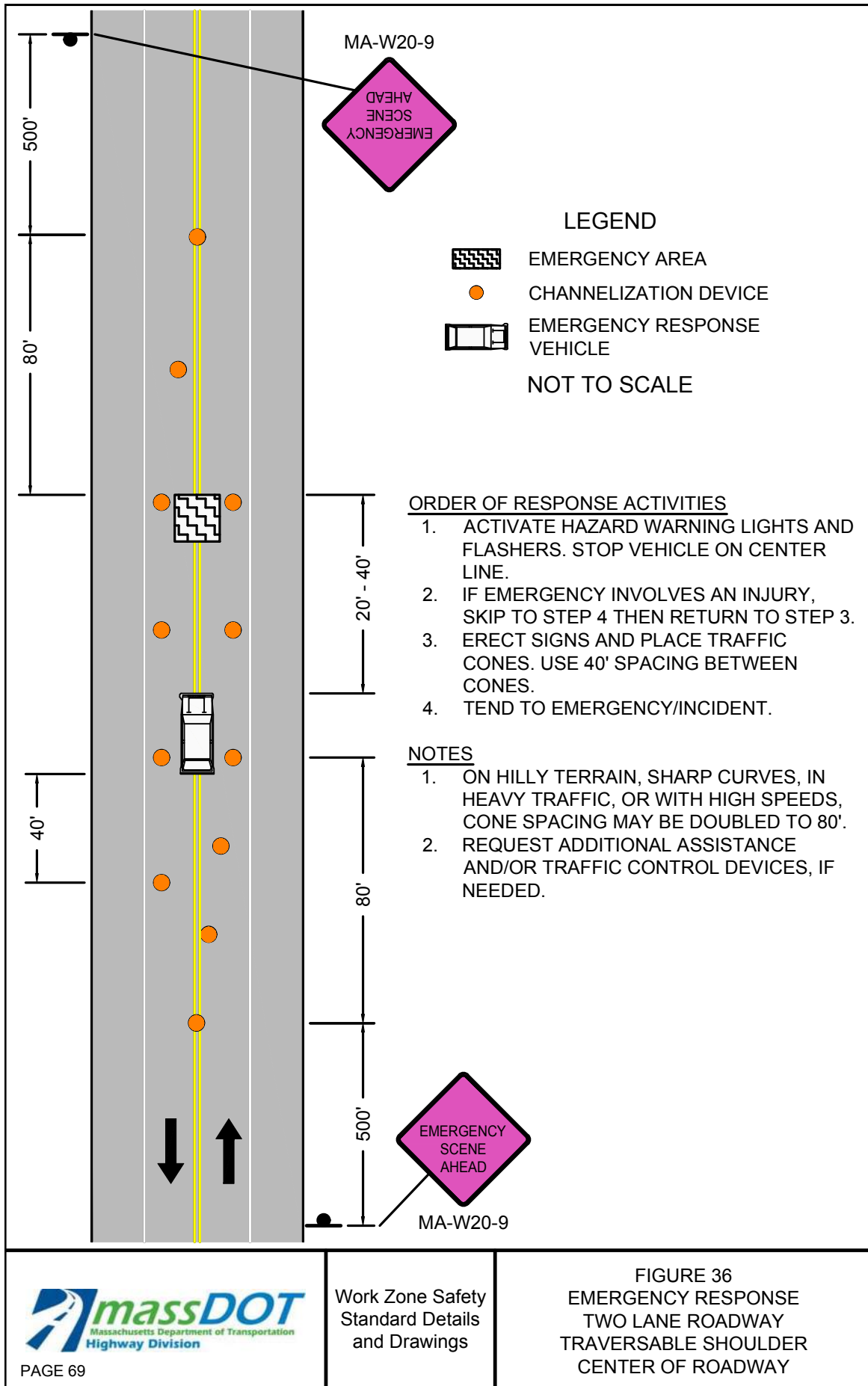
1. ACTIVATE HAZARD WARNING LIGHTS AND FLASHERS. PULL VEHICLE OVER TO THE LEFT EDGE OF TRAVEL LANE BEFORE STOPPING.
2. IF EMERGENCY INVOLVES AN INJURY, SKIP TO STEP 4 THEN RETURN TO STEP 3.
3. ERECT SIGNS AND PLACE TRAFFIC CONES. USE 40' SPACING BETWEEN CONES.
4. TEND TO EMERGENCY/INCIDENT.

NOTES

1. ON HILLY TERRAIN, SHARP CURVES, IN HEAVY TRAFFIC, OR WITH HIGH SPEEDS, CONE SPACING MAY BE DOUBLED TO 80'.
2. REQUEST ADDITIONAL ASSISTANCE AND/OR TRAFFIC CONTROL DEVICES, IF NEEDED.



MA-W20-9

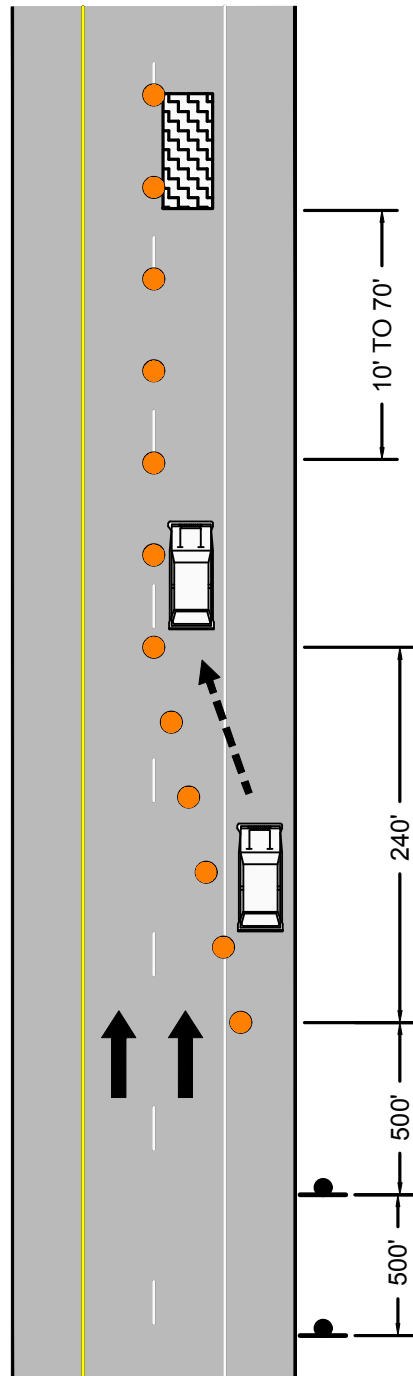




PAGE 70

Work Zone Safety
Standard Details
and Drawings

FIGURE 37
EMERGENCY RESPONSE
MULTILANE DIVIDED ROADWAY
RIGHT LANE



LEGEND

- EMERGENCY AREA
- CHANNELIZATION DEVICE
- EMERGENCY RESPONSE VEHICLE
- RESPONSE VEHICLE MOVEMENT

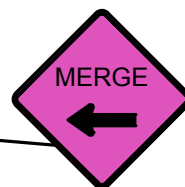
NOT TO SCALE

ORDER OF RESPONSE ACTIVITIES

1. ACTIVATE HAZARD WARNING LIGHTS AND FLASHERS. STOP VEHICLE IN BREAKDOWN LANE.
2. IF EMERGENCY INVOLVES AN INJURY, SKIP TO STEP 6 THEN RETURN TO STEP 3.
3. ERECT SIGNS AND PLACE TRAFFIC CONES. USE 40' SPACING BETWEEN CONES.
4. MOVE RESPONSE VEHICLE BEHIND EMERGENCY.
5. PLACE ADDITIONAL CONES.
6. TEND TO EMERGENCY.

NOTES

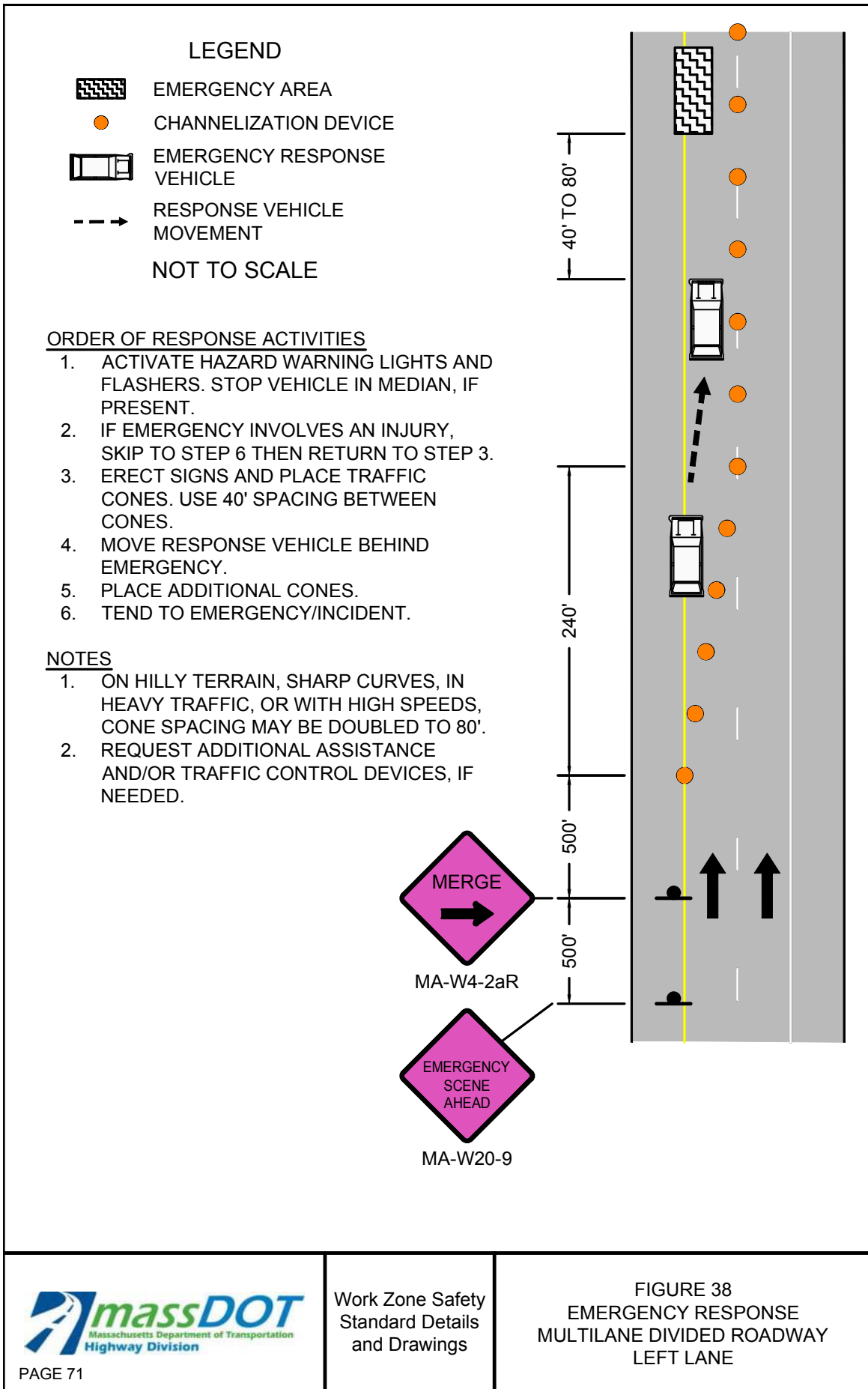
1. ON HILLY TERRAIN, SHARP CURVES, IN HEAVY TRAFFIC, OR WITH HIGH SPEEDS, CONE SPACING MAY BE DOUBLED TO 80'.
2. REQUEST ADDITIONAL ASSISTANCE AND/OR TRAFFIC CONTROL DEVICES, IF NEEDED.



MA-W4-2aL



MA-W20-9

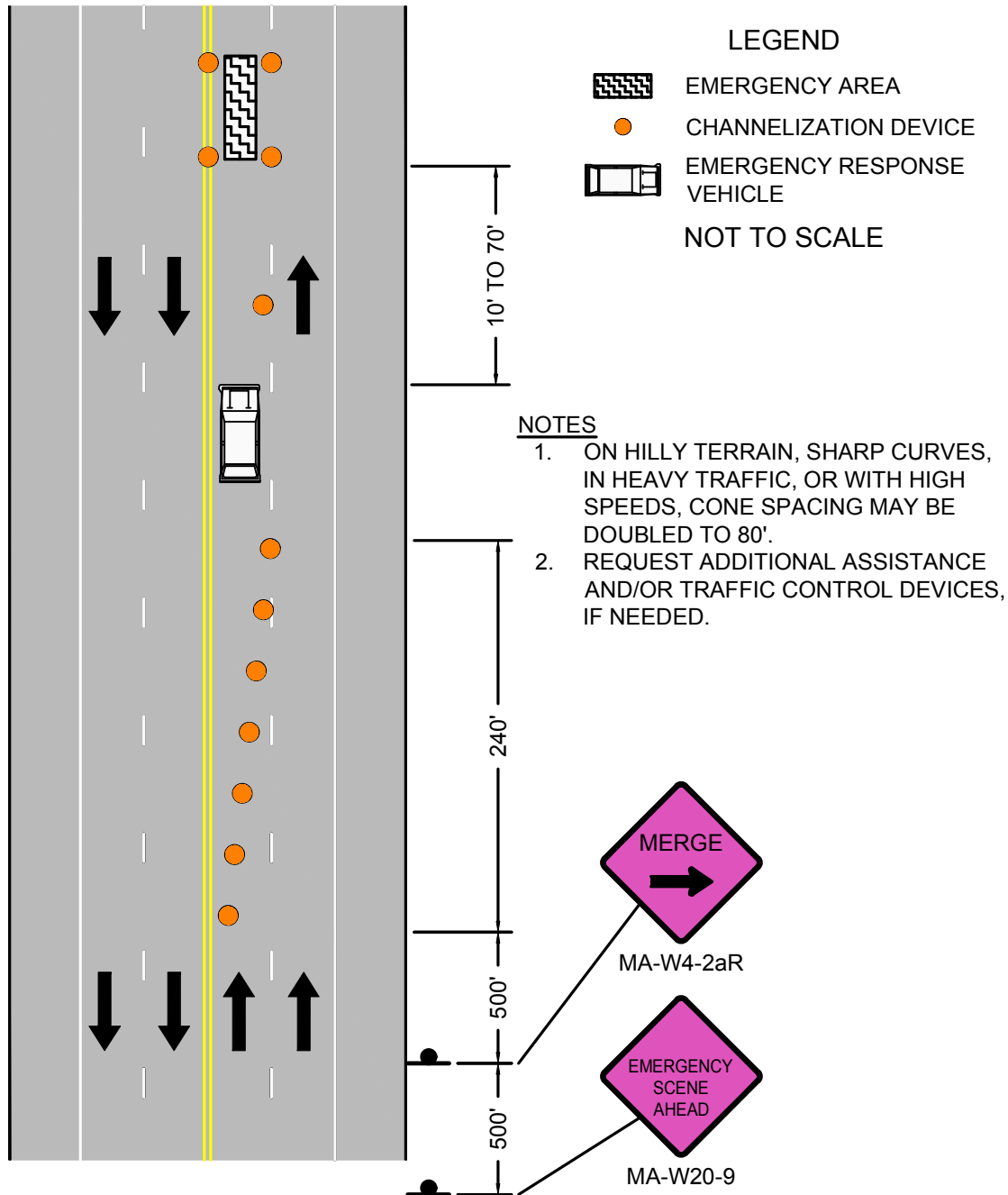


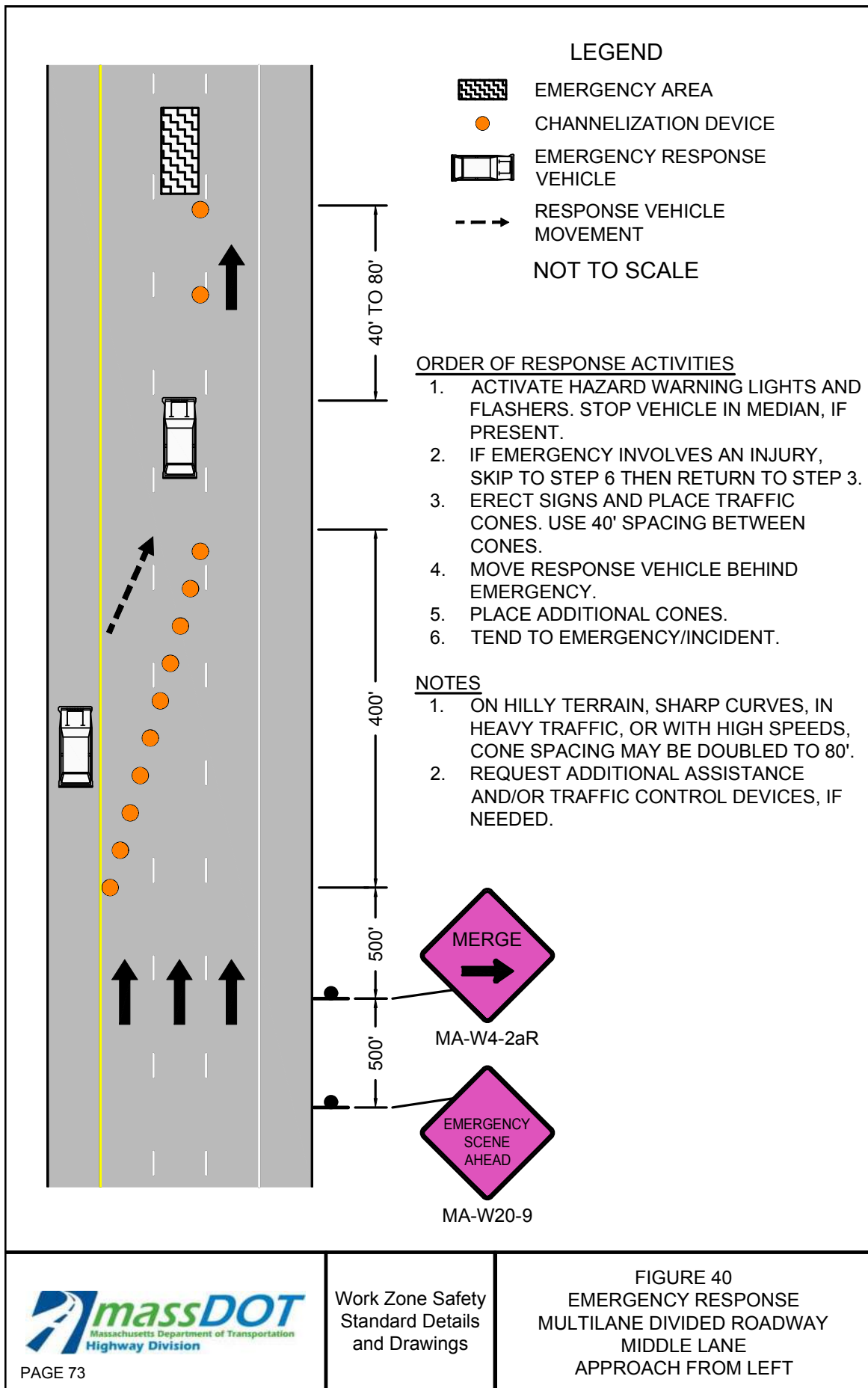


PAGE 72

Work Zone Safety
Standard Details
and Drawings

FIGURE 39
EMERGENCY RESPONSE
MULTILANE UNDIVIDED
ROADWAY
LEFT LANE



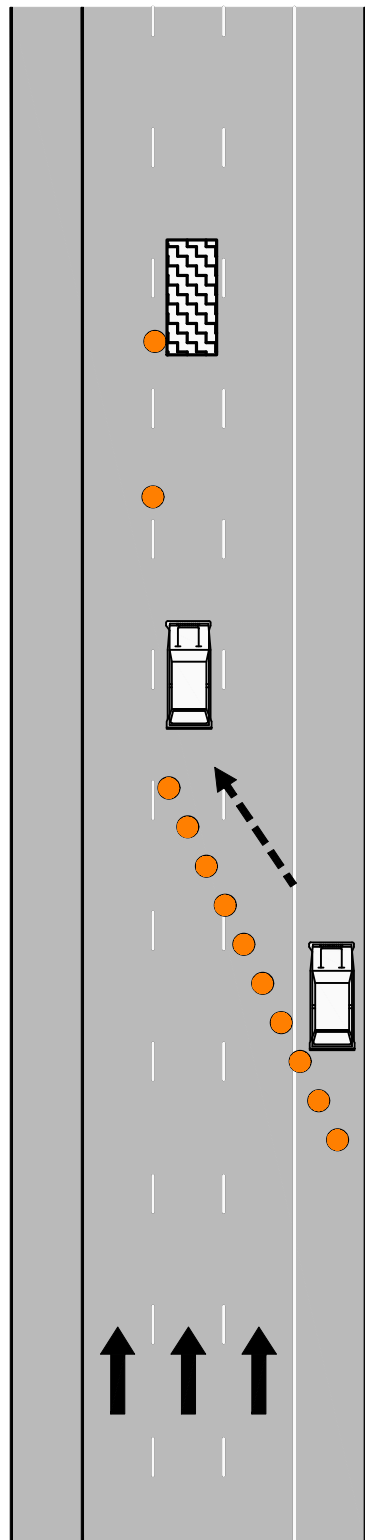




PAGE 74

Work Zone Safety
Standard Details
and Drawings

FIGURE 41
EMERGENCY RESPONSE
MULTILANE DIVIDED ROADWAY
MIDDLE LANE
APPROACH FROM RIGHT



LEGEND

- EMERGENCY AREA
- CHANNELIZATION DEVICE
- EMERGENCY RESPONSE VEHICLE
- RESPONSE VEHICLE MOVEMENT

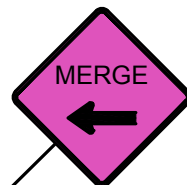
NOT TO SCALE

ORDER OF RESPONSE ACTIVITIES

1. ACTIVATE HAZARD WARNING LIGHTS AND FLASHERS. STOP VEHICLE IN BREAKDOWN LANE.
2. IF EMERGENCY INVOLVES AN INJURY, SKIP TO STEP 6 THEN RETURN TO STEP 3.
3. ERECT SIGNS AND PLACE TRAFFIC CONES. USE 40' SPACING BETWEEN CONES.
4. MOVE RESPONSE VEHICLE BEHIND EMERGENCY.
5. PLACE ADDITIONAL CONES.
6. TEND TO EMERGENCY.

NOTES

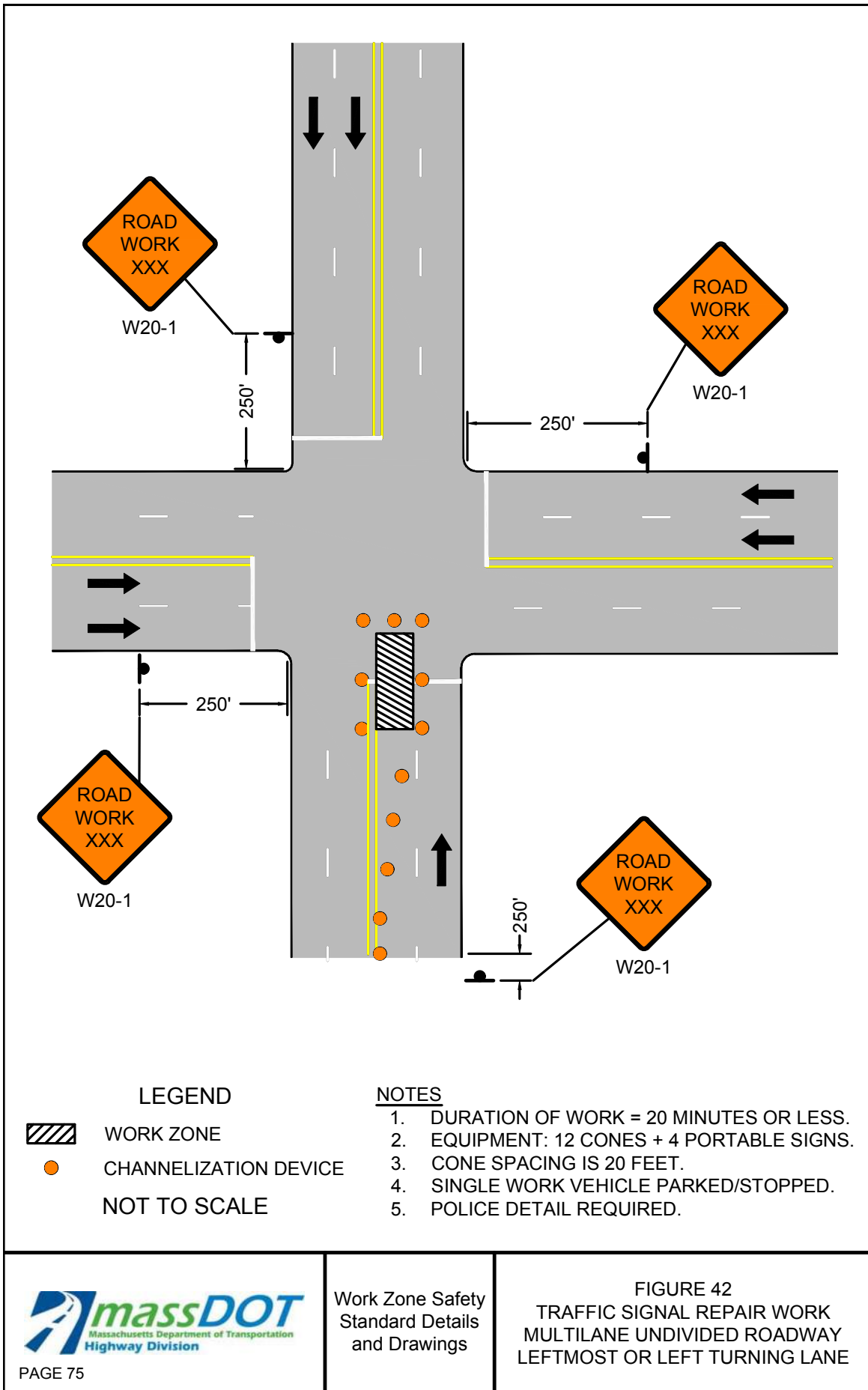
1. ON HILLY TERRAIN, SHARP CURVES, IN HEAVY TRAFFIC, OR WITH HIGH SPEEDS, CONE SPACING MAY BE DOUBLED TO 80'.
2. REQUEST ADDITIONAL ASSISTANCE AND/OR TRAFFIC CONTROL DEVICES, IF NEEDED.



MA-W4-2aL



MA-W20-9

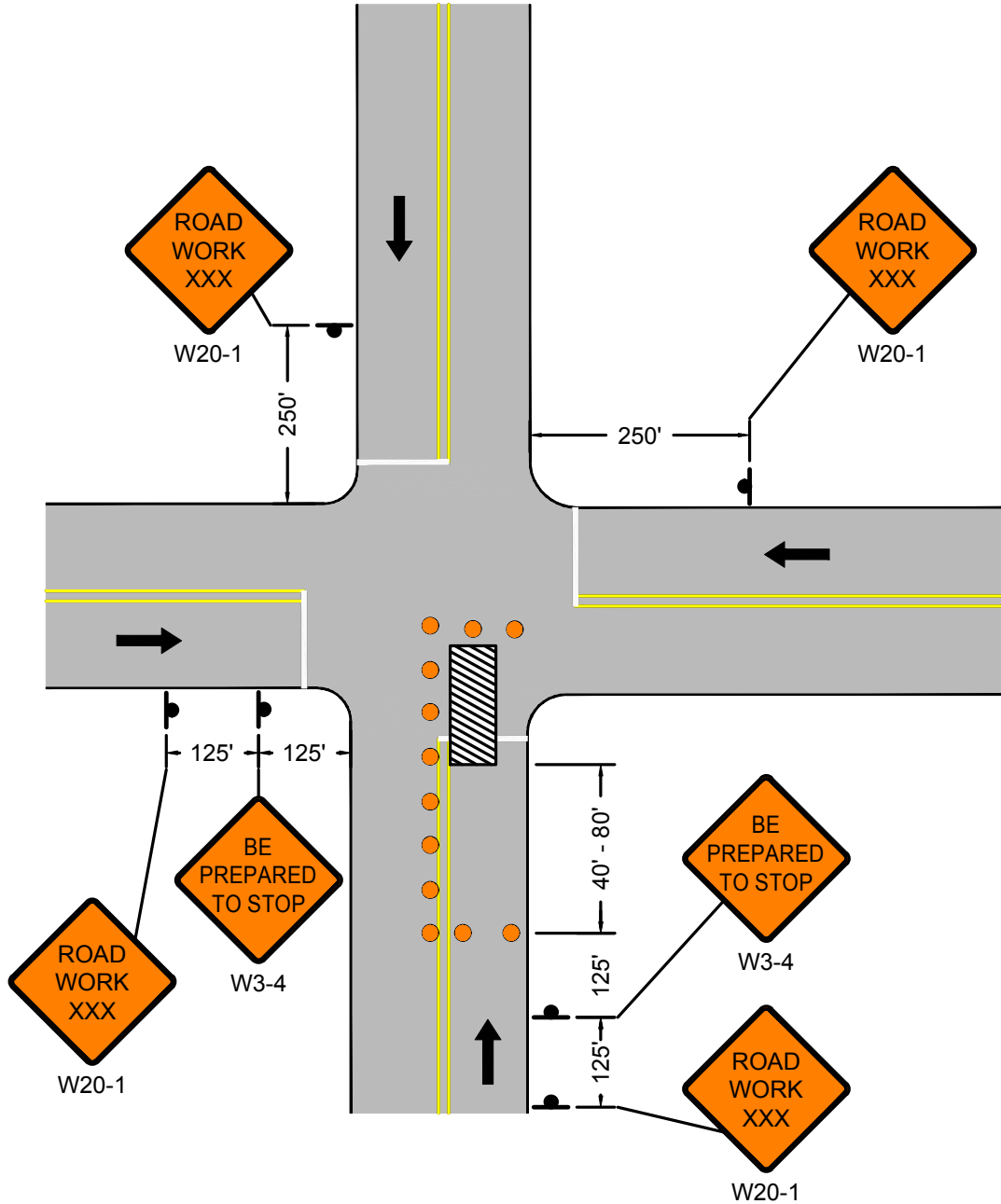






PAGE 76

Work Zone Safety
Standard Details
and Drawings

FIGURE 43
TRAFFIC SIGNAL REPAIR WORK
TWO LANE UNDIVIDED ROADWAY
ONE LEG OF INTERSECTION

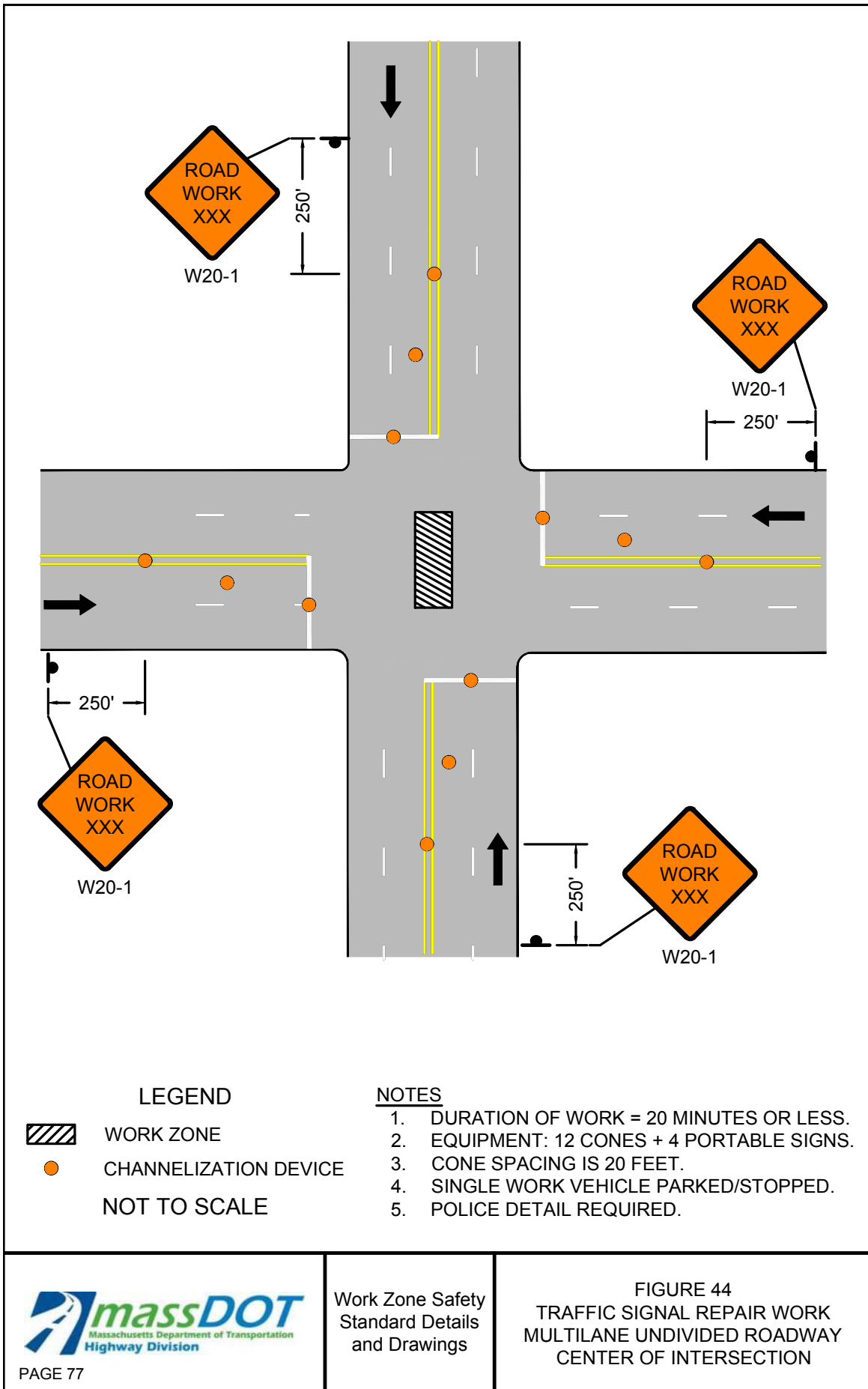


LEGEND

-  WORK ZONE
-  CHANNELIZATION DEVICE
- NOT TO SCALE

NOTES

1. DURATION OF WORK = 20 MINUTES OR LESS.
2. EQUIPMENT: 12 CONES + 6 PORTABLE SIGNS.
3. CONE SPACING IS 20 FEET.
4. SINGLE WORK VEHICLE PARKED/STOPPED.
5. POLICE DETAIL REQUIRED.

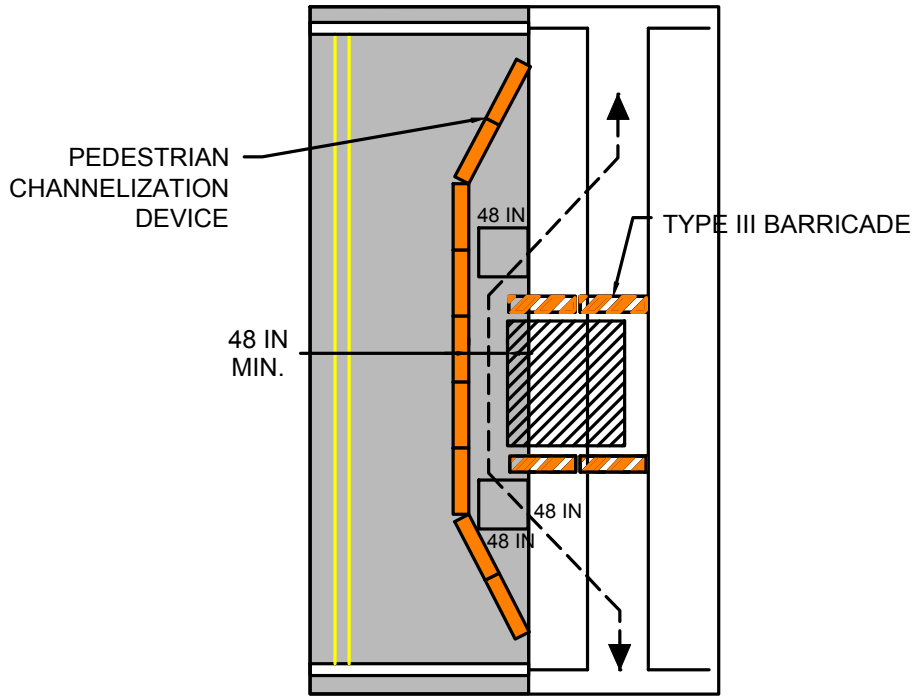




PAGE 78

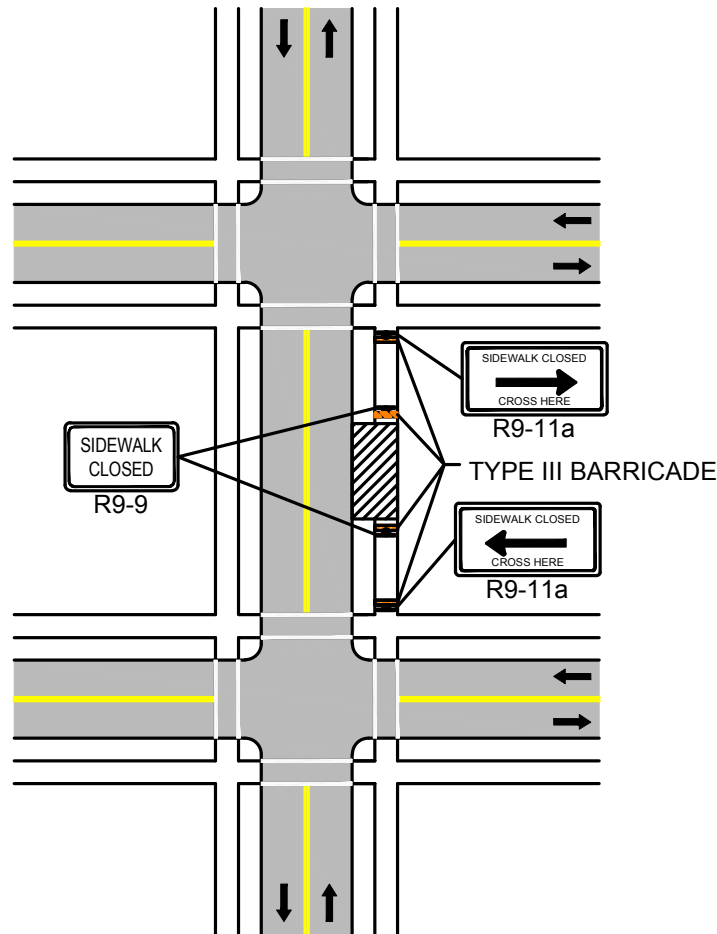
Work Zone Safety
Standard Details
and Drawings

FIGURE 45
PEDESTRIAN BYPASS



NOTES:

1. WHEN EXISTING PEDESTRIAN FACILITIES ARE DISRUPTED, CLOSED, OR RELOCATED IN A TTC ZONE, TEMPORARY FACILITIES SHALL BE PROVIDED AND THEY SHALL BE DETECTABLE AND INCLUDE ACCESSIBILITY FEATURES CONSISTENT WITH THE FEATURES PRESENT IN THE EXISTING PEDESTRIAN FACILITY.
2. A PEDESTRIAN CHANNELIZATION DEVICE THAT IS DETECTABLE BY A PERSON WITH A VISUAL DISABILITY TRAVELING WITH THE AID OF A LONG CANE SHALL BE PLACED ALONG THE FULL LENGTH OF THE TEMPORARY PEDESTRIAN ROUTE.
3. WHEN USED, TEMPORARY RAMPS SHALL COMPLY WITH AMERICANS WITH DISABILITIES ACT.
4. THE ALTERNATE PATHWAY SHOULD HAVE A SMOOTH CONTINUOUS HARD SURFACE FOR THE ENTIRE LENGTH OF THE TEMPORARY PEDESTRIAN FACILITY.
5. THE TEMPORARY SIDEWALK SHOULD BE A MINIMUM OF 4 FEET WIDE. IF THE SIDEWALK EXCEEDS 200 FEET THEN A 5 FOOT BY 5 FOOT PASSING ZONE SHALL BE PROVIDED NEAR THE MID-POINT OF THE CLOSURE.
6. THE PROTECTIVE REQUIREMENTS OF A TTC WORK ZONE MAY HAVE AN IMPACT IN DETERMINING THE NEED FOR TEMPORARY TRAFFIC BARRIERS AND THEIR USE IN PROVIDING PEDESTRIAN DELINEATION SHOULD BE BASED ON ENGINEERING JUDGMENT.
7. ON-DEMAND PEDESTRIAN ASSISTANCE PERSONNEL TO ASSIST WITH NAVIGATION AROUND THE CLOSURE/WORK AREA MAY BE CONSIDERED AS AN OPTION IN PLACE OF PROVIDING ADA/AAB DEVICES FOR WORK FOR CLOSURES LASTING 4 HOURS OR LESS.
8. CONTROLS ONLY FOR PEDESTRIAN TRAFFIC ARE SHOWN; VEHICULAR TRAFFIC SHOULD BE HANDLED AS SHOWN ELSEWHERE. THESE DETAILS ARE USED IN CONJUNCTION WITH THE PROPOSED LANE CLOSURE DETAILS AND DURING CONSTRUCTION STAGING, AS DETERMINED BY THE ENGINEER.



NOTES:

1. CLOSURE OF A SIDEWALK FACILITY SHALL CONSTITUTE THE PROVISION FOR MANAGING PEDESTRIAN TRAFFIC AND ACCOMMODATING ALL USERS. IF THE EXISTING PEDESTRIAN ACCESS ROUTE(S) CAN BE TEMPORARILY RELOCATED ALONG THE EXISTING SIDEWALK, AND SAID FACILITY PROVIDES A MINIMUM WIDTH OF 48-INCHES OF SOLID, SMOOTH UNOBSTRUCTED SURFACE, THEN NO DETOURING OF THE ROUTE SHALL BE REQUIRED. DELINEATION OF THE WORK AREA IS STILL REQUIRED.
2. IF IT IS NECESSARY TO DIVERT PEDESTRIAN TRAFFIC TO AN ALTERNATE ROUTE ACROSS THE ROADWAY FROM THE EXISTING FACILITY, THE FIGURE ABOVE SHALL BE FOLLOWED TO PROVIDE ADEQUATE DIRECTION TO PEDESTRIANS. ALTERNATE ROUTE SHALL PROVIDE THE SAME LEVEL OF ACCOMMODATION AS THE FACILITY THAT IS BEING DETOURED AND RETAIN ADA COMPLIANCE IN ITS ENTIRETY.
3. FOR EMERGENCY OR SHORT-DURATION SIDEWALK CLOSURES OF 4-HOURS OR LESS, IT IS OPTIONAL TO HAVE ON-DEMAND PEDESTRIAN ASSISTANCE PERSONNEL AVAILABLE AT ALL TIMES DURING THE CLOSURE TO ASSIST THOSE MOBILITY CHALLENGED PERSONS WHO REQUIRE ADDITIONAL ASSISTANCE TO SAFELY NAVIGATE AROUND THE WORK AREA IN LIEU OF A FULL DETOUR.



PAGE 80

Work Zone Safety
Standard Details
and Drawings

STATIONARY OPERATIONS
BIKE LANE CLOSURE

POSTED SPEED LIMIT (MPH)	SPACING FOR BIKE ADVANCE WARNING SIGNS (FT) (A,B))	CHANNELIZATION DEVICES (DRUMS OR CONES)			
		TRANSITION LENGTH (L/3)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	150 / 150	100	305	20	45
45-55	150 / 150	220	495	40	35
60-65	150 / 150	260	645	40	40

* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

NOTES

1. DETAIL SHALL BE USED IN CONJUNCTION WITH THE PROPOSED LANE CLOSURE DETAILS. SIGNING SHOWN ONLY FOR BIKE TRAFFIC. FOLLOW ALL OTHER RELEVANT DETAILS FOR TTC DEVICES FOR VEHICULAR TRAFFIC.
2. ** SIGN SHALL BE USED ONLY IF THERE IS A MARKED BIKE LANE.
3. *** SIGN SHALL BE USED ONLY IF THERE IS NO MARKED BIKE LANE.

LEGEND



WORK ZONE



CHANNELIZATION DEVICE



FLASHING ARROW BOARD



PORTABLE CHANGEABLE MESSAGE SIGN



TRUCK MOUNTED ATTENUATOR



RADAR SPEED FEEDBACK BOARD



POLICE DETAIL OR UNIFORMED FLAGGER

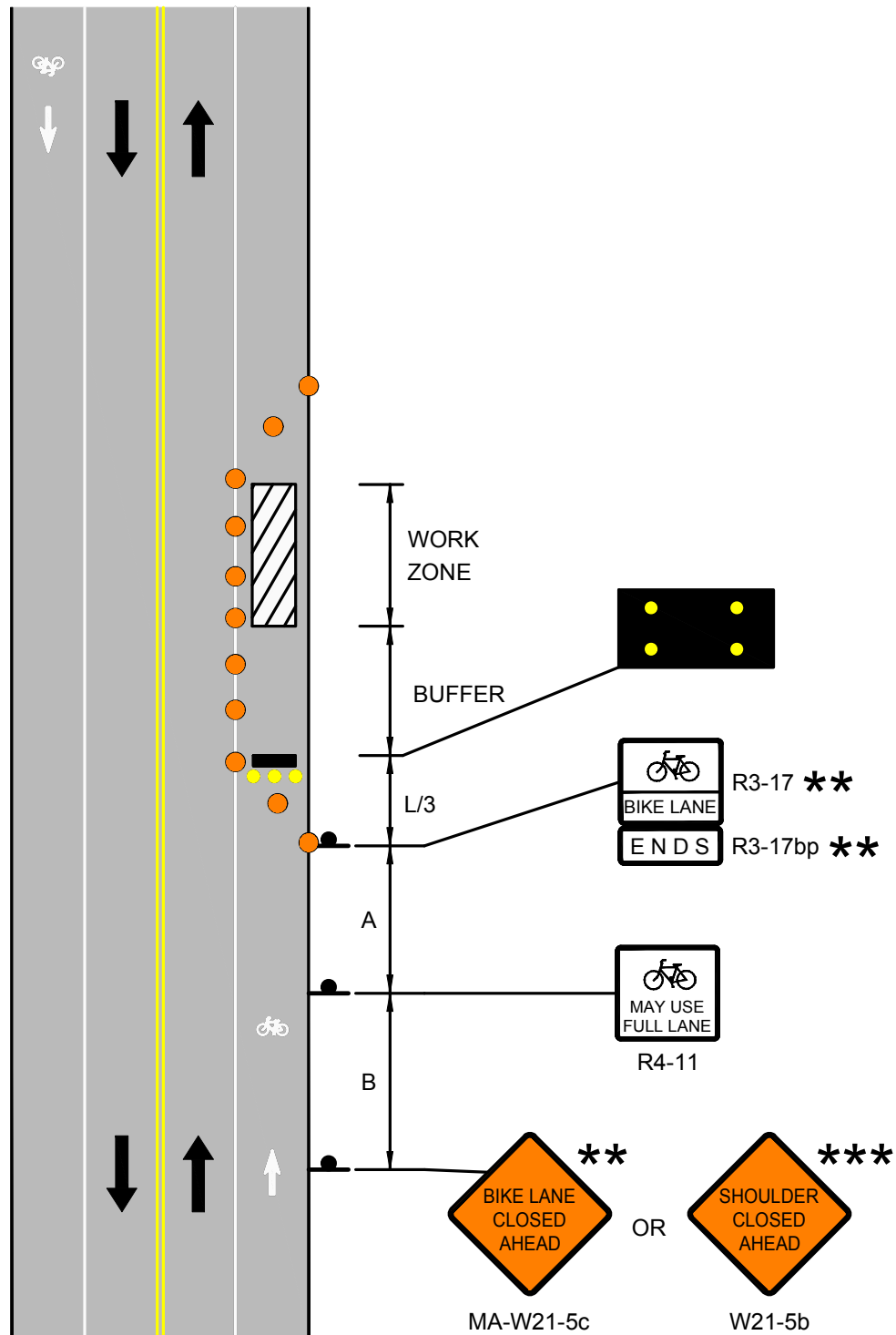


TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE





Rev. June, 2017

DOCUMENT A00820

**Massachusetts Department of Transportation
Conditions of Custody****REQUEST FOR RELEASE OF MASSDOT AUTOCAD FILES FORM**

(Only to be used following award of contract)

City/Town: HARDWICK-NEW BRAINTREEProject File Number: 608551Contract Number: 126586Project Description: Bridge Replacement, H-08-003=N-07-002, Creamery Road over Ware River

All AutoCAD files are provided solely as a courtesy to facilitate public access to information. MassDOT attempts to provide current and accurate information but cannot guarantee so. MassDOT provides such documents, files or other data "as is" without any warranty of any kind, either expressed or implied, including but not limited to, accuracy, reliability, omissions, completeness and currentness. The Commonwealth of Massachusetts and its Consultants shall not be liable for any claim for damages, including lost profits or other consequential, exemplary, incidental, indirect or special damages, relating in any way to the documents, files or other data accessible from this file, including, but not limited to, claims arising out of or related to electronic access or transmission of data or viruses. Because data stored on electronic media can deteriorate undetected or be modified without our knowledge, MassDOT cannot be held liable for its completeness or correctness. MassDOT makes no representation as to the compatibility of these files beyond the version of the stated CAD software.

By signing this form, I agree that it shall be my responsibility to reconcile this electronic data with the conformed contract documents, and that only the conformed contract documents shall be regarded as legal documents for this Project. I understand that this authorization does not give me the right to distribute the files. I agree to the terms above and wish to receive the AutoCAD files.

This signed form shall be emailed to the Highway Design Engineer at the MassDOT -Highway Division at the following email address:

DOTHighwayDesign@dot.state.ma.us

Attn: AutoCAD Files

Name of person requesting AutoCAD files: _____

Affiliation/Company: _____

Address: _____

Telephone number: _____

Email address: _____

Signature/Date: _____

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DOCUMENT A00830

COMBINED PERMIT APPLICATION

ARMY CORPS OF ENGINEERS

Permit Application

and

MASSACHUSETTS Department of Environmental Protection

Water Quality Certificate Application

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Maura Healey, Governor
Kimberley Driscoll, Lieutenant Governor
Gina Fiandaca, Secretary & CEO

Proposal No. 608851-126586



December 27, 2023

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

RE: Water Quality Certification
Creamery Road over Ware River (Bridge No. H-08-003=N-07-002)
Hardwick and New Braintree, MA
MassDOT Project 608851
Transmittal #X285973, Fill Project Certification

Dear Ms. Davis,

The Massachusetts Department of Transportation, Highway Division (MassDOT) is submitting this 401 Water Quality Certification (WQC) application for the replacement of a bridge over Ware River on Creamery Road in Hardwick and New Braintree, MA. This project is being filed under the MassDOT bridge exemption because the replacement is the functional equivalent and in similar alignment to the existing bridge.

MassDOT is replacing the bridge on Creamery Road due to the functionally obsolete and structurally deficient existing structure. The bridge replacement project requires a 401 WQC and authorization under Section 404 as it will permanently disturb 1,690 square feet (sf) of Waters of the US and temporarily disturb an estimated 1,165 square feet (sf) of Waters of the US associated with Ware River. Additionally, the project will permanently impact 607 square feet (sf) of Vegetated Wetland and temporarily disturb 275 square feet (sf) of Vegetated Wetland.

A pre-application meeting for this project was held on January 12, 2022 with the Massachusetts Department of Environmental Protection. The project proponent hereby certifies that all information contained herein is true, accurate, and complete to the best of my knowledge and belief. The project proponent hereby requests that the certifying authority review and take action on this CWA 401 certification request within the applicable reasonable period of time.

The Section 7 Consultation (USFWS) which includes the Mussel Survey and Turtle Protection Plan and the Northern Long-eared Bat Acoustic Survey are currently being completed and will be provided when available.

If you require any additional information regarding the subject project, please contact me at (857) 262-0757 or by email at courtney.l.walker@dot.state.ma.us.

Sincerely,

Ten Park Plaza, Suite 4160, Boston, MA 02116
Tel: 857-368-4636, TTY: 857-368-0655
mass.gov/massdot



Courtney Walker
Wetlands & Water Resources Coordinator
MassDOT Highway Division, Environmental Services

Cc: William Brown, MassDOT
Kylie Abouzeid, MassDOT
Ryan Hale, MassDEP
Ryan Morrison, MassDEP
Tyler Lewis, MassDEP
Dan Vasconcelos, US Army Corps of Engineers
William Zinni, Hardwick Conservation Commission
Jim Brown, New Braintree Conservation
Commission



Maura Healey, Governor
Kimberley Driscoll, Lieutenant Governor
Gina Fiandaca, Secretary & CEO

Proposal No. 608851-126586



December 27, 2023

Dan Vasconcelos
Regulatory Division
Department of the Army
New England District, Corps of Engineers
696 Virginia Road
Concord, MA 01742

RE: Pre-Construction Notification Application
Creamery Road over Ware River (Bridge No. H-08-003=N-07-002)
Hardwick and New Braintree, MA
MassDOT Project 608851

Dear Mr. Vasconcelos,

The Massachusetts Department of Transportation, Highway Division (MassDOT) is submitting this application for Pre-Construction Notification Application for the replacement of a bridge over the Ware River on Creamery Road in Hardwick and New Braintree, MA.

MassDOT is replacing the bridge on Creamery Road due to the functionally obsolete and structurally deficient existing structure. The bridge replacement project requires a 401 WQC and authorization under Section 404 as it will permanently disturb 1,690 square feet (sf) of Waters of the US and temporarily disturb an estimated 1,165 square feet (sf) of Waters of the US associated with Ware River. Additionally, the project will permanently impact 607 square feet (sf) of Vegetated Wetland and temporarily disturb 275 square feet (sf) of Vegetated Wetland.

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If you require any additional information regarding the project, please contact me at (857) 262-0757 or by email at courtney.l.walker@dot.state.ma.us.

Sincerely,

Courtney Walker
Wetlands & Water Resources Coordinator
MassDOT Highway Division, Environmental Services

Cc: William Brown, MassDOT
Kylie Abouzeid, MassDOT
Heidi Davis, MassDEP
Tyler Lewis, MassDEP
Ryan Hale, MassDEP
Ryan Morrison, MassDEP

Ten Park Plaza, Suite 4160, Boston, MA 02116
Tel: 857-368-4636, TTY: 857-368-0655
mass.gov/massdot

William Zinni, Hardwick Conservation Commission
Jim Brown, New Braintree Conservation Commission

PUBLIC NOTICE

Massachusetts Department of Environmental Protection
Division of Wetlands and Waterways
100 Cambridge Street, Suite 900
Boston, MA 02114

Pursuant to 33 U.S.C. 1341 and M.G.L. c. 21 §43 and 33 U.S.C. 1341 M.G.L. c. 21 §§ 26 - 53, notice is given of a 401 Water Quality Certification application for the replacement of Bridge No. H-08-003=N-07-002 carrying Creamery Road over Ware River in the Towns of Hardwick and New Braintree by the Massachusetts Department of Transportation – Highway Division, 10 Park Plaza, Room 7360, Boston, MA 02116. The project includes bridge replacement. Due to the existing structurally deficient and functionally obsolete condition of the existing superstructure and substructure of the existing Bridge No. H-08-003=N-07-002, the work includes the replacement of a new superstructure constructed of multiple composite steel plate girders on pile supported integral abutments. Additional information may be obtained from the Massachusetts Department of Transportation – Highway Division at the above address, Attention Courtney Walker or by emailing courtney.l.walker@state.ma.us. Written comments should be sent to Heidi Davis, MassDEP Wetlands Program, 100 Cambridge Street, Suite 900, Boston, MA 02114 or heidi.davis@mass.gov within 21 days of this notice.

Any group of ten persons, any aggrieved person, or any governmental body or private organization with a mandate to protect the environment who submits written comments within 21 days of this notice may appeal the Department's Certification. Failure to submit written comments before the end of the public comment period may result in the waiver of any right to an adjudicatory hearing.

JOINT APPLICATION FOR 401 WATER QUALITY CERTIFICATION
AND 404 PRE-CONSTRUCTION NOTIFICATION

Bridge Replacement
Bridge No. H-08-003=N-07-002
Creamery Road Over Ware River
Hardwick-New Braintree, Massachusetts

MassDOT Contract No. 608851



Prepared for



Massachusetts Department of Transportation

December 26, 2023

Prepared by



Building Strong Client Relationships Through Engineering Excellence

TABLE OF CONTENTS

WATER QUALITY CERTIFICATE AND ACOE PCN FORMS	2
1.0 PROJECT DESCRIPTION.....	1
2.0 PROJECT NEED	1
3.0 EXISTING CONDITIONS	2
4.0 PROPOSED CONDITIONS	3
5.0 ANTICIPATED CONSTRUCTION SEQUENCE.....	4
6.0 IMPACTS TO WATERS OF THE UNITED STATES	5
6.1 Permanent Vegetated Wetland and Land under Water Impacts	5
6.2 Temporary Vegetated Wetland and Land under Water Impacts	6
7.0 WETLAND REPLICATION/MITIGATION	6
8.0 SEDIMENTATION CONTROL MEASURES	6
9.0 DEWATERING	7
10.0 STORMWATER MANAGEMENT.....	7
11.0 FISHERIES AND WILDLIFE / NATURAL HERITAGE ENDANGERED SPECIES / VERNAL POOLS	7
12.0 STREAM CROSSING NARRATIVE.....	8
13.0 ALTERNATIVE ANALYSIS.....	9
14.0 CONCLUSION.....	11

ATTACHMENTS

Attachment A – Figures

- Figure 1 – USGS Map
- Figure 2 – Aerial Map
- Figure 3 – Environmental Constraints Map
- Figure 4 – FEMA Map

Attachment B – Site Photo Log

Attachment C – Public Notice

Attachment D – Wetland Evaluation Report with Data Forms

Attachment E – WQC Specifications

- Item 102.30 – Herbicide Treatment of Invasive Plants
- Item 102.33 – Invasive Plant management Strategy
- Item 755.35 – Inland Wetland Replication Area
- Item 755.45 – Wetland Restoration
- Item 755.75 – Wetland Specialist
- Item 755.76 – Wetland Monitoring Reports
- Item 983.5 – Streambed and Bank Restoration
- Item 991.1 – Control of Water – Structure No. H-08-003=N-07-002
- MESA NHESP Determination & Contract Specifications

Attachment F – Stormwater Management Memorandum

Attachment G – WQC/ACOE Submission Plans

WATER QUALITY CERTIFICATE AND ACOE PCN FORMS





Enter your transmittal number

X285973

Transmittal Number

Your unique Transmittal Number can be accessed online:

<http://www.mass.gov/eea/agencies/massdep/service/approvals/transmittal-form-for-payment.html>
Massachusetts Department of Environmental Protection**Transmittal Form for Permit Application and Payment**

1. Please type or print. A separate Transmittal Form must be completed for each permit application.

2. Make your check payable to the Commonwealth of Massachusetts and mail it with a copy of this form to: MassDEP, P.O. Box 4062, Boston, MA 02211.

3. Three copies of this form will be needed.

Copy 1 - the original must accompany your permit application. **Copy 2** must accompany your fee payment. **Copy 3** should be retained for your records

4. Both fee-paying and exempt applicants must mail a copy of this transmittal form to:

MassDEP
P.O. Box 4062
Boston, MA
02211

*** Note:**
For BWSC Permits, enter the LSP.

A. Permit Information

BRP WW 11

401 Water Quality Certification

1. Permit Code: 4 to 7 character code from permit instructions

2. Name of Permit Category

Bridge Replacement, Bridge No. No. H-08-003=N-07-002, Creamery Road over Ware River

3. Type of Project or Activity

B. Applicant Information – Firm or Individual

Massachusetts Department of Transportation - Highway Division

1. Name of Firm - Or, if party needing this approval is an individual enter name below:

2. **Last Name** of Individual3. **First Name** of Individual

4. MI

10 Park Plaza, Room 7360

5. Street Address

Boston

MA

02116

(857) 262-0757

N/A

6. City/Town

7. State

8. Zip Code

9. Telephone #

10. Ext. #

Courtney Walker

courtney.l.walker@dot.state.ma.us

11. Contact Person

12. e-mail address

C. Facility, Site or Individual Requiring Approval

Creamery Road Bridge over Ware River

1. Name of Facility, Site Or Individual

Bridge No. H-08- 003 (18J)=N-07-002 (6KY) , Creamery Road over Ware

2. Street Address

Hardwick and New Braintree

MA

01031

N/A

3. City/Town

4. State

5. Zip Code

6. Telephone #

7. Ext. #

8. DEP Facility Number (if Known)

9. Federal I.D. Number (if Known)

10. BWSC Tracking # (if Known)

D. Application Prepared by (if different from Section B)*

Green International Affiliates, Inc.

1. Name of Firm Or Individual

100 Ames Pond Drive, Suite 200

2. Address

Tewksbury

MA

01876

(978) 923-0400

N/A

3. City/Town

4. State

5. Zip Code

6. Telephone #

7. Ext. #

Danielle Spicer, P.E.

8. Contact Person

9. LSP Number (BWSC Permits only)

E. Permit - Project Coordination

1. Is this project subject to MEPA review? ☐ yes ☒ no
If yes, enter the project's EOE file number - assigned when an Environmental Notification Form is submitted to the MEPA unit:

EOEA File Number

F. Amount Due**Special Provisions:**

1. ☒ **Fee Exempt** (city, town or municipal housing authority)(state agency if fee is \$100 or less).
There are no fee exemptions for BWSC permits, regardless of applicant status.
2. ☐ **Hardship Request** - payment extensions according to 310 CMR 4.04(3)(c).
3. ☐ **Alternative Schedule Project** (according to 310 CMR 4.05 and 4.10).
4. ☐ **Homeowner** (according to 310 CMR 4.02).

DEP Use Only

Permit No:

Rec'd Date:

Reviewer:

Check Number

Dollar Amount

Date

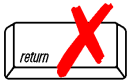


Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands and Waterways
BRP WW 10 Major Project Certification
BRP WW 11 Minor Project Certification
401 water Quality Certification for Fill and excavation
Projects in waters and Wetlands

X285973
 Transmittal Number #

A. Applicant Information

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



1. Which permit category are you applying for?

☐ BRP WW 10 ☒ BRP WW 11

2. Applicant/Owner:

Massachusetts Department of Transportation - Highway Division

Name

10 Park Plaza, Room 7360

Address

Boston

City/Town

MA

State

02116

Zip Code

Courtney Walker

Contact Person

N/A

Telephone (home)

(857) 262-0757

(work)

3. Authorized Agent

Green International Affiliates, Inc.

Name

100 Ames Pond Drive, Suite 200

Address

Tewksbury

City/Town

MA

State

01876

Zip Code

Danielle Spicer

Contact Person

dspicer@greenintl.com

Telephone (home)

978-923-0400

(work)



Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands and Waterways
BRP WW 10 Major Project Certification
BRP WW 11 Minor Project Certification
401 water Quality Certification for Fill and excavation
Projects in waters and Wetlands

X285973

Transmittal Number #

B. Project Information

1. Project Location:

Creamery Road Bridge No. H-08-003=N-07-002 over Ware River

Address

Hardwick and New Braintree

City/Town

MA

State

01031

Zip Code

Ware River

Nearest or Adjacent Waterbody

2. Project Name (if any):

Bridge Replacement, Bridge No. H-08-003=N-07-002, Creamery Road Over Ware River (MassDOT
Project # 608851)

3. a. Describe project purpose:

The purpose of this project is to replace the existing Bridge No. H-08-003 (18J)=N-07-002 (6KY) because the existing structure is functionally obsolete and structurally deficient. The bridge was built in 1939 and was reconstructed in 1961. It has been recommended that the bridge be replaced with a new superstructure.

b. Is the project

☒ water-dependent☐ non water-dependent



Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands and Waterways
BRP WW 10 Major Project Certification
BRP WW 11 Minor Project Certification
401 water Quality Certification for Fill and excavation
Projects in waters and Wetlands

X285973
Transmittal Number #

B. Project Information (cont.)

4. a. provide a brief description of the proposed project (See Application Instructions and include a copy of the Notice of intent, if any.):

The proposed work consists of the replacement of the superstructure of Bridge No. H-08-003=N-07-002 carrying Creamery Road over the Ware River in the Towns of Hardwick and New Braintree. The proposed bridge will be constructed in the same location as the existing bridge and will contain a similar pavement width and carry the same number of travel lanes as the existing structure. The bridge will be fully closed during the construction, due to its' one-lane, two-way nature and its proposed complete replacement (see Project Narrative for more information)

b. Notice of Intent File number (if any): N/A

5. Identify the loss in square feet of each type of resource area (see Application Instructions for additional information.):

a. Bordering vegetated wetland:	<u>607 (perm.), 275 (temp.)</u> square feet
b. Isolated vegetated wetland:	<u>0</u> square feet
c. Land under water:	<u>1,690 (perm.); 1,165 (temp.)</u> square feet
d. Total cumulative loss of a. + b. + c.:	<u>2,297 (perm.); 1,440 (temp.)</u> square feet
e. Salt marsh:	<u>0</u> square feet

6. a. Will the proposed project occur in any wetlands or waters designated as "Outstanding Resource Waters"?

☐ Yes ☒ No

If yes has public notice been published in the Environmental Monitor?

☒ Yes ☐ No

TBD

Date of Publication

- | | |
|--|---|
| b. Is this project a subdivision or any part of a subdivision? | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| c. Is the project categorically subject to MEPA? | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| If yes, has final action been taken? | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| If yes, please include copy of MEPA certificate. | |



Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands and Waterways
BRP WW 10 Major Project Certification
BRP WW 11 Minor Project Certification
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Projects in waters and Wetlands

X285973
Transmittal Number #

B. Project information (cont.)

7. Alternatives Analysis:

As related to the project purpose, attach a detailed description of alternatives to the proposed project that were considered and why none are available that avoid adverse impacts to wetlands and waters.

If no alternatives are available, describe how the activity will minimize or mitigate the adverse impacts to wetlands and waters.

See application instructions for information required. Attach required documentation.

C. Additional Information

1. Is any of your proposed work exempt from the Massachusetts Wetlands Protection Act or taking place in a federal non-state wetland?

☒ Yes ☐ No

If yes, see Application Instructions for additional information needed.

2. Public notice to a newspaper of general circulation within the area of the proposed activity must be published within 10 days of the date of this application. Is proof of public notice submitted?

☒ Yes ☐ No

(See Application Instructions for additional information)


D. Certification

Application is hereby made for water quality certification.

"I certify that I am familiar with the work proposed and that to the best of my knowledge and belief the information contained in this application is true, complete, and accurate"


Applicant's Signature

Courtney Walker
Print name


Agent's Signature

Daneille Spicer, P.E.
Print Name

12/8/2023
Date

U.S. Army Corps of Engineers (USACE), New England District (NAE)

PRE-CONSTRUCTION NOTIFICATION (PCN)**DATA REQUIRED BY THE PRIVACY ACT OF 1974**

Authority	Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332.
Principal Purpose	The information provided will be used in evaluating activities under Pre-Construction Notification procedures within New England.
Routine Uses	This information may be shared with other federal, state, and local government agencies during the application review process. Submission of requested information is voluntary. However, if information is not provided the PCN application cannot be fully evaluated nor can USACE render a permit decision.
Instructions	The applicant must complete ALL required sections of this document before their submission to USACE. The PCN submission to USACE shall include one set of drawings which show the location and character of the proposed activity, statements that address each required field below, and documentation that supports each field (e.g., emails, letters, description/narrative, phone calls, surveys, reports, etc.). Electronic submissions to the following address are strongly preferred: cenae-r-ma@usace.army.mil . The email subject line shall contain the following: General Permit #, PCN, City/Town, and date submitted. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY USACE)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE
--------------------	----------------------	------------------	------------------------------

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME First - Courtney Middle - Last - Walker Company - Massachusetts Department of Transportation E-mail Address - courtney.l.walker@dot.state.ma.us	8. AUTHORIZED AGENT'S NAME AND TITLE (<i>agent is not required</i>) First - Danielle Middle - Last - Spicer Company - Green International Affiliates E-mail Address - dspicer@greenintl.com
6. APPLICANT'S ADDRESS: Address- 10 Park Plaza, Room 7360 City - Boston State - MA Zip - 02166 Country - US	9. AGENT'S ADDRESS: Address- 100 Ames Pond Drive, Suite 200 City - Tewksbury State - MA Zip - 0187 Country - US
7. APPLICANT'S PHONE NOs. with AREA CODE a. Residence b. Business c. Fax d. Mobile N/A 857-262-0757 N/A N/A	10. AGENT'S PHONE NOs. with AREA CODE a. Residence b. Business c. Fax d. Mobile N/A 978-923-040 N/A N/A

STATEMENT OF AUTHORIZATION

11. I hereby authorize, Danielle Spicer to act on my behalf as my agent in the processing of this general permit PCN application and to furnish, upon request, supplemental information in support of this general permit PCN application.


 SIGNATURE OF APPLICANT

12/27/2023
 DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME or TITLE (<i>see instructions</i>) HARDWICK - NEW BRAINTREE - BRIDGE REPLACEMENT - H-08-003=N-07-002, CREAMERY ROAD OVER WARE RIVER	
13. NAME OF WATERBODY, IF KNOWN (<i>if applicable</i>) WARE RIVER	14. PROPOSED ACTIVITY STREET ADDRESS (<i>if applicable</i>) Creamery Road Bridge over Ware River City: Hardwick/New State: MA Zip: 01031
15. LOCATION OF PROPOSED ACTIVITY (<i>see instructions</i>) Latitude: 42°19'15" °N Longitude: 72°10'29" °W	

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (*see instructions*)

State Tax Parcel ID: N/A

Municipality:

Section: N/A

Township: N/A

Range: N/A

17. DIRECTIONS TO THE SITE.

The Bridge No. H-08-003=N-07-002 carries Creamery Road over Ware River. The site is located approximately 950 feet southeast of the State Route 32 (Lower Road) and Creamery Road intersection in Hardwick. Creamery Road continues into New Braintree where it becomes Unitas Road. +

18. IDENTIFY THE SPECIFIC GENERAL PERMIT(S) YOU PROPOSE TO USE:

GP No. 23 (Linear Transportation Projects and Wetland/Stream Crossings)

19. DESCRIPTION OF PROPOSED GENERAL PERMIT ACTIVITY (*see instructions*)

Permanent disturbance to LUW/WOTUS (1,690 square feet) will be required for the new slope protection measures because of the proposed expanded fills for the roadway side slopes that will be extended to form the substructure slope protection on either side of the river channel. Temporary LUW/WOTUS (1,165 square feet) will be associated with cutting down the existing abutments and placing the rip rap at the edge of the Ware River to help protect integral abutments.

20. DESCRIPTION OF PROPOSED MITIGATION MEASURES (*see instructions*)

To protect the wetland resource areas and minimize the impacts to the waterway during construction, a combination of proper erosion and sediment control BMPs will be installed during construction. Erosion control measures will be implemented as described in the approved plans. This includes the installation of silt fence/compost filter tube barriers or similar measures along all roadways and around work areas.

21. PURPOSE OF GENERAL PERMIT ACTIVITY (*Describe the reason or purpose of the project, see instructions*)

Due to the existing structurally deficient and functionally obsolete condition of the existing superstructure and substructure of the existing Bridge No. H-08-(18J)=N-07-002, it has been recommended that the bridge be replaced with a new superstructure constructed of multiple composite steel plate girders on pile supported integral abutments. The project will not result in dredging within LUW/WOTUS over 100 cubic yards.

22. Quantity of Wetlands, Streams, or Other Types of Waters Directly Affected by Proposed General Permit Activity (*see instructions*)

Area (square feet)	Length (linear feet)	Volume (cubic yards)	Duration	Purpose
607	N/A	11 (fill); 11 (cut)	Permanent	Permanent VW impacts
275	N/A	0	Temporary	Temporary VW impacts
1,690	N/A	56(dredge);37(fill)	Permanent	Permanent LUW/WOTUS impacts
1,165	N/A	0	Temporary	Temporary LUW/WOTUS impacts

Each PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site.

23. List any other GP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project on any related activity (*see instructions*)

Section 401 Water Quality Certification for Minor Fill and and Excavation Projects

24. If the proposed activity will result in the loss of aquatic resources that exceed those identified in the New England District Compensatory Mitigation Thresholds, explain how the compensatory mitigation requirement will be satisfied. (*see instructions*)

N/A

25. Is Any Portion of the General Permit Activity Already Complete? ☐ Yes ☒ No If Yes, describe the completed work:

26. List the name(s) of any species listed as endangered or threatened under the Endangered Species Act that might be affected by the proposed GP activity or utilize the designated critical habitat that might be affected by the proposed GP activity. (*see instructions*)

This project has been reviewed by the U.S. Fish and Wildlife Service (Service) and received a "may affect, and is not likely to adversely affect (NLAA)" determination to the endangered Indiana bat (*Myotis sodalis*) and/or the endangered northern long-eared bat on October 19, 2023.

27. List any historic properties that have the potential to be affected by the proposed GP activity or include a vicinity map indicating the location of the historic property or properties. Attach relevant project information, along with any responses received from project notifications to this submittal. (*see instructions*)

N/A

28. For a proposed GP activity that will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, identify the Wild and Scenic River or the "study river":

There are no Wild and Scenic Rivers within 0.25 miles of the project area.

29. If the proposed GP activity also requires permission from the USACE pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers federally authorized civil works project, have you submitted a written request for section 408 permission from the USACE district having jurisdiction over that project? ☐ Yes ☒ No

If "yes", please provide the date your request was submitted to the USACE District:

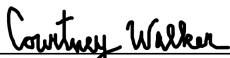
30. Does the activity require a 401 Water Quality Certification (WQC)? If so, specify the type of 401 WQC that is required (general or individual). In cases where an individual 401 WQC is required, provide the date the 401 WQC certification request was submitted to the certifying authority and their contact information.

General 401 Water Quality Certification

31. If the terms of the GP(s) you want to use require additional information to be included in the PCN (i.e. sampling and analysis plan), please include that information in this space or provide it on an additional sheet of paper marked Block 30. (*see instructions*)

N/A

32. I certify that the information in this pre-construction notification is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.



SIGNATURE OF APPLICANT

12/27/2023

DATE

Danielle Spicer, P.E.

Digitally signed by Danielle Spicer, P.E.
DN: cn=Danielle Spicer, P.E., o=Green International
Affiliates, Inc. ou, email=dspicer@greenintl.com, c=US
Date: 2023.12.08 10:08:45 -05'00'

12/08/2023

SIGNATURE OF AGENT

DATE

The Pre-Construction Notification must be signed by the person who desires to undertake the proposed activity (applicant) and, if the statement in block 11 has been filled out and signed, the authorized agent.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than \$10,000 or imprisoned not more than five years or both.

**Instructions for Preparing a
Department of the Army
General Permit (GP) Pre-Construction Notification (PCN)**

Blocks 1 through 4. To be completed by the U.S. Army Corps of Engineers.

Block 5. Applicant' Name. Enter the name and the e-mail address of the responsible party or parties. If the responsible party is an agency, company, corporation, or other organization, indicate the name of the organization and responsible officer and title. If more than one party is associated with the PCN, please attach a sheet of paper with the necessary information marked Block 5.

Block 6. Address of Applicant. Please provide the full address of the party or parties responsible for the PCN. If more space is needed, attach an extra sheet of paper marked Block 6.

Block 7. Applicant Telephone Number(s). Please provide the telephone number where you can usually be reached during normal business hours.

Blocks 8 through 11. To be completed, if you choose to have an agent.

Block 8. Authorized Agent's Name and Title. Indicate name of individual or agency, designated by you, to represent you in this process. An agent can be an attorney, builder, contractor, engineer, consultant, or any other person or organization. Note: An agent is not required.

Blocks 9 and 10. Agent's Address and Telephone Number. Please provide the complete mailing address of the agent, along with the telephone number where they can be reached during normal business hours.

Block 11. Statement of Authorization. To be completed by the applicant, if an agent is to be employed.

Block 12. Proposed General Permit Activity Name or Title. Please provide a name identifying the proposed GP activity, e.g., Windward Marina, Rolling Hills Subdivision, or Smith Commercial Center.

Block 13. Name of Waterbody. Please provide the name (if it has a name) of any stream, lake, marsh, or other waterway to be directly impacted by the GP activity. If it is a minor (no name) stream, identify the waterbody the minor stream enters.

Block 14. Proposed Activity Street Address. If the proposed GP activity is located at a site having a street address (not a box number), enter it in Block 14.

Block 15. Location of Proposed Activity. Enter the latitude and longitude of where the proposed GP activity is located. Indicate whether the project location provided is the center of the project or whether the project location is provided as the latitude and longitude for each of the "corners" of the project area requiring evaluation. If there are multiple sites, please list the latitude and longitude of each site (center or corners) on a separate sheet of paper and mark as Block 15.

Block 16. Other Location Descriptions. If available, provide the Tax Parcel Identification number of the site, Section, Township, and Range of the site (if known), and / or local Municipality where the site is located.

Block 17. Directions to the Site. Provide directions to the site from a known location or landmark. Include highway and street numbers as well as names. Also provide distances from known locations and any other information that would assist in locating the site. You may also provide a description of the location of the proposed GP activity, such as lot numbers, tract numbers, or you may choose to locate the proposed GP activity site from a known point (such as the right descending bank of Smith Creek, one mile downstream from the Highway 14 bridge). If a large river or stream, include the river mile of the proposed GP activity site if known. If there are multiple locations, please indicate directions to each location on a separate sheet of paper and mark as Block 17.

Block 18. Identify the Specific General Permit(s) You Propose to Use. List the number(s) of the General Permit(s) you want to use to authorize the proposed activity (e.g., GP 4).

Block 19. Description of the Proposed General Permit Activity. Describe the proposed GP activity, including the direct and indirect adverse environmental effects of the proposed activity. The description of the proposed activity should be sufficiently detailed for USACE to determine that the adverse environmental effects of the activity will be no more than minimal. Identify the materials to be used in construction, as well as the methods by which the work is to be done.

Provide drawings to show that the proposed GP activity complies with the terms of the applicable GP(s). Drawings should contain sufficient detail to provide an illustrative description of the proposed GP activity, but do not need to be detailed engineering plans. The written descriptions and illustrations are an important part of the application. Please describe, in detail, what you wish to do. If more space is needed, attach an extra sheet of paper marked Block 19.

Block 20: Description of Proposed Mitigation Measures. Describe any proposed mitigation measures intended to reduce the adverse environmental effects caused by the proposed GP activity. The description of any proposed mitigation measures should be sufficiently detailed for USACE to determine how the measures would avoid and minimize adverse environmental effects. If adverse effects exceed the New England District compensatory mitigation thresholds, you must document how compensatory mitigation would be satisfied in Block 24.

Block 21. Purpose of General Permit Activity. Describe the purpose and need for the proposed GP activity. What will it be used for and why? Also include a brief description of any related activities associated with the proposed project. Provide the approximate dates you plan to begin and complete all work.

Block 22. Quantity of Wetlands, Streams, or Other Types of Waters Directly Affected by the Proposed General Permit Activity. For discharges of dredged or fill material into Waters of the U.S., provide the amount of wetlands, streams, or other types of waters filled, flooded, excavated, or drained by the proposed GP activity. For structures or work in Navigable Waters of the U.S. subject to Section 10 of the Rivers and Harbors Act of 1899, provide the amount of navigable waters filled, dredged, occupied by one or more structures (e.g., aids to navigation, mooring buoys) by the proposed GP activity. The area of impact includes the structures or fills with direct or indirect effects to waters of the U.S. The length of impact includes the length of a stream, including its banks, that are directly affected by the structures or fills. The duration of impact should be identified as temporary (xx days) or permanent. The impact purpose should briefly describe what structure or fill is responsible for the impact.

Block 23. Identify Any Other General Permit(s), Regional General Permit(s), or Individual Permit(s) Used to Authorize Any Part of Proposed Activity or Any Related Activity. List any other GP(s) or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. For linear projects, list other separate and distant crossings of waters and wetlands authorized by these GPs that do not require PCNs. If more space is needed, attach an extra sheet of paper marked Block 23.

Block 24. Compensatory Mitigation Statement for Losses Greater Than the New England District Compensatory Mitigation Thresholds. New England District requires compensatory mitigation at a minimum one for one replacement ratio or greater for all aquatic resource losses that require a PCN and exceed the New England District Compensatory Mitigation Thresholds, unless USACE determines in writing that either some other form of mitigation is more environmentally appropriate or the adverse environmental effects of the proposed GP activity are no more than minimal without compensatory mitigation, and provides an activity specific waiver of this requirement. Describe the proposed compensatory mitigation for wetland losses greater than the New England District Compensatory Mitigation Thresholds or provide an explanation of why USACE should not require wetland compensatory mitigation for the proposed GP activity. If more space is needed, attach an extra sheet of paper marked Block 24.

Block 25. Is Any Portion of the General Permit Activity Already Complete? Describe any work that has already been completed for the GP activity.

Block 26. List the Name(s) of Any Species Listed As Endangered or Threatened under the Endangered Species Act that Might be Affected by the General Permit Activity. If you are not a federal agency, and if any listed species or designated critical habitat might be affected or is in the vicinity of the proposed GP activity, or if the proposed GP activity is located in designated critical habitat, list the name(s) of those endangered or threatened species that might be affected by the proposed GP activity or utilize the designated critical habitat that might be affected by the proposed GP activity. If you are a Federal agency, and the proposed GP activity requires a PCN, you must provide documentation demonstrating compliance with Section 7 of the Endangered Species Act.

Block 27. List Any Historic Properties that Have the Potential to be Affected by the General Permit Activity. If you are not a federal agency, and if any historic properties have the potential to be affected by the proposed GP activity, list the name(s) of those historic properties that have the potential to be affected by the proposed GP activity. Provide all relevant documentation about these historic properties in the PCN submittal. If you are a Federal agency, and the proposed GP activity requires a PCN, you must provide documentation demonstrating compliance with Section 106 of the National Historic Preservation Act.

Block 28. List the Wild and Scenic River or Congressionally Designated Study River if the General Permit Activity Would Occur in such a River. If the proposed GP activity will occur in a river in the National Wild and Scenic River System or in a river officially designated by Congress as a "study river" under the Wild and Scenic Rivers Act, provide the name of the river. For a list of Wild and Scenic Rivers and study rivers, please visit <http://www.rivers.gov/>

Block 29. General Permit Activities that also Require Permission from the USACE Under 33 U.S.C. 408. If the proposed GP activity also requires permission from the USACE under 33 U.S.C. 408 because it will temporarily or permanently alter, occupy, or use a USACE federal authorized civil works project, indicate whether you have submitted a written request for section 408 permission from the USACE district having jurisdiction over that project.

Block 30. 401 Water Quality Certification. As described above, specify if the activity requires a 401 WQC from the certifying authority.

Block 31. Other Information Required For General Permit Pre Construction Notifications. The terms of some of the General Permits include additional information requirements for preconstruction notifications:

- * Maintenance – information regarding the original design capacities and configurations of the outfalls, intakes, small impoundments, and canals.
- * Temporary Construction, Access, and Dewatering – a restoration plan showing how all temporary fills and structures will be removed and the area restored to pre-project conditions.
- * Repair of Uplands Damaged by Discrete Events – documentation, such as a recent topographic survey or photographs, to justify the extent of the proposed restoration.
- * Commercial Shellfish Aquaculture Activities – (1) a map showing the boundaries of the project area, with latitude and longitude coordinates for each corner of the project area; (2) the name(s) of the species that will be cultivated during the period this GP is in effect; (3) whether canopy predator nets will be used; (4) whether suspended cultivation techniques will be used; and (5) general water depths in the project area (a detailed survey is not required). Dredging – (1) a proposed sampling and analysis plan shall be provided to USACE for approval prior to its execution. Pre-application meetings are encouraged.
- * Beach Nourishment – sediment grain size should be determined for the length of the beach where nourishment is proposed. The frequency and locations of sediment sampling shall be sufficient to identify the sediment composition of the beach profile. This data shall be consolidated to generate a sediment gradation curve for each sampled transect. Each sampled transect should also be identified on the project plans (drawings).

If more space is needed, attach an extra sheet of paper marked Box 31.

Block 32. Signature of Applicant or Agent. The PCN must be signed by the person proposing to undertake the GP activity, and if applicable, the authorized party (agent) that prepared the PCN. The signature of the person proposing to undertake the GP activity shall be an affirmation that the party submitting the PCN possesses the requisite property rights to undertake the GP activity (including compliance with special conditions, mitigation, etc.).

DELINEATION OF WETLANDS, OTHER SPECIAL AQUATIC SITES, AND OTHER WATERS

Each PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current wetland delineation manual and regional supplement published by the USACE. The permittee may ask the USACE to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the USACE does the delineation, especially if the project site is large or contains many wetlands, other special aquatic sites, and other waters. The 60-day PCN review period will not start until a delineation has been completed.

DRAWINGS AND ILLUSTRATIONS

General Information.

Three types of illustrations are needed to properly depict the work to be undertaken. These illustrations or drawings are identified as a Vicinity Map, a Plan View or a Typical Cross Section Map. Identify each illustration with a figure or attachment number. For linear projects (e.g. roads, subsurface utility lines, etc.) gradient drawings should also be included. Please submit one copy of all drawings on 8½ x 11 inch plain white paper (electronic submissions preferred). Use the fewest number of sheets necessary for your drawings or illustrations. Each illustration should identify the project, the applicant, and the type of illustration (vicinity map, plan view, or cross section). While illustrations need not be professional (many small, private project illustrations are prepared by hand), they should be clear, accurate, and contain all necessary information.

ADDITIONAL INFORMATION AND REQUIREMENTS

For proposed GP activities that involve discharges into waters of the United States, water quality certification from the State, Tribe, or EPA must be obtained or waived. Some States, Tribes, or EPA have issued water quality certification for one or more GPs. Please check the New England District website to see if water quality certification has already been issued for the GP(s) you wish to use. For proposed GP activities in coastal states, state Coastal Zone Management Act consistency concurrence must be obtained, or a presumption of concurrence must occur. Some States have issued Coastal Zone Management Act consistency concurrences for one or more GPs. Please check the New England District website to see if Coastal Zone Management Act consistency concurrence has already been issued for the GP(s) you wish to use.

1.0 PROJECT DESCRIPTION

The Massachusetts Department of Transportation, Highway Division (MassDOT) proposes to replace Bridge No. H-08-003=N-07-002 which carries Creamery Road over the Ware River, dividing the Town of Hardwick and the Town of New Braintree. The bridge is located approximately 950 ft southeast of the State Route 32 (Lower Road) and Creamery Road intersection in Hardwick. Creamery Road continues into New Braintree, where it becomes Unitas Road. The following Application will use the Creamery Road name when referring to the crossing roadway over the Ware River. The project includes the reconstruction of an approximately 500-foot section of the Creamery/Unitas Road that contains the bridge and its northern/southern approaches.

Creamery Road/Unitas Road is classified by MassDOT as a Rural Local Roadway and, like Bridge No. H-08-003=N-07-002, is owned and maintained by the Towns of Hardwick and New Braintree (Unitas Road). The roadway provides northwest-southeast movements, providing connections to Goddard Street northwest of the project limits in the Town of Hardwick, and to West Road southeast of the project limits in the Town of New Braintree. The road has an average traffic flow of approximately 109 vehicles per day, with 6% of which may be trucks. The area surrounding Bridge No. H-08-003=N-07-002 is relatively flat and rural, with some forested and agricultural areas in both towns.

The proposed bridge qualifies for the Bridge Exemption in the 2014 Transportation Bond Bill and, therefore, will be exempt from state permitting (WPA, MEPA, and Ch. 91).

This project consists of maintenance and improvement of an existing roadway and a bridge (including improvements to existing drainage systems and repaving). As the proposed project is a roadway project, it is therefore categorized as a “Redevelopment Project” under the Massachusetts Stormwater Management Standards. The project is therefore designed to meet the Standards to the maximum extent practicable. A Stormwater Management Memorandum is attached demonstrating the compliance of the project with the ten state stormwater standards.

The project is subject to review under Section 401 Water Quality Certification Regulations (314 CMR 9.00) and the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act. Since the project involves discharge of the dredged or fill materials within the Waters of The United States under jurisdiction of the U.S. Army Corps of Engineers (USACE), a Pre-Construction Notification (PCN) Form along with required attachments and plans is being submitted concurrently to the USACE pursuant to Section 404 of the Clean Water Act (CWA).

2.0 PROJECT NEED

The purpose of this project is to replace the existing Bridge No. H-08-(18J)=N-07-002 (6KY) because the existing structure is functionally obsolete and structurally deficient. The bridge was built in 1939 and was reconstructed in 1961. It has been recommended that the bridge be replaced with a new superstructure constructed of multiple composite steel plate girders on pile supported integral abutments.

3.0 EXISTING CONDITIONS

Creamery Road is a one-lane, two-way road classified as a Rural Local Roadway and is approximately 14+/- feet wide. There are no shoulders on either side of the road. At present, there are neither bicycle nor pedestrian accommodations along the roadway. The posted speed limit is 25 mph in both directions. It ends at the New Braintree town line and becomes Unitas Road, also classified as a Rural Local Roadway and is approximately 14+/- feet wide.

The existing Bridge No. H-08-003=N-07-002, built in 1939 and reconstructed in 1961, is a single span steel stringer structure logged south to north with an overall length of 79'-4", an out-to-out deck width of approximately 13 feet and a curb-to-curb width of 11 feet. The structure consists of two steel beams supporting a reinforced concrete deck with a bare concrete wearing surface. The south stub abutment consists of a reinforced concrete cap with a stone masonry backwall and stone masonry stem. The north abutment consists of reinforced concrete. The bridge carries one 11'- 0" wide travel lane with no shoulders on either side of the road. The approach roadways consist of bituminous concrete with a curb-to-curb width of approximately 14 feet. There are guardrails along both sides of both approaches.

There are existing aerial utilities along the west side of the structure. There is a utility pole at the northwest corner of the approach.

Under existing conditions, stormwater sheet flows off the roadway and through the vegetation along the side of the road before discharging to the Ware River. There is no existing drainage infrastructure within the project area.

The land uses in the vicinity of the project contain some mixed residential, commercial, and agricultural uses but overall, the area is fairly undeveloped with approximately 72% forest cover. Adjacent to the bridge location land uses are predominately forested, cultivated fields, and farmstead/low density residential developments.

The Ware River flows in the southwest direction beneath the bridge with a channel width of approximately 75 feet. The channel banks upstream from the crossing are bordered by forest, brush, and agricultural fields. The average channel slope based on the project field survey is 0.2% through the crossing. The Ware River is a part of the Chicopee River watershed in the Town of Palmer. The overall Chicopee River watershed covers an area of 722 square miles. Ware River originates near the Town of Hubbardston approximately 20 miles upstream from the subject crossing. The Ware River streambed material consists of sand and gravel alluvium deposits. The Ware River drainage area at the Creamery Road crossing site is estimated to be 148 square miles. Additionally, the river is located within Federal Emergency Management Agency (FEMA) mapped floodplain and is classified as Zone A and has an associated floodway area.

The Ware River is part of the Boston public water supply operated by the Massachusetts Water Resource Authority (MWRA) which can divert water from the Ware River to either the Wachusett or Quabbin Reservoirs from the Ware River Diversion dam. The Creamery Road crossing is located approximately 10 miles downstream from the Ware River Diversion. Based on the information provided in the Hydraulic Study Report generated by MassDOT, the existing normal bankfull flow width (BFW) of the Ware River near the crossing is approximately 85 to 95 based on the field survey, while the BFW at the crossing is estimated to be around 90 feet.

Wetland and watercourse field delineation within a project area was conducted by BL Companies on March 28 and May 3, 2023, in accordance with the methodology outlined in 1987 *U.S. Army Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987) and subsequent guidance documents including the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0)* (US Corps of Engineers, January 2012). Further details on the wetland resource areas present and the wetland flagging can be found in Attachment D – Wetland Delineation Data Forms and Memorandum.

4.0 PROPOSED CONDITIONS

The proposed superstructure type is the 44-inch deep steel plate girder spanning 100 feet from bearing to bearing. The three 44-inch plate girders were chosen to create a redundant system. This alternative is the lightest and the shallowest superstructure option. The clearance (freeboard) of 2.59 feet will be achieved for the proposed structure. To reduce the likelihood of rusting at the beam end, the structure will be designed as an integral abutment system which removes the need for joints over the beam ends where water can infiltrate.

The proposed bridge substructure will be constructed of multiple composite steel plate girders on pile supported integral abutments. Integral abutments also remove the need for a deck joint over the beam ends where water often leaks through to the superstructure causing rusting and spalling. The proposed work on substructure includes the removal of the existing South Abutment entirely and cutting down the existing North Abutment below OHW and constructing the new abutment behind it. There will be rip rap placed in front of the new North Abutment and on top of the existing foundation that remains. During construction of the substructure, the abutments can be left in place to be used as cofferdams. The structure will have an out-to-out deck width of 16'- 10" and a curb-to-curb width of 14 feet. The proposed superstructure will have a clear span of 96'-0" in order to avoid conflicts with the remnants of the existing bridge substructure. The bridge rail will be a standard MassDOT approved CT-TL2 bridge rail.

The bridge will remain a one-lane structure that will carry one 14-foot wide lane to be used in both directions, no shoulders are proposed for the bridge. The intent of the project is to maintain a single span super structure and increase the out-to-out width from approximately 13 feet to over 16 feet. The span length of the structure is primarily dictated by MassDOT hydraulic conclusions to provide a minimum bank width of 95 feet. The required span length of 100 feet (96 feet clear span) is primarily dictated by hydraulic requirements.

The limits of construction will extend approximately 200 feet from each approach. The proposed approach and bridge width will accommodate one shared 14-foot travel lane with shoulders on each side with widths varying from 0'- 0" to 3'- 0", which will match existing conditions. The bridge will be located on a tangent alignment with a 1.11-degree slope from north to south. The roadway will be raised approximately 2 feet to meet hydraulic clearance requirements. The roadway profile raise will extend the construction limits approximately 200 feet from the end of the bridge at each approach.

The utility pole at the northwest corner of the approach will be relocated for construction purposes as well as to meet required offset distances from the proposed guardrail. The overhead lines along the west side of the bridge are far enough from the bridge site and will not be impacted by construction.

The existing drainage conditions are maintained in the proposed conditions. No curbing is proposed along the roadway and stormwater will continue to sheet flow off the road through woods and grass acting as

a vegetated filter strip and providing some treatment before the runoff discharges to the Ware River. There is one inlet proposed at the low point of the road to collect rainwater/snowmelt during winter months when snowbanks create a gutter. This inlet will be a deep sump and hooded catch basin and will discharge to a rip rap apron and then more than 50 feet of vegetation prior to flowing into the Ware River for treatment. The minor increase in impervious area resulting from proposed improvements (630 square feet) will not increase the peak rate of runoff for the drainage area because the increased pavement surface area and decreased water surface area have the same runoff coefficient and there is no change to drainage patterns or watershed areas. Please refer to the Stormwater Memo included as Attachment F to this Application for details.

Based on the Hydraulic analysis, the recommended bankfull width for this crossing is 95'-0" with a design scour depth of 5' (Elevation 544.79). The 10-year design flood event elevation at the bridge is 552.04. To meet MassDOT freeboard requirements of 2', the minimum low chord elevation for the proposed structure is 554.04. The design flood velocity is 5.8 ft/sec (~4 mph).

5.0 ANTICIPATED CONSTRUCTION SEQUENCE

Since Creamery Road is a rural road, with a relatively low design speed, no special provisions will be made for pedestrian traffic. The bridge will be fully closed during the construction, due to its one-lane, two-way configuration, and its proposed complete replacement. The traffic will be detoured 4.9 miles for the duration of construction. Staged construction is not feasible due to the existing curb-to-curb being only 11 feet in conjunction with significantly deteriorated beams. In addition, over building the structure or constructing a temporary bridge would likely infringe on private property. It is anticipated that the majority of construction can be done in the dry; however, if dewatering is required it will be done per MassDOT Control of Water Specification and as detailed in Section 9 below. Construction is anticipated to be complete in one construction season. The recommended construction sequencing is listed below; however, the actual means and methods of construction is at the discretion of the contractor.

Recommended Construction Sequence

1. Install sediment and erosion control measures.
2. Install traffic controls.
3. Tree removal and pruning & trimming of trees.
4. Fence off work zone, mobilize equipment and crews, prepare work area(s), and set up staging and storage area(s).
5. Install floating sediment barrier(s) as needed in river downstream of project work area(s).
6. Install temporary protective shielding beneath bridge span to prevent demolition debris from dropping into river.
7. Install temporary Support of Excavation and control of water measures as needed.
8. Demolish existing bridge deck.
9. Clearing and rough grading for wetland replication.
10. Construction of wetland replication area, installation of wetland replication area, and maintenance of area.
11. Construct new bridge abutments, retaining wall, and wingwalls with slope improvements around abutments.
12. Backfill project area.
13. Install beams and pour end diaphragm.
14. Install approach slab, overlay, and approach pavement.
15. Construction of new catch basins.
16. Completing roadway construction, upgrading signage, pavement markings, and guardrails.

17. Installation of landscaping and grassed areas.
18. Maintenance of wetland replication area: check for plantings that are damaged or failing to thrive and adjust/replace plantings as recommended by Wetland Specialist.
19. Removal and disposal of sediment and erosion control measures.
20. Removal of traffic controls.

Equipment that is likely to be utilized for this project includes dump trucks, flatbed trucks, front-end loader(s), backhoe(s), skid steer(s), excavator, hoe rams, drilling rigs, concrete pumpers, boom trucks, air hammers, air compressor(s), and a crane. Equipment can be parked on roadway pavements off-limits for construction staging purposes. Staging equipment in Vegetated Wetland or LUW/WOTUS resource areas shall be prohibited.

6.0 IMPACTS TO WATERS OF THE UNITED STATES

The project's resource area impacts will occur in Land under Water (LUW)/Water of the United States (WOTUS) and Vegetated Wetlands (VWs), resulting from permanent construction and temporary work taking place within and along the Ware River. The overall impacts to Vegetated Wetlands and Land under Water are summarized below and noted on the WQC/ACOE Impacts Plan:

Table 5.1: Land under Water and Wetlands Impacts

Resource Area	Permanent Impacts (ft ²)	Temporary Impacts (ft ²)
LUW/WOTUS	1,690	1,165
VWs	607	275
Total	2,297	1,440

6.1 Permanent Vegetated Wetland and Land under Water Impacts

Areas of Vegetated Wetland (VW) are located along the Ware River and border the bridge on its north, east, and south quadrants. Regrading associated with the bridge work will occur in a small portion of Vegetated Wetlands. The construction activities necessary for bridge replacement will result in permanent impacts to Vegetated Wetland areas. No isolated Vegetated Wetlands are present in the vicinity of the bridge.

Expanded fills for the roadway side slopes will extend around the present bridge abutments and form the substructure slope protection on either side of the river channel. The new slope protection measures will edge into LUW/WOTUS areas and will therefore result in some permanent Land under Water impacts on both sides of the Ware River. Regrading will also be necessary along the sides of the fill sections beneath Creamery Road/Unitas Road, whose pavements are proposed to be widened where they approach the bridge. As shown in the plans, the riverbed beneath the proposed Bridge No. H-08-003=N-07-002 will be maintained. The project will not result in dredging within LUW/WOTUS over 100 cubic yards.

To minimize the impacts to the LUW/WOTUS and wetland areas, proper erosion and sediment controls will be installed during construction. This includes the installation of silt fence/compost filter tube barriers or similar measures along all roadways and around work areas. Further details regarding the restoration of wetland resource areas can be found in the Wetland Replication/Restoration Specifications in Attachment E.

6.2 Temporary Vegetated Wetland and Land under Water Impacts

The temporary impacts to VWs at the north- and southeast quadrants of the bridge are associated with the placement of the Erosion & Sediment Control Best Management Practices (BMPs) to protect the wetlands where regrading and slope stabilization is proposed. Additional measures to restore temporary impacts can be found in *755.45 Wetland Restoration Specification* included in Appendix E of this report.

The proposed temporary work within the LUW/WOTUS is associated with cutting down the existing abutments and placing the riprap at the edge of Ware River to help protect the proposed integral abutments. Temporary flow diversions will be necessary in order for the contractor to access work sites at the edges of the waterway “in the dry” and safely deploy material, equipment, and workers where they are needed.

Floating sediment curtains will be available on-site if/when needed to be installed at downstream locations to collect any construction sediment that moves downstream from the work site. Any unintentional drops or spills of debris into the river or its bed will be removed therefrom immediately. All debris originating from the demolition of the portions of existing abutments will be legally disposed of off-site as construction debris. The proposed work will not change the stream’s water carrying capacity and will not impact either ground water quality or surface water quality.

7.0 WETLAND REPLICATION/MITIGATION

The project has been designed to avoid wetland resource area impacts to the maximum extent practicable and will mitigate unavoidable resource area impacts in accordance with state regulations (Massachusetts Wetland Protection Act regulations at 310 CMR 10.55(4)(b), and the Massachusetts Department of Environmental Protection’s (“MassDEP”) “Massachusetts Inland Wetland Replication Guidelines” (MassDEP, March 2002). Vegetated Wetland areas impacted by the construction activities will be replicated in accordance with the standards cited above.

Project elements are incorporated into the proposed work that help to minimize impacts to wetland resource areas. To mitigate for total Vegetated Wetland losses (fill) of 607 +/- square feet associated with the bridge regrading, a wetland replication area is proposed to be constructed at the northeast quadrant of the bridge. The wetland replication area will contain an area of approximately 650 square feet and will be a wetland seed mix and no woody vegetation will be planted. This will provide mitigation for the wetland losses at an approximate ratio of 1:1 and in accordance with the MassDOT Specification 755.35 *Inland Wetland Replication Area*. Further details on the restoration of wetland resource area as well as the temporary impacts to the Bordering Vegetated Wetlands can be found in the Wetland Replication/Restoration Specification in Attachment E.

8.0 SEDIMENTATION CONTROL MEASURES

The Contractor will be required to keep floating silt fence onsite and ready to deploy when construction work is likely to discharge sediment into the waterway. The floating silt fence will not be allowed to block more than 50 percent of the channel width. The floating silt fence will be arranged to contain any sediment discharges from work areas and will be cleaned as recommended by the floating silt fence manufacturer. The floating silt fence will be removed from the waterway when construction work allows and removed from the site when no longer needed.

To protect the wetland resource areas during construction, erosion and sediment control measures will be installed. A line of compost filter tubes or similar measures are anticipated to be used along the limits of work on either side of the bridge to provide a sediment and erosion control barrier between proposed work areas and resource areas. The compost filter tube will be installed as detailed in the Plans so that it can both capture sediment and can serve as a barrier to turtle migration across Creamery Road. Where construction will happen adjacent to the wetland replication area, coir logs will be utilized. Additional sediment erosion controls will be installed per the Turtle Barrier Specification which is included in contract documents and prepared in conjunction with MassDOT. This is intended to provide protection to a turtle species of concern that inhabits the NHESP Priority Habitat that associates with the Ware River at the project site. These controls will be maintained until work in these areas is complete and an adequate vegetative ground cover on roadside slopes has developed. The barrier will then be disposed of in accordance with MassDOT standards.

The erosion controls will be maintained in good condition until on-site soils are stabilized. All areas will be permanently stabilized following the completion of construction work.

9.0 DEWATERING

During construction, dewatering of work areas where abutments are to be cut down will need to take place. Dewatering for abutments within temporary cofferdams to allow for work at the existing abutments “in the dry” will mainly be for removal of surface water that enters the work area by precipitation or splash-over. Work on the proposed integral abutments may require some groundwater removal, if work cannot take place during periods with reduced groundwater levels.

The Contractor will be expected to perform this work in accordance with MassDOT Special Provisions for Control of Water. The Contractor must treat dewatering discharges, prior to outletting these flows to local waterways, for removal of sediments. This will be done by use of sediment tanks, fractionalization tanks, sediment basins, or other approved means, sized to handle anticipated flows pumped from the work areas for the footings. Outlets from these treatment measures will discharge onto splash pads or other measures that will prevent concentrated flows that could erode bank soils or streambed materials enroute to the receiving watercourse.

10.0 STORMWATER MANAGEMENT

Stormwater management for this project has been designed in compliance with the Stormwater Management Standards as defined in detail in the DEP’s Stormwater Management Handbook. As the proposed project is categorized as a “Redevelopment Project” under the Massachusetts Stormwater Management Standards; therefore, the project is designed to meet the Standards to the maximum extent practicable.

Please refer to the Stormwater Management Memorandum included as Attachment F to this Application for detailed Stormwater Management measures proposed for this project.

11.0 FISHERIES AND WILDLIFE / NATURAL HERITAGE ENDANGERED SPECIES / VERNAL POOLS

The limits of Natural Heritage and Endangered Species Program (NHESP) Priority Habitats (PH)1356 and Estimated Habitats of Rare Wildlife (EH 968) about the entire project area. The closest certified vernal pool (CVP5034) identified on MassGIS is located 2,085 feet northeast of the project limits, in the Town of New

Braintree. A potential vernal pool (PVP10157) is located approximately 860 feet northeast of project limits, in the Town of Hardwick. Project activities are not expected to negatively impact these vernal pools.

The Ware River is not designated as a Cold Water Fishery. The closest area of critical environmental concern (ACEC) to the project site is the Central Nashua River ACEC in the Town of Grafton, the limits of which are approximately 26 miles northeast of the project. This project is also not within an Outstanding Resource Water (ORW). Refer to Figure 3 – Environmental Constraints Map in Attachment A for details.

According to the Federally Listed Endangered and Threatened Species in Massachusetts, the Northern Long-eared Bat (*Myotis septentrionalis*) (NLEB) is a proposed Endangered Species located Statewide; however, this species is protected by the Massachusetts Natural Heritage and Endangered Species Program (NHESP). Review of their habitat on NHESP's website indicate that in warmer months they can be found in forested areas, specifically in clustered stands of large trees and in colder months they can be found in natural caves and abandoned mines. The closest recorded NLEB hibernaculum is located 18.4 miles south of the project site in the Town of Sturbridge. This project has been reviewed by the U.S. Fish and Wildlife Service (Service) and received a "may affect, and is not likely to adversely affect (NLAA)" determination to the endangered Indiana bat (*Myotis sodalis*) and/or the endangered northern long-eared bat on October 19, 2023. The overall. No time of year restrictions are required for the project at this time. If additional cutting is proposed by the Contractor that is outside the scope of this contract, additional review is required by the MassDOT Highway Division's Environmental Services Section, and time of year restrictions may apply to such tree cutting.

Additionally, the project will occur within Wood Turtle (*Glyptemys insculpta*) habitat and freshwater Creeper mussel (*Strophitus undulatus*) species habitat, both protected under the Massachusetts Endangered Species Act. The Natural Heritage & Endangered Species Program of the Massachusetts Division of Fisheries & Wildlife (the "Division") received the MESA Project Review Checklist and supporting documentation for review pursuant to the Massachusetts Endangered Species Act (MESA) (MGL c.131A) and its implementing regulations (321 CMR 10.00). The Division provided the conditions to be implemented in order for this project to not result in a Take of state-listed species. In accordance with these conditions, the Turtle Protection Plan and the Mussel Protection Conditions, both prepared in conjunction with MassDOT, are included in contract documents. Refer to Figure 3 – Environmental Constraints Map in Attachment A as well as Attachment E for details.

12.0 STREAM CROSSING NARRATIVE

The proposed replacement bridge achieves partial compliance with the Massachusetts River and Stream Crossing Standards (revised June 2012) by conforming with Stream Crossing General Standards (SCGS) #1, #3, #4, #5, and #6. General Standard #2 only applies to culverted stream crossings.

SCGS #1 posits that *"Spans (bridges, 3-sided box culverts, open-bottom culverts or arches) that preserve the natural stream channel are strongly preferred."* The existing single-span bridge is being replaced in kind, and as shown in the Plans.

SCGS #3 calls for a new span to incorporate a width that, at a minimum, equals 1.2 times bankfull width of the stream. Based on the information provided in the Hydraulic Study Report generated by MassDOT, the existing normal bankfull flow width (BFW) near the crossing is approximately 85 to 95 based on the field survey, while the BFW at the crossing is estimated to be around 90 feet. The USGS regression equations for bankfull geometries estimate the BFW to be 109 feet at the crossing which is higher than observed due to the numerous flood control and water supply dams upstream. The existing south

abutment will be removed to provide adequate inspection clearances, since the hydraulic requirements prevented the proposed south abutment from being located at the existing abutment locations. Additionally, hydraulics also required the existing north abutment to be cut at the proposed ground line to increase the channel width. The existing abutments have a span of 77-feet which encroaches into natural BFW. The required span length of 100 feet (96' clear span) is primarily dictated by hydraulic requirements. To meet MassDOT freeboard requirements of 2 feet, the minimum low chord elevation for the proposed structure is 554.04'. Based on the Hydraulic analysis, the recommended BFW of 95 feet for this crossing cannot not meet the 1.2 times BFW of the stream recommendation. Increasing the width of the crossing further was not recommended by the Hydraulic analysis in order to maintain continuity of the existing channel upstream and downstream of the bridge.

SCGS #4 calls for placement of natural substrate within the structure. The existing single-span bridge is being replaced in kind, and as shown in the Plans, most of the stream channel cross-section will not be affected by the proposed bridge replacement work. The original stream channel cross-section will be altered but natural substrate will be placed over the altered streambed. The natural substrate shall consist of streambed materials stockpiled for re-use from upstream and downstream of the bridge, or similar streambed materials from nearby reaches of the river, as specified in Special Provision Item 983.5 Streambed/Bank Restoration.

SCGS #5 calls for “... *bed forms and streambed characteristics so that water depths and velocities are comparable to those found in the natural channel at a variety of flows.*” A single-span crossing of the waterway will be maintained, and installation methods for the new structure will not significantly impact the underlying stream channel. The shape and surface characteristics of the deepest part of the Ware River will largely be unchanged, as will most stream bed areas near the bridge replacement work zone.

SCGS #6 provides a desired level of “*openness*” for stream crossings so that wildlife will utilize the crossing for passage beneath a roadway. The desired ratio of cross-sectional area of opening to passage length is a minimum value of 0.82 feet. For the proposed bridge replacement, a cross-sectional area of 1,032 square feet divided by a passage length of 16'-10", both as shown in the Plans, yields a value of 61.3 feet, well in excess of the minimum value of 0.82 feet.

13.0 ALTERNATIVE ANALYSIS

Three alternatives have been identified: No Build, Bridge Replacement using Prestressed Spaced Box Beams, and Bridge Replacement using Multiple Steel Plate Girder.

Alternative 1: No Build

The No-Build Alternative assumes that the proposed superstructure replacement project would not be constructed, and the existing bridge would remain in place being structurally deficient and functionally obsolete, that will eventually require closure. This alternative is not considered acceptable, since Creamery Road is a direct connection between the adjacent Towns of Hardwick and New Braintree across the Ware River, while the proposed detour around the bridge is approximately 4.9 miles, imposing an inconvenience to nearby residents and local first responders. It is desirable for local residents to have the bridge crossing reconstructed.

Alternative 2 (Preferred): Bridge Replacement using Multiple Steel Plate Girder

The proposed structure type is the 44" deep steel plate girder spanning 100' from bearing to bearing. This alternative calls for the use of three 44" plate girders based on preliminary sizing compared to span length. Three beams were chosen to create a redundant system. A two-girder system would be considered fracture critical and was thus avoided. This alternative has the lightest and the shallowest beams of all alternatives investigated. The steel girders weigh approximately 35 kips each. This provides more flexibility for crane sizes. In addition, the bridge will be designed with an optional field splice that would allow the contractor to choose between transporting two smaller components to the site as opposed to one beam over 100' long. To reduce the likelihood of rusting at the beam end, the structure will be designed as an integral abutment system which removes the need for joints over the beam ends where water can infiltrate.

The limits of construction which will extend approximately 200' from each approach. A disadvantage of the steel superstructure option is the increased risk of section loss due to rusting. Rusting has been an issue in the past at this bridge site aided by the presence of water beneath the bridge.

The decision for the plate girder was mainly dictated by constructability. The concrete superstructure options would force the contractor into using heavy duty cranes when compared to the steel beam option due to their increased weight. The contractor would also be required to transport beams over 100' long to the site as opposed to two sections which would be plausible with a spliced steel beam.

Alternative 3: Bridge Replacement using Prestressed Spaced Box Beams

This alternative calls for the use of four B36-48 prestressed box beams placed 5' on center with an 8" deck. A concrete beam was considered for this alternative due to beam rusting being an issue with the existing steel bridge. Additional benefits of spread box beams is that the sides of the beams are exposed for view during inspections when compared to adjacent box beams.

Using a shallower beam with greater concrete strength was considered to save on weight and depth. The use of a 36" wide x 42" deep beam using the MassDOT LRFD span tables would exceed the maximum span length of 94' with final concrete strength of 6,500 psi (proposed bearing to bearing is 100'). The Prestressed Concrete Institute Bridge Design Manual tables assumes a final concrete strength of 8,000 psi and provides for a maximum span length under 100'.

An integral abutment system was investigated for this system to remove the deck joint over the beam end. Deck joints present the increased possibility of beam end spalling due to water infiltration beneath the joints and the freeze thaw cycle. The use of spread box beams is required per MassDOT for an integral abutment as opposed to adjacent box beams. This is due to the requirement of having transverse dowels inserted at the end of the beams to make the beam and the end diaphragm composite. The beam size is based on the MassDOT LRFD Bridge manual Part II, Drawing Number 6.2.3 which dictates the size of the beam based on span length.

Out of all the alternatives this is the heaviest beam. At a 100' span, the weight and size of the beam become prohibitive for transportation and requires more heavy-duty cranes on site, which are the issues when considering the rural location of the bridge.

All impact to the waterway and vegetated wetland areas associated with Alternatives 2 and 3 were minimized to the maximum extent feasible. The wetland impacts would not change between

Alternatives 2 and 3, while Alternative 1 (No-Build) is not considered acceptable since it does not meet the project purpose.

14.0 CONCLUSION

After careful analysis of three different alternatives, the project need and purpose is to replace the existing Bridge No. H-08-(18J)=N-07-002 (6KY) because the existing structure is functionally obsolete and structurally deficient. The project has been designed to avoid wetland resource area impacts to the maximum extent practicable. All unavoidable impacts will be mitigated in accordance with regulatory requirements. The applicant respectfully requests that MassDEP find these measures adequately protective of the interests identified in the 401 Water Quality Regulations and issue a Water Quality Certificate approving the work shown on the accompanying plan set.

ATTACHMENTS

Attachment A – Figures:

Figure 1 - USGS Map

Figure 2 – Aerial Map

Figure 3 – Environmental Constraints Map

Figure 4 – FEMA Map

Attachment B – Site Photo Log

Attachment C – Public Notice

Attachment D – Wetland Evaluation Report with Data Forms

Attachment E – Wetland Specifications, Cultural Resources and Section 7/USFWS Project Records

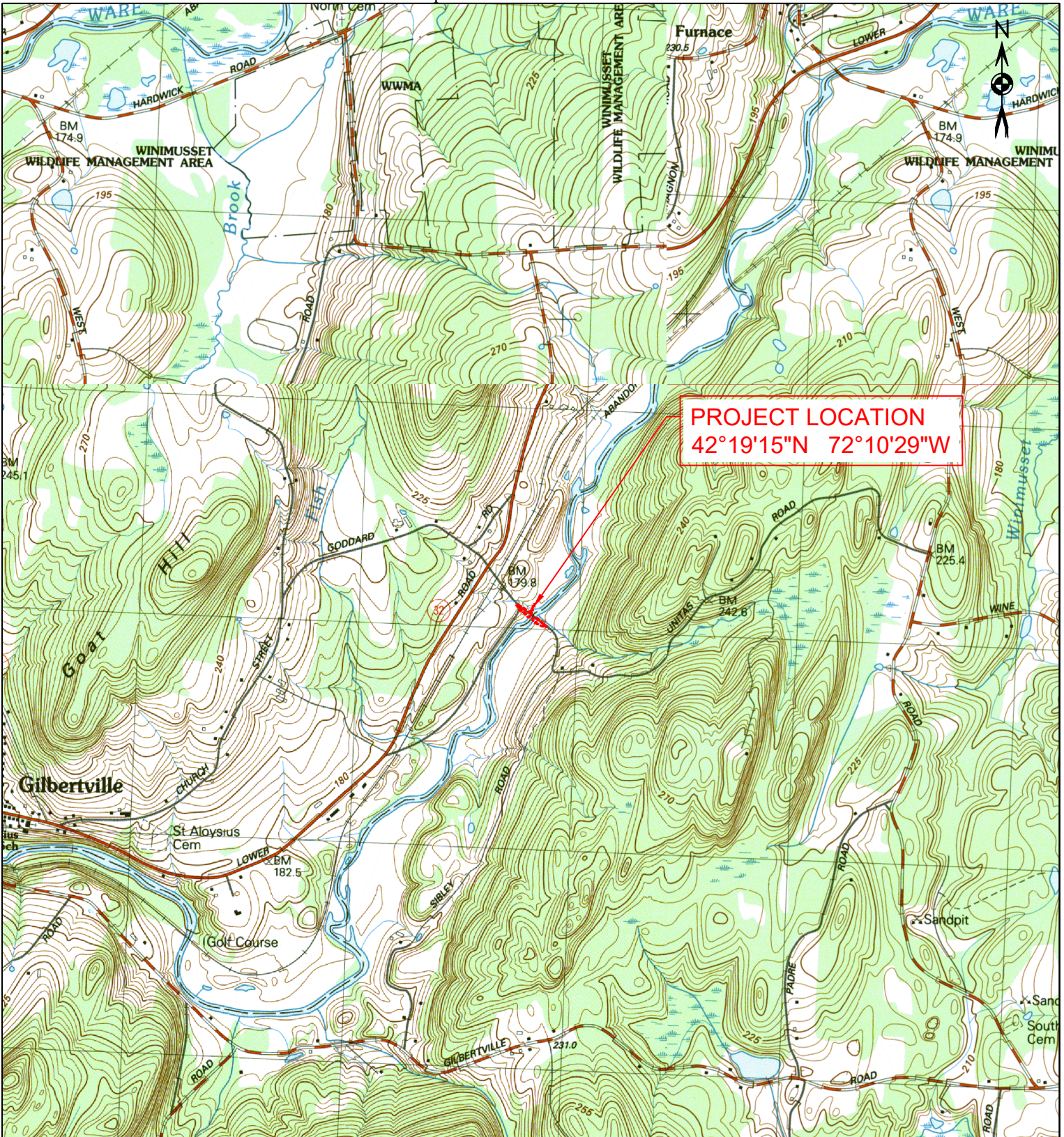
- Item 102.30 – Herbicide Treatment of Invasive Plants
- Item 102.33 – Invasive Plant management Strategy
- Item 755.35 – Inland Wetland Replication Area
- Item 755.45 – Wetland Restoration
- Item 755.75 – Wetland Specialist
- Item 755.76 – Wetland Monitoring Reports
- Item 983.5 – Streambed and Bank Restoration
- MESA NHESP Determination & Contract Specifications

Attachment F – Stormwater Management Memo

Attachment G – WQC/ACOE Submission Plans

Attachment A – Figures

- Figure 1 – USGS Map
- Figure 2 – Aerial Map
- Figure 3 – Environmental Constraints Map
- Figure 4 – FEMA Map



LEGEND:

--- LIMIT OF WORK

SCALE IN FEET



ELEVATIONS IN METERS

USGS LOCUS MAP

HARDWICK — NEW BRAINTREE — BRIDGE REPLACEMENT
H-08-003=N-07-002, CREAMERY ROAD OVER WARE RIVER
HARDWICK, MA — NEW BRAINTREE, MA PROJECT #608851

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Highway Division

SCALE: AS NOTED

PROJECT NO. 18045

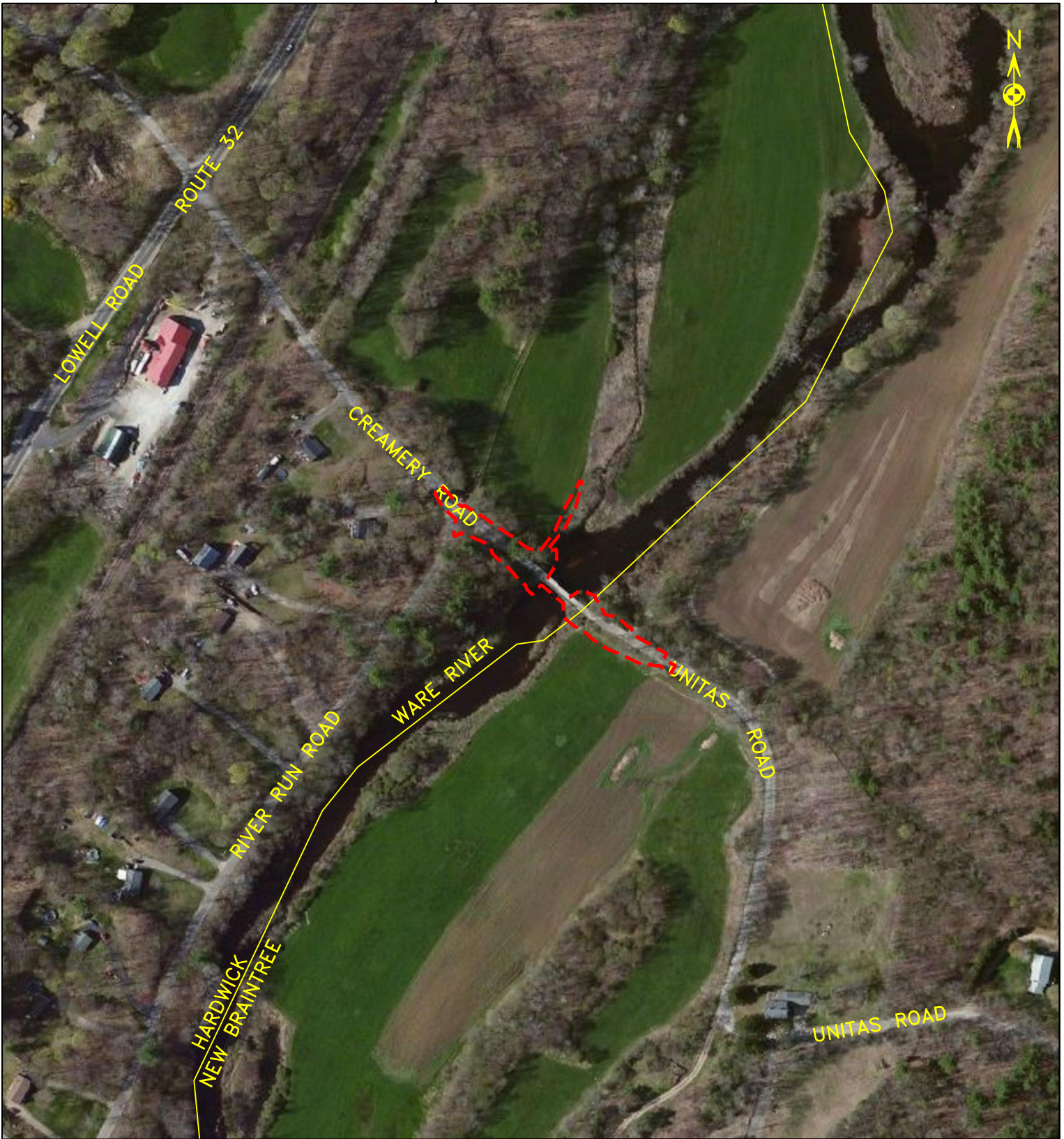
DATE: 05/11/2023

DRAWN BY: OF

REVISED:

CHECKED BY: MC

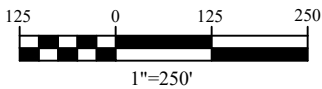
**FIGURE
1**



LEGEND:

- APPROXIMATE PROPERTY LINE
- - - LIMIT OF WORK

SCALE IN FEET




NOTE: DATA TAKEN FROM MASSGIS

AERIAL LOCUS MAP

HARDWICK – NEW BRAINTREE – BRIDGE REPLACEMENT
H-08-003=N-07-002, CREAMERY ROAD OVER WARE RIVER
HARDWICK, MA – NEW BRAINTREE, MA PROJECT #608851

PREPARED BY:

 **GREEN INTERNATIONAL AFFILIATES, INC.**
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PREPARED FOR:

 **massDOT**
Massachusetts Department of Transportation
Highway Division

SCALE: AS NOTED

PROJECT NO. 18045.01

DATE: 05/11/2023
REVISED:

DRAWN BY: OF
CHECKED BY: MC

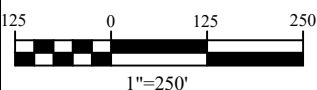
FIGURE
2



LEGEND:

- MUNICIPAL BOUNDARIES
- LIMIT OF WORK
- DEP WETLANDS
- OPEN WATER
- DEP LINEAR FEATURES
- NHESP PRIORITY HABITATS OF RARE SPECIES
- NHESP ESTIMATED HABITATS OF RARE WILDLIFE
- POTENTIAL VERNAL POOLS
- ★ CERTIFIED VERNAL POOLS

SCALE IN FEET



NOTE: DATA TAKEN FROM MASSGIS

ENVIRONMENTAL CONSTRAINTS MAP

HARDWICK – NEW BRAINTREE – BRIDGE REPLACEMENT
H-08-003=N-07-002, CREAMERY ROAD OVER WARE RIVER
HARDWICK, MA – NEW BRAINTREE, MA PROJECT #608851

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massDOT
Massachusetts Department of Transportation
Highway Division

SCALE: AS NOTED

PROJECT NO. 18045

DATE: 5/11/2023

DRAWN BY: OF

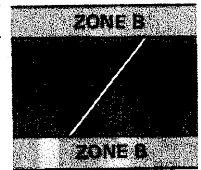
REVISED:

CHECKED BY: MC

FIGURE
3

KEY TO MAP

- 500-Year Flood Boundary ————
- 100-Year Flood Boundary ————
- Zone Designations*
- 100-Year Flood Boundary ————
- 500-Year Flood Boundary ————
- Base Flood Elevation Line
With Elevation In Feet**
- Base Flood Elevation in Feet
Where Uniform Within Zone**
- Elevation Reference Mark
- River Mile
- **Referenced to the National Geodetic Vertical Datum of 1929



513

(EL 987)

RM7 X

• M1.5

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

For adjoining map panels, see separately printed Index To Map Panels.

FROM PANEL 250307726B:

INITIAL IDENTIFICATION:

JUNE 28, 1971

FLOOD HAZARD BOUNDARY MAP REVISIONS:

OCTOBER 29, 1976

FLOOD INSURANCE RATE MAP EFFECTIVE:

SEPTEMBER 15, 1981

FLOOD INSURANCE RATE MAP REVISIONS:

Refer to the FLOOD INSURANCE RATE MAP EFFECTIVE date shown on this map to determine when actuarial rates apply to structures in the zones where elevations or depths have been established.

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE
PROJECT LOCATION

NOTE:
THE FLOOD ZONE DATA SHOWN IS TAKEN FROM THE FEDERAL INSURANCE RATE MAPS (FIRM) FOR THE TOWN OF HARDWICK, MA (FIRM COMMUNITY PANEL 2503070026B, DATED 09/16/1981.) AND TOWN OF NEW BRAINTREE, MA (FIRM COMMUNITY PANEL 2503200002B, DATED 06/15/1984.)

SCALE IN FEET



1" = 250'

FEMA MAP

HARDWICK-NEW BRAINTREE - BRIDGE REPLACEMENT H-08-003=N-07-002
CREAMERY ROAD OVER WARE RIVER
HARDWICK, MA, NEW BRAINTREE, MA PROJECT #608851

PREPARED BY:

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PREPARED FOR:

massDOT
Massachusetts Department of Transportation
Highway Division

SCALE: AS NOTED

PROJECT NO. 16033

DATE: 06/11/2023

DRAWN BY: OF

REVISED:

CHECKED BY: MC

FIGURE
4

Attachment B – Site Photo Log



Creamery Road Bridge over Ware River (#605342)

Bridge No. H-08-003(18J)=N-07-002(6KY)

Hardwick-New Braintree, MA

Green Project No. 18045



GREEN INTERNATIONAL
AFFILIATES, INC.

Photo Log



Photo #1 – Southeast approach (looking southeast) from the bridge towards New Braintree.



Photo #2 – View southeast at the bridge north approach and downstream side of Ware River.

Creamery Road Bridge over Ware River (#605342)

Bridge No. H-08-003(18J)=N-07-002(6KY)

Hardwick-New Braintree, MA

Green Project No. 18045



GREEN INTERNATIONAL
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Photo #3 - View looking northwest at the bridge from the southeast approach roadway.



Photo #4 - View looking south east of south abutment.

Creamery Road Bridge over Ware River (#605342)

Bridge No. H-08-003(18J)=N-07-002(6KY)

Hardwick-New Braintree, MA

Green Project No. 18045



GREEN INTERNATIONAL
AFFILIATES, INC.



Photo #5 - View of the north abutment looking from the underside of the bridge.



Photo #6 – View looking southwest downstream side of Ware River from the Bridge No. H-08-003=N-07-002.

Attachment C – Public Notice



Attachment D – Wetland Evaluation Report with Data Forms





WETLAND AND WATERCOURSE EVALUATION REPORT

Proposed Bridge Replacement Unitas Road over the Ware River

Prepared for:

Massachusetts Department of Transportation
10 Park Plaza, Suite 4160
Boston, MA 02116

Prepared by:

BL Companies
355 Research Parkway
Meriden, CT 06450-7100

Date: May 2, 2023
BL Project No: 2100472.0003

Sagan Simko, CPSS, PWS
Senior Project Scientist II

Wesley Wolf
Senior Project Manager

TABLE OF CONTENTS

	<u>Page</u>
I. INTRODUCTION	1
A. Project Location and Description.....	1
B. Description of Project Area	1
II. METHODOLOGY	1
A. Records Research	1
B. Field Investigation	2
1. Wetland and Watercourse Delineation	2
2. Wetland and Watercourse Classification	2
III. RESULTS	4
A. Records Research	4
B. Field Investigation	4
1. Wetlands	5
2. Watercourses	6
C. Functions & Values	6
IV. SUMMARY	6
V. REFERENCES	8

APPENDICES

- A Wetland and Watercourse Delineation Mapping
 - Figure 1 - Street Project Location Map
 - Figure 2 - USGS Project Location Map (USGS Topographic Map)
 - Figure 3 - Soils Map
 - Figure 4 - NWI
 - Figure 5 - FEMA Map
 - Figure 6 - Aerial Imagery Map
 - Figure 7 - Field Data Location Map
- B Color Photographs
- C Data Forms
- D Professional Qualifications

I. INTRODUCTION

A. PROJECT LOCATION AND DESCRIPTION

The Massachusetts Department of Transportation (MassDOT) is proposing the replacement of Bridge No. H-08-003=N-07-002 (also known as the Unitas Road Bridge) over the Ware River, along with associated site improvements, in Hardwick / New Braintree, MA, containing a total of approximately 3.04 acres ("Project Area"). The Project Area is located near 116 Creamery Road, Gilbertville, MA 01031-9849 (see **Appendix A, Figure 1**).

MassDOT ("Client") has contracted BL Companies ("BL") to characterize existing wetlands and watercourses that may be affected by the Project and describe the habitats and major vegetative cover types within the Project Area. BL conducted wetland and watercourse field delineations within a Project Area defined by the Client (see **Appendix A**) on March 28 and May 3, 2023. This Project Area included the entire 3.04-acre area described above. Investigations were conducted to identify, and delineate if present, the extent and location of jurisdictional wetlands and "Waters of the U.S." within the Project Area pursuant to the Federal Clean Water Act (Sections 401 and 404), and in Massachusetts, activities are also regulated under the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40) regulations. In conjunction with the U.S. Army Corps of Engineers (USACE), this program is administered by the Massachusetts Department of Environmental Protection (MassDEP). Jurisdictional wetlands were defined using the 1987 *U.S. Army Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987) and subsequent guidance documents including the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0)* (US Corps of Engineers, January 2012). Waters of the U.S., which include all streams, adjacent wetlands, and other waterbodies, are defined in 33 CFR 328.3(a). Professional qualifications of the individual(s) involved in the performance of field surveys and preparation of this report are provided in **Appendix D**.

B. DESCRIPTION OF PROJECT AREA

The Project Area is located near 116 Creamery Road, Gilbertville, MA 01031-9849.

The Project Area lies within the New England physiographic province, which is a mountainous area that has been subjected to Pleistocene glaciation. Structural features of this province include block-fault basins, large intrusive igneous masses, and shoreline cliffs. (NPS, 2017).

II. METHODOLOGY

A. RECORDS RESEARCH

A desktop analysis of the Project Area was conducted prior to performing field surveys and included the entire defined area of investigation. Data reviewed included aerial photography, US Geological Survey 7.5-Minute Topographic Quadrangle Maps, US Fish and Wildlife Service (USFWS) National Wetland Inventory Maps (NWI), Flood Insurance Rate Maps (FIRM) provided by the Federal Emergency Management Administration (FEMA), Massachusetts' Geographic Information Systems Open Data Website, and soil information from the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). Other sensitive resource data were reviewed as available. This compiled data was used during field investigations and the subsequent report.

B. FIELD INVESTIGATION

Field investigations were conducted to verify records research and identify land use and plant communities within the Project Area, and to determine the presence or absence of wetland and watercourse features.

1. WETLAND AND WATERCOURSE DELINEATION

Investigations included the inspection of the Project Area to identify areas that satisfied the three (3) wetland criteria under natural (typical) conditions: a dominance of hydrophytic vegetation, wetland hydrology, and hydric soils, according to the 1987 USACE manual and 2012 Regional Supplement mentioned above. Failure to confirm all three (3) parameters would result in the finding that the area under evaluation is a non-wetland under typical conditions. Furthermore, waterbodies are identified as features with a defined bed and bank or other geographical feature that appears to hold or convey water at some point throughout the year.

When identified, wetland sampling is conducted along the gradient between wetland and adjacent upland areas to identify the location of the wetland boundary based upon the above criteria. Sample Points (and/or data points) were placed within selected locations of wetland areas to identify important, defining characteristics and to resolve obscure transitions between mixed wetlands and uplands. Visual estimates of percent vegetation cover by species, indicators of hydrology, and a soil profile were recorded on Wetland Determination Data Forms.

When identified, waterbody data collection included various physical parameters such as height of banks, top of bank to top of bank width, ordinary high water, water depth, presence of aquatics, substrate characteristics, and flow regime.

Mapping of any wetland boundaries and watercourse ordinary high-water marks ("OHWM") was supplemented using a Trimble® TDC150 Global Positioning System (GPS) unit with sub-foot accuracy.

2. WETLAND AND WATERCOURSE CLASSIFICATION

Identified wetlands were classified in accordance with the methods of Cowardin *et al.* (1979), which categorizes wetlands based on dominant (>30 percent cover within a single stratum) vegetation: palustrine emergent ("PEM"), palustrine scrub-shrub ("PSS"), palustrine forested ("PFO"), or some combination of these wetland types. Inundated features, such as ponds and lakes, were classified as palustrine unconsolidated bottom ("PUB"). Wetlands were also classified with the Hydrogeomorphic Method (HGM) of wetland classification (Brinson, 1993).

Hydrology was considered present when a minimum of one (1) primary or two (2) secondary indicators were identified. Indicators of wetland hydrology (saturated or inundated soils) along with signs of previous prolonged inundation within the upper 12 inches of the surface were noted at each sample location where observed. Other positive primary indicators of hydrology include high water table, watermarks, sediment deposits, drift deposits, algal mat or crust, iron deposits, inundation visible on aerial imagery, sparsely vegetated concave surface, water-stained leaves, aquatic fauna, marl deposits, hydrogen sulfide odor, oxidized rhizospheres on living roots, presence of reduced iron, recent iron reduction in tilled soils, or thin muck surface. Additionally, secondary indicators of hydrology include surface soil cracks, drainage patterns, moss trim lines, dry-season water table, crayfish burrows, saturation visible on aerial imagery, stunted or stressed plants, geomorphic position, shallow aquitard, and microtopographic relief. A positive FAC-neutral test which was evaluated as a hydrophytic vegetation indicator is also considered a secondary indicator of hydrology.

Dominant species in a stratum (tree, shrub, herbaceous or vine) were determined by visually estimating the percent cover of each species within a plot of an approximately 30-foot (ft.) radius for trees, 15-ft. radius for saplings/shrubs, 5-ft. radius for herbs, and a 30-ft. radius for woody vines. Dominant vegetation was determined by the 50/20 Rule; by establishing the plant species that individually or collectively account for more than 50 percent of the total coverage of vegetation in the stratum, plus any other species that, by itself, accounts for at least 20 percent of the total. Species nomenclature and wetland indicator status follows that of the USACE National Wetland Plant List (2020, Version 3.5). Hydrophytic species are those wetland plants with an indicator status of OBL (obligate wetland), FACW (facultative wetland), or FAC (facultative). Species listed as FACU (facultative upland) or UPL (upland) are more indicative of upland areas and generally do not occur in wetlands. The hydrophytic vegetation criterion was determined to be present if the following tests were met including the Rapid Test, the Dominance Test or the Prevalence Index. All wetland habitats were classified according to the USFWS, and Classification of Wetlands and Deepwater Habitats of the United States (Cowardin *et al.* 1979).

As outlined in the National Technical Committee for Hydric Soils Version 8.2 (2018), soils were examined and sampled by using a hand auger or sharpshooter shovel to dig to a depth of approximately 16 to 20 inches or to refusal. Soil colors were determined using the 2010 Munsell® Soil Color Chart and taken while moist or were wetted. Observations of redoximorphic (redox) concentrations, the apparent accumulation of iron (Fe) and manganese (Mn) oxides within the soil profile were noted as appropriate. Redox depletions, bodies of low chroma and value of four (4) or more where Fe-Mn oxides have been stripped were also noted where observed. These features are usually an indication of periodic, seasonal, or permanent saturated soil conditions (Vepraskas 1994). Observations of hydric soil characteristics were based on the United States Department of Agriculture (USDA) textures, and hydric soil was considered present if one or more of the indicators were identified.

Biophysical elements such as a wetland's landscape position, geology, hydrology, substrate, and vegetation determine the wetland functions and to what capacity they are performed. Due to the differing biophysical characteristics between on-site wetlands, the functions the wetlands provide and the capacity to perform those functions can vary. To better understand these differences, a description of the assessed wetland functions and values is completed based on the 1999 USACE Highway Methodology Workbook Supplement. This method requires describing each of the wetland communities and indicating the functions and values they provide. Biological, physical, chemical, and anthropogenic variables are all considered in the assessment. Wetland functions are defined as self-sustaining properties of a wetland ecosystem that exist in the absence of society. Wetland values are defined as benefits derived from one or more wetland functions and the physical characteristics that are associated with the wetland.

Field investigations also included the identification of watercourses based on flow regime: perennial (PER), intermittent (INT), or ephemeral (EPH). Perennial watercourses contain base flow supported with ground water throughout the year. Intermittent watercourses are those that contain base flow supported by ground water at least seasonally. Ephemeral waterbodies are primarily supported by precipitation. Watercourses were also classified in accordance with Cowardin *et al.* (1979). Riverine Systems include all wetlands and deep-water habitats contained within a channel. A channel is defined as "an open conduit either naturally or artificially created which periodically or continuously contains moving water, or which forms a connecting link between two bodies of standing water." There are six (6) subsystems: Tidal, Lower Perennial, Upper Perennial, Intermittent, Unknown Perennial, and Ephemeral. Jurisdiction is ultimately determined through the USACE's Jurisdictional Determination process.

III. RESULTS

A. RECORDS RESEARCH

The USGS Ware, Massachusetts 7.5-Minute Topographic Quadrangle (see **Appendix A, Figure 2**), and Google Earth, indicate the Project Area has an elevation range between approximately 545 feet and 550 feet above mean sea level (AMSL).

According to the NRCS Web Soil Survey, three (3) soil series were identified within the Project Area. Table 1 includes the soil series and physical characteristics and limitations. Soils mapping for the Project Area is provided in **Appendix A, Figure 3**.

Table 1. Soil Series within the Project Area

Map Unit Symbol	Soil Unit Name	Hydric Soil Components (%)	Drainage Class	Depth to Restrictive Layer (inches)	Depth to Water Table (inches)
19A	Lim very fine sandy loam, 0 to 3 percent slopes, frequently flooded	95	Poorly drained	More than 80 inches	About 6 to 10 inches
253A	Hinckley loamy sand, 0 to 3 percent slopes	0	Excessively drained	More than 80 inches	More than 80 inches
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	0	Somewhat excessively drained	More than 80 inches	More than 80 inches

The Massachusetts state wetlands mapping with integrated USFWS NWI wetlands indicated the presence of four (4) mapped features within the Project Area. These features were mapped as a Riverine, Lower Perennial, Unconsolidated Bottom, Permanently Flooded (R2UBH); a Riverine, Upper Perennial, Unconsolidated Bottom, Permanently Flooded (R3UBH); a Riverine, Intermittent, Streambed, Seasonally Flooded (R4SBC); and a Palustrine, Forested, Broad-Leaved Deciduous / Needle-Leaved Evergreen, Seasonally Flooded (PFO1/4C) (see **Appendix A, Figure 4**).

Review of the Federal Emergency Management Agency (FEMA) map indicates the Project Area is located within an area that is not included on the FEMA mapping (see **Appendix A, Figure 5**).

Aerial photography indicates the Project Area is comprised of wooded, shrubby, and herbaceous areas along the Ware River, with agricultural and residential areas surrounding the Project Area on all sides (see **Appendix A, Figure 6**).

B. FIELD INVESTIGATION

Field observations reflected similar land use as observed during the desktop review. The Project Area is comprised of wooded, shrubby, and herbaceous areas along the Ware River, with agricultural and residential areas surrounding the Project Area on all sides.

Based on field observations, it has been determined that four (4) wetland areas and two (2) streams are present within the Project Area (see **Appendix A, Figure 7**). Field Data Location Mapping, photographs of the Project Area, and Water Body Data Forms are provided in **Appendices A, B, and C**, respectively.

1. WETLANDS

Wetland A:

Wetland A is a Palustrine, Emergent (PEM) wetland. This wetland is located within the northwestern portion of the Project Area, within the riparian area of Stream 1 (Ware River).

The hydrologic indicators for Wetland A are High Water Table (A2), Saturation (A3), and Geomorphic Position (D2). Dominant vegetation includes arrow-leaf tearthumb (*Persicaria sagittata*), reed canarygrass (*Phalaris arundinacea*), and sensitive fern (*Onoclea sensibilis*) in the herbaceous layer.

The soil observed in Wetland A meets the hydric soil indicator for Depleted Matrix (F3). According to the Natural Resources Conservation Service (NRCS) Web Soil Survey, the soil mapped within the delineated wetland area is Hinckley loamy sand, 0 to 3 percent slopes (253A). Soil observed within the wetland most closely matched the nearby hydric Lim very fine sandy loam series.

Wetland B:

Wetland B is classified as a Palustrine, Emergent, Persistent, Temporarily Flooded (PEM1A) wetland. This wetland is located within the northeastern portion of the Project Area, within the riparian area of Stream 1 (Ware River).

The hydrologic indicators for Wetland B are High Water Table (A2), Saturation (A3), and Geomorphic Position (D2). Dominant vegetation includes northern arrow-leaf tearthumb (*Persicaria sagittata*), reed canarygrass (*Phalaris arundinacea*), common rush (*Juncus effusus*), and sensitive fern (*Onoclea sensibilis*) in the herbaceous layer.

The soil observed in Wetland B meets the hydric soil indicator for Depleted Matrix (F3). According to the Natural Resources Conservation Service (NRCS) Web Soil Survey, the soil mapped within the delineated wetland area is Hinckley loamy sand, 0 to 3 percent slopes (253A). Soil observed within the wetland most closely matched the nearby hydric Lim very fine sandy loam series.

Wetland C:

Wetland C is a Palustrine, Scrub-Shrub (PSS) wetland. This wetland is located within the southeastern portion of the Project Area, within the riparian area of Stream 1 (Ware River) and Stream 2.

The hydrologic indicators for Wetland C are Saturation (A3) and Geomorphic Position (D2). Dominant vegetation includes red osier dogwood (*Cornus sericea*) in the shrub layer and skunk cabbage (*Symplocarpus foetidus*), reed canarygrass (*Phalaris arundinacea*), and common rush (*Juncus effusus*) in the herbaceous layer.

The soil observed in Wetland C meets the hydric soil indicator for Depleted Matrix (F3). According to the Natural Resources Conservation Service (NRCS) Web Soil Survey, the soil mapped within the delineated wetland area is Merrimac fine sandy loam, 3 to 8 percent slopes (254B). Soil observed within the wetland most closely matched the nearby hydric Lim very fine sandy loam series.

Wetland D:

Wetland D is a Palustrine, Emergent (PEM) wetland. This wetland is located within the southeastern portion of the Project Area, within the riparian area of Stream 1 (Ware River).

The hydrologic indicators for Wetland D are High Water Table (A2), Saturation (A3), and Geomorphic Position (D2). Dominant vegetation includes arrow-leaf tearthumb (*Persicaria sagittata*), reed canarygrass (*Phalaris arundinacea*), and common rush (*Juncus effusus*) in the herbaceous layer.

The soil observed in Wetland D meets the hydric soil indicator for Depleted Matrix (F3). According to the Natural Resources Conservation Service (NRCS) Web Soil Survey, the soil mapped within the delineated wetland area is Lim very fine sandy loam, 0 to 3 percent slopes, frequently flooded (19A). Soil observed within the wetland closely matched the hydric Lim soil series.

2. WATERCOURSES

Stream 1 is classified as a Riverine, Lower Perennial / Upper Perennial, Unconsolidated Bottom, Permanently Flooded watercourse (R2/3UBH). Stream 1 is the Ware River, which flows northeast to southwest, beneath the Unitas Road bridge. The substrate of Stream 1 consisted primarily of approximately 75% gravel to 25% silt throughout the entire reach of the watercourse. The watercourse was 1 to 3 feet deep at the time of the investigation, with a moderate flow. The channel varied in width from 90 to 95 feet. Contributing flow to the stream includes Wetland A, Wetland B, Wetland C, Wetland D, Stream 2, as well as surface water runoff from the surrounding upland areas.

Stream 2 is best described as a Riverine, Intermittent, Streambed, Seasonally Flooded watercourse (R4SBC). Stream 2 is an unnamed tributary (UNT) to the Ware River and flows southeast to northwest. The substrate of Stream 2 consisted primarily of approximately 5% cobbles, 80% gravel and 15% silt throughout the entire reach of the watercourse. The watercourse was 1 to 3 inches deep at the time of the investigation, with a moderate flow. The channel varied in width from 3 to 5 feet. Contributing flow to the stream includes Wetland C and surface water runoff from the surrounding upland areas.

C. FUNCTIONS & VALUES

The functions and values of the Stream 1 complex area (consisting of Stream 1, Stream 2, Wetland A, Wetland B, Wetland C, and Wetland D) include ground water recharge/discharge, floodflow alteration, fish habitat, nutrient retention, and wildlife habitat. Ground water is discharged when the ground water table is high and intersects the soil surface. This function is prominent in the Stream 1 complex area. The riparian areas along Stream 1 and Stream 2 allow for surface water to slowly percolate back into the water table, which allows for floodwater to be retained, abating downstream flooding. Nutrients from the adjacent agricultural and residential properties, as well as roadways, can be absorbed and retained within the vegetation of the riparian area of this stream complex. The wooded and shrubby stream embankment area provides a contrasting habitat area to the surrounding upland agricultural and maintained residential areas.

IV. SUMMARY

Based upon these observations and best professional judgement, it has been determined that four (4) wetlands and two (2) streams that constitute potential jurisdictional features are located within the Project Area.

The findings of this investigation represent a study of the proposed project for non-tidal wetlands and watercourses. This type of study depends on the time of year, the conditions at that time of year, site-specific influences (e.g. artificial disturbance), and individual professional judgment. It is, therefore, a professional estimate of the Project Area's wetlands and watercourses based upon available information and techniques.

The data that is the basis for this report is on file at BL Companies' Meriden, CT office.

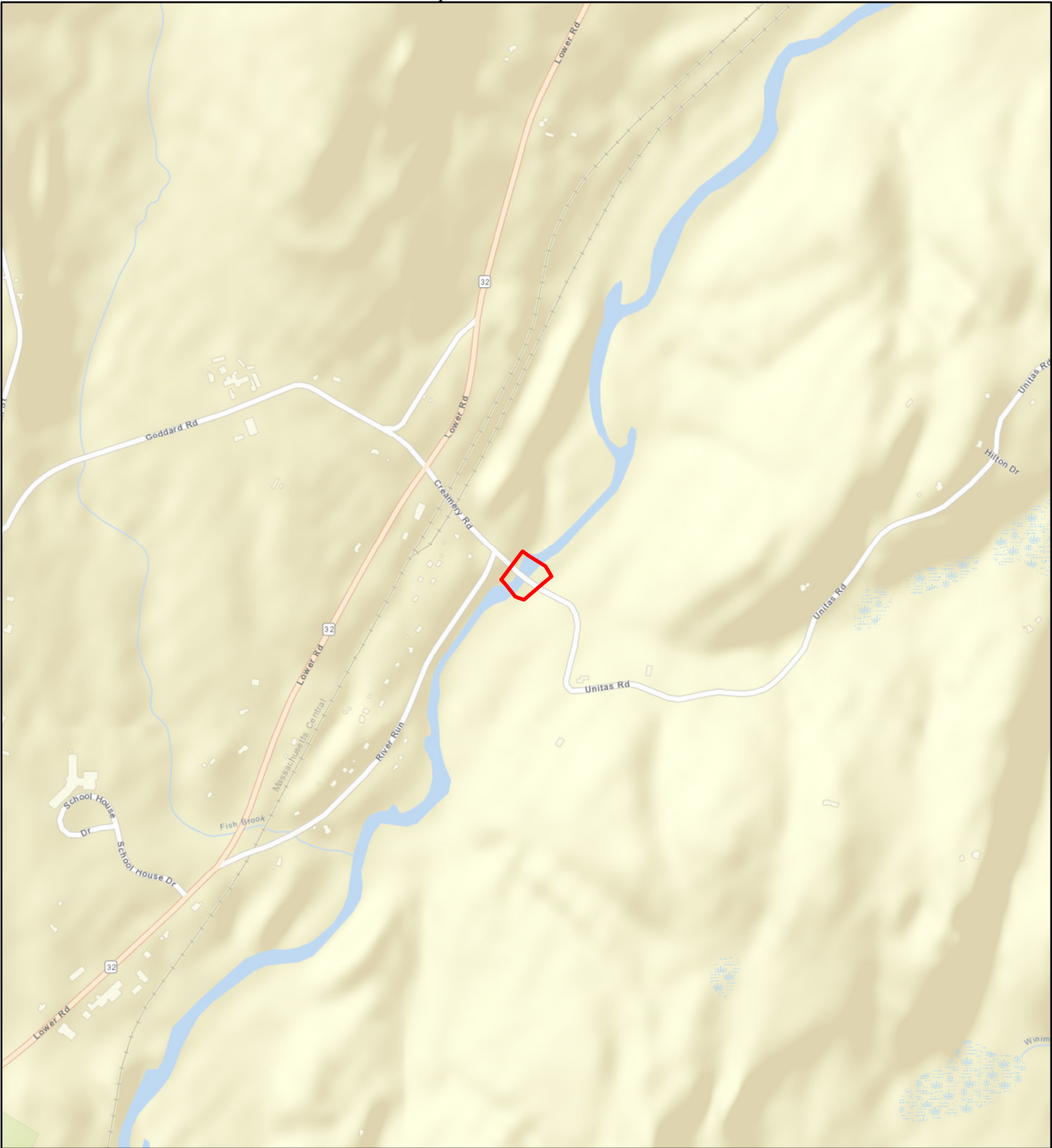
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17. Vepraskas MJ. 1994. Redoximorphic Features for Identifying Aquic Conditions. North Carolina Agricultural Research Service. North Carolina State University. Raleigh, North Carolina. Technical Bulletin 301. 33 pp.

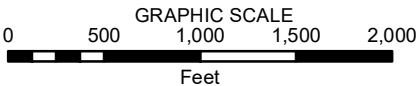



APPENDIX A

Wetland and Watercourse Delineation Mapping

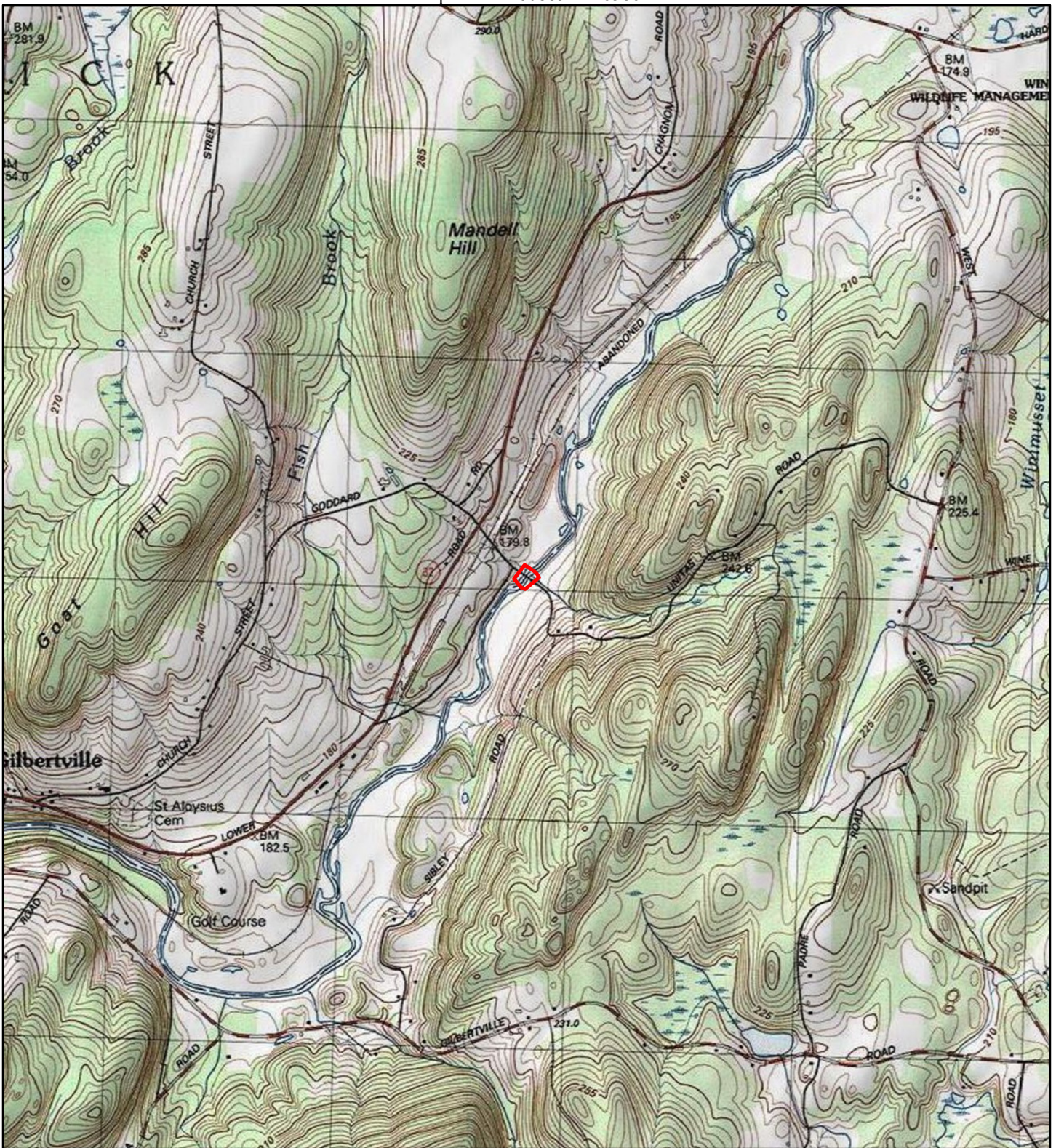


UNITAS ROAD OVER WARE RIVER PROJECT - PROJECT LOCATION MAP

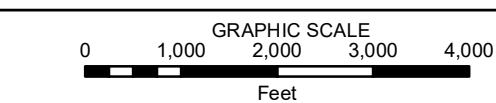


 Legend  Project Area		DRAWN BY: SMS	PROJECT NO: 2100472.003
		CHECKED BY: WGW	
		SCALE: 1:12,000	Figure 1
		 Architecture Engineering Environmental Land Surveying Companies	355 Research Parkway Meriden, CT 06450-7100 (203) 630-1406

Unitas Road, Hardwick / New Braintree, Massachusetts



UNITAS ROAD OVER WARE RIVER PROJECT - USGS TOPOGRAPHIC MAP



Legend

Project Area

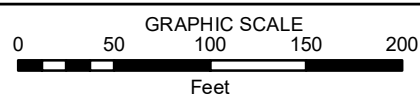
DRAWN BY: SMS	PROJECT NO: 2100472.003
CHECKED BY: WW	
SCALE: 1:24,000	Figure 2
Architecture Engineering Environmental Land Surveying	355 Research Parkway Meriden, CT 06450-7100 (203) 630-1406

Unitas Road, Hardwick / New Braintree, Massachusetts

Document Path: G:\JOBS21\04\2100472\+ASSIGNMENTS\ASSIGNMENT 3 - Hardwick_ New Braintree\GIS\MXD\2. USGS Topographic Map.mxd



UNITAS ROAD OVER WARE RIVER PROJECT - SOILS MAP



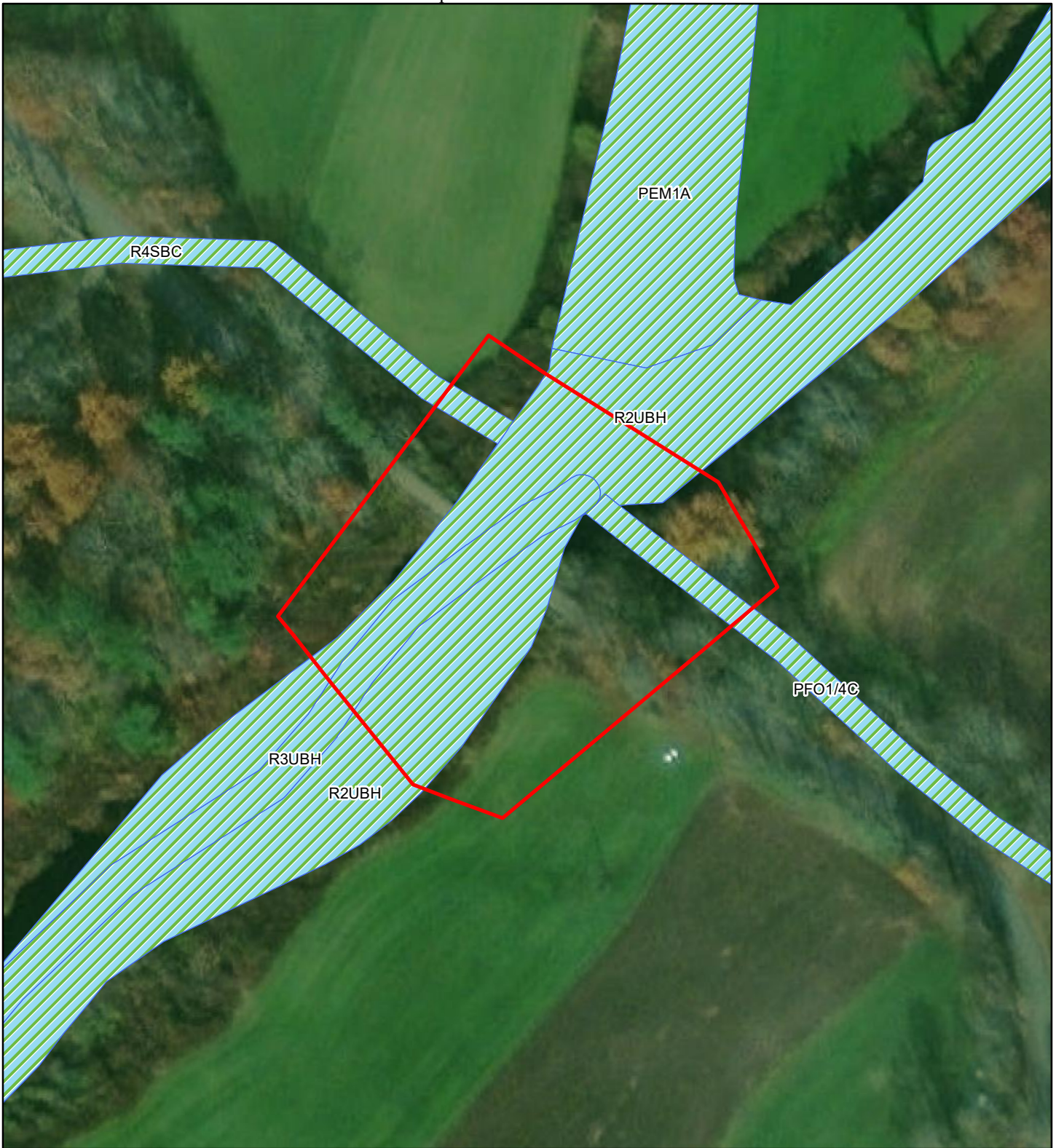
Legend

Project Area Soil Type / Boundary

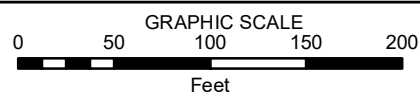
DRAWN BY: SMS	PROJECT NO: 2100472.003
CHECKED BY: WW	
SCALE: 1:1,200	Figure 3
Architecture Engineering Environmental Land Surveying	355 Research Parkway Meriden, CT 06450-7100 (203) 630-1406

Unitas Road, Hardwick / New Braintree, Massachusetts

Document Path: G:\JOBS21\04\2100472\+ASSIGNMENTS\ASSIGNMENT 3 - Hardwick_New Braintree\GIS\MXD\3. Soil Survey Map.mxd



UNITAS ROAD OVER WARE RIVER PROJECT - NWI & MA WETLANDS MAP



Legend

-  Project Area
-  MA Wetlands
-  NWI Wetlands

DRAWN BY:
SMS

CHECKED BY:
WW

SCALE:
1:1,200



PROJECT NO:
2100472.003

Figure 4

355 Research Parkway
Meriden, CT 06450-7100
(203) 630-1406

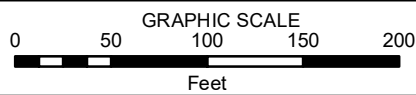
Unitas Road, Hardwick / New Braintree, Massachusetts

Document Path: G:\JOBS21\04\2100472\+ASSIGNMENTS\ASSIGNMENT 3 - Hardwick_New Braintree\GIS\MXD\4. NWI Map.mxd

AREA NOT INCLUDED IN
DIGITAL FLOOD HAZARD MAPPING
FIRM Panel 2503200002B
Effective Date 6/15/1984



UNITAS ROAD OVER WARE RIVER PROJECT - FEMA MAP



Legend

Project Area Area Not Included

DRAWN BY:
SMS

CHECKED BY:
WW

PROJECT NO:
2100472.003

SCALE:
1:1,200

Figure 5

Architecture
Engineering
Environmental
Land Surveying

355 Research Parkway
Meriden, CT 06450-7100
(203) 630-1406




Unitas Road, Hardwick / New Braintree, Massachusetts

Document Path: G:\JOBS21\04\2100472\+ASSIGNMENTS\ASSIGNMENT 3 - Hardwick_New Braintree\GIS\MXD\5. FEMA Map.mxd

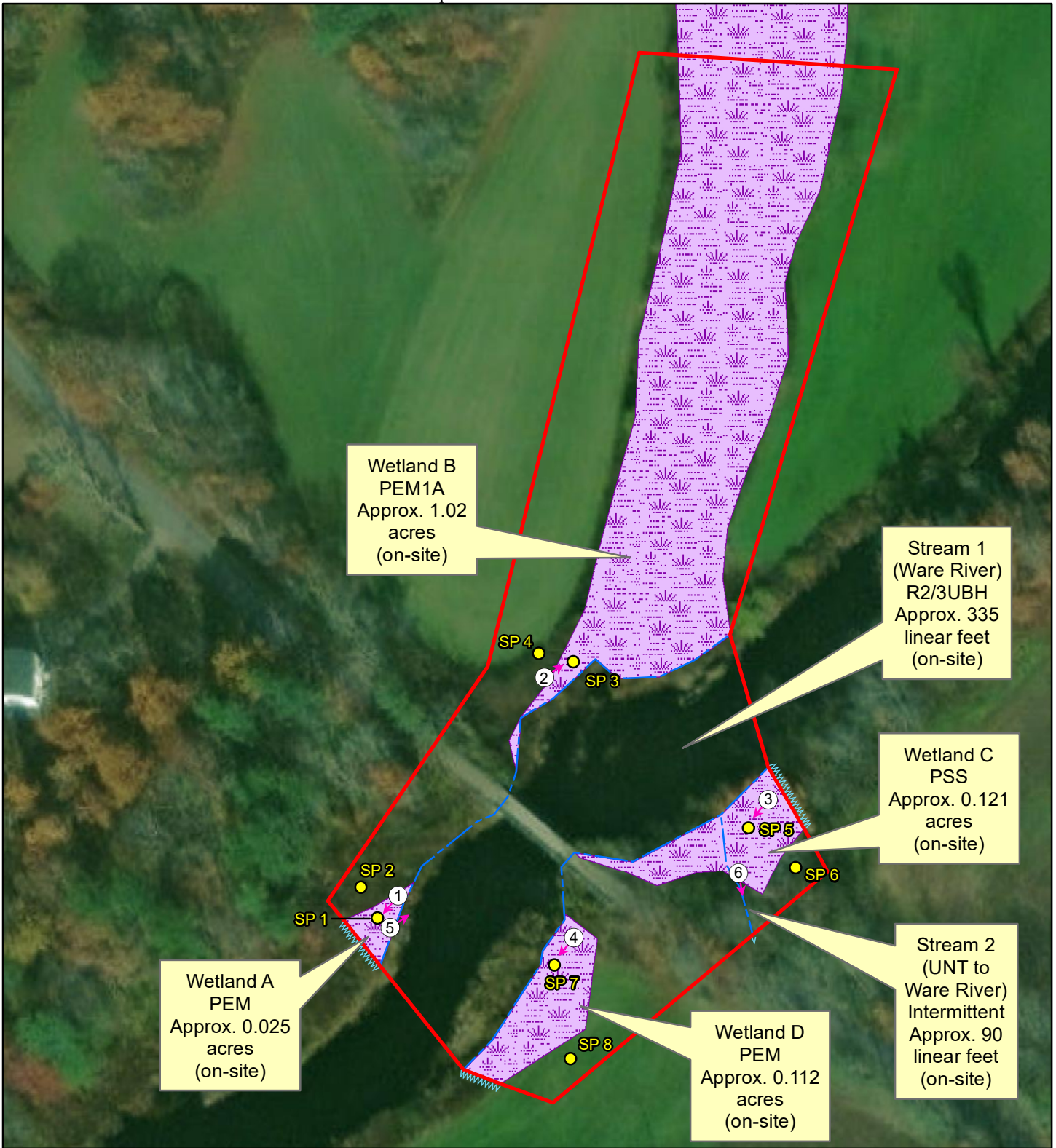


UNITAS ROAD OVER WARE RIVER PROJECT - AERIAL IMAGERY MAP



<p>GRAPHIC SCALE</p> <p>0 50 100 150 200</p> <p>Feet</p>		<p>DRAWN BY: SMS</p> <p>CHECKED BY: WW</p>	<p>PROJECT NO: 2100472.003</p>
<p>Legend</p> <p> Project Area</p>		<p>SCALE: 1:1,200</p>	<p>Figure 6</p>
<p>Unitas Road, Hardwick / New Braintree, Massachusetts</p>			<p>355 Research Parkway Meriden, CT 06450-7100 (203) 630-1406</p>

Document Path: G:\JOBS21\04\2100472\+ASSIGNMENTS\ASSIGNMENT 3 - Hardwick_New Braintree\GIS\MXD\6. Aerial Imagery Map.mxd



UNITAS ROAD OVER WARE RIVER PROJECT - FIELD DATA LOCATION MAP



<p>GRAPHIC SCALE</p> <p>0 50 100 150 200</p> <p>Feet</p>		<p>DRAWN BY: SMS</p>	<p>PROJECT NO: 2100472.003</p>
<p>Legend</p> <p> Project Area</p> <p> Sample Point (SP)</p> <p> Photo Number / Direction</p> <p> Delineated Streams</p> <p> Delineated Wetlands</p> <p> Continuous Features</p>		<p>CHECKED BY: WW</p>	<p>SCALE: 1:1,200</p>
<p>Unitas Road, Hardwick / New Braintree, Massachusetts</p>		<p> Architecture Engineering Environmental Land Surveying Companies</p>	<p>355 Research Parkway Meriden, CT 06450-7100 (203) 630-1406</p>

Document Path: G:\JOBS21\04\2100472\+ASSIGNMENTS\ASSIGNMENT 3 - Hardwick_New Braintree\GIS\MXD\7. Field Data Location Map.mxd

APPENDIX B

Color Photographs



Architecture
Engineering
Environmental
Land Surveying

MassDOT
Unitas Road Over Ware River
Hardwick / New Braintree, Massachusetts
Photographic Documentation

Photo # 1

Date: March 28, 2023

Direction: Southwest

Description

Southwestern view of Wetland A, a PEM riparian area.



Photo # 2

Date: March 28, 2023

Direction: Northeast

Description

Northeastern view of Wetland B, a PEM riparian area.





Architecture
Engineering
Environmental
Land Surveying

**MassDOT
Unitas Road Over Ware River
Hardwick / New Braintree, Massachusetts
Photographic Documentation**

Photo # 3

Date: March 28, 2023

Direction: Southwest

Description

Southwestern view of Wetland C, a PSS riparian area.



Photo # 4

Date: March 28, 2023

Direction: Southwest

Description

Southwestern view of Wetland D, a PEM riparian area.





Architecture
Engineering
Environmental
Land Surveying

MassDOT
Unitas Road Over Ware River
Hardwick / New Braintree, Massachusetts
Photographic Documentation

Photo # 5

Date: March 28, 2023

Direction: Northeast

Description

Northeastern view of Stream 1 (Ware River).



Photo # 6

Date: March 28, 2023

Direction: Southeast

Description

Southeastern view of Stream 2 (UNT to Ware River).



APPENDIX C

Data Forms

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Unitas Road over Ware River City/County: Hardwick / New Braintree / Worcester Sampling Date: 3/28/2023
 Applicant/Owner: MassDOT State: MA Sample Point: SP 1
 Investigator(s): Sagan M. Simko, CPSS, PWS Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 2
 Subregion (LRR or MLRA): LRR R, MLRA 144A Lat: 42.32082 Long: -72.17512 Datum: NAD83
 Soil Map Unit Name: Hinckley loamy sand, 0 to 3 percent slopes (253A) NWI Classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____ If yes, optional Wetland Site ID: <u>Wetland A</u>
Remarks: (Explain alternative procedures here or in a separate report) Sample Point 1 is a Palustrine, Emergent (PEM) wetland point, located in the northwestern portion of the Project Area.	

HYDROLOGY

Wetland hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>3</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>2</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
--	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: A positive indication of wetland hydrology was observed (primary and secondary indicators were present).	
---	--

VEGETATION (Four Strata) - Use scientific names of plants.Sampling Point: SP 1

Tree Stratum	Absolute % cover	Dominant Species?	Indicator Status																																	
(Plot size: <u>30 ft.</u>)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)																																
1. <i>None observed</i>																																				
2.																																				
3.																																				
4.																																				
5.																																				
6.																																				
7.																																				
	<u>0</u>	= Total Cover		Prevalence Index Worksheet: <table style="width: 100%;"> <tr> <td colspan="2">Total % Cover of:</td> <td colspan="2">Multiply by:</td> </tr> <tr> <td>OBL species</td> <td><u>60</u></td> <td>x 1 =</td> <td><u>60</u></td> </tr> <tr> <td>FACW species</td> <td><u>40</u></td> <td>x 2 =</td> <td><u>80</u></td> </tr> <tr> <td>FAC species</td> <td><u>0</u></td> <td>x 3 =</td> <td><u>0</u></td> </tr> <tr> <td>FACU species</td> <td><u>0</u></td> <td>x 4 =</td> <td><u>0</u></td> </tr> <tr> <td>UPL species</td> <td><u>0</u></td> <td>x 5 =</td> <td><u>0</u></td> </tr> <tr> <td>Column Totals:</td> <td><u>100</u></td> <td>(A)</td> <td><u>140</u> (B)</td> </tr> <tr> <td colspan="2">Prevalence Index = B/A =</td> <td colspan="2"><u>1.40</u></td> </tr> </table>	Total % Cover of:		Multiply by:		OBL species	<u>60</u>	x 1 =	<u>60</u>	FACW species	<u>40</u>	x 2 =	<u>80</u>	FAC species	<u>0</u>	x 3 =	<u>0</u>	FACU species	<u>0</u>	x 4 =	<u>0</u>	UPL species	<u>0</u>	x 5 =	<u>0</u>	Column Totals:	<u>100</u>	(A)	<u>140</u> (B)	Prevalence Index = B/A =		<u>1.40</u>	
Total % Cover of:		Multiply by:																																		
OBL species	<u>60</u>	x 1 =	<u>60</u>																																	
FACW species	<u>40</u>	x 2 =	<u>80</u>																																	
FAC species	<u>0</u>	x 3 =	<u>0</u>																																	
FACU species	<u>0</u>	x 4 =	<u>0</u>																																	
UPL species	<u>0</u>	x 5 =	<u>0</u>																																	
Column Totals:	<u>100</u>	(A)	<u>140</u> (B)																																	
Prevalence Index = B/A =		<u>1.40</u>																																		
Sapling/Shrub Stratum																																				
(Plot size: <u>15 ft.</u>)																																				
1. <i>None observed</i>																																				
2.																																				
3.																																				
4.																																				
5.																																				
6.																																				
7.																																				
	<u>0</u>	= Total Cover																																		
Herb Stratum				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤ 3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																																
(Plot size: <u>5 ft.</u>)																																				
1. <i>Persicaria sagittata</i>	<u>60</u>	<u>Yes</u>	<u>OBL</u>																																	
2. <i>Phalaris arundinacea</i>	<u>20</u>	<u>Yes</u>	<u>FACW</u>																																	
3. <i>Onoclea sensibilis</i>	<u>20</u>	<u>Yes</u>	<u>FACW</u>																																	
4.																																				
5.																																				
6.																																				
7.																																				
8.																																				
9.																																				
10.																																				
11.																																				
12.																																				
	<u>100</u>	= Total Cover																																		
Woody Vine Stratum				Definitions of Five Vegetation Strata: Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH) regardless of height. Sapling/Shrub - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine - All woody vines greater than 3.28 ft in height.																																
(Plot size: <u>30 ft.</u>)																																				
1. <i>None observed</i>																																				
2.																																				
3.																																				
4.																																				
	<u>0</u>	= Total Cover																																		

Remarks:

The hydrophytic vegetation criterion has been met.

[illegible]

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Unitas Road over Ware River City/County: Hardwick / New Braintree / Worcester Sampling Date: 3/28/2023
 Applicant/Owner: MassDOT State: MA Sample Point: SP 2
 Investigator(s): Sagan M. Simko, CPSS, PWS Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 4
 Subregion (LRR or MLRA): LRR R, MLRA 144A Lat: 42.32088 Long: -72.17516 Datum: NAD83
 Soil Map Unit Name: Hinckley loamy sand, 0 to 3 percent slopes (253A) NWI Classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <u>X</u> Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report) Sample Point 2 is a forested Upland (UPL) point, located in the northwestern portion of the Project Area.	

HYDROLOGY

Wetland hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
---	---

Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
--	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No primary or secondary indicators were present; therefore, the hydrology criterion has not been met.

VEGETATION (Four Strata) - Use scientific names of plants.Sampling Point: **SP 2**

<u>Tree Stratum</u> (Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <u>Betula lenta</u>	<u>20</u>	<u>Yes</u>	<u>FACU</u>
2. <u>Pinus strobus</u>	<u>20</u>	<u>Yes</u>	<u>FACU</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
	<u>40</u> = Total Cover		

<u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <u>Lonicera japonica</u>	<u>70</u>	<u>Yes</u>	<u>FACU</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
	<u>70</u> = Total Cover		

<u>Herb Stratum</u> (Plot size: <u>5 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <u>Lamium amplexicaule</u>	<u>5</u>	<u>Yes</u>	<u>NI</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
	<u>5</u> = Total Cover		

<u>Woody Vine Stratum</u> (Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <u>Vitis labrusca</u>	<u>5</u>	<u>Yes</u>	<u>FACU</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
	<u>5</u> = Total Cover		

Dominance Test worksheet:

Number of Dominant Species
That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant
Species Across All Strata: 4 (B)

Percent of Dominant Species
That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>0</u>	x 2 = <u>0</u>
FAC species <u>0</u>	x 3 = <u>0</u>
FACU species <u>115</u>	x 4 = <u>460</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>115</u> (A)	<u>460</u> (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- 2 - Dominance Test is >50%
- 3 - Prevalence Index is $\leq 3.0^1$
- 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH) regardless of height.

Sapling/Shrub - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic**Vegetation**

Present? Yes _____ No X

Remarks:

The hydrophytic vegetation criterion has not been met.

[illegible]

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Unitas Road over Ware River City/County: Hardwick / New Braintree / Worcester Sampling Date: 3/28/2023
 Applicant/Owner: MassDOT State: MA Sample Point: SP 3
 Investigator(s): Sagan M. Simko, CPSS, PWS Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 2
 Subregion (LRR or MLRA): LRR R, MLRA 144A Lat: 42.32132 Long: -72.17459 Datum: NAD83
 Soil Map Unit Name: Hinckley loamy sand, 0 to 3 percent slopes (253A) NWI Classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____ If yes, optional Wetland Site ID: Wetland B
Remarks: (Explain alternative procedures here or in a separate report) Sample Point 3 is a Palustrine, Emergent, Persistent, Temporarily Flooded (PEM1A) wetland point, located in the northeastern portion of the Project Area.	

HYDROLOGY

Wetland hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>3</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>2</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

A positive indication of wetland hydrology was observed (primary and secondary indicators were present).

VEGETATION (Four Strata) - Use scientific names of plants.Sampling Point: **SP 3**

Tree Stratum	Absolute % cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
(Plot size: 30 ft.)				
1. <i>None observed</i>				Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
2. _____				Total Number of Dominant Species Across All Strata: 2 (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)
4. _____				
5. _____				
6. _____				
7. _____				
	0	= Total Cover		
				Prevalence Index Worksheet:
Sapling/Shrub Stratum				
(Plot size: 15 ft.)				
1. <i>None observed</i>				Total % Cover of: 20 x 1 = 20
2. _____				FACW species 80 x 2 = 160
3. _____				FAC species 0 x 3 = 0
4. _____				FACU species 0 x 4 = 0
5. _____				UPL species 0 x 5 = 0
6. _____				Column Totals: 100 (A) 180 (B)
7. _____				
	0	= Total Cover		Prevalence Index = B/A = 1.80
				Hydrophytic Vegetation Indicators:
Herb Stratum				
(Plot size: 5 ft.)				
1. <i>Phalaris arundinacea</i>	60	Yes	FACW	<input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation
2. <i>Onoclea sensibilis</i>	20	Yes	FACW	<input checked="" type="checkbox"/> 2 - Dominance Test is >50%
3. <i>Persicaria sagittata</i>	10	No	OBL	<input checked="" type="checkbox"/> 3 - Prevalence Index is ≤ 3.0 ¹
4. <i>Juncus effusus</i>	10	No	OBL	4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
5. _____				Problematic Hydrophytic Vegetation ¹ (Explain)
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
	100	= Total Cover		¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
				Definitions of Five Vegetation Strata:
Woody Vine Stratum				
(Plot size: 30 ft.)				
1. <i>None observed</i>				Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH) regardless of height.
2. _____				Sapling/Shrub - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.
3. _____				Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
4. _____				Woody vine - All woody vines greater than 3.28 ft in height.
	0	= Total Cover		
				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____

Remarks:

The hydrophytic vegetation criterion has been met.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 3/2	100					Loamy Sand	
3-18	10YR 6/2	80	10YR 5/6	20	C	M	Loamy Sand	
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.					² Location: PL=Pore Lining, M=Matrix.			
Hydric Soils Indicators:					Indicators for Problematic Hydric Soils ³ :			
<input type="checkbox"/> Histosol (A1)			<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R,		<input type="checkbox"/> 2 cm Muck (A10) (LRR K, L, MLRA 149B)			
<input type="checkbox"/> Histic Epipedon (A2)			MLRA 149B)		<input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)			
<input type="checkbox"/> Black Histic (A3)			<input type="checkbox"/> Thin Dark Surface (S9) (LRR R, MLRA 149B)		<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)			
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L)		<input type="checkbox"/> Dark Surface (S7) (LRR K, L)			
<input type="checkbox"/> Stratified Layers (A5)			<input type="checkbox"/> Loamy Gleyed Matrix (F2)		<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR K, L)			
<input type="checkbox"/> Depleted Below Dark Surface (A11)			<input checked="" type="checkbox"/> Depleted Matrix (F3)		<input type="checkbox"/> Thin Dark Surface (S9) (LRR K, L)			
<input type="checkbox"/> Thick Dark Surface (A12)			<input type="checkbox"/> Redox Dark Surface (F6)		<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)			
<input type="checkbox"/> Sandy Mucky Mineral (S1)			<input type="checkbox"/> Depleted Dark Surface (F7)		<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149B)			
<input type="checkbox"/> Sandy Gleyed Matrix (S4)			<input type="checkbox"/> Redox Depressions (F8)		<input type="checkbox"/> Mesic Spodic (TA6) (MLRA 144A, 145, 149B)			
<input type="checkbox"/> Sandy Redox (S5)					<input type="checkbox"/> Red Parent Material (F12)			
<input type="checkbox"/> Stripped Matrix (S6)					<input type="checkbox"/> Very Shallow Dark Surface (F22)			
<input type="checkbox"/> Dark Surface (S7) (LRR R, MLRA 149B)					<input type="checkbox"/> Other (Explain in Remarks)			
³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.								
Restrictive Layer (if observed):								
Type: _____								
Depth (inches): _____						Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____		
Remarks:								
<p>A positive indication of hydric soil was observed.</p>								

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Unitas Road over Ware River City/County: Hardwick / New Braintree / Worcester Sampling Date: 3/28/2023
 Applicant/Owner: MassDOT State: MA Sample Point: SP 4
 Investigator(s): Sagan M. Simko, CPSS, PWS Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 2
 Subregion (LRR or MLRA): LRR R, MLRA 144A Lat: 42.32134 Long: -72.17468 Datum: NAD83
 Soil Map Unit Name: Hinckley loamy sand, 0 to 3 percent slopes (253A) NWI Classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <u>X</u> Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report) Sample Point 4 is an herbaceous Upland (UPL) point, located in the northeastern portion of the Project Area.	

HYDROLOGY

Wetland hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No primary or secondary indicators were present; therefore, the hydrology criterion has not been met.

VEGETATION (Four Strata) - Use scientific names of plants.Sampling Point: **SP 4**

<u>Tree Stratum</u> (Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>None observed</i>			
2.			
3.			
4.			
5.			
6.			
7.			
	<u>0</u> = Total Cover		

<u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>None observed</i>			
2.			
3.			
4.			
5.			
6.			
7.			
	<u>0</u> = Total Cover		

<u>Herb Stratum</u> (Plot size: <u>5 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>Dactylis glomerata</i>	100	Yes	FACU
2. <i>Rosa multiflora</i>	2	No	FACU
3. <i>Lamium amplexicaule</i>	2	No	NI
4. <i>Allium vineale</i>	2	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	<u>106</u> = Total Cover		

<u>Woody Vine Stratum</u> (Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>None observed</i>			
2.			
3.			
4.			
	<u>0</u> = Total Cover		

Dominance Test worksheet:

Number of Dominant Species
That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant
Species Across All Strata: 1 (B)

Percent of Dominant Species
That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>0</u>	x 2 = <u>0</u>
FAC species <u>0</u>	x 3 = <u>0</u>
FACU species <u>104</u>	x 4 = <u>416</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>104</u> (A)	<u>416</u> (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- 2 - Dominance Test is >50%
- 3 - Prevalence Index is $\leq 3.0^1$
- 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH) regardless of height.

Sapling/Shrub - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic**Vegetation**

Present? Yes No X

Remarks:

The hydrophytic vegetation criterion has not been met.

[illegible]

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Unitas Road over Ware River City/County: Hardwick / New Braintree / Worcester Sampling Date: 3/28/2023
 Applicant/Owner: MassDOT State: MA Sample Point: SP 5
 Investigator(s): Sagan M. Simko, CPSS, PWS Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 2
 Subregion (LRR or MLRA): LRR R, MLRA 144A Lat: 42.32082 Long: -72.17512 Datum: NAD83
 Soil Map Unit Name: Merrimac fine sandy loam, 3 to 8 percent slopes (254B) NWI Classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____ If yes, optional Wetland Site ID: <u>Wetland C</u>
Remarks: (Explain alternative procedures here or in a separate report) Sample Point 5 is a Palustrine, Scrub-Shrub (PSS) wetland point, located in the southeastern portion of the Project Area.	

HYDROLOGY

Wetland hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>4</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

A positive indication of wetland hydrology was observed (primary and secondary indicators were present).

VEGETATION (Four Strata) - Use scientific names of plants.

Sampling Point: SP 5

Tree Stratum	Absolute % cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
(Plot size: <u>30 ft.</u>)				
1. <i>None observed</i>				Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)
2. _____				Total Number of Dominant Species Across All Strata: <u>2</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
4. _____				
5. _____				
6. _____				
7. _____				
	<u>0</u> = Total Cover			
				Prevalence Index Worksheet:
Sapling/Shrub Stratum				
(Plot size: <u>15 ft.</u>)				
1. <i>Cornus sericea</i>	<u>20</u>	<u>Yes</u>	<u>NI</u>	Total % Cover of: _____ Multiply by: _____
2. _____				OBL species <u>25</u> x 1 = <u>25</u>
3. _____				FACW species <u>60</u> x 2 = <u>120</u>
4. _____				FAC species <u>0</u> x 3 = <u>0</u>
5. _____				FACU species <u>0</u> x 4 = <u>0</u>
6. _____				UPL species <u>0</u> x 5 = <u>0</u>
7. _____				Column Totals: <u>85</u> (A) <u>145</u> (B)
	<u>20</u> = Total Cover			Prevalence Index = B/A = <u>1.71</u>
				Hydrophytic Vegetation Indicators:
Herb Stratum				
(Plot size: <u>5 ft.</u>)				
1. <i>Phalaris arundinacea</i>	<u>60</u>	<u>Yes</u>	<u>FACW</u>	<input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation
2. <i>Juncus effusus</i>	<u>20</u>	<u>Yes</u>	<u>OBL</u>	<input checked="" type="checkbox"/> 2 - Dominance Test is >50%
3. <i>Symplocarpus foetidus</i>	<u>5</u>	<u>No</u>	<u>OBL</u>	<input checked="" type="checkbox"/> 3 - Prevalence Index is ≤ 3.0 ¹
4. _____				<u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
5. _____				<u>Problematic Hydrophytic Vegetation¹ (Explain)</u>
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
	<u>85</u> = Total Cover			¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
				Definitions of Five Vegetation Strata:
Woody Vine Stratum				
(Plot size: <u>30 ft.</u>)				
1. <i>None observed</i>				Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH) regardless of height.
2. _____				Sapling/Shrub - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.
3. _____				Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
4. _____				Woody vine - All woody vines greater than 3.28 ft in height.
	<u>0</u> = Total Cover			
				Hydrophytic Vegetation
				Present? Yes <u>X</u> No _____

Remarks:

The hydrophytic vegetation criterion has been met.

[illegible]

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Unitas Road over Ware River City/County: Hardwick / New Braintree / Worcester Sampling Date: 3/28/2023
 Applicant/Owner: MassDOT State: MA Sample Point: SP 6
 Investigator(s): Sagan M. Simko, CPSS, PWS Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 4
 Subregion (LRR or MLRA): LRR R, MLRA 144A Lat: 42.32091 Long: -72.17401 Datum: NAD83
 Soil Map Unit Name: Merrimac fine sandy loam, 3 to 8 percent slopes (254B) NWI Classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <u>X</u> Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report) Sample Point 6 is a forested Upland (UPL) point, located in the southeastern portion of the Project Area.	

HYDROLOGY

Wetland hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%;"> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) </div> <div style="width: 50%;"> <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks) </div> </div>	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
--	---

Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No primary or secondary indicators were present; therefore, the hydrology criterion has not been met.

VEGETATION (Four Strata) - Use scientific names of plants.Sampling Point: **SP 6**

<u>Tree Stratum</u> (Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>Acer rubrum</i>	20	Yes	FAC
2. <i>Prunus serotina</i>	20	Yes	FACU
3. <i>Betula lenta</i>	20	Yes	FACU
4. <i>Quercus rubra</i>	20	Yes	FACU
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
	80 = Total Cover		

<u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>Lonicera japonica</i>	70	Yes	FACU
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
	70 = Total Cover		

<u>Herb Stratum</u> (Plot size: <u>5 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>Lamium amplexicaule</i>	10	Yes	NI
2. <i>Allium vineale</i>	10	Yes	FACU
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
	20 = Total Cover		

<u>Woody Vine Stratum</u> (Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>Vitis labrusca</i>	5	Yes	FACU
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
	5 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species
That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant
Species Across All Strata: 7 (B)

Percent of Dominant Species
That Are OBL, FACW, or FAC: 14% (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>0</u>	x 2 = <u>0</u>
FAC species <u>20</u>	x 3 = <u>60</u>
FACU species <u>145</u>	x 4 = <u>580</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>165</u> (A)	<u>640</u> (B)

Prevalence Index = B/A = 3.88

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- 2 - Dominance Test is >50%
- 3 - Prevalence Index is $\leq 3.0^1$
- 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH) regardless of height.

Sapling/Shrub - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic**Vegetation**

Present? Yes No X

Remarks:

The hydrophytic vegetation criterion has not been met.

[illegible]

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Unitas Road over Ware River City/County: Hardwick / New Braintree / Worcester Sampling Date: 3/28/2023
 Applicant/Owner: MassDOT State: MA Sample Point: SP 7
 Investigator(s): Sagan M. Simko, CPSS, PWS Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 2
 Subregion (LRR or MLRA): LRR R, MLRA 144A Lat: 42.32072 Long: -72.17461 Datum: NAD83
 Soil Map Unit Name: Lim very fine sandy loam, 0 to 3 percent slopes, frequently flooded (19A) NWI Classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____ If yes, optional Wetland Site ID: Wetland D
Remarks: (Explain alternative procedures here or in a separate report) Sample Point 7 is a Palustrine, Emergent (PEM) wetland point, located in the southwestern portion of the Project Area.	

HYDROLOGY

Wetland hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No <u>X</u> Water Table Present? Yes <u>X</u> No _____ Saturation Present? Yes <u>X</u> No _____ (includes capillary fringe)	Depth (inches): _____ Depth (inches): <u>6</u> Depth (inches): <u>4</u> Wetland Hydrology Present? Yes <u>X</u> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

A positive indication of wetland hydrology was observed (primary and secondary indicators were present).

VEGETATION (Four Strata) - Use scientific names of plants.Sampling Point: **SP 7**

Tree Stratum	Absolute % cover	Dominant Species?	Indicator Status																																	
(Plot size: 30 ft.)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)																																
1. <i>None observed</i>																																				
2.																																				
3.																																				
4.																																				
5.																																				
6.																																				
7.																																				
	<u>0</u>	= Total Cover																																		
Sapling/Shrub Stratum				Prevalence Index Worksheet: <table style="width: 100%;"> <tr> <td colspan="2">Total % Cover of:</td> <td colspan="2">Multiply by:</td> </tr> <tr> <td>OBL species</td> <td><u>80</u></td> <td>x 1 =</td> <td><u>80</u></td> </tr> <tr> <td>FACW species</td> <td><u>20</u></td> <td>x 2 =</td> <td><u>40</u></td> </tr> <tr> <td>FAC species</td> <td><u>0</u></td> <td>x 3 =</td> <td><u>0</u></td> </tr> <tr> <td>FACU species</td> <td><u>0</u></td> <td>x 4 =</td> <td><u>0</u></td> </tr> <tr> <td>UPL species</td> <td><u>0</u></td> <td>x 5 =</td> <td><u>0</u></td> </tr> <tr> <td>Column Totals:</td> <td><u>100</u></td> <td>(A)</td> <td><u>120</u> (B)</td> </tr> <tr> <td colspan="2">Prevalence Index = B/A =</td> <td colspan="2"><u>1.20</u></td> </tr> </table>	Total % Cover of:		Multiply by:		OBL species	<u>80</u>	x 1 =	<u>80</u>	FACW species	<u>20</u>	x 2 =	<u>40</u>	FAC species	<u>0</u>	x 3 =	<u>0</u>	FACU species	<u>0</u>	x 4 =	<u>0</u>	UPL species	<u>0</u>	x 5 =	<u>0</u>	Column Totals:	<u>100</u>	(A)	<u>120</u> (B)	Prevalence Index = B/A =		<u>1.20</u>	
Total % Cover of:		Multiply by:																																		
OBL species	<u>80</u>	x 1 =	<u>80</u>																																	
FACW species	<u>20</u>	x 2 =	<u>40</u>																																	
FAC species	<u>0</u>	x 3 =	<u>0</u>																																	
FACU species	<u>0</u>	x 4 =	<u>0</u>																																	
UPL species	<u>0</u>	x 5 =	<u>0</u>																																	
Column Totals:	<u>100</u>	(A)	<u>120</u> (B)																																	
Prevalence Index = B/A =		<u>1.20</u>																																		
(Plot size: 15 ft.)																																				
1. <i>None observed</i>																																				
2.																																				
3.																																				
4.																																				
5.																																				
6.																																				
7.																																				
	<u>0</u>	= Total Cover																																		
Herb Stratum				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤ 3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																																
(Plot size: 5 ft.)																																				
1. <i>Persicaria sagittata</i>	<u>60</u>	<u>Yes</u>	<u>OBL</u>																																	
2. <i>Phalaris arundinacea</i>	<u>20</u>	<u>Yes</u>	<u>FACW</u>																																	
3. <i>Juncus effusus</i>	<u>20</u>	<u>Yes</u>	<u>OBL</u>																																	
4.																																				
5.																																				
6.																																				
7.																																				
8.																																				
9.																																				
10.																																				
11.																																				
12.																																				
	<u>100</u>	= Total Cover																																		
Woody Vine Stratum				Definitions of Five Vegetation Strata: Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH) regardless of height. Sapling/Shrub - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine - All woody vines greater than 3.28 ft in height.																																
(Plot size: 30 ft.)																																				
1. <i>None observed</i>																																				
2.																																				
3.																																				
4.																																				
	<u>0</u>	= Total Cover																																		

Remarks:

The hydrophytic vegetation criterion has been met.

[illegible]

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Unitas Road over Ware River City/County: Hardwick / New Braintree / Worcester Sampling Date: 3/28/2023
 Applicant/Owner: MassDOT State: MA Sample Point: SP 8
 Investigator(s): Sagan M. Simko, CPSS, PWS Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 2
 Subregion (LRR or MLRA): LRR R, MLRA 144A Lat: 42.32054 Long: -72.17461 Datum: NAD83
 Soil Map Unit Name: Lim very fine sandy loam, 0 to 3 percent slopes, frequently flooded (19A) NWI Classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <u>X</u> Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report) Sample Point 8 is an herbaceous Upland (UPL) point, located in the southwestern portion of the Project Area.	

HYDROLOGY

Wetland hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes _____ No <u>X</u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks: No primary or secondary indicators were present; therefore, the hydrology criterion has not been met.		

VEGETATION (Four Strata) - Use scientific names of plants.Sampling Point: **SP 8**

<u>Tree Stratum</u> (Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>None observed</i>			
2.			
3.			
4.			
5.			
6.			
7.			
<u>0</u> = Total Cover			

<u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>None observed</i>			
2.			
3.			
4.			
5.			
6.			
7.			
<u>0</u> = Total Cover			

<u>Herb Stratum</u> (Plot size: <u>5 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>Dactylis glomerata</i>	100	Yes	FACU
2. <i>Lamium amplexicaule</i>	2	No	NI
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
<u>102</u> = Total Cover			

<u>Woody Vine Stratum</u> (Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>None observed</i>			
2.			
3.			
4.			
<u>0</u> = Total Cover			

Dominance Test worksheet:

Number of Dominant Species
That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant
Species Across All Strata: 1 (B)

Percent of Dominant Species
That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>0</u>	x 2 = <u>0</u>
FAC species <u>0</u>	x 3 = <u>0</u>
FACU species <u>100</u>	x 4 = <u>400</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>100</u> (A)	<u>400</u> (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- 2 - Dominance Test is >50%
- 3 - Prevalence Index is $\leq 3.0^1$
- 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH) regardless of height.

Sapling/Shrub - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic**Vegetation**

Present? Yes No X

Remarks:

The hydrophytic vegetation criterion has not been met.

[illegible]

BL Companies
 355 Research Parkway
 Meriden, CT 06450-7100
Waterbody Data Form

Feature ID: Stream 1

Feature Name: Ware River

Associated Wetland ID: Wetland A, Wetland B, Wetland C, Wetland D

Project Name/Number: Unitas Road Over Ware River Project		
Date: 03/28/2023	Client: MassDOT	Latitude/Longitude: 42.320995, -72.174680
Team: SMS	County/State: Worcester County, MA	Quad Name: Ware, MA

Waterbody Type:	<input type="checkbox"/> Lake	<input type="checkbox"/> Pond	<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Ag. Ditch	<input type="checkbox"/> Other				
Stream Flow:	<input type="checkbox"/> Fast	<input checked="" type="checkbox"/> Moderate	<input type="checkbox"/> Slow	<input type="checkbox"/> Very Slow	<input type="checkbox"/> None				
Flow Type:	<input checked="" type="checkbox"/> Perennial (Flows year-round)		<input type="checkbox"/> Ephemeral (Flows only in response to rainfall)						
	<input type="checkbox"/> Intermittent (Flows <3 months)		<input type="checkbox"/> Other						
Direction of Flow:	<input type="checkbox"/> N	<input type="checkbox"/> NE	<input type="checkbox"/> E	<input type="checkbox"/> SE	<input type="checkbox"/> S	<input checked="" type="checkbox"/> SW	<input type="checkbox"/> W	<input type="checkbox"/> NW	<input type="checkbox"/> No Flow
OHWM Width:	90' (Varies)								
Sinuosity:	<input type="checkbox"/> Braided	<input type="checkbox"/> Meandering	<input checked="" type="checkbox"/> Straight	<input type="checkbox"/> N/A					
Stream Width:	95' (Varies)								
Stream Depth:	1' – 10' (Varies)								
Bank Height:	Left:	1'—3' (Varies)							
(Looking Downstream)	Right:	1'—3' (Varies)							
Bank Slope (%):	Left:	45%							
(Looking Downstream)	Right:	45%							

Qualitative Attributes

Water Appearance:			
<input type="checkbox"/> Clear	<input type="checkbox"/> Turbid	<input type="checkbox"/> Sheen on Surface	<input type="checkbox"/> Floating Algal mats
<input checked="" type="checkbox"/> Slightly Turbid	<input type="checkbox"/> Very Turbid	<input type="checkbox"/> Greenish Color	<input type="checkbox"/> Obvious Surface Scum
<input type="checkbox"/> No Flow	<input type="checkbox"/> Other:		
Stream Substrate: Gravel, Silt			
Aquatic Habitats:			
<input type="checkbox"/> Sand Bar	<input type="checkbox"/> Gravel Riffles	<input checked="" type="checkbox"/> In-stream Emergent Plants	% Cover: 5%
<input type="checkbox"/> Gravel Bar	<input checked="" type="checkbox"/> Deep Pools	<input checked="" type="checkbox"/> In-stream Submerged Plants	% Cover: 5%
<input type="checkbox"/> Mud Bar	<input type="checkbox"/> Bank Root Systems	<input checked="" type="checkbox"/> Fringing Wetlands ¹	
<input type="checkbox"/> Undercut Banks	<input checked="" type="checkbox"/> Overhanging Trees/Shrubs	<input type="checkbox"/> None	
¹ Characteristics: Palustrine Emergent (PEM) & Palustrine Scrub-Shrub (PSS)			
Aquatic Organisms Observed: None			
Tributary Condition:			
<input checked="" type="checkbox"/> Natural	<input type="checkbox"/> Artificial (Man-Made)	<input checked="" type="checkbox"/> Manipulated	
Channel Condition:			
<input checked="" type="checkbox"/> Channelization/Braiding	<input type="checkbox"/> Unnatural Straightening	<input type="checkbox"/> Downcutting	
<input type="checkbox"/> Dikes/Berms	<input type="checkbox"/> Excessive Bank Erosion	<input type="checkbox"/> N/A	
Habitat Characteristics, Aquatic, and Terrestrial Diversity Description: Stream 1 flows in a southwesterly direction within the central portion of the study area. Stream 1 receives hydrology from Stream 2, Wetland A, Wetland B, Wetland C, Wetland D, as well as from adjacent uplands that consist of forested areas and active farm fields. Stream 1 is mostly straight with moderate flow velocity. The riparian zone of this stream consists of trees and shrubs and herbaceous plant areas. Stream 1 exhibited small areas of in-stream emergent plants and submerged plants. No macroinvertebrates observed.			
Stream Quality:	<input type="checkbox"/> High	<input checked="" type="checkbox"/> Moderate	<input type="checkbox"/> Low
Comments:			

BL Companies
 355 Research Parkway
 Meriden, CT 06450-7100
Waterbody Data Form

Feature ID: Stream 2

Feature Name: UNT to Ware River

Associated Wetland ID: Wetland C

Project Name/Number: Unitas Road Over Ware River Project		
Date: 03/28/2023	Client: MassDOT	Latitude/Longitude: 42.320852, -72.174141
Team: SMS	County/State: Worcester County, MA	Quad Name: Ware, MA

Waterbody Type:	<input type="checkbox"/> Lake	<input type="checkbox"/> Pond	<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Ag. Ditch	<input type="checkbox"/> Other				
Stream Flow:	<input type="checkbox"/> Fast	<input checked="" type="checkbox"/> Moderate	<input type="checkbox"/> Slow	<input type="checkbox"/> Very Slow	<input type="checkbox"/> None				
Flow Type:	<input type="checkbox"/> Perennial (Flows year-round)		<input type="checkbox"/> Ephemeral (Flows only in response to rainfall)						
	<input checked="" type="checkbox"/> Intermittent (Flows <3 months)		<input type="checkbox"/> Other						
Direction of Flow:	<input type="checkbox"/> N	<input type="checkbox"/> NE	<input type="checkbox"/> E	<input type="checkbox"/> SE	<input type="checkbox"/> S	<input type="checkbox"/> SW	<input type="checkbox"/> W	<input checked="" type="checkbox"/> NW	<input type="checkbox"/> No Flow
OHWM Width:	3' (Varies)								
Sinuosity:	<input type="checkbox"/> Braided	<input type="checkbox"/> Meandering	<input checked="" type="checkbox"/> Straight	<input type="checkbox"/> N/A					
Stream Width:	5' (Varies)								
Stream Depth:	1" – 3" (Varies)								
Bank Height:	Left:	6'—8' (Varies)							
(Looking Downstream)	Right:	6'—8' (Varies)							
Bank Slope (%):	Left:	45%							
(Looking Downstream)	Right:	50%							

Qualitative Attributes

Water Appearance:			
<input checked="" type="checkbox"/> Clear	<input type="checkbox"/> Turbid	<input type="checkbox"/> Sheen on Surface	<input type="checkbox"/> Floating Algal mats
<input type="checkbox"/> Slightly Turbid	<input type="checkbox"/> Very Turbid	<input type="checkbox"/> Greenish Color	<input type="checkbox"/> Obvious Surface Scum
<input type="checkbox"/> No Flow	<input type="checkbox"/> Other:		
Stream Substrate: Cobble, gravel, Silt			
Aquatic Habitats:			
<input type="checkbox"/> Sand Bar	<input type="checkbox"/> Gravel Riffles	<input checked="" type="checkbox"/> In-stream Emergent Plants	% Cover: 5%
<input type="checkbox"/> Gravel Bar	<input type="checkbox"/> Deep Pools	<input type="checkbox"/> In-stream Submerged Plants	% Cover:
<input type="checkbox"/> Mud Bar	<input type="checkbox"/> Bank Root Systems	<input checked="" type="checkbox"/> Fringing Wetlands ¹	
<input type="checkbox"/> Undercut Banks	<input checked="" type="checkbox"/> Overhanging Trees/Shrubs	<input type="checkbox"/> None	
¹ Characteristics: Palustrine Scrub-Shrub (PSS)			
Aquatic Organisms Observed: None			
Tributary Condition:			
<input checked="" type="checkbox"/> Natural	<input type="checkbox"/> Artificial (Man-Made)	<input checked="" type="checkbox"/> Manipulated	
Channel Condition:			
<input checked="" type="checkbox"/> Channelization/Braiding	<input type="checkbox"/> Unnatural Straightening	<input type="checkbox"/> Downcutting	
<input type="checkbox"/> Dikes/Berms	<input type="checkbox"/> Excessive Bank Erosion	<input type="checkbox"/> N/A	
Habitat Characteristics, Aquatic, and Terrestrial Diversity Description: Stream 2 flows in a northwesterly direction within the southeastern portion of the study area. Stream 2 receives hydrology from Wetland C and adjacent uplands that consist of forested areas and active farm fields. Stream 2 is mostly straight with moderate flow velocity. The riparian zone of this stream consists of trees and shrubs and herbaceous plant areas. Stream 2 exhibited small areas of in-stream emergent plants. No macroinvertebrates observed.			
Stream Quality:	<input type="checkbox"/> High	<input checked="" type="checkbox"/> Moderate	<input type="checkbox"/> Low
Comments:			

APPENDIX D

Professional Qualifications

SAGAN SIMKO, CPSS, PWS**RESUME****PROJECT ROLE**

Senior Project Scientist II

EDUCATION

Bachelor of Science (Environmental Resource Management), The Pennsylvania State University, 2005; Master of Science (Biology), Bloomsburg University of Pennsylvania, 2015

REGISTRATION

Certified Professional Soil Scientist (CPSS), 2012, #36359; Professional Wetland Scientist (PWS), 2012, #2284; API 1169 Certification, 2019, #91498

PROFESSIONAL MEMBERSHIPS

Soil Science Society of America, Society of Wetland Scientists

SUMMARY OF QUALIFICATIONS

Mr. Simko has approximately 14 years of experience in performing an array of wetland delineations and site assessments. His experience encompasses soil morphological evaluations, infiltration and percolation testing, wetland mitigation design and monitoring, Bog Turtle habitat identification, as well as threatened and endangered species surveys. In addition, he has completed carbonate geology site evaluations, identification of asbestos-containing material, and underground storage tank removals and investigations. Mr. Simko's computer skills include ArcGIS 10 and GPS Pathfinder Office. As a Senior Project Scientist II at BL Companies, Mr. Simko's responsibilities include wetland investigations, soil investigations, ground water investigations, Phase I site assessments, remediation related activities, remediation system monitoring and maintenance, and engineering compliance inspection for natural gas pipeline projects.

RELEVANT EXPERIENCE**Consultant Liaison Engineering Services for the State and Federal Local Bridge Program, Connecticut Department of Transportation, Statewide, Connecticut**

Served as Senior Project Scientist for several bridge rehabilitation and replacement projects for CTDOT across the state. Responsibilities included performing wetland delineations, function and values assessments, and bat habitat assessments at each bridge location where natural resources were identified as being within the proximity of proposed work. Additional responsibilities included attaining environmental permitting for the CTDEEP and U.S. ACOE, identifying invasive species, and coordination for listed species.

Amazon.com Services LLC, DEB3 – Delivery Station Buildout, Waterbury, Connecticut

Served as lead Soil Scientist and Wetlands Investigator for a proposed site redevelopment project. Responsibilities included reverification of wetland delineations and coordination with the City Planner for Waterbury, CT in order to move the project through the Inland Wetland Commission application process.

Hope Street Culvert Replacement, City of Stamford, Connecticut

Served as lead Wetland Investigator for an emergency culvert replacement project in the vicinity of Hope Street & Mead Street, Stamford Connecticut.

4-Lot Subdivision Inland Wetland Commission Peer-Review Stratford, Connecticut

Served as lead Soil and Wetland Scientist in the performance of a peer review of a proposed 4-lot subdivision application submission to the Inland Wetland Commission of Stratford, CT.

Avangrid – Wetland Delineations and Vernal Pool Investigation Within Metro North Railroad Corridor, West Port to New Haven, CT

Served as lead Soil and Wetland Scientist and Biologist in the performance of survey work for wetlands and vernal pool areas along the railroad corridor between West Port and New Haven, CT.

Simmonsville Bridge Replacement, Rhode Island Department of Transportation, Johnston, Rhode Island

Served as Senior Project Scientist, with responsibilities including wetlands delineation, function and values assessment, bat habitat assessments, and close coordination with the bridge designer in order to submit environmental permit documentation on a fast-track basis.

Route 37 Bridge Rehabilitations and Replacements, Rhode Island Department of Transportation, Warwick and Cranston, Rhode Island

Served as Senior Project Scientist, with responsibilities including wetlands delineation, function and values assessment and close coordination with the bridge designer in order to submit environmental permit documentation on a fast-track basis.

Williams, Transco Pipeline, Atlantic Sunrise Pipeline Project, Various Counties, Pennsylvania

Serves as Senior Engineering Compliance Inspector within Columbia County, PA. Served as Senior Project Scientist for the completion of soil test pit evaluations and stormwater detention basin infiltration testing for compressor station sites throughout the state.

Kinder Morgan, Utopia Pipeline, Various Counties, Ohio

Serves as Senior Project Scientist for an approximately 225-miles ethane/propane pipeline through northern Ohio. Responsibilities include conducting wetland, soils and natural resource studies.

Dominion Energy, Atlantic Coast Pipeline, Various Counties, West Virginia & Virginia

Served as an Environmental Scientist and conducted wetland screenings, delineations, permitting, and mitigation design and monitoring for 130 miles of natural gas pipeline projects for the Krause and Wellsboro pipelines.

SWEPI (Shell), Various Counties, Pennsylvania

As an Environmental Scientist, Mr. Simko conducted wetland screenings, delineations, permitting, and mitigation design and monitoring for 130 miles of natural gas pipeline projects for the Krause and Wellsboro pipelines. Services were completed in 2015.

Hilcorp & Cabot Natural Gas, Various Natural Gas Well Pads & Pipeline Projects, Various Counties, Pennsylvania

As E&S inspector, Mr. Simko conducted E&S inspections at various natural gas well pads and gathering pipeline projects located in the northern tier and southwestern portions of Pennsylvania. His duties involved preparing inspection reports and photo documentation. Services were completed in 2014.

PVR Natural Gas Gathering, Various Natural Gas Well Pads & Pipeline Projects, Susquehanna & Wyoming Counties, Pennsylvania

Served as the Environmental Scientist responsible for wetland screenings and delineations for another company to install a gas pipeline at their facility, as well as various other natural gas pipeline and well pad projects throughout northern Wyoming County and Susquehanna County in Pennsylvania. Services were completed in 2013.

Williams (Access) Midstream Company, Various Natural Gas Well Pad Sites, Columbia County, Pennsylvania

Served as the Environmental Scientist responsible for wetland screenings and delineations, as well as threatened and endangered species habitat assessments, for various natural gas well pad sites within Columbia County, Pennsylvania. Services were completed in 2013.

PP&L Susquehanna to Roseland 500 KV Electric Transmission Line, Pennsylvania

Served as the Environmental Scientist responsible for wetland delineations, as well as threatened and endangered species habitat assessments, for a large segment of electric transmission line within Pennsylvania of the PPL Electric Utilities project known as the Susquehanna-Roseland Line. Firm of Record: Woodland Design Associates, Inc., Honesdale, Pennsylvania

WESLEY G. WOLF**RESUME****PROJECT ROLE**

Senior Project Manager

EDUCATION

BS, Biology, 1992, West Chester University

CERTIFICATIONS / TRAINING

PA Fish & Boat Commission Scientific Collector's Permit

PA DCNR Wild Plant Management Permit

OSHA 40-Hour Hazardous Waste Site Training CFR29 1910.120, 1986

OSHA 8-Hour Refresher Training for Hazardous Waste Sites, 1987-2021

PA DEP Certified Drinking Water Laboratory Director 1996-2007

Pollution Biology, Penn State University, 2002

Environmental Law, Penn State University, 2001

Wetlands Ecology, Penn State University, 2001

SUMMARY OF QUALIFICATIONS

Mr. Wolf specializes in building client trust and enduring relationships within the environmental studies and permitting sections across multiple disciplines of the engineering field. His overall experience is focused on natural resources evaluations to include wetlands and aquatic resources, overseeing groups conducting wetland delineations, permitting, mitigation, and plant and animal surveys. Additional responsibilities include managing large scale projects with multi-disciplined teams to accomplish client permitting and site evaluation goals. Technical background includes experience with studies in terrestrial ecology and botany, environmental compliance monitoring, and construction oversight during and after completion of construction projects.

Mr. Wolf has extensive experience leading teams that interface with the multiple state, local and federal regulatory agencies, including the U.S. Army Corps of Engineers (USACE), state environmental protection departments, the US Environmental Protection Agency (USEPA) Inland Wetland Commissions (IWC) as part of ongoing project coordination for multi-faceted development, energy generation and transmission projects. Team lead and project manager for linear energy siting and routing projects over thousands of acres throughout the northeast down through Florida and into the Midwestern states.

RELEVANT EXPERIENCE**City of Stratford CT Inland Wetland Commission Review**

Conducted third party review of a proposed residential development that was proposed near a Tier 1 vernal pool and associated inland freshwater wetland. The City of Stratford's Inland Wetland Commission had requested a third-party review of a development proposed near a sensitive resource and surrounding neighborhood. Reviewed and critiqued proposed impacts from stormwater, on site septic and proximity to bedrock and informed how these components may have impact on the wetlands at the site. There were approximately 25 different negative components identified and presented to the IWC, which helped the IWC to determine that the development needed significant improvement before it could be approved.

Pameacha Pond Dam Removal Project, Middletown, CT

Conduct dam and natural resources assessment and developed a containment plan to ensure that the invasive northern snakehead fish was contained within the impoundment area of the Pameacha Pond. Work with stream restoration team to develop a post dam removal restoration strategy including evaluating an upstream reference reach using horizontal surveys and channel evaluation.

Metro North Railroad Catenary Bonnet Replacement Project-Fairfield to Bridgeport, CT

Oversee and lead natural resources (NR) investigations along the Metro North Railroad as part of electric transmission line support upgrades. NR investigations included vernal pool surveys and identification of obligate species or eggs present in pools as indicator species, inland wetlands delineations and tidal wetlands delineations using both high, high tide lines coupled with vegetative transition demarcations as identified in the field.

Multiple Solar Sites, CT

Oversee and direct natural resources team to conduct wetland delineations, functions and values assessments and habitat surveys for multiple sites located throughout Connecticut. Field delineations are conducted utilizing the US Army Corps of Engineers 1987 Wetland Delineation Manual (Environmental Laboratory, 1987) along with the appropriate Regional

Supplements. The CT hydric or poorly drained soils delineation line is included in the final report mapping to align with both state and federal guidance in mapping wetland areas. Interface with various Inland Wetland Commission (IWC) within different local jurisdictions

Thin Layer Placement Marsh Restoration, Old Lyme CT

Lead mitigation options discussion, research methodologies and present white paper to the USACE - New England District, the Connecticut Department of Energy and Environmental Protection (CTDEEP) and Office of Environmental Protection within the CTDOT. Prepare research teams to conduct onsite testing, locate potential dredge material sources, interface with multiple state, federal and private entities to corroborate feasibility of restoration design.

Natural Gas Transmission Installation, PG&CRRP, Maryland

Oversaw and conducted stream and wetlands field surveys, forest stand delineations, cultural resources surveys, mitigation site investigation and permitting assistance through a high-density residential area of Laurel through Waldorf MD of a proposed natural gas transmission line. Interfaced with MDE and the Baltimore Districts of the USACE to complete the field review of a jurisdictional determination for the pipeline route.

Natural Gas Transmission Line Replacement, Virginia and Maryland

Oversaw and conducted stream and wetlands field surveys along the VA and MD transmission line segments. T&E species clearances interfaced with Norfolk and Baltimore Districts of the USACE to document Nationwide Permit (NWP) and State Programmatic General Permit (SPGP) 5 Permit applicability for the projects. In-place state memorandums of agreements (MOAs) for ongoing maintenance activities within the transmission line right of way.

Gas Fired Power Generation Plant, Southern Virginia

Lead permitting for natural resources assessments including streams and wetlands, permitting for impact to streams and wetlands and mitigation bank identification and credit secure for wetlands and stream impacts. Oversaw field crews that conducted habitat surveys to provide documentation for clearance of U.S. Fish and Wildlife Service (USFWS) identified T&E species at the location and successfully permitted roadway impacts to the site.

Coal Combustion Residuals Remediation, Eastern Virginia

Lead natural resources team for identification of threatened and endangered (T&E) species reviews and field survey verification, guided and oversaw surveys for small whorled pogonia and northern long-eared bat, U.S. Fish and Wildlife Service (USFWS) eagle take and monitoring permitting, stream and wetlands surveys; utilizing the 1987 USACE Wetlands Delineation Manual and regional supplement for the Atlantic and Gulf Coastal Plain and the Unified Stream Methodology (USM) for the entire 489+ acre parcel. Procured the Jurisdictional Determination (JD) and successful Section 404/401 VDEQ permitting for impacts to streams and wetlands, including mitigation for impacts. Oversight of cultural resources surveys and interactions with the VDHR, which included archeological assessments of historic structures and Phase 1a for locations on site identified from desktop surveys. Completed and successfully fulfilled requirements for impacts to Resource Protection Areas (RPA's) under the County's Chesapeake Bay Preservation Act, including the Preservation Area Site Assessment (PASA) using the Fairfax method to conduct Perennial Flow Determinations (PFD) and the associated Water Quality Impact Assessment (WQIA) for encroachments into RPA's and mitigation for RPA impacts.

Pipeline Replacement and Relocation Projects, Northwest Pennsylvania

Project manager for multiple pipeline replacement projects within several Exceptional Value (EV) and wild trout streams located adjacent to wetlands. Oversaw and assisted field teams in delineating water resources, collecting Level Two Rapid Assessment (L2RA) data and compilation of the environmental assessment. Manage surveyors conducting rare, threatened or endangered species surveys for endangered plant and reptiles known to occur within the project boundaries. Facilitate, oversee preparation and final review for submittal of Joint Permit Application (JPA) and associated restoration plan in lieu of mitigation for impacts to water resources on the project. Interface with PA Department of Environmental Protection (PADEP) and USACE representative to conduct a jurisdictional determination (JD) for routes and permit successful JPA or general permit submittal. The projects' scope also included stream restoration, cultural resources clearances, NPDES permitting, construction

monitoring, environmental inspections and post construction monitoring of restored resources and impacted wetlands and streams.

12 Mitigation Sites, Northeast Pennsylvania

Served as project manager on inception to monitoring for 12 mitigation sites located in northeast Pennsylvania. Wetlands mitigation and stream restoration was required for 12 different pipeline projects located in Wyoming and Susquehanna County, PA. Oversaw and conducted site identification, met with landowners and secured approvals from the PADEP and USACE to construct the sites. Installed groundwater monitoring wells, performed initial assessments of the water resources and then designed the mitigation sites for construction. Selected the construction contractor and conducted oversight during construction. Performed post construction monitoring for each of the 12 successful mitigation and stream restoration locations.

Attachment E – WQC Specifications

- Item 102.30 – Herbicide Treatment of Invasive Plants
- Item 102.33 – Invasive Plant management Strategy
- Item 755.35 – Inland Wetland Replication Area
- Item 755.45 – Wetland Restoration
- Item 755.75 – Wetland Specialist
- Item 755.76 – Wetland Monitoring Reports
- Item 983.5 – Streambed and Bank Restoration
- Item 991.1 – Control of Water – Structure No. H-08-003=N-07-002
- MESA NHESP Determination & Contract Specifications



ITEM 102.3**HERBICIDE TREATMENT OF INVASIVE PLANTS****HOURL**

Work under this item consists of herbicide treatment of invasive plants currently existing within the project limits and as directed. An Invasive Plant Management Strategy (IPMS) shall be submitted to the Engineer for review and approval and the IPMS shall be implemented on-site. The IPMS shall be measured and paid for under Item 102.33 Invasive Plant Management Strategy.

Work under this item shall be coordinated with work and schedule for Selective Clearing, Clearing and Grubbing, Mowing, Tree Removal, Planting, and Wetland Mitigation items.

Payment is per hour on-site and shall be compensation for a minimum crew of 2 licensed applicators, 2 back-pack sprayers and mist-blowers, a properly equipped spray truck with spray hoses, and a tank with sufficient capacity for a full day of work. This item is not intended for manual removal of plants.

Management of plants determined to have been introduced to the site via imported loam, compost, mulch, plants, equipment, or other construction activities will be the Contractor's responsibility and at the Contractor's expense.

Herbicide shall be applied during daytime hours only.

Measures to prevent the introduction of invasive plant species to the site and to correct their introduction as a result of construction-related activities shall be covered under the Standard Specifications, Division I - Subsections 7.01(D) Plant Pest Control and 7.13 Protection and Restoration of Property as amended in these Special Provisions.

Plant species targeted for management under this item shall be as determined in the field per the site walk and as specified in the IPMS.

The definition of invasive plant species shall be as described by Massachusetts Invasive Plant Advisory Group (MIPAG): "non-native species that have spread into native or minimally managed plant systems in Massachusetts, causing economic or environmental harm by developing self-sustaining populations and becoming dominant and/or disruptive to those systems."

Control of invasive plants shall begin immediately with the initiation of construction activities and prior to any clearing or site disturbance. Treatment areas shall include stockpile locations and may, upon approval of the Engineer, extend outside the project limit. Treatment shall be done each consecutive year for the duration of the contract unless specified otherwise in the IPMS or unless directed otherwise by the MassDOT invasive species contact. Work shall be done during the growing season from May – October unless otherwise specified in the IPMS.

Areas identified for vegetation control measures shall be as shown on the plans and as determined in the field by the Engineer and a MassDOT Landscape Architect. Contact at MassDOT Landscape Design Section is: stephanie.smoot@state.ma.us.

SUBMITTALS

No work shall begin without approval of the submittals.

Within 15 business days prior to the site walk, the Contractor shall submit all qualifications to the Engineer for approval by MassDOT Landscape Design.

Submittals include the following items.

Qualifications

1. Company must provide proof of qualifications by providing the following:
 - a. Narrative describing company, its expertise and experience with invasive plant control.
 - b. Demonstrate experience with herbicide treatment as part of restorations and in sensitive areas
 - c. Describe company's technical qualifications and past performance.
2. Company must meet licensing requirements:
 - a. All crew applicators must have a Massachusetts Commercial Applicator License (CORE).
 - b. At least one or more applicator must have a ROW certification, if required for work.
 - c. Company must provide name(s) of applicator(s) and Applicator License/Certification number for all contractor crew leaders working on the project.
 - d. Company must provide documentation of any warnings, penalties or fines received in the last three (3) years.
3. Company must provide proof of experience with invasive plant control and include following:
 - a. At least five (5) references from prior invasive plant control work completed in last five (5) years. Provide contact information including address, phone number and email.
 - b. Provide a summary of each of these projects including nature of the problem, specific invasive vegetation treated, dates and period of treatment, methodologies used, and summary of success or not in terms of meeting performance objectives. Include summary of equipment used.
 - c. Photo documentation of these projects.
 - d. GPS coordinates of project locations, if available.
4. Crew leader must have expertise with invasive plant control and provide the following:
 - a. Have held Core license for at least five (5) years.
 - b. Resume listing five (5) or more years of experience applying pesticides with the company or with another company specializing in vegetation management.

The following companies are pre-approved by MassDOT Landscape Design Section:

Groundscapes Express, Inc.

P.O. Box 737

Wrentham, MA 02093

Contact: Butch Goodwin

Solitude Lake Management

590 Lake Street

Shrewsbury, MA 01545

Contact: Keith Gazaille

Email: butch@groundscapesexpress.com

Phone: 508-400-5366

Email: kgazaille@solitudelake.com

Phone: 508-885-0101

Land Stewardship, Inc.

PO Box 511

Turner Falls, MA 01376

Contact: Chris Polatin

Email: info@landstewardshipinc.com

Phone: 413-367-5292

SWCA Environmental Consultants

15 Research Drive

Contact: Scott Fisher

Phone: 413-658.2056

Email: sfisher@swca.com

Amherst, MA 01002

Native Habitat Restoration

P.O. Box 582

Stockbridge, MA 01262

Contact: Jess M. Toro : 413-358-7400

Email: nativehabitatrestoration@gmail.com

Phone: 413-394-0277

Vegetation Control Service, Inc.

2342 Main St.

Athol, MA 01331

Contact: Andrew Powers

Email: apowers@vegetationcontrol.com

Phone: 800-323-7706

Invasive Plant Management Strategy (IPMS)

At least thirty (30) days prior to proposed treatment the IPMS shall be submitted for approval by the Engineer and MassDOT Landscape Architect. All chemicals, methods and work done under this item shall be consistent with the IPMS. The IPMS shall be as described under Item 102.33.

Herbicide Use Report

Within two (2) weeks after each application, the Contractor shall provide to the Engineer a completed and signed MassDOT Herbicide Use Report.

Photo Documentation

Digital photos with date and time of herbicide application work may be required and shall be submitted upon request.

MATERIALS

All proposed herbicides shall be as approved in the IPMS. Herbicides shall be labeled for the method of treatment and shall meet all federal, state and local regulation requirements. Application rates will depend on herbicide proposed and shall be per the manufacturer's label for specific application.

METHODS

All methods used shall be as approved in the IPMS which shall be determined during the Initial Site Walk as described under Item 102.33 Invasive Plant Management Strategy.

The Contractor shall be responsible for marking delineated areas and plants to be preserved, removed, or otherwise treated. Fencing or other materials needed for marking and delineating protected areas shall be incidental to this item.

The Contractor shall notify the Engineer a minimum of 3 days prior to date of expected herbicide application. Applicators shall notify the Engineer upon arriving on-site.

Herbicide Applications

All herbicide application shall conform to Massachusetts Pesticide Laws and Regulations per the Massachusetts Department of Agricultural Resources (MDAR) Pesticide Bureau.

Mixing, applying and/or disposing of herbicides shall always be in accordance with instructions on their labels and all applicable federal, state, and local regulations. Mixing shall not occur within sensitive areas, wetlands, or buffer zones.

Contractor shall not spray 2 hours prior to precipitation, during rain, or during windy conditions. The Contractor shall be responsible for monitoring weather conditions and adjusting the work schedule as appropriate for the herbicide and application method to be used.

Targeted vegetation shall be identified and marked prior to treatment. Plants treated by foliar spray, injection or glove application or other methods that leave standing vegetation, as opposed to cut-stump application, shall remain clearly marked for identification through the contract period.

Desirable vegetation shall be protected from both spray and other physical damage.

Contractor is responsible for any damage to vegetation not designated for removal or treatment. Vegetation damaged shall be restored. Cost of replacement plants and/or restoration shall be borne by the Contractor.

Contractor shall ensure that the public does not enter a work area while herbicide application or spraying is underway.

Disposal Of Invasive Plant Material

All material to be cleared shall become the property of the Contractor. The satisfactory disposal of all cleared plant material (seeds, roots, woody vegetation, associated soils, etc.) shall be the Contractor's responsibility.

The Contractor shall take measures to prevent viable plant material from leading to further infestations (seeds, roots, woody material, etc.) while stockpiled, in transit, or at final disposal locations. All precautions shall be taken to avoid contamination of natural landscapes with invasive plants or invasive plant material.

Chipping, shredding, or on-site burning of plant material must be approved by the Engineer and included in the IMPS.

For plant material taken to an incinerating facility per the IPMS, a receipt from that facility shall be submitted to the Engineer as proof of disposal.

Where feasible, it is preferable to dispose of plants on-site or to bury them on-site with on-going monitoring for re-sprouting. Disposal locations and methods must be approved and included in the IPMS. Site work such as grading and seeding to stabilize and restore disposal area shall be incidental to this item.

The Contractor shall be responsible for treating or otherwise managing areas of re-growth due to improper disposal. Treatment shall be at the Contractor's expense.

Follow-Up Treatment

Plants and areas shall be re-treated as necessary and as appropriate to the time of year. Treatment shall be for the duration of the contract and per the IPMS.

MEASURE OF SUCCESS

The expectation is a minimum of 85-95 percent control achieved after the first treatment, depending on plants targeted and extent of population, and based on the expectations laid out in the IPMS. The expectation for the contract duration is 95-100% eradication by the end of the treatment period, unless otherwise specified in the IPMS.

METHOD OF MEASUREMENT

Item 102.3 will be measured for payment by the Hour of crew time spent on the project doing actual herbicide application work. A crew shall be defined as a minimum of two licensed applicators each equipped with (at minimum) back-pack sprayer and mist blower. The crew shall also have a properly equipped spray truck with hoses and a tank with sufficient capacity for a full day of work.

BASIS OF PAYMENT

Item 102.3 will be paid at the contract unit price per Hour, which price shall include all labor, materials, equipment, tools, and all incidentals required to complete the work.

Payment will be based upon time spent on the project doing actual work and shall not include travel time to and from the Contractor's place of business and shall also not include time for investigative field trips.

If there is only one applicator, hourly payment shall be adjusted to 50 percent of the unit price.

The Invasive Plant Management Strategy will be paid for under Item 102.33.

ITEM 102.33**INVASIVE PLANT MANAGEMENT STRATEGY****HOUR**

This item consists of providing an Invasive Plant Management Strategy (IPMS) for the control of invasive plants currently existing on the project site and/or as directed and shall be coordinated with Item 102.3 Herbicide Treatment of Invasive Plants. The IPMS shall be submitted for review and approval and the IPMS shall be implemented on-site.

Herbicide treatment for invasive plants shall be as described under Item 102.3 Herbicide Treatment of Invasive Plants and shall be compensated per that Item.

Work under this item shall be coordinated with work and schedule for Selective Clearing, Clearing and Grubbing, Mowing, Tree Removal, Planting, and Wetland Mitigation as relevant to the project.

Individual attending the site walk and determining the Invasive Plant Management Strategy must demonstrate expertise with vegetation management and invasive plant control.

SUBMITTALS

Task Summary: For measurement of payment, the contractor shall submit the total sum and a breakdown of hours for the following tasks performed, which shall include at least: Site Walk/s, IPMS Written Reports, Site Monitoring if required by MassDOT, and Final Report if required by MassDOT.

Qualifications

Individual shall be from the same company as that providing services for Item 102.3 Herbicide Treatment of Invasive Plants or shall meet the following requirements:

- Submit copy of current Core license.
- Submit a resume listing five (5) or more years of experience managing invasive plants with a company specializing in vegetation management. References shall be submitted if requested.

Invasive Plant Management Strategy (IPMS)

At least thirty (30) days prior to construction activities and/or any proposed treatment, submit a written IPMS proposal for approval by the Engineer and MassDOT Landscape Architect. All chemicals and methods proposed shall be consistent with applicable Massachusetts Wetlands Protection Act Order of Conditions.

The IPMS shall be completed in coordination with the Roadway Contractor and the Engineer and shall include the following as appropriate to the project:

I. Project Information

- a. Company writing IPMS and performing herbicide application.
- b. Date of site walk
- c. Attendees at site walk
- d. Expected end date of contract and expected last treatment (month/season)

II. Brief Description of Conditions

- a. Provide a free-hand sketch on construction plans or aerial image showing species, location, and as relevant, show or note extent of population as relevant to Strategy (i.e., population extends off ROW preventing eradication, small population and eradication deemed feasible within contract schedule, etc.).

III. Coordination with Roadway Contractor regarding other work

- a. Tree Work: Note coordination to be implemented with tree removal, clearing, and clearing and grubbing as applicable to the project.
- b. Wetland Mitigation - Include management proposed for wetland mitigation areas in the IPMS, if and as required.
- c. Planting: If there will be planting in areas proposed for treatment, propose treatment and schedule to avoid herbicide damage to plants.
- d. Mowing: If coordination is required with state mowers, note need in IPMS.

IV. Soil Management

- a. Provide specifics on how soil with invasive plant roots (in particular) or seeds will be handled (i.e., separate stockpiles, plant material will be buried on-site, re-used on-site, disposed off site and if so, where?).
- b. Show stockpile locations on plan and include treatment schedule.
- c. Note measures that will be implemented to avoid spread through equipment, including how and where equipment will be cleaned.

V. Invasive Plant Treatment & Management

- a. Proposed chemical and methods of treatment for each species or area.
- b. Time of treatment based on target plant species.
- c. Submit product label including application methods and rates (entire MSDS information need not be submitted if available online).
- d. Proposed performance metrics or measure of treatment success if different from that specified under Item 102.3.
- e. Method for disposing invasive plant material. This includes material that may result in spread (i.e., seeds, roots) and material that has been treated and/or is not viable (foliage, dead wood, etc.). Methods may include grinding in place, stockpiling and treating, and incinerating offsite.
- f. Expected follow-up treatment for duration of contract.

VI. Monitoring Schedule if requested by MassDOT.

Note: The IPMS is critical for identifying pre-construction conditions as well as strategies for minimizing import or spread of invasive plants. Failure to provide an approved IPMS may jeopardize this item, in which case, the contractor will be responsible for management of invasive plants found on-site at no cost to the contract.

Photo Documentation

Digital photos with date and time verification shall be provided with the IPMS and with any follow-up monitoring or reporting.

IPMS Follow-up Amendments

The IPMS may be amended to address additional concerns or adjust to conditions. The amended IPMS shall be submitted to the Engineer and MassDOT Landscape Architect for approval at least thirty (30) days prior to any proposed treatment.

Final Report

A final inspection and report documenting the status of the invasive control may be required for regulatory purposes or for instances where control will be continued by others. The report shall include photo documentation of pre-construction (existing) and post-treatment conditions, notations on a plan or aerial image of area treated, summary of treatment performed, and control achieved.

INITIAL SITE WALK

Prior to any work the Contractor shall walk the site with the Engineer and the MassDOT Landscape Architect to determine the IPMS. During the site walk the Contractor shall identify limits of work and, as necessary, mark locations of areas designated for treatment and individual plants targeted for treatment or removal. The Contractor shall be responsible for marking delineated areas and plants to be preserved, removed, or otherwise treated. Fencing or other materials needed for marking and delineating protected areas shall be incidental to this item.

METHOD OF MEASUREMENT

Item 102.33 will be measured for payment by the Hour. The basis for measurement shall be per the completion of tasks as approved under the Task Summary submittal.

BASIS OF PAYMENT

Item 102.33 will be paid at the contract unit price per Hour, which price shall include all labor, materials, equipment, tools, and all incidentals required to complete the work.

Payment shall not include travel time to and from the Contractor's place of business.

ITEM 755.35**INLAND WETLAND REPLICATION AREA****Lump Sum**

The work under this item shall conform to the relevant provisions of Sections 120, 770, 771 of the Standard Specifications and the following:

Work under this item shall include furnishing material and the construction and maintenance of inland wetland replication areas as shown on the drawings and as required by the Engineer. Inland Wetland Replication Area shall hereafter be referred to as Replication Area. All work shall be in coordination with an approved Wetland Specialist as specified under that item.

Wetland Restoration work shall be as specified and compensated under that item. Construction of tidal wetlands shall be as specified under the appropriate item for tidal wetland mitigation.

The Replication Area shall be constructed prior to wetland impacts unless otherwise approved by the Engineer, specified herein, or specified in permit conditions and approvals. Construction schedule shall be appropriate to planting and seeding season (see below). Changes to this schedule will require written approval from the Engineer.

DESCRIPTION OF WORK

Construction of the Replication Area shall be completed as shown on the drawings at the following location(s):

Area/s A at Station: 2+35 – 2+55 North

Area = 650 sf.

Replication Area shall be constructed to meet the requirements of all associated permits and certifications, including relevant performance standards of the Massachusetts Wetlands Protection Act (MGL C. 131, s40), Section 401 Water Quality Certification, and Section 404, U.S. Army Corps of Engineers Permit.

The Contractor is responsible for protection and preservation of natural areas adjacent to the Replication Area both within and outside the project limits and for the duration of the Contract; including but not limited to damage to soils or vegetation due to erosion, sedimentation, compaction, trampling, vehicles, storage of materials, or other negligence shall be repaired to the satisfaction of the Engineer and at the Contractor's expense.

The Wetland Specialist overseeing the Wetland Replication construction work shall not be from the same company as that which is performing planting, seeding, or participating in any aspect of the Wetland Replication construction.

SUBMITTALS - DOCUMENTS

Request for Conditional Acceptance: As specified below, a letter requesting Conditional Acceptance of the work and the site conditions shall be submitted to the Engineer.

Request for Final Acceptance: As specified below, a letter requesting Final Acceptance of the work and the site conditions shall be submitted to the Engineer.

Monitoring Reports: Reports shall be submitted to the Engineer as specified below. Reports shall be compensated under Item 755.75 and 755.76.

SUBMITTALS - MATERIAL

Soil and Amendments

No soil, compost, or other soil amendment imported to the work site shall contain seeds, roots, stems, or other viable parts of invasive plants or other noxious plants.

At least sixty (60) days prior to installation and prior to ordering, the Contractor shall submit for approval sources of soil, compost, and amendments. Submittal shall include the supplier and location of the source. Off-site sources shall be identified and available for inspection by the Wetland Specialist prior to transport of material to the site to verify that they are likely to be free of invasive plant species, including all viable plant parts.

Samples of tested and approved wetland soil and soil amendments for soil texture, organic carbon content or other routine soil analysis parameters (e.g., pH, Cation Exchange Capacity, Percent Base Saturation) and Soil Organic Matter Analysis will be required if requested by the Engineer. The grab samples shall be collected by the Contractor or Wetland Specialist from multiple representative locations in the wetland topsoil mix following the “Umass Soil and Plant Tissue Testing Laboratory Sampling and Collection Protocols” (or equivalent certification paperwork provided by the soil supplier). The lab analysis shall be provided to the Engineer along with written certification from the Contractor or Wetland Specialist that the wetland topsoil was collected per the referenced protocol and meets the desired specification. The analysis and written certification of same shall be provided to the Engineer prior to placing the wetland topsoil in the Replication Area.

Seed Mix

Certificate of Materials from the supplier shall be submitted 30 days prior to seeding and must be approved prior to ordering materials. Seed species listed on the certificate shall include ecotype region (i.e., *Asclepias incarnata*, PA Ecotype).

Seed tag from the bag of seed used shall be submitted to the Engineer at the time of seeding. Seed tag shall include ecotype region and species, guaranteed percentages of purity, weed content and germination of the seed, and the net weight. Seed tag shall match the Certificate of Materials, include the name of the supplier, and date material was sent.

Bill of lading or notarized Certificate of Compliance from the Supplier serving as proof of purchase shall be submitted if requested by the Engineer. Document shall include date of sale, quantity, lot number, and address of Supplier. This shall match the seed tag. Notary shall not work for either the contractor or seed supplier.

Other Material: Submittals shall be per the respective item.

MATERIALS

Sediment Control Barrier and Erosion Prevention Measures

Coir logs shall be used in lieu of sediment control barrier if there is saturated soil or the potential for standing water in the proposed location.

Erosion prevention measures for disturbed areas adjacent to the Replication Area shall include but not necessarily be limited to compost blankets, jute mesh, seeding, and/or combinations thereof as approved by the Engineer.

Sediment controls and erosion prevention devices and measures shall be compensated under the respective items.

Wetland Soil

Soil appropriate for the Replication Area may be either hydric soil excavated from the impacted wetland, a manufactured mix of compost and on-site borrow, or a combination thereof, as approved by the Engineer.

Hydric soil from the impacted wetland area may be spread on the surface of the constructed Replication Area as an inoculant or can be placed in a bulk fashion in a roughly 1:1 ratio of area and depth. Soil shall be handled such that the original soil structure is preserved and shall not be compacted, screened, or otherwise processed.

Hydric soil from the impacted wetland that is infested with invasive plant species identified on the Massachusetts Invasive Plant Advisory Group (MIPAG) shall not be used in the Replication Area unless approved by the Wetland Specialist and Engineer. To the extent possible, infested soil shall be disposed of within the project limits in an upland area outside of regulated areas and as approved by the Invasive Plant Management Strategy item (if in the contract) or by the Engineer.

A manufactured mix suitable for wetlands shall consist of on-site borrow from the proposed Replication Area (if approved by the Wetland Specialist and Engineer) thoroughly mixed with compost to achieve a target organic carbon content of 10-12% (up to 21% percent organic matter) by dry weight. The organic material used for mixing shall be well or partially decomposed. Clean leaf compost is the preferred soil amendment to achieve these standards though other materials may be used if approved by the Wetland Specialist and Engineer. Note that "clean" refers both to a negligible amount (<1%) of physical contaminants such as plastic and to the lack of chemical contaminants that might pose a hazard to plants or animals. Off-site borrow may be used for mixing if approved in advance by the Engineer.

No soil or soil amendment shall be brought on site without approval of the material source by the Wetland Specialist and the Engineer. Soils used in the replacement area shall be free of rocks greater than 4 inches in diameter.

Seed Mix

Seeding shall conform to 765.635 NATIVE SEEDING AND ESTABLISHMENT.
Fertilizers shall not be used.

Wetland Mix**765.551– FACW Meadow Mix**

Botanical Name	Common Name	% PLS by Weight
Grass		
Carex vulpinoidea	Fox Sedge	26.00%
Elymus riparius	Riverbank Wild Rye	23.00%
Carex lurida	Shallow Sedge	17.00%
Carex lupulina	Hop Sedge	8.00%
Scirpus atrovirens	Green Bulrush	3.00%
Juncus effusus	Soft Rush	2.50%
Cinna arundinacea	Sweet Woodreed	2.00%
Carex comosa	Bearded Sedge	2.00%
Glyceria canadensis	Manna Grass	1.00%
Scirpus cyperinus	Woolgrass	1.00%
Juncus tenuis	Path Rush	0.50%
		86.00%
Herb/Forb		
Verbena hastata	Blue Vervain	4.00%
Asclepias incarnata	Swamp Milkweed	2.00%
Aster prenanthoides	Zig Zag Aster	1.00%
Sisyrinchium angustifolium	Narrowleaf blue-eyed grass	1.00%
Eupatorium maculatum	Joe-pye Weed	1.00%
Aster puniceus	Aster -Swamp	1.00%
Aster novae-angliae	New England Aster	1.00%
Vernonia noveboracensis	New York Ironweed	1.00%
Eupatorium perfoliatum	Boneset	1.00%
Aster umbellatus	Flat Topped White Aster	0.50%
Mimulus ringens	Monkey Flower	0.50%
		14.00%
		100.00%

Seeding Rate: Species ecotype shall be as native to New England region as possible. Apply this mix at 20 lbs PLS/acre.

Upland MixWater

The Contractor shall provide water and all equipment required at no extra cost. Water shall be suitable for irrigation and free from ingredients harmful to plants and wildlife. Water from the

adjacent water bodies or waterways shall not be utilized. It is the Contractor's responsibility to correct injury or damage due to the lack of water, too much water, or use of contaminated water.

Mulch/Compost Blanket for Seeding

Hydromulch shall be per the manufacturer's recommendations and shall be wood fiber or straw mulch only. Mulch shall be incidental to seeding.

Compost Blanket may be used in lieu of mulch for seeding. Compost Blanket shall meet the material and submittal requirements of that Item 751.7 and shall be applied as specified below. Compost Blanket shall be compensated under that item.

CONSTRUCTION METHODS & SEQUENCE

SITE PROTECTION MEASURES

Minimizing Damage

The Contractor shall plan and execute operations in a manner minimizing the amount of excavated and exposed fill or other foreign materials that could be washed or otherwise carried into Replication Area and nearby resource areas.

Construction of and access to the Replication Area shall minimize damage to existing vegetation and soils as specified herein. Damage to soils or vegetation shall be repaired to the satisfaction of the Engineer and at the Contractor's expense. If required for soil remediation, tilling and the addition of compost shall be at the Contractor's expense.

Wetland topsoil shall be deposited and graded in the Replication Area in a manner that minimizes travel and subsequent compaction of the subgrade (including any specified pit and mound topography) to the extent practicable, including use of track mounted excavators as appropriate. Should soils be compacted, they shall be loosened by a method such as disking, spring-tooth harrowing and/or rototilling. The Contractor shall use boards, timber or composite mats, or other approved materials as necessary, to protect existing and/or new wetlands from compaction due to heavy foot traffic or if equipment is required to travel over wetland soil. All labor and materials required for protection and preservation of site shall be incidental to this item.

Stockpiling of Soil

Stockpiling of soil, including hydric soil for replication, shall be at least 100 feet from the edge of the bordering and isolated vegetated wetlands and inland banks, unless approved otherwise by the Engineer. Stockpiled soils shall be securely stabilized and contained. Any areas of exposed soil or stockpiles within and adjacent to the Replication Area that will remain inactive for more than 7 calendar days shall be sown with a mix of rapid germinating annual grasses (e.g., annual rye) covered with a layer of straw mulch applied at a rate of 90 pounds per 1,000 square feet. As necessary, the mulch shall be anchored with a tacking coat (non-tar) applied by a hydro seeder or other method recommended by the Wetland Specialist in consultation with the Engineer. In the event that there is excess borrow, it shall be disposed of under Excavation, Item 120.1.

Sediment Barriers

Placement: Sediment barriers shall be installed along the downslope perimeter of the Replication Area beginning and ending in the surrounding upland so that no excavated material or disturbed soil can enter adjacent wetlands or waters. Where construction work is immediately upgradient of the wetland, barriers shall be located so as to protect the Replication Area until slopes are stabilized. Sediment barriers shall be in place and approved by the Engineer prior to excavation work. No work shall take place outside the barriers.

Maintenance: The Contractor shall ensure that all sediment barriers function as intended and at all times per the specifications of those respective items.

Existing Trees to Remain

Tree protection shall be per the relevant specifications and as shown on the plans or as required by the Engineer. To protect root systems of existing trees to remain, the limits of the Replication Area may be adjusted, but, the total area of replication required by the permits shall not be reduced. Access route may be adjusted as required.

Trees to be retained as snags (upright dead or dying trees left for wildlife habitat) within or adjacent to the Replication Area shall be as shown on the plans or as directed by the Wetland Specialist or Landscape Architect during the initial site walk. Trees to remain as snags shall be clearly marked prior to clearing. Trees that pose a potential fall hazard (i.e., are near a roadway) should have limbs and trunk cut such that the tree does not pose a fall hazard.

Coarse woody debris in the form of cut trees, stumps, logs, and brush shall be incorporated as shown on the plans or as directed by the Wetland Specialist or Landscape Architect. On site material shall be selected and marked by the Wetland Specialist, retained on the project site, and placed as specified below under Incorporation of Coarse Woody Debris.

All trees, stumps, or brush not specified to remain shall be removed and shall not be stockpiled in the wetland resource areas while awaiting disposal.

Work shall be coordinated with Clearing or Tree Removal Item and compensated under that Item.

PRE-WETLAND CONSTRUCTION SITE WALK

Delineating the Replication Area and Access Route. The Contractor shall stake out the Replication Area boundaries and the intended access route and set grade stakes for approval by the Wetland Specialist and Engineer. Following staking and demarcation of areas, the Engineer and Wetland Specialist shall approve or modify as necessary the limits of work, the access route, final location and configuration of replication, grade stake elevations, proposed location of sediment barriers, and review proposed construction methods.

As part of the delineation and approval process, the Wetland Specialist shall mark trees to be converted to snags, select coarse woody debris to be retained for re-use, and select rocks or other elements to be used for habitat features.

Invasive Plants: As part of the initial site walk, the wetland to be impacted and the proposed replication site shall be inspected for the presence of invasive plants. If invasive plants are found they shall be addressed as described herein under Invasive Plants.

SOIL WORK

Final grades in the Replication Area shall meet the target elevations as shown on the Plans or as adjusted by the Wetland Specialist to achieve the desired hydrology and micro-habitat. If adjustments are required, a Request for Information (RFI) shall be submitted to the Engineer for approval. Adjustments shall be documented and included in the As-Built plans (if required) and/or other applicable required documents.

Excavation & Grading

When required by permits, the Wetland Specialist shall notify MADEP and the ACOE (as applicable) at least 72 hours prior to excavation.

Soil in the proposed wetland areas that must be removed for grades to conform to the proposed elevations shall be stripped and disposed of, or, if suitable for reuse, be stockpiled in an approved location. Stockpiled soils shall be kept wet and not allowed to dry out. Procedures for maintaining appropriate moisture levels shall be documented by the Wetland Specialist and provided to the Engineer and the Contractor.

Replication area shall be excavated as shown on the drawings. Where replication area is adjacent to existing reference wetland, finish grade of replication shall generally match existing grades and micro-topography, notwithstanding any deviations that are necessary to achieve the desired hydrology and habitat in the Replication Area.

Prior to placement of backfill, scarify subgrade to a depth of 4 to 6 inches.

Placement of Wetland Soil

Following excavation, scarification, and grading of sub-grade, and after the sub-grade elevations are approved by the Wetland Specialist, suitable soil previously removed or an evenly mixed organic/mineral soil created on-site shall be spread to the design depth and thickness over the proposed wetland areas as shown on the plans and as directed by the Wetland Specialist.

Vehicles used to transport soil from offsite shall be washed or cleaned with air pressure to prevent exotic or invasive seeds or root fragments from contaminating the Replication Area.

Final Grading

The finished grade of the Replication Area shall be at an elevation that will provide an unrestricted hydrologic connection between the Replication Area and adjacent resource areas. The hydrologic connection should be in keeping with restoring the intended function of the replacement wetland relative to the impacted reference wetland. The Contractor shall verify that this elevation is not at a level that could negatively alter the hydrology of an adjacent wetland. Microtopography in the form of hummocks, pits and mounds shall be as shown on the plans or as

adjusted by the Wetland Specialist. Final elevations and grading of wetland soil shall be approved by the Wetland Specialist and the Engineer.

To avoid compaction once soil has been placed, no heavy equipment shall travel across placed soil and no work shall occur in wet or moist soil. Soil that is compacted due to construction activities shall be replaced with soil as specified herein and at the Contractor's expense.

RESTORING VEGETATION

Incorporation of Coarse Woody Material

If specified within this Contract or if directed by the Wetland Specialist or Landscape Architect during the initial site walk, woody debris shall be incorporated into the Replication Area and/or adjacent upland buffer. Material shall be placed as shown on the plans or as directed following placement of wetland soil and prior to application of compost and/or seed. Woody material shall cover a minimum of 5-20 percent of the Replication Area, depending on whether it is a meadow or woodland wetland and how much wood is available from construction clearing. Where trees are cut for construction purposes, logs of a minimum length of 8 feet must comprise a minimum of 50% of the woody material left on site. Brush shall be included along with logs and stumps as directed. Woody material shall be placed in a deliberate and naturalistic manner.

Seeding

Following placement of wetland soil and planting (if included), the Replication Area shall be seeded using one of the following methods:

- Broadcast by hand or with a hand-held spreader followed by application of straw mulch. If necessary, seed shall be lightly raked to insure good seed-to-soil contact.
- Hand broadcast seed with Compost Blanket pneumatically applied at the same time to ensure light cover of soil topdressing over seed.

If spring conditions are drier than usual, supplemental watering may be required. If sowing during the summer months, supplemental watering will likely be required until germination.

If required, seeding limits for different seed mixes shall be determined by the Wetland Specialist.

SEED ESTABLISHMENT AND INVASIVE MANAGEMENT

Seed establishment shall conform to 765.635 NATIVE SEEDING AND ESTABLISHMENT

Seeding that fails to established according to the conditions of acceptance below shall be over-seeded as required by the Engineer. Washouts and channels shall be repaired and stabilized prior to overseeding. Excessive weed growth shall be pulled out by the roots or, with approval from the Engineer, cut prior to over-seeding. Soil repair and weed control are incidental to this item.

Invasive Plants: Corrective measures shall be taken to remove or treat invasive plant species in the Replication Areas. Invasive plants shall include those listed as invasive by Massachusetts

Invasive Plant Advisory Group (MIPAG) and the US Army Corp of Engineer's New England District's Compensatory Mitigation Guidance

The strategy for chemical and/or manual removal shall be as directed by the Wetland Specialist, shall continue for the duration of the monitoring period, and shall be incidental to this item.

CONDITIONAL ACCEPTANCE OF WORK

Conditional Acceptance shall indicate approval of the wetland construction work and agreement that work has been done according to plan or modified as approved.

Upon completion of construction, the Contractor shall submit a Request for Conditional Acceptance that includes a brief narrative from the Wetland Specialist demonstrating that the wetland replication construction work was done according to plans (or how modified) and meets required permit conditions. The narrative shall include, photo-documentation of pre-construction conditions as well as soil work, planting, and seeding. Seed tags shall be submitted as part of the Request for Conditional Acceptance.

Upon receipt of a Request for Conditional Acceptance, the Engineer, the Wetland Specialist, and regulatory representative (if required) shall assess the Replication Area and surrounding areas. At a minimum, the following conditions shall be included in the narrative and reviewed as part of the on-site assessment of whether:

- The final finished target elevations have been met and maintained relative to the approved plans and reference wetland. Areas that are too high or too low should be identified along with suggested corrective measures.
- Hydrology meets performance standards.
- Specified seed mix has been seeded. If inspected 30 or more days after seeding, seeded species in the wetland and adjacent upland shall show signs of good germination and healthy growth.
- Planted woody and herbaceous species meet specifications and are establishing well.
- Soils are stabilized and there is no sediment in the wetland and no channeling of slopes.
- There are no invasive plants visible in the replication area.

Upon approval that the work meets the above conditions, MassDOT will issue a letter of Conditional Acceptance. If the Wetland Replication work is not approved, MassDOT will issue a rejection letter requiring corrective actions. The Wetland Specialist shall recommend corrective actions. Work not approved shall be addressed by the Contractor at no extra cost.

Wetland Specialist shall be compensated under Item 755.75.

Erosion of adjacent slopes or the flow of sediments into the wetland between Conditional and Final Acceptance shall be immediately addressed by the Contractor.

FINAL ACCEPTANCE OF WORK

Following one full growing season, the Contractor shall submit a Request for Final Acceptance.

Submittal shall include a brief narrative of conditions. Upon receiving the Request, the Engineer, Contractor, Wetland Specialist and regulatory representative (if required) shall assess the Replication Area. Final Acceptance will initiate the start of the Wetland Monitoring Period.

The following conditions shall be inspected and approved for acceptance and payment.

- Hydrology is functioning as intended.
- The desired seeded species are establishing well and cover at least 95 percent of the Replication Area, excluding areas of open water areas or planned bare soil.
- No sediments have entered the wetland.
- Adjacent slopes are stabilized with desirable vegetation.
- There are no visible invasive plants.
- Silt fence and non-biodegradable sediment barrier materials have been removed.

If the mitigation work does not meet the above condition and is not approved, MassDOT will issue a rejection letter requiring corrective action. The Wetland Specialist shall recommend corrective actions. Work not approved will be addressed by the Contractor at no extra cost.

Wetland Specialist shall be compensated under Item 755.75.

MONITORING REPORTS FOR REGULATORY COMPLIANCE

Post wetland construction Monitoring Reports shall be completed and submitted by the Wetland Specialist as specified and compensated under Item 755.76 Wetland Monitoring Reports.

Generally, the following conditions shall be met upon each inspection:

- Hydrology is functioning as intended.
- The desired seeded species are establishing well and cover 95 percent of the area, excluding areas of open water areas or planned bare soil.
- No sediments have entered into wetland.
- Adjacent slopes are stabilized with desirable vegetation.
- There are no visible invasive plants.

If, at the end of the required monitoring period, the requirements have not been met and success of the wetland replication area has not been achieved as determined by the Monitoring Reports, the Contractor shall provide corrective measures. All costs associated with corrective measures and plant replacement shall be incidental to this item with no additional compensation.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 755.35 will be paid for at the Contract unit price per Lump Sum, which price shall include all labor, materials, equipment, submittals, maintenance, all required soil, site preparation, grading, wetland seeding, planting, mulching, watering, monitoring wells, registered surveyor, as-built plans, and all incidental costs necessary to complete the work as required.

Payment shall be as follows:

- 60% upon Conditional Acceptance.
- 20% once all permit construction requirements have been met and approved.
- 20% upon Final Acceptance.

Wetland seeding and establishment shall be incidental to Item 755.35

Wetland Restoration will be paid under 755.45

Excavation will be paid under Item 120.1

Compost Blanket will be paid under Item 751.7

Sediment Control Barrier will be paid under Item 767.121

Coir Log will be paid under Item 767.13

Wetland Specialist will be paid under Item 755.75

Wetland Monitoring Reports for follow-up monitoring will be paid under Item 755.76

ITEM 755.45**WETLAND RESTORATION****SQUARE YARD****DESCRIPTION**

The work under this item shall conform to the relevant provisions of Subsections 120, 751, 765, 767, and 771 of the Standard Specifications and the following:

The work under this item shall include all labor and furnishing of materials to complete the work specified herein to protect and restore existing inland wetland areas that will be temporarily impacted as shown on the drawings and as required by the Engineer.

Inland Wetland Replication work shall be as specified and compensated under that item. Tidal wetland mitigation shall be as specified under the appropriate item for tidal wetlands.

Restoration Area shall be constructed to meet the requirements of all associated permits and certifications, including relevant performance standards of the Massachusetts Wetlands Protection Act (MGL C. 131, s40), Section 401 Water Quality Certification, and Section 404, U.S. Army Corps of Engineers General Permit.

All work shall be in coordination with an approved Wetland Specialist. Wetland Specialist qualifications and requirements shall be per Item 755.75, Wetland Specialist.

SUBMITTALS – DOCUMENTS

Request for Conditional Acceptance: As specified below, a letter requesting Conditional Acceptance of the work and the site conditions shall be submitted to the Engineer.

Request for Final Acceptance: As specified below, a letter requesting Final Acceptance of the work and the site conditions shall be submitted to the Engineer.

Monitoring Reports: Reports shall be submitted to the Engineer as specified below. Reports shall be compensated under Item 755.76 Wetland Monitoring Reports.

ASSOCIATED ITEMS AND MATERIALS

Geotextile Fabric for Temporary Soil Protection shall be as specified under that item.

Timber Mat shall be as specified under that item.

Compost shall be in accordance with Subsection 751 and M1.06.0 Organic Soil Additives of the Standard Specifications. Compost shall not contain seeds, roots, stems, or other viable parts of invasive plants or other noxious plants. Off-site sources shall be identified and available for inspection prior to transport of material to the site to verify that they are likely to be free of invasive plant species, including all viable plant parts.

Compost Blanket shall be as specified under that item.

Seed Mix

Seeding shall conform to 765.635 NATIVE SEEDING AND ESTABLISHMENT.

Required submittals include:

- Certificate of Materials from the supplier shall be submitted and approved 30 days prior to ordering seed. Seed species listed on the certificate shall include ecotype region (i.e., *Asclepias incarnata*, PA Ecotype).
- Seed tag from the bag of seed used shall be submitted to the Engineer at the time of seeding. Seed tag shall include ecotype region and species, guaranteed percentages of purity, weed content and germination of the seed, and the net weight. Seed tag shall match the Certificate of Materials, include the name of the supplier, and date material was sent.
- Bill of lading or a notarized Certificate of Compliance from the Supplier serving as proof of purchase shall be submitted if requested by the Engineer. Document shall include date of sale, quantity, lot number, and address of Supplier. This shall match the seed tag. Notary shall not work for either the contractor or seed supplier.

Seed mix shall be:

Mix 765.551 Wetland Mix – FACW Meadow Mix

Botanical Name	Common Name	% PLS by Weight
Grass		
Carex vulpinoidea	Fox Sedge	26.00%
Elymus riparius	Riverbank Wild Rye	23.00%
Carex lurida	Shallow Sedge	17.00%
Carex lupulina	Hop Sedge	8.00%
Scirpus atrovirens	Green Bulrush	3.00%
Juncus effusus	Soft Rush	2.50%
Cinna arundinacea	Sweet Woodreed	2.00%
Carex comosa	Bearded Sedge	2.00%
Glyceria canadensis	Manna Grass	1.00%
Scirpus cyperinus	Woolgrass	1.00%
Juncus tenuis	Path Rush	0.50%
		86.00%
Herb/Forb		
Verbena hastata	Blue Vervain	4.00%
Asclepias incarnata	Swamp Milkweed	2.00%
Aster prenanthoides	Zig Zag Aster	1.00%
Sisyrinchium angustifolium	Narrowleaf blue-eyed grass	1.00%
Eupatorium maculatum	Joe-pye Weed	1.00%

Aster puniceus	Aster -Swamp	1.00%
Aster novae-angliae	New England Aster	1.00%
Vernonia noveboracensis	New York Ironweed	1.00%
Eupatorium perfoliatum	Boneset	1.00%
Aster umbellatus	Flat Topped White Aster	0.50%
Mimulus ringens	Monkey Flower	0.50%
		14.00%
		100.00%

Seeding Rate: Species ecotype shall be as native to New England region as possible. Apply this mix at 20 lbs PLS/acre.

Fertilizers shall not be used.

Straw mulch or hydromulch shall be per Section M6 of the Standard Specifications.

Water

The Contractor shall provide water and all equipment required at no extra cost. Water shall be suitable for irrigation and free from ingredients harmful to plants and wildlife. Water from the adjacent water bodies or waterways shall not be utilized. It is the Contractor's responsibility to correct injury or damage due to the lack of water, too much water, or use of contaminated water.

CONSTRUCTION METHODS & SEQUENCE

Site Protection Prior to Impacts

Prior to any land work, as part of the initial site-walk, the Wetland Specialist shall photo-document the site and provide a summary report of existing conditions as outlined under Item 755.75 Wetland Specialist.

Where and as required vegetation shall be cut flush and area surveyed to establish pre-construction elevations.

Following the cutting and surveying, temporary separation fabric or timber matting shall be placed as required to protect soil and vegetation from compaction, contamination, and/or other damages. Fabric and timber mats shall be placed as specified under the respective items and the Engineer shall approval placement.

Restoration Upon Completion of Roadway Construction Work

Sediment Barriers

If required for sediment control during Restoration work (i.e, tilling is required to restore soil), sediment barriers shall be installed along the downslope perimeter of the Restoration Area beginning and ending in the surrounding upland so that no disturbed soil can enter adjacent

wetlands or waters. Sediment barriers shall be in place and approved by the Engineer prior to any soil disturbance. No work shall take place outside the barriers.

Removal of Fill and Grading

Fill and temporary separation fabric or mats shall be removed and disposed of as specified under the respective items.

If required, grades shall be restored to pre-construction elevations as shown in the baseline survey or as required by the Engineer and Wetland Specialist to restore hydrologic functions. Final elevations shall be approved by the Engineer prior to soil preparation and seeding. Grading shall be incidental to this item.

Following approval of grading to elevations required, soil shall be prepared and seeded as follows.

Soil Tilling with Compost

Two inches of compost shall be applied over the impacted area and soil shall be tilled to a depth of 4 inches below the existing grade. Following tilling, soil shall be raked relatively smooth, or as directed. Upon approval of prepared soil, area shall be seeded and hydromulched.

Seeding with Mulch

Upon approval of prepared soil, area shall be seeded. Seeding may be hand broadcast with straw mulch applied or hydroseeded per the Standard Specifications and per the manufacturer's directions. Hydromulch shall be straw or wood fiber only and shall be per the manufacturer's recommendations.

Seed tags shall be submitted at time of seeding.

SEED ESTABLISHMENT

Seeding shall conform to 765.635 NATIVE SEEDING AND ESTABLISHMENT.

Seeding that fails to establish according to the conditions of acceptance below shall be over-seeded as required by the Engineer. Washouts and channels shall be repaired and stabilized prior to overseeding. Excessive weed growth shall be pulled out by the roots or, with approval from the Engineer, cut prior to over-seeding. Soil repair and weed control are incidental to this item.

CONDITIONAL ACCEPTANCE OF WORK

Conditional Acceptance shall indicate approval of the wetland restoration work and agreement that work has been done according to plan or modified as approved.

Upon completion of construction, the Contractor shall submit a Request for Conditional Acceptance that includes a brief narrative from the Wetland Specialist (if applicable to project) demonstrating that the wetland restoration work was done according to plans (or how modified) and meets required permit conditions (if applicable). The narrative shall include, photo-

documentation of pre-construction conditions as well as soil work, planting, and seeding. Seed tags shall be submitted as part of the Request for Conditional Acceptance.

Upon receipt of a Request for Conditional Acceptance, the Engineer, the Wetland Specialist, and regulatory representative (if required) shall assess the Restoration Area and the surrounding areas. At a minimum, the following conditions shall be included in the narrative and reviewed as part of the on-site assessment of whether:

- The target elevations have been restored per the survey or adjusted per the Engineer. Areas that are too high or too low should be identified along with suggested corrective measures.
- Soil compaction has been mitigated.
- Soils are stabilized and there is no sediment in the wetland and no channeling of slopes.
- Hydrology meets performance standards and has been adequately restored.
- Specified seed mix has been seeded and seeded species in the wetland and adjacent upland show signs of good germination and healthy growth.
- There are no invasive plants visible in the restored wetland area.
- Silt fence and non-biodegradable sediment barrier materials have been removed.

Upon approval that the work meets the above conditions, MassDOT will issue a letter of Conditional Acceptance. If the Wetland Restoration work is not approved, MassDOT will issue a rejection letter requiring corrective actions. Work not approved shall be addressed by the Contractor at no extra cost.

Erosion of adjacent slopes or the flow of sediments into the wetland between Conditional and Final Acceptance shall be immediately addressed by the Contractor.

FINAL ACCEPTANCE OF WORK

Following one full growing season, the Contractor shall submit a Request for Final Acceptance. Submittal shall include a brief narrative of conditions. Upon receiving the Request, the Engineer, Wetland Specialist and regulatory representative (if required) shall assess the Restoration Area. Final Acceptance will initiate the start of the Monitoring Period (if required).

The following conditions shall be inspected and approved for acceptance and payment:

- Hydrology is functioning as intended.
- The desired seeded species are establishing well and cover 100 percent of the restoration area, excluding areas of open water, large boulders or planned bare soil.
- No sediments have entered the wetland.
- Adjacent slopes are stabilized with desirable vegetation.
- There are no visible invasive plants.

If the restoration work is not approved, MassDOT will issue a rejection letter requiring corrective action. All costs associated with corrective measures and plant replacement shall be incidental to this item with no additional compensation. Work not approved shall be addressed by the Contractor at no extra cost.

MONITORING REPORTS FOR REGULATORY COMPLIANCE

Post wetland construction Monitoring Reports shall be completed and submitted by the Wetland Specialist as specified and compensated under Item 755.76 Wetland Monitoring Reports.

Generally, the following conditions shall be met upon each inspection:

- Hydrology is functioning as intended, relative to the preexisting condition of the restored wetland.
- Seeded species are establishing well and cover 100 percent of the area, excluding areas of open water areas or planned bare soil.
- No sediments have entered into wetland.
- Adjacent slopes are stabilized with desirable vegetation.
- There are no visible invasive plants.

If, at the end of the required monitoring period, the requirements have not been met and success of the wetland replication area has not been achieved as determined by the Monitoring Reports, the Contractor shall provide corrective measures. All costs associated with corrective measures and plant replacement shall be incidental to this item with no additional compensation.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 755.45 will be paid for at the Contract unit price per Square Yard, which price shall include all labor, materials, compost and amendments, seed, mulch, equipment, submittals, maintenance, grading, and incidental costs necessary to complete the work as required.

Payment shall be as follows:

- 50% upon completion of soil preparation and seeding
- 25% upon Conditional Acceptance
- 25% upon Final Acceptance or approval of the Engineer

Excavation of temporary fill will be paid under Item 120.1

Geotextile Fabric for Temporary Soil Protection will be paid under Item 698.31

Sediment Control Barrier will be paid under Item 767.121

Compost Blanket will be paid under Item 751.73

Timber Mat will be paid under Item 767.91

Wetland Specialist will be paid under Item 755.75

Wetland Monitoring Reports for follow-up monitoring will be paid under Item 755.76

ITEM 755.75**WETLAND SPECIALIST****HOUR**

Work under this Item shall be for services of a Wetland Scientist, Wetland Ecologist, Restoration Ecologist, or other professional with similar qualifications hereafter referred to as the “Wetland Specialist.”

“Wetland Mitigation” shall be used herein for applicable wetland work. For this project, applicable wetland work is for: Item 755.35 Inland Wetland Replication Area (creation of a new wetland) and/or Item 755.45 Wetland Restoration (restoration after temporary impacts).

The Wetland Specialist shall demonstrate knowledge and expertise to coordinate and oversee all work associated with the Wetland Mitigation as defined herein, as shown on the Plans, as required by permits, and as specified under the relevant Wetland Mitigation items.

Regulatory monitoring reports following Final Acceptance of the Wetland Mitigation shall be per Item 755.76, Wetland Monitoring Reports.

For all onsite work, the Wetland Specialist shall sign in and sign out with the Engineer.

The Wetland Specialist shall not be from the same company as the company responsible for planting, seeding, and/or maintaining the wetland.

QUALIFICATIONS

The Wetland Specialist shall have a minimum of five (5) years of experience with construction and monitoring of wetland mitigation areas similar in size, type, and complexity to the Contract mitigation. When required by permits, at least ten (10) years of experience may be required. The Wetland Specialist shall be thoroughly versed in the Commonwealth of Massachusetts Wetlands Protection Act (MGL C.131, s.40), U.S. Army Corps of Engineers New England District Compensatory Mitigation Guidance, and all other relevant regulations of the Massachusetts Department of Environmental Protection and the U.S. Army Corps of Engineers New England District.

QUALIFICATIONS

Within sixty (60) days following the Notice to Proceed, the Contractor shall provide proof of qualifications for the Wetland Specialist to the Engineer for approval. Submittals shall include, but not be limited to, the following:

- Resume of the individual on-site implementing the Wetland Specialist work. If the Wetland Specialist changes over the course of the project, the new individual shall submit resume and qualifications for approval 30 days prior to doing any work on-site.
- Resume of any personnel working on-site in place of the Wetland Specialist. Individual shall be approved prior to work on-site.

- Narrative describing the company, its expertise, technical qualifications and experience with wetland construction.
- At least three (3) references from prior work of a similar nature completed in the last five (5) years and by the individuals who will perform the work. Provide contact information for each reference including address, phone number and email.
- A summary of each reference project including nature of the work, project size, dates, and period of construction and monitoring, methodologies used, and summary of success (or not) in terms of meeting performance objectives. Summary shall include a minimum of one before and one after photo for each project.

SUBMITTALS – DOCUMENTATION AND REPORTS

Wetland Construction Oversight

Wetland Specialist shall provide documentation of pre-existing conditions and wetland construction as specified below and as part of fulfilling the Scope of Work described below. Documentation shall include photos that are clear and legible. Photos are incidental to this item.

- ***Site Walk Prior to Disturbance and Construction of Wetlands:*** Provide brief assessment with photos, including documentation of the existing wetlands to be impacted (both permanent and temporary), proposed wetland replication area, and reference/model wetland areas (typically an adjacent undisturbed wetland or the existing wetland to be impacted). Photos of existing wetlands that will be temporarily impacted shall include a view from at least 3 angles.
- ***Excavation and Grading:*** Documentation shall include minimum of two photos of the excavated wetland and two photos after final grading prior to planting and seeding. For restoration areas, photos shall show soil preparation (i.e, tilling and grading), if applicable.
- ***Approval of Subgrades:*** The Wetland Specialist shall inspect the sub-grade of the Replication Area to ensure that proper hydrology is likely to be established and shall provide the Engineer with written confirmation and photographs upon completion of subgrade excavation work. Written confirmation shall include recommended field adjustments, based on field observations, to achieve the desired hydrology and designed wetland system.
- ***Planting and Seeding:*** Provide assessment and photos of vegetation upon completion of planting and seeding work.

Wetland construction documentation and reports shall be submitted with Request for Conditional Acceptance and for Water Quality Certifications, and other regulatory permits as required.

Requests for Acceptance of Work & Regulatory Compliance

The Wetland Specialist shall submit the following documents if and as specified herein and under Item the relevant Wetland Mitigation items:

- Request for Conditional Acceptance.
- Request for Final Acceptance.

SCOPE OF WORK

In the event of discrepancies with the applicable permits, the Wetland Specialist shall submit a Request for Information (RFI) to the Engineer.

General

The Wetland Specialist shall be responsible for the following:

- Review and have a comprehensive knowledge of the environmental permits relevant to the specific mitigation work being done so as to ensure compliance throughout the duration of the contract.
- Identify and inform the Contractor and Engineer of unique site conditions which may require adjustments to the schedule, design, or construction methods. For example, wildlife nesting, illegal dumping, or rare species.
- Identify and inform the Contractor and Engineer of any sediment or erosion control problems observed within mitigation areas.
- Advise so as to avoid impacts to adjacent areas and regulated wetland resources.
- Participate in necessary meetings as required by permits and when requested by the Engineer.

Inspections & Construction Oversight

The Wetland Specialist shall be responsible for, but not limited to, the following:

- Pre-Construction Site Walk
 - Following surveying, flagging, and staking of all relevant boundaries and elevations by the Contractor, the Wetland Specialist shall walk the site with the Engineer and the Contractor to review existing and proposed conditions, recommend changes if necessary, and approve the following: location and boundaries of the Mitigation Area, target elevations and grades, location of tree protection associated with the Mitigation Area, and final layout and limits of clearing for access route.
 - Select and mark snags, logs, and woody material to be retained for incorporation into the Wetland Mitigation, as appropriate.
 - Note invasive plants in and adjacent to Wetland Mitigation.
 - Provide summary report if and as specified under Wetland Mitigation items.
- Excavation, Soil Placement, Grading for Replication Areas
 - Approve excavated depth and grading for appropriate wetland hydrology, subsoil preparation, and finished grade of placed wetland soil.
 - Adjust grades as required and approve microtopography. If grades need to be adjusted, submit an RFI to the Engineer.
 - If requested by the Engineer, the Wetland Specialist shall inspect stockpiled wetland soil for moisture content and signs of undesirable weeds.
- Soil Protection and Restoration Measures for Restoration Areas
 - Review and approve methods of soil protection and restoration if required.
 - Confirm decompaction will adequately restore appropriate wetland hydrology. If decompaction measures need to be adjusted, submit an RFI to the Engineer.
- Re-vegetation of Mitigation Area

- Locate woody material to be re-used.
- Verify seed used complies with specifications and site conditions, determine limits for wetland seeding based on elevations, approve seeding and mulching methods, and collect seed tags to submit with Request for Conditional Acceptance.
- Review planting methods (if applicable) prior to installation and oversee layout of wetland plants.

Conditional Acceptance

Upon completion of construction of the wetland, as part of the Request for Conditional Acceptance, the Wetland Specialist shall provide a brief narrative demonstrating that the wetland construction work was done according to plans (or how modified) and meets the conditions required for acceptance as specified under the Wetland Mitigation items. Submittal shall include a report and photo documentation of pre-construction conditions, construction work, seeding, planting, and other work as specified under the Wetland Mitigation items. Photos of completed Wetland Restoration areas shall include the same views as the pre-construction reference photos.

Upon receipt of a Request for Conditional Acceptance, the Engineer, the Wetland Specialist and regulatory representative (if required) shall assess the Wetland Mitigation and surrounding area to ensure that it meets the conditions specified under the Wetland Mitigation items.

Upon approval, MassDOT will issue a letter of Conditional Acceptance. If the Wetland Mitigation work is not approved, MassDOT will issue a rejection letter requiring corrective action. The Wetland Specialist shall recommend corrective actions.

Request for Final Acceptance

Following one full growing season, the Wetland Specialist shall provide a brief narrative of the status of the Wetland Mitigation to be submitted with the Request for Final Acceptance.

Upon receipt of the Request, the Engineer, the Wetland Specialist and regulatory representative (if required) shall assess the Wetland Mitigation and surrounding area to ensure that it meets the conditions specified under the relevant Wetland Mitigation items.

If the Wetland Mitigation is not approved, MassDOT will issue a rejection letter requiring corrective action. The Wetland Specialist shall recommend corrective actions.

METHOD OF MEASUREMENT

Item 755.75 Wetland Specialist shall be measured per hour for on-site service provided by the Wetland Specialist.

Work shall include all inspections, photos, submittals, and associated tasks for construction and restoration oversight, narratives for Conditional and Final Acceptance, documentation required for permits, and all other work specified above. Payment shall not include travel time or time spent off-site on reports. Decimal Pay Limits will be 0.25 hours.

BASIS OF PAYMENT

Item 755.75 Wetland Specialist shall be paid at the Contractor bid price for each hour, or fraction thereof, spent on-site to perform the work as described above. Reports and photo documentation are required for payment.

Post wetland construction reports shall be per Item 755.76, Wetland Monitoring Reports.

ITEM 755.76**WETLANDS MONITORING REPORTS****LUMP SUM**

Work under this item shall be for the submittal of Wetland Monitoring Reports following the completion of wetland construction and shall include all inspections, photos, and other work required to complete those reports as specified herein.

“Wetland Mitigation” shall be used herein for applicable wetland work, whether Wetland Replication (creation of a new wetland) and/or Wetland Restoration (restoration after temporary impacts).

The Contractor shall retain the services of a Wetland Scientist, Wetland Ecologist, Restoration Ecologist, or other professional with similar qualifications, hereafter referred to as the “Wetland Specialist,” to complete the Wetland Monitoring reports. Wetland Specialist shall meet requirements specified under Item 755.75 Wetland Specialist.

All on-site Wetland Specialist services required to complete the construction and revegetation of the wetland replication, including preparation and submission of monitoring reports during construction, shall be per Item 755.75 Wetland Specialist.

SCOPE OF WORK**Post-Construction Wetland Monitoring Reports**

Final Acceptance of the wetland construction work as specified under item 755.35 shall initiate the beginning of the Monitoring Period.

Inspections and reports shall be performed to ensure compliance with mitigation requirements defined under the relevant Wetland Mitigation items and with all applicable environmental permits. Monitoring reports shall cover the following:

- Identification of all plant species present
- Percent cover for each plant species and overall percent surface area cover by indigenous wetland plant species for replication area and upland
- Description of the viability, health, and vigor of installed plants as well as volunteer plant species within the replication areas
- Description of remedial measures taken to ensure criteria are met
- Depth to apparent water table and/or depth of surface inundation, both as measured from the soil surface and data loggers, as appropriate.
- A conclusion regarding the success of the wetland mitigation area relative to the performance standards at 310 CMR 10.55(4)(b) (unless varied), the design plans, and performance criteria established by MADEP in the variance conditions (when applicable), and the reference wetland.
- Recommendation for a corrective plan of action if needed.

Reports shall be submitted to the Engineer as a digital copy in Portable Document Format (PDF) unless otherwise requested. Hard copies shall be provided as requested by the Engineer. All reports shall be marked with the applicable permit numbers and identifying information as required in the permits. Reports shall include photo documentation of the wetland/s being monitored and shall include a minimum of 3 views from different orientations. Views shall be labeled.

Spring Reports, when required, shall be submitted to the Engineer by July 1 for dispersal to the appropriate permitting agencies.

End of Year Reports (which may serve as the Fall Report) shall be based on inspections that occur prior to October 15th. Reports shall be submitted to the Engineer no later than November 1 of each year.

Monitoring Reports shall be as follows for 2 years:

MassDEP: WQC – 2 Reports: 1 spring inspection, 1 fall inspection

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 755.76 Wetland Monitoring Reports and associated inspections shall be at the Contract unit price per Lump Sum and shall include all labor, materials, equipment, and all incidental costs required to complete the work. Lump Sum will be paid in equal installments of the Lump Sum divided by the number of reports submitted. Payment shall be upon submittal and acceptance of each report, based on the following schedule:

- Year 1 = 2 Reports
- Year 2 = 2 Reports

ITEM 983.5**STREAMBED/BANK RESTORATION****TON****DESCRIPTION**

This work shall consist of removing, stockpiling, and replacing river bed material in the proposed bridge replacement and the upstream and downstream approaches in the limits of work. The streambed restoration shall replicate the existing natural channel bed outside the work area in terms of material, roughness, shape, profile, and appearance. The ultimate product will, to the extent possible, replicate the function and appearance of the natural stream channel, as illustrated by photo-documentation herein (Figures A).

The Contractor shall coordinate with his/her sub-contractors to ensure all required equipment is available on-site to complete the work in this manner. The streambed restoration is required to comply with environmental permits issued for the project. MassDOT Environmental Services will provide a Fluvial Geomorphologist (Geomorphologist) to provide a pre-construction meeting, on-site oversight during construction, and assistance during streambed restoration construction to ensure the restoration is constructed as shown on the Plans, as required by these Special Provisions and in accordance with permit requirements.

At least 30 days prior to the commencement of construction, the Contractor shall coordinate with David Paulson (MassDOT Wetlands & Wildlife Unit Supervisor, (508) 389-6366 / david.j.paulson@state.ma.us) to set up an initial (virtual or in person) meeting with MassDOT's Geomorphologist, Contractor, and Resident Engineer. At this meeting, the Geomorphologist will provide an overview of the restoration work. The Contractor should be prepared to discuss the anticipated means, methods, and schedule.

Process Approval:

In lieu of a mockup, the Contractor shall schedule an onsite meeting to discuss the streambed restoration with the Geomorphologist and respective parties from MassDOT. The Geomorphologist shall be onsite during initial streambed restoration. The Contractor shall provide the Geomorphologist adequate access to observe, direct, and inspect the channel restoration work throughout the duration of the removal, stockpile, and reinstallation of the existing streambed material. If material is being brought to the site for streambed restoration, the Contractor shall provide the Geomorphologist with photographs to see the material.

MATERIAL

The top 1.5 feet of streambed material excavated from the existing streambed shall be removed and stockpiled to facilitate reinstallation and replication of the natural streambed. The excavated streambed material below the top 2 feet shall be stockpiled and reused to fill the voids in the proposed riprap placed below the top streambed restoration layer.

In the event that the excavated material is not suitable or there is not enough available suitable material, additional streambed restoration material shall be locally sourced that matches the

composition of the existing native river bed. Initial observations at the site revealed that the streambed material generally consists of sand, gravel, and small cobble. Around the bridge, angular boulders with 6- to 18-inch diameter exist intermittently within the streambed, yet these are likely associated with past armoring.

The streambed material must be approved by the Resident Engineer and Geomorphologist prior to use.

Related Items

Crushed Stone. Shall conform to the requirements of Item 156. Crushed Stone and shall be paid for under that item.

Riprap Stone shall conform to the requirements of Item 983. Dumped Riprap and shall be paid for under that item.

CONSTRUCTION

Channel

The streambed material shall be reinstalled over riprap (MassDOT Item 983.), as depicted on the plans, to an average thickness of 1.5 feet, with variations in thickness as necessary to replicate existing channel conditions. The initial placement of streambed material shall fill / choke the voids in the underlying riprap. Fill voids by shaking stone with the teeth of an excavator bucket, hand tamping with metal tamping rods, and by spraying water to settle fines between large stones. Plate compactors shall not be used. The purpose of filling the voids is to prevent subsurface flow where surface water disappears into large voids between the stone fill below the channel bed surface during low flow conditions. The final streambed shape and appearance shall be finalized in the field as directed by the Geomorphologist.

Reinstallation of the stockpiled streambed material shall be placed on top of the riprap to restore streambed habitat and fish passage. The streambed materials shall be installed during normal low water conditions behind cofferdams in accordance with the environmental permits.

Completion

Once all material has been placed in the stream channel and approved by the Geomorphologist and Resident Engineer, the Contractor shall remove the cofferdams in such a way as to slowly wet the stream to minimize the initial sediment release. Every attempt shall be made to minimize the downstream movement of sediment.

The final streambed shall maintain the general configuration of the existing streambed and there shall be minimal subsurface flow upon final inspection by the Resident Engineer and Geomorphologist. The project must be passable by fish and other aquatic organisms following construction.

The streambed restoration to be measured for payment will be the complete and accepted work for restoration of the streambed within the limits shown on the Plans as approved by the Resident Engineer and Geomorphologist.

BASIS OF PAYMENT

The accepted streambed restoration will be paid for on a lump sum basis. Payment will be full compensation for excavating, stockpiling, transporting, and placing the material specified and for furnishing all labor, tools, equipment, testing, and incidentals necessary to complete the work.

The Geomorphologist will be provided by MassDOT at no cost to the Contractor.

FIGURES





Figure A: Existing Streambed Material Near the Bridge

ITEM 991.1**CONTROL OF WATER - STRUCTURE NO. H-08-003=N-07-002****LUMP SUM**

The work under this item shall conform to the relevant provisions of Section 140 and 950 of the Standard Specifications and the following:

The work under this item includes all temporary control of water and dewatering measures necessary to accomplish the construction of the proposed abutment. The Contractor shall design, furnish, install, maintain, and cut and/or remove the water control structure as required based upon the actual site conditions. The Contractor shall be responsible for the design of the water control structure.

The water control system shall consist of sandbagging, soldier pile and lagging, or any other system that satisfies the design criteria herein and as shown on the plans. The water control structure must be capable of supporting excavations required for completion of work or shall be used in conjunction with temporary excavation support.

In general, groundwater was encountered above the bottom of the proposed abutments and wingwalls. Therefore, groundwater will likely be encountered in excavations for the proposed structures. If needed, temporary excavation dewatering should be performed so that the work conducted is completed in the dry. It is likely that dewatering may be accomplished by pumping from filtered sumps installed in low points of the excavation. A temporary earth support system with appropriate groundwater cutoff would help to minimize ground water flow into the excavation. Discharge water should be managed in accordance with local, state, and federal government requirements.

The Contractor shall take all steps to fulfill the requirements the Massachusetts DEP Erosion and Sedimentation Controls guidelines. Link to document:
<https://www.mass.gov/files/documents/2016/08/qz/esfull.pdf>

Dewatering of excavation areas shall be conducted to ensure that the proposed bridge substructure is placed in the dry.

The Contractor shall construct and maintain all necessary protective works, shall furnish all materials required and shall furnish, install, maintain, and operate all necessary equipment for the removal of water and control of water in the work area as required. The method of dewatering shall be chosen by the Contractor and approved by the Engineer.

The Contractor shall review the boring logs and site conditions to assess the bearing soils and determine the Contractor's methods for the control of water.

The Contractor should take precautions to reduce subgrade disturbance by diverting storm water run-off away from construction areas and maintaining effective dewatering.

The work to be performed under this item shall include the design, installation, and removal of the water control structure, all pumping, sandbagging, earth operations, dewatering, detention basins, and other measures, required for maintaining sufficient water control, for retaining adjacent embankments, excavation within the channel, and for accomplishing the demolition of the existing structure, and the construction of the proposed structure.

SUBMITTALS

Plans and calculations for water control structures and dewatering methods shall be developed by the Contractor and designed and stamped by a Professional Engineer registered in the Commonwealth of Massachusetts. Prior to the start of construction, the design must be submitted for the approval of the Engineer.

Submittals shall include, but not be limited to, excavation support, if required.

The design for excavation support shall include all construction loads, including but not limited to, earth and water lateral pressures.

CONSTRUCTION METHODS

The Contractor is advised that the effectiveness of the water control method used will vary based on the field conditions and the time at which the actual excavation work is being performed. The Engineer has the right to order the Contractor to stop all excavation operations when in the Engineer's judgement, the Contractor's water control operations are failing to produce adequate results or are posing a threat to the environment.

Upon completion of work, all temporary cofferdams and other protective works shall be completely removed. The Contractor shall be responsible for complete and proper diversion of water during all stages of this project and shall repair, at no additional expense, any damage to the foundations, structures, or any other part of the work caused by floods, high water, or failure of any part of the diversion of protective works for any cause whatsoever. Contractor shall remove and legally dispose of all collected sediment.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 991.1 will be paid for at the contract unit price Lump Sum. This price shall include compensation for the design, installation, removal, and all necessary equipment, pumps, materials, and labor for the control of water.



Maura Healey, Governor
Kimberley Driscoll, Lieutenant Governor
Gina Fiandaca, Secretary & CEO
Jonathan L. Gulliver, Highway Administrator



RECEIVED

June 16, 2023

Ms. Brona Simon
State Historic Preservation Officer
Massachusetts Historical Commission
220 Morrissey Boulevard
Boston, MA 02125

CONCURRENCE: *Brona Simon*
7/17/23
BRONA SIMON
STATE HISTORIC
PRESERVATION OFFICER
MASSACHUSETTS
HISTORICAL COMMISSION

JUN 21 2023

MASS. HIST. COMM

RC-68026

RE: **Hardwick-New Braintree —**
Replacement of Bridge H-08-003=N-07-002 (MassDOT #608851)
Section 106 Review – No Adverse Effect
Section 4(f): Permanent Easements – *de minimis* impact
Section 4(f): Temporary Occupancies – No 4(f) Use

Dear Ms. Simon:

The Massachusetts Department of Transportation (MassDOT) proposes to expend federal funds to replace Bridge H-08-003=N-07-002, which carries Creamery Road/Unitas Road over Ware River between Hardwick and New Braintree. The bridge will be replaced on existing alignment with a slightly wider structure. The proposed bridge and approach roadway cross-section will include a single 14'-wide travel lane, as exists presently. The proposed work along the bridge approaches will extend approximately 260' to the west and 200' to the east of the bridge, encompassing a total project length of 560 feet.

The project area is adjacent to agricultural fields at the northern edge of the Grigas Farm, one of the oldest dairy farms in New Braintree. The farm includes the 1739 Georgian style William Anderson House, as well as several 19th century barns and agricultural outbuildings, and appears to be eligible for listing in the National Register of Historic Places. Kurt Jergensen, Historic Bridge Specialist, reviewed Bridge H-08-003=N-07-002 determined that it is ineligible for listing in the National Register. The bridge is a single-span steel stringer bridge constructed in 1939. While the substructure arrangement is unusual, with a conglomeration of older stone masonry from a previous bridge with typical 20th century concrete abutment breastwalls, the superstructure is a typical mid-20th century steel stringer design with no architectural character and standard engineering details. Inventory photos of the bridge are enclosed.

MassDOT has reviewed the project under the terms of the Massachusetts Statewide Programmatic Agreement for Section 106 of the National Historic Preservation Act of 1966, as amended [36 CFR Part 800.3(a)(2),] and has determined that the project will have **No Adverse Effect** on properties that are listed in or may be eligible for listing in the National Register of Historic Places.

Project Description

The proposed work will include full replacement of the bridge on existing alignment with a structure 3' wider than existing. The proposed bridge and approach roadway cross-section will include a single 14'-wide travel lane. The proposed new bridge will consist of a single-span steel stringer superstructure supported by reinforced concrete integral abutments on H-pile footings. The bridge will have reinforced concrete CT-TL2 open parapet railings, also known as 'Texas rail'. The road will be closed for the duration of construction and traffic will be detoured, primarily to the north along Route 32 (Lower Road) and West Road.

Roadway reconstruction along the bridge approaches will include full-depth pavement reconstruction; minor roadway widening along the bridge approaches, to provide a consistent cross-section; grading roadside slopes along the bridge approaches; installation of guardrail along the bridge approaches, as none presently exist; installation of temporary erosion and sedimentation controls, and related work. Gravel shoulders will be added along the bridge approaches, to provide sufficient pull-off space for two vehicles to pass each other, without increasing the pavement width. The shoulders will be three feet wide and approximately 100' long. A single catch basin will be installed at the northeasterly corner of the bridge, to capture runoff coming downhill along Unitas Road and discharge to bordering wetlands next to the bridge. A mechanically stabilized earth retaining wall with precast concrete block facing will also be constructed in this area. This wall will be located in the vicinity of Station 4+75 – 5+60 LT, measuring 85' in length and 6' high at its maximum extent. The existing roadside slope will be excavated for construction of the wall footing.

A wetland replication area will be constructed to the northeast of the bridge in the vicinity of Station 2 + 50 LT. The narrow, linear replication area (approximately 800 sq. ft.) will be constructed on the slope between an upland field and wetlands along the riverbank. The slope will be graded and wetland soil with Facultative Wetland Meadow seed mix will be installed. Temporary access to the area will be constructed on geotextile fabric and timber matting. The access alignment will be restored with a compost blanket and a mid-height grassland seed mix.

National Register-eligible Grigas Farm

The southerly limit of the project corridor crosses into the northernmost boundary of the National Register-eligible **Grigas Farm** and **William Anderson House (NBR.121 – 125)**. The Anderson House is a Georgian style residence constructed in 1739, located at 87 Sibley Road, a mile to the south of the bridge in New Braintree. Along with several barns and outbuildings dating to the first half of the 19th century and about 340 acres of hayfields, cultivated fields and woodland along the east bank of the Ware River, the Grigas farm is one of two large dairy farms in New Braintree that have been in active production for over a century. The farm has been recommended for listing in the National Register, including the fields adjacent to Unitas Road and the bridge. The portion of the property abutting the project area is characterized by a mix of hayfield and cultivated cornfield, with a narrow border of trees and undergrowth along the roadway and riverbank.

Proposed work along the south side of Unitas Road will include guardrail installation, slope grading and removal of fourteen deciduous trees. Proposed work along the north side of Unitas Road includes construction of the mechanically stabilized earth retaining wall in the vicinity of Station 4+75 – 5+60 LT, as well as construction of a drainage outfall and removal of fifteen deciduous trees. None of the proposed work is likely to impact agricultural activities, as all proposed grading, tree clearing and other construction along the south side of the road will take place within marginal vegetated areas between the paved roadway and established fields. Along the northerly side of the roadway, construction activities will take place along graded slopes abutting wooded wetlands. The deciduous trees that will be cleared in this area are typically a mix of smaller trees measuring 10" in diameter or less, with a few larger trees measuring 12" to 16" in diameter. Two large trees will be removed, one measuring 24" in diameter, located in the vicinity of Station 4+15, LT, and another, measuring 18" in diameter, located in the vicinity of Station 4+70, RT.

Archaeological Assessment

A review of the MHC's archaeological maps in MACRIS revealed no recorded sites in the vicinity of the project area. Numerous recorded pre-Contact sites are clustered to the north and east, the closest of which is over a mile from the project area. The nearest recorded pre-Contact sites are: 19-WR-399, located approximately 1.15 miles to the southwest; 19-WR-639, a flake scatter site located approximately 1.0 mile to the southeast; 19-WR-299 (Pioneer Valley Academy Site), a flake scatter site located approximately 1.2 miles to the east; 19-WR-48 (Ware River Campsite), located approximately 1.3 miles to the northeast. It is the opinion of the MassDOT Archaeologist that low sensitivity can be ascribed to the project's direct area of potential effect based on the impacts of past bridge and roadway construction and unfavorable conditions (slope and wetlands). Soil borings indicate the roadway approaches to the bridge were constructed on 8' to 10' of fill to carry the crossing over the wide floodplain. The majority of the project work, including the bridge, retaining wall construction, and road work, will be confined to the existing bridge alignment and roadway and roadway slope. The project work will raise the roadway by approximately two feet, with associated slope grading. The proposed wetland replication area will be constructed in an unfavorable area on the slope between an upland field and wetlands surrounding a small tributary stream. Temporary access to the area will be constructed across mowed hayfield, with no excavation proposed. A review of historic aerial photos indicates the area immediately northeast of the bridge was part of the river / flooded throughout the 20th-century. The area appears to have slowly filled in with wetland vegetation over the past 20 years.

Section 4(f) Evaluation: Permanent Easements – De minimis impact

Permanent easements are required from the parcels occupied by the National Register-eligible Grigas Farm. These easements are highlighted in blue on the enclosed Right of Way plans. Any taking or easement that results in the permanent incorporation of land from a public or private historic site into a transportation facility (e.g., drainage structures, retaining walls, utilities) is regarded as a transportation use and must be evaluated and approved under Section 4(f) of the Department of Transportation Act of 1966, as amended [23 CFR Part 774].

A permanent utility easement is required from the parcel to the south of Unitas Road. The proposed easement is labeled Parcel PUE-2 and encompasses approximately 2,445 square feet. The easement encompasses a narrow corridor extending along existing overhead utility lines and will allow for future maintenance of overhead utility lines and one utility pole.

Two permanent slope easements are required, one located to the south of Unitas Road and one to the north of the road. The proposed easements are labeled Parcel S-2 and Parcel S-3, encompassing approximately 598 square feet and 641 square feet, respectively. These easements will allow for grading and future maintenance of slopes adjacent to the easterly bridge abutment.

A permanent drainage easement is required from the parcel to the north of Unitas Road. The proposed easement is labeled Parcel D-1 and encompasses approximately 249 square feet. The easement encompasses the proposed catch basin outfall and will allow for construction and future maintenance of the outfall.

A permanent wall easement is required from the parcel to the north of Unitas Road. The proposed easement is labeled Parcel W-1 and encompasses approximately 853 square feet. The easement encompasses the proposed retaining wall and will allow for construction and future maintenance of the wall.

It is MassDOT's expectation that the Federal Highway Administration (FHWA) will determine that the proposed takings required from these National Register-listed and -eligible properties meet the criteria for a Section 4(f) *de minimis* finding, pursuant to 23 CFR 774.3(b). This project, therefore, does not require an individual Section 4(f) evaluation. This letter is intended to inform the State Historic Preservation Officer (SHPO) that this project is expected to qualify for a *de minimis* finding under Section 4(f) based on the concurrence of your office with this Section 106 finding of No Adverse Effect, pursuant to 23 CFR 774.5(b)(1)(ii).

Section 4(f) Evaluation: Temporary Occupancies – No 4(f) use

This project also requires temporary occupancies, also known as temporary construction easements, on two parcels occupied by the NR-eligible Grigas Farm. These temporary occupancies will allow various construction activities, including tree removal, slope grading, and other related work. The proposed temporary occupancies are highlighted in yellow on the enclosed plans.

It is MassDOT's opinion that the temporary occupancies on parcels occupied by the NR-eligible Grigas Farm will satisfy the five conditions required for a temporary occupancy not to constitute a "use" within the meaning of Section 4(f), pursuant to 23 CFR 774.13(d):

- (1) Duration must be temporary, i.e., less than the time needed for construction of the project, and there should be no change in ownership of the land;
- (2) Scope of the work must be minor, i.e., both the nature and the magnitude of the changes to the Section 4(f) property are minimal
- (3) There are no anticipated permanent adverse physical impacts, nor will there be interference with the protected activities, features, or attributes of the property, on either a temporary or permanent basis;
- (4) The land being used must be fully restored, i.e., the property must be returned to a condition which is at least as good as that which existed prior to the project; and
- (5) There must be documented agreement of the official(s) with jurisdiction over the Section 4(f) resource regarding the above conditions.

The SHPO is the official with jurisdiction over a historic site for the purposes of Section 4(f), pursuant to 23 CFR 774.17. Your concurrence with this No Adverse Effect finding will signify that your office agrees with MassDOT's assessment that the proposed temporary occupancies do not constitute a "use" of NR-listed or -eligible historic properties under Section 4(f) and that the conditions listed above have been satisfied, pursuant to Condition 5.

Early Coordination and Effect Determination

MassDOT's design consultant, Green International, solicited comments relating to historic properties from the Hardwick Historical Commission and the New Braintree Historical Commission in a letter dated April 14, 2020. MassDOT did not receive any comments or concerns from either of the Commissions in response to that letter.

In the opinion of MassDOT, the proposed replacement of Bridge and related roadway improvements along Creamery Road in Hardwick and Unitas Road in New Braintree will have **No Adverse Effect** on the National Register-eligible Gringas Farm and William Anderson House. No other National Register-listed or -eligible properties or districts are located within or immediately adjacent to the project area. The proposed work will not disturb or displace any stone walls, fences, bars, gates or other agricultural features that define the landscape, nor will it disrupt agricultural production in adjacent fields associated with Grigas Farm.

MassDOT solicits your concurrence with our No Adverse Effect finding for the project in accordance with Stipulation V.C.1 of the amended Section 106 Programmatic Agreement. A copy of this letter has been forwarded to the Federal Highway Administration as specified under the terms of the Programmatic Agreement. If you should have any questions about this project, please contact me at 207-590-4999.

Sincerely,



Kurt Jergensen
Historic Bridge Specialist
Environmental Services

cc: Cassandra Ostrander, FHWA

Encl: Project plans, incl. ROW plans
Locus map
Bridge Inventory photos

FOR FHWA USE

MassDOT Request for Federal Highway Administration (FHWA) Approval

MassDOT Highway Division requests final approval from FHWA that the proposed "use" of the above-described Section 4(f) resources meets the criteria of a *de minimis* impact, as specified under 23 CFR 774.17.

Joi Singh, Division Administrator (or designee)
Federal Highway Administration
Massachusetts Division

Date _____

Harwood, Jameson (DOT)

From: Jergensen, Kurt E. (DOT)
Sent: Tuesday, April 25, 2023 6:34 PM
To: Bettina Washington
Cc: tcrm2@wampanoagtribe-nsn.gov; Harwood, Jameson (DOT)
Subject: Hardwick-New Braintree, Br. H-08-003=N-07-002 replacement (608851)
Attachments: Hardwick-New Braintree PNF.pdf; 608851_Locus map.pdf; 608851_HWY-HIGHWAY PLANS.pdf; 608851_BR13-30(H-08-003=N-07-002).pdf

Dear Ms. Washington,

MassDOT is submitting the enclosed information regarding the above-noted project to the Tribal Historic Preservation Officer to meet the Section 106 consultation requirements of the US Army Corps of Engineers. Please submit any written comments or concerns regarding historic or archaeological properties that may be affected by this project to Carrie Lavallee, P.E., Chief Engineer, Massachusetts Department of Transportation, 10 Park Plaza, Boston, MA 02116-3973, Attn: Jameson Harwood.

You also may send comments, questions, or requests for more information by email to either myself or Jameson Harwood.

Thank you very much.

Kurt Jergensen
Historic Bridge Specialist
Environmental Services
MassDOT, Highway Division
Ten Park Plaza, Boston, MA 02116
Cell: 207-590-4999

Harwood, Jameson (DOT)

From: Jergensen, Kurt E. (DOT)
Sent: Tuesday, April 25, 2023 6:36 PM
To: Robinson, David S (EEA)
Cc: Harwood, Jameson (DOT)
Subject: Hardwick-New Braintree, Br. H-08-003=N-07-002 replacement (608851)
Attachments: Hardwick-New Braintree PNF.pdf; 608851_Locus map.pdf; 608851_HWY-HIGHWAY PLANS.pdf; 608851_BR13-30(H-08-003=N-07-002).pdf

Dear Mr. Robinson,

MassDOT is submitting the enclosed information regarding the above-noted project to the Board of Underwater Archaeological Resources to meet the Section 106 consultation requirements of the US Army Corps of Engineers. Please submit any written comments or concerns regarding historic or archaeological properties that may be affected by this project to Carrie Lavalley, P.E., Chief Engineer, Massachusetts Department of Transportation, 10 Park Plaza, Boston, MA 02116-3973, Attn: Jameson Harwood.

You also may send comments, questions, or requests for more information by email to either myself or Jameson.

Thank you very much.

Kurt Jergensen
Historic Bridge Specialist
Environmental Services
MassDOT, Highway Division
Ten Park Plaza, Boston, MA 02116
Cell: 207-590-4999

Harwood, Jameson (DOT)

From: Jergensen, Kurt E. (DOT)
Sent: Tuesday, April 25, 2023 6:35 PM
To: David Weeden
Cc: 106Review@mwtribe-nsn.gov; Harwood, Jameson (DOT)
Subject: Hardwick-New Braintree, Br. H-08-003=N-07-002 replacement (608851)
Attachments: Hardwick-New Braintree PNF.pdf; 608851_Locus map.pdf; 608851_HWY-HIGHWAY PLANS.pdf; 608851_BR13-30(H-08-003=N-07-002).pdf

Dear Mr. Weeden,

MassDOT is submitting the enclosed information regarding the above-noted project to the Tribal Historic Preservation Officer to meet the Section 106 consultation requirements of the US Army Corps of Engineers. Please submit any written comments or concerns regarding historic or archaeological properties that may be affected by this project to Carrie Lavallee, P.E., Chief Engineer, Massachusetts Department of Transportation, 10 Park Plaza, Boston, MA 02116-3973, Attn: Jameson Harwood.

You also may send comments, questions, or requests for more information by email to either myself or Jameson Harwood.

Thank you very much.

Kurt Jergensen
Historic Bridge Specialist
Environmental Services
MassDOT, Highway Division
Ten Park Plaza, Boston, MA 02116
Cell: 207-590-4999

Harwood, Jameson (DOT)

From: Jergensen, Kurt E. (DOT)
Sent: Tuesday, April 25, 2023 6:36 PM
To: Tashtesook@aol.com
Cc: Harwood, Jameson (DOT)
Subject: Hardwick-New Braintree, Br. H-08-003=N-07-002 replacement (608851)
Attachments: Hardwick-New Braintree PNF.pdf; 608851_Locus map.pdf; 608851_HWY-HIGHWAY PLANS.pdf; 608851_BR13-30(H-08-003=N-07-002).pdf

Dear Mr. Brown,

MassDOT is submitting the enclosed information regarding the above-noted project to the Tribal Historic Preservation Officer to meet the Section 106 consultation requirements of the US Army Corps of Engineers. Please submit any written comments or concerns regarding historic or archaeological properties that may be affected by this project to Carrie Lavalley, P.E., Chief Engineer, Massachusetts Department of Transportation, 10 Park Plaza, Boston, MA 02116-3973, Attn: Jameson Harwood.

You also may send comments, questions, or requests for more information by email to either myself or Jameson Harwood.

Thank you very much.

Kurt Jergensen
Historic Bridge Specialist
Environmental Services
MassDOT, Highway Division
Ten Park Plaza, Boston, MA 02116
Cell: 207-590-4999

950 CMR: OFFICE OF THE SECRETARY OF THE COMMONWEALTH

APPENDIX A
 MASSACHUSETTS HISTORICAL COMMISSION
 220 MORRISSEY BOULEVARD
 BOSTON, MASS. 02125
 617-727-8470, FAX: 617-727-5128

PROJECT NOTIFICATION FORM

Project Name: Replacement of Bridge H-08-003=N-07-002 (MassDOT 608851)
Location /Address: Creamery Road/ Unitas Road over Ware River
City/Town: Hardwick-New Braintree
Project Proponent
Name: Massachusetts Department of Transportation
Address: 10 Park Plaza
City/Town/Zip/Telephone: Boston, MA 02116 / T: 207-590-4999

Agency license or funding for the project (list all licenses, permits, approvals, grants or other entitlements being sought from state and federal agencies).

<u>Agency Name</u>	<u>Type of License or funding (specify)</u>
--------------------	---

FHWA	Federal Aid funding
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US Army Corps of Engineers	Section 404 permit
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Project Description (narrative):

The Massachusetts Department of Transportation (MassDOT) proposes to replace Bridge H-08-003=N-07-002, which carries Creamery Road/ Unitas Road over Ware River between Hardwick and New Braintree. Bridge H-08-003=N-07-002, constructed in 1939, consists of a single-span steel stringer superstructure supported on reinforced concrete abutments. The north abutment is a full-height concrete gravity wall with dry-laid masonry wingwalls, while the south abutment is a concrete stub abutment with an earlier mortared stone abutment behind, acting as backwall and wingwalls. The bridge has two-rail timber plank railings with timber posts.

The proposed work will include full replacement of the bridge on existing alignment with a structure 3' wider than existing. The proposed bridge and approach roadway cross-section will include a single 14'-wide travel lane. The proposed new bridge will consist of a single-span steel stringer superstructure supported by reinforced concrete integral abutments on H-pile footings. The bridge will have reinforced concrete CT-TL2 open parapet railings, also known as 'Texas rail'. The road will be closed for the duration of construction and traffic will be detoured, primarily to the north along Route 32 (Lower Road) and West Road.

Roadway reconstruction along the bridge approaches will extend approximately 260' to the west and 200' to the east of the bridge, encompassing a total project length of 560 feet. Work will also include full-depth pavement reconstruction along the existing bridge approaches; minor roadway widening along the bridge approaches, to provide a consistent cross-section; grading roadside slopes along the bridge approaches; installation of guardrail along the bridge approaches, as none presently exist; installation of temporary erosion and sedimentation controls, and related work. A single catch basin will be installed at the northeasterly corner of the bridge, to capture runoff coming downhill along Unitas Road and discharge to bordering wetlands next to the bridge. A mechanically stabilized earth retaining wall will also be constructed

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in this area, with precast concrete block facing. This wall will be located in the vicinity of Station 4+75 – 5+60 LT, measuring 85' in length and 6' high at its maximum extent. The existing roadside slope will be excavated for construction of the wall footing.

A wetland replication area will be constructed to the northeast of the bridge (Station 2 + 50 LT). The narrow, linear replication area (approximately 800 sq. ft.) will be constructed on the slope between an upland field and wetlands along the riverbank. The slope will be graded and wetland soil with Facultative Wetland Meadow seed mix will be installed. Temporary access to the area will be constructed on geotextile fabric and timber matting. The access alignment will be restored with a compost blanket and a mid-height grassland seed mix.

Does the project include demolition? If so, specify nature of demolition and describe the building(s) which are proposed for demolition.

[Bridge H-08-003=N-07-002 will be removed and replaced. The bridge was reviewed by Kurt Jergensen, Historic Bridge Specialist, and determined to be ineligible for listing in the National Register. While the substructure is an unusual conglomeration of older stone masonry with more typical 20th century concrete construction, the superstructure is a typical mid-20th century steel stringer design with no architectural character and standard engineering details.

Does the project include rehabilitation of any existing buildings? If so, specify nature of rehabilitation and describe the building(s) which are proposed for rehabilitation

[N/A]

Does the project include new construction? If so, describe (attach plans and elevations if necessary).

[H-08-003=N-07-002 will be removed and replaced on the same alignment with a wider structure. The approach roadway cross-section will be widened minimally, up to 2 feet.

To the best of your knowledge, are any historic or archaeological properties known to exist within the project's area of potential impact? If so, specify.

[Review of the National Register of Historic Places revealed no National Register-listed districts or individual properties within or adjacent to the project area. Review of the Inventory of Historic and Archaeological Assets revealed one inventoried property: the Grigas Farm and William Anderson House (NBR.121 – 125). The Anderson House is a Georgian style residence constructed in 1739, located at 87 Sibley Road, a mile to the south of the bridge in New Braintree. Along with several barns and outbuildings dating to the first half of the 19th century and about 340 acres of fields and woodland along the east bank of the Ware River, the Grigas farm is one of two large dairy farms in New Braintree that have been in active production for over a century. The farm has been recommended for listing in the National Register, including the fields extending up to Unitas Road.

A review of the MHC's archaeological maps in MACRIS revealed no recorded sites in the vicinity of the project area. Numerous recorded pre-Contact sites are clustered to the north and east. The nearest pre-Contact sites are: 19-WR-399, located approximately 1.15 miles to the southwest; 19-WR-639, a flake scatter site located approximately 1.0 mile to the southeast; 19-WR-299 (Pioneer Valley Academy Site), a flake scatter site located approximately 1.2 miles to the east; 19-WR-48 (Ware River Campsite), located approximately 1.3 miles to the northeast. It is the opinion of the MassDOT Archaeologist that low sensitivity can be ascribed to the project's direct area of potential effect based on the impacts of past bridge and roadway construction and unfavorable conditions (slope and wetlands). Soil borings indicate the roadway approaches to the bridge were constructed on 8 to 10-ft. of fill to carry the crossing over the wide floodplain. The majority of the project work, including the bridge, retaining wall construction, and road work, will be confined to the existing bridge alignment and roadway and roadway slope. The project work will raise the

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roadway/roadway slope approximately 2-ft. A utility easement will be required on the alignment of an existing overhead utility corridor west of the bridge. The proposed wetland replication area will be constructed in an unfavorable area on the slope between an upland field and wetlands surrounding a small tributary stream. Temporary access to the area will be constructed across mowed hayfield, with no excavation proposed. A review of historic aerial photos indicates the area immediately northeast of the bridge was part of the river / flooded throughout the 20th-century. The area appears to have slowly filled in with wetland vegetation in the 21st-century. |

What is the total acreage of the project area?

Woodland	<u><1</u>	acres	Productive Resources:		
Wetland	<u> </u>	acres	Agriculture	<u><1</u>	acres
Floodplain	<u><1</u>	acres	Forestry	<u> </u>	acres
Open Space	<u> </u>	acres	Mining/Extraction	<u> </u>	acres
Developed	<u> </u>	acres	Total Project Acreage	<u><3</u>	acres

What is the acreage of the proposed new construction?

<1 acres

What is the present land use of the project area?

The Project area is situated amid tree-lined hayfield margins and riverbanks. The proposed bridge replacement, roadway reconstruction and retaining wall construction will take place within the existing bridge and roadway footprint, as well as roadside slopes.

Please attach a copy of the section of the USGS quadrangle map which clearly marks the project location.

This Project Notification Form has been submitted to the MHC in compliance with 950 CMR 71.00.

Signature of person submitting this form:



Date: 4/25/2023

Name: Kurt Jergensen

Address: 10 Park Plaza

City/Town/Zip: Boston, MA 02116

Telephone: 207-590-4999

REGULATORY AUTHORITY

950 CMR 71.00: M.G.L. c. 9, §§ 26-27C as amended by St. 1988, c. 254.

7/1/93

950 CMR - 276



United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104



In Reply Refer To:

October 19, 2023

Project code: 2024-0005976

Project Name: 608851-HARDWICK- NEW BRAINTREE- BRIDGE REPLACEMENT,
CREAMERY ROAD OVER WARE RIVER

Subject: Concurrence verification letter for the '608851-HARDWICK- NEW BRAINTREE- BRIDGE REPLACEMENT, CREAMERY ROAD OVER WARE RIVER' project under the amended February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion (dated March 23, 2023) for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat (NLEB).

To whom it may concern:

The U.S. Fish and Wildlife Service (Service) has received your request dated October 19, 2023 to verify that the **608851-HARDWICK- NEW BRAINTREE- BRIDGE REPLACEMENT, CREAMERY ROAD OVER WARE RIVER** (Proposed Action) may rely on the concurrence provided in the amended February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion (dated March 23, 2023) for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat (PBO) to satisfy requirements under Section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 *et seq.*).

Based on the information you provided (Project Description shown below), you have determined that the Proposed Action is within the scope and adheres to the criteria of the PBO, including the adoption of applicable avoidance and minimization measures. **At least one of the qualification interview questions indicated an activity or portion of your project is consistent with a not likely to adversely affect determination therefore, the overall determination for your project is, may affect, and is not likely to adversely affect (NLAA) the endangered Indiana bat (*Myotis sodalis*) and/or the endangered northern long-eared bat (*Myotis septentrionalis*).** Consultation with the Service pursuant to section 7(a)(2) of ESA (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) is required.

The Service has 14 calendar days to notify the lead Federal action agency or designated non-federal representative if we determine that the Proposed Action does not meet the criteria for a NLAA determination under the PBO. If we do not notify the lead Federal action agency or designated non-federal representative within that timeframe, you may proceed with the Proposed

Action under the terms of the NLAA concurrence provided in the PBO. This verification period allows Service Field Offices to apply local knowledge to implementation of the PBO, as we may identify a small subset of actions having impacts that were unanticipated. In such instances, Service Field Offices may request additional information that is necessary to verify inclusion of the proposed action under the PBO.

For Proposed Actions that include bridge/culvert or structure removal, replacement, and/or maintenance activities: If your initial bridge/culvert or structure assessment documented signs of bat use or occupancy, or an assessment failed to detect Indiana bats and/or NLEBs, yet are later detected prior to, or during construction, please submit the Post Assessment Discovery of Bats at Bridge/Culvert or Structure Form (User Guide Appendix E) to this Service Office within 2 working days of any potential take. In these instances, potential incidental take of Indiana bats and/or NLEBs is covered under the Incidental Take Statement in the 2018 FHWA, FRA, FTA PBO (provided that the take is reported to the Service).

If the Proposed Action is modified, or new information reveals that it may affect the Indiana bat and/or northern long-eared bat in a manner or to an extent not considered in the PBO, further review to conclude the requirements of ESA Section 7(a)(2) may be required.

For Proposed Actions that include bridge/culvert or structure removal, replacement, and/or maintenance activities:

If your initial bridge/culvert or structure assessments failed to detect Indiana bats and/or NLEB use or occupancy, yet bats are later detected prior to, or during construction, please submit the Post Assessment Discovery of Bats at Bridge/Culvert or Structure Form (User Guide Appendix E) to this Service Office within 2 working days of the incident. In these instances, potential incidental take of Indiana bats and/or NLEBs may be exempted provided that the take is reported to the Service.

If the Proposed Action may affect any other federally-listed or proposed species, and/or any designated critical habitat, additional consultation between the lead Federal action agency and this Service Office is required. If the proposed action has the potential to take bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act may also be required. In either of these circumstances, please contact this Service Office.

The following species may occur in your project area and **are not** covered by this determination:

- Monarch Butterfly *Danaus plexippus* Candidate

PROJECT DESCRIPTION

The following project name and description was collected in IPaC as part of the endangered species review process.

NAME

608851-HARDWICK- NEW BRAINTREE- BRIDGE REPLACEMENT, CREAMERY ROAD OVER WARE RIVER

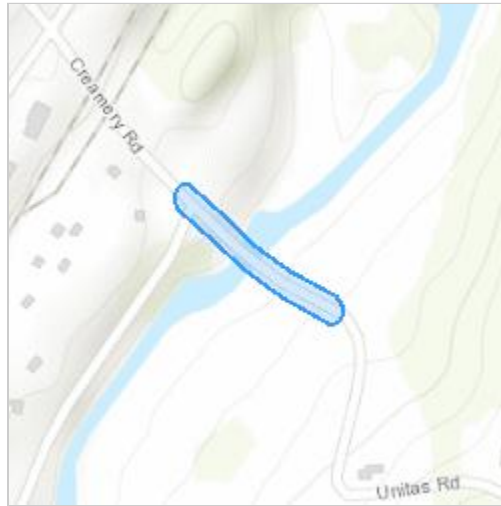
DESCRIPTION

608851 - HARDWICK- NEW BRAINTREE- BRIDGE REPLACEMENT,
H-08-003=N-07-002, CREAMERY ROAD OVER WARE RIVER

This proposed bridge project consists of a 100' long single span bridge. The bridge will increase the total curb-to-curb width to 14' and an architecturally styled concrete bridge railing system will be located along both sides of the bridge with a steel highway guard railing located on both sides of both approaches. The roadway will be raised approximately 2' to provide for hydraulic clearances which will require approximately 200' of roadway improvements along both sides of the bridge. No pedestrian or bicycle accommodation improvements will be provided.

Monarch Butterfly: Candidate Species only, no conservation measures at this time.

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@42.320916800000006,-72.17466386141098,14z>



DETERMINATION KEY RESULT

Based on your answers provided, this project(s) may affect, but is not likely to adversely affect the endangered Indiana bat and/or the endangered northern long-eared bat, therefore, consultation with the U.S. Fish and Wildlife Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended 16 U.S.C. 1531 *et seq.*) is required. However, also based on your answers provided, this project may rely on the concurrence provided in the amended February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion (dated March 23, 2023) for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat.

QUALIFICATION INTERVIEW

1. Is the project within the range of the Indiana bat^[1]?

[1] See [Indiana bat species profile](#)

Automatically answered

No

2. Is the project within the range of the northern long-eared bat^[1]?

[1] See [northern long-eared bat species profile](#)

Automatically answered

Yes

3. Which Federal Agency is the lead for the action?

A) *Federal Highway Administration (FHWA)*

4. Are *all* project activities limited to non-construction^[1] activities only? (examples of non-construction activities include: bridge/abandoned structure assessments, surveys, planning and technical studies, property inspections, and property sales)

[1] Construction refers to activities involving ground disturbance, percussive noise, and/or lighting.

No

5. Does the project include *any* activities that are **greater than** 300 feet from existing road/rail surfaces^[1]?

[1] Road surface is defined as the actively used [e.g. motorized vehicles] driving surface and shoulders [may be pavement, gravel, etc.] and rail surface is defined as the edge of the actively used rail ballast.

No

6. Does the project include *any* activities **within** 0.5 miles of a known Indiana bat and/or NLEB hibernaculum^[1]?

[1] For the purpose of this consultation, a hibernaculum is a site, most often a cave or mine, where bats hibernate during the winter (see suitable habitat), but could also include bridges and structures if bats are found to be hibernating there during the winter.

No

7. Is the project located **within** a karst area?

No

8. Is there *any* suitable^[1] summer habitat for Indiana Bat or NLEB **within** the project action area^[2]? (includes any trees suitable for maternity, roosting, foraging, or travelling habitat)

[1] See the Service's [summer survey guidance](#) for our current definitions of suitable habitat.

[2] The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR Section 402.02). Further clarification is provided by the [User's Guide for the Range-wide Programmatic Consultation for Indiana Bat and Northern Long-eared Bat](#).

Yes

9. Will the project remove *any* suitable summer habitat^[1] and/or remove/trim any existing trees **within** suitable summer habitat?

[1] See the Service's [summer survey guidance](#) for our current definitions of suitable habitat.

Yes

10. Will the project clear more than 20 acres of suitable habitat per 5-mile section of road/rail?

No

11. Have presence/probable absence (P/A) summer surveys^{[1][2]} been conducted^{[3][4]} **within** the suitable habitat located within your project action area?

[1] See the Service's [summer survey guidance](#) for our current definitions of suitable habitat.

[2] Presence/probable absence summer surveys conducted within the fall swarming/spring emergence home range of a documented Indiana bat hibernaculum (contact local Service Field Office for appropriate distance from hibernacula) that result in a negative finding requires additional consultation with the local Service Field Office to determine if clearing of forested habitat is appropriate and/or if seasonal clearing restrictions are needed to avoid and minimize potential adverse effects on fall swarming and spring emerging Indiana bats.

[3] For projects within the range of either the Indiana bat or NLEB in which suitable habitat is present, and no bat surveys have been conducted, the transportation agency will assume presence of the appropriate species. This assumption of presence should be based upon the presence of suitable habitat and the capability of bats to occupy it because of their mobility.

[4] Negative presence/probable absence survey results obtained using the [summer survey guidance](#) are valid for a minimum of two years from the completion of the survey unless new information (e.g., other nearby surveys) suggest otherwise.

Yes

SUBMITTED DOCUMENTS

- *Acoustic_Bridge Report_608851_Final_Binder_reduced.pdf* <https://ipac.ecosphere.fws.gov/project/KIUZUQPBKZHHDNKUT6PFRVCIXQ/projectDocuments/133414559>

12. Did the presence/probable absence (P/A) summer surveys detect Indiana bats and/or NLEB^[1]?

[1] P/A summer surveys conducted within the fall swarming/spring emergence home range of a documented Indiana bat hibernaculum (contact local Service Field Office for appropriate home range) that result in a negative finding requires additional consultation with the local Service Field Office to determine if clearing of forested habitat is appropriate and/or if seasonal clearing restrictions are needed to avoid and minimize potential adverse effects on fall swarming and spring emerging Indiana bats.

No

13. Were the P/A summer surveys conducted **within** the fall swarming/spring emergence range of a documented Indiana bat hibernaculum^[1]?

[1] Contact the local Service Field Office for appropriate distance from hibernacula.

No

14. Does the project include activities **within documented NLEB habitat**^{[1][2]}?

[1] Documented roosting or foraging habitat – for the purposes of this consultation, we are considering documented habitat as that where Indiana bats and/or NLEB have actually been captured and tracked using (1) radio telemetry to roosts; (2) radio telemetry biangulation/triangulation to estimate foraging areas; or (3) foraging areas with repeated use documented using acoustics. Documented roosting habitat is also considered as suitable summer habitat within 0.25 miles of documented roosts.)

[2] For the purposes of this key, we are considering documented corridors as that where Indiana bats and/or NLEB have actually been captured and tracked to using (1) radio telemetry; or (2) treed corridors located directly between documented roosting and foraging habitat.

No

15. Will the removal or trimming of habitat or trees occur **within** suitable but **undocumented NLEB** roosting/foraging habitat or travel corridors?

Yes

16. What time of year will the removal or trimming of habitat or trees **within** suitable but **undocumented NLEB** roosting/foraging habitat or travel corridors occur?

C) During both the active and inactive seasons

17. Will *any* tree trimming or removal occur **within** 100 feet of existing road/rail surfaces?

Yes

18. Will *any* tree trimming or removal occur **between** 100-300 feet of existing road/rail surfaces?

No

19. Are *all* trees that are being removed clearly demarcated?

Yes

20. Will the removal of habitat or the removal/trimming of trees involve the use of **temporary** lighting?

Yes

21. Will the removal of habitat or the removal/trimming of trees include installing new or replacing existing **permanent** lighting?

No

22. Does the project include wetland or stream protection activities associated with compensatory wetland mitigation?

Yes

23. Does the project include slash pile burning?

No

24. Does the project include *any* bridge removal, replacement, and/or maintenance activities (e.g., any bridge repair, retrofit, maintenance, and/or rehabilitation work)?

Yes

25. Is there *any* suitable habitat^[1] for Indiana bat or NLEB **within** 1,000 feet of the bridge? (includes any trees suitable for maternity, roosting, foraging, or travelling habitat)

[1] See the Service's current [summer survey guidance](#) for our current definitions of suitable habitat.

Yes

26. Has a bridge assessment^[1] been conducted **within** the last 24 months^[2] to determine if the bridge is being used by bats?

[1] See [User Guide Appendix D](#) for bridge/structure assessment guidance

[2] Assessments must be completed no more than 2 years prior to conducting any work below the deck surface on all bridges that meet the physical characteristics described in the Programmatic Consultation, regardless of whether assessments have been conducted in the past. Due to the transitory nature of bat use, a negative result in one year does not guarantee that bats will not use that bridge/structure in subsequent years.

Yes

SUBMITTED DOCUMENTS

- *Acoustic_Bridge Report_608851_Final_Binder_reduced.pdf* <https://ipac.ecosphere.fws.gov/project/KIUZUQPBKZHHDNKUT6PFRVCIXQ/projectDocuments/133414559>

27. Did the bridge assessment detect *any* signs of Indiana bats and/or NLEBs roosting in/under the bridge (bats, guano, etc.)^[1]?

[1] If bridge assessment detects signs of *any* species of bats, coordination with the local FWS office is needed to identify potential threatened or endangered bat species. Additional studies may be undertaken to try to identify which bat species may be utilizing the bridge prior to allowing *any* work to proceed.

Note: There is a small chance bridge assessments for bat occupancy do not detect bats. Should a small number of bats be observed roosting on a bridge just prior to or during construction, such that take is likely to occur or does occur in the form of harassment, injury or death, the PBO requires the action agency to report the take. Report all unanticipated take within 2 working days of the incident to the USFWS. Construction activities may continue without delay provided the take is reported to the USFWS and is limited to 5 bats per project.

No

28. Will the bridge removal, replacement, and/or maintenance activities include installing new or replacing existing **permanent** lighting?

No

29. Does the project include the removal, replacement, and/or maintenance of *any* structure other than a bridge? (e.g., rest areas, offices, sheds, outbuildings, barns, parking garages, etc.)

No

30. Will the project involve the use of *any* **temporary** lighting in addition to the lighting already indicated for habitat removal (including the removal or trimming of trees), or bridge/structure removal, replacement or maintenance activities?

Yes

31. Is there *any* suitable habitat **within** 1,000 feet of the location(s) where **temporary** lighting (other than the lighting already indicated for habitat removal (including the removal or trimming of trees) or bridge/structure removal, replacement or maintenance activities) will be used?

Yes

32. Will the project install new or replace existing **permanent** lighting?

No

33. Does the project include percussives or other activities (**not including tree removal/trimming or bridge/structure work**) that will increase noise levels above existing traffic/background levels?

Yes

34. Will the activities that use percussives (**not including tree removal/trimming or bridge/structure work**) and/or increase noise levels above existing traffic/background levels be conducted *during* the active season^[1]?

[1] Coordinate with the local Service Field Office for appropriate dates.

Yes

35. Will *any* activities that use percussives (**not including tree removal/trimming or bridge/structure work**) and/or increase noise levels above existing traffic/background levels be conducted *during* the inactive season^[1]?

[1] Coordinate with the local Service Field Office for appropriate dates.

Yes

36. Are *all* project activities that are **not associated with** habitat removal, tree removal/trimming, bridge and/or structure activities, temporary or permanent lighting, or use of percussives, limited to actions that DO NOT cause any additional stressors to the bat species?

Examples: lining roadways, unlighted signage, rail road crossing signals, signal lighting, and minor road repair such as asphalt fill of potholes, etc.

Yes

37. Will the project raise the road profile **above the tree canopy**?

No

38. Are the wetland or stream protection activities associated with compensatory wetland/stream mitigation portion of this project consistent with a Not Likely to Adversely Affect determination in this key?

Automatically answered

Yes, because your activities associated with compensatory wetland/stream mitigation activities do not clear suitable summer habitat and are not within 0.5 miles of Indiana bat or NLEB hibernaculum.

39. Are the project activities that use percussives (not including tree removal/trimming or bridge/structure work) consistent with a Not Likely to Adversely Affect determination in this key?

Automatically answered

Yes, because the activities are within 300 feet of the existing road/rail surface, greater than 0.5 miles from a hibernacula, and conducted during the active season within undocumented habitat.

40. Are the project activities that use percussives (not including tree removal/trimming or bridge/structure work) and/or increase noise levels above existing traffic/background levels consistent with a No Effect determination in this key?

Automatically answered

Yes, because the activities are within 300 feet of the existing road/rail surface, greater than 0.5 miles from a hibernacula, and conducted during the inactive season

41. Is the location of this project consistent with a Not Likely to Adversely Affect determination in this key?

Automatically answered

Yes, because no bats were detected during presence/probable absence surveys conducted during the summer survey season and outside of the fall swarming/spring emergence periods. Additionally, all activities were at least 0.5 miles from any hibernaculum.

42. Is the bridge removal, replacement, or maintenance activities portion of this project consistent with a No Effect determination in this key?

Automatically answered

Yes, because the bridge has been assessed using the criteria documented in the BA and no signs of bats were detected

43. **General AMM 1**

Will the project ensure *all* operators, employees, and contractors working in areas of known or presumed bat habitat are aware of *all* FHWA/FRA/FTA (Transportation Agencies) environmental commitments, including all applicable Avoidance and Minimization Measures?

Yes

PROJECT QUESTIONNAIRE

1. Have you made a No Effect determination for *all* other species indicated on the FWS IPaC generated species list?

N/A

2. Have you made a May Affect determination for *any* other species on the FWS IPaC generated species list?

N/A

3. How many acres^[1] of trees are proposed for removal between 0-100 feet of the existing road/rail surface?

[1] If described as number of trees, multiply by 0.09 to convert to acreage and enter that number.

1

4. Please describe the proposed bridge work:

This proposed bridge project consists of a 100' long single span bridge. The bridge will increase the total curb-to-curb width to 14' and an architecturally styled concrete bridge railing system will be located along both sides of the bridge with a steel highway guard railing located on both sides of both approaches. The roadway will be raised approximately 2' to provide for hydraulic clearances which will require approximately 200' of roadway improvements along both sides of the bridge. No pedestrian or bicycle accommodation improvements will be provided.

5. Please state the timing of all proposed bridge work:

March 2025 - October 2026

6. Please enter the date of the bridge assessment:

8/3/2023

AVOIDANCE AND MINIMIZATION MEASURES (AMMS)

This determination key result includes the commitment to implement the following Avoidance and Minimization Measures (AMMs):

GENERAL AMM 1

Ensure all operators, employees, and contractors working in areas of known or presumed bat habitat are aware of all FHWA/FRA/FTA (Transportation Agencies) environmental commitments, including all applicable AMMs.

DETERMINATION KEY DESCRIPTION: FHWA, FRA, FTA PROGRAMMATIC CONSULTATION FOR TRANSPORTATION PROJECTS AFFECTING NLEB OR INDIANA BAT

This key was last updated in IPaC on October 10, 2023. Keys are subject to periodic revision.

This decision key is intended for projects/activities funded or authorized by the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), and/or Federal Transit Administration (FTA), which may require consultation with the U.S. Fish and Wildlife Service (Service) under Section 7 of the Endangered Species Act (ESA) for the endangered **Indiana bat** (*Myotis sodalis*) and the endangered **northern long-eared bat** (NLEB) (*Myotis septentrionalis*).

This decision key should only be used to verify project applicability with the Service's [amended February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion \(dated March 23, 2023\) for Transportation Projects](#). The programmatic biological opinion covers limited transportation activities that may affect either bat species, and addresses situations that are both likely and not likely to adversely affect either bat species. This decision key will assist in identifying the effect of a specific project/activity and applicability of the programmatic consultation. The programmatic biological opinion is not intended to cover all types of transportation actions. Activities outside the scope of the programmatic biological opinion, or that may affect ESA-listed species other than the Indiana bat or NLEB, or any designated critical habitat, may require additional ESA Section 7 consultation.

IPAC USER CONTACT INFORMATION

Agency: Massachusetts Department of Transportation

Name: Julia Hoogeboom

Address: 10 Park Plaza

City: Boston

State: MA

Zip: 02116

Email: julia.a.hoogeboom@dot.state.ma.us

Phone: 8574452880

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Federal Highway Administration



MASSWILDLIFE

DIVISION OF FISHERIES & WILDLIFE

1 Rabbit Hill Road, Westborough, MA 01581

p: (508) 389-6300 | f: (508) 389-7890

MASS.GOV/MASSWILDLIFE

November 16, 2023

Julia Hooageboom

10 park plaza

Boston, MA 02116

RE: Applicant: Julia Hooageboom
 Project Location: Creamery Road Bridge (H-08-003=N-07-002) over Ware River
 Project Description: 608851 - HARDWICK- NEW BRAINTREE- BRIDGE REPLACEMENT, H-08-003=N-07-002,
 CREAMERY ROAD OVER WARE RIV
 NHESP File No.: 23-8704

Dear Applicant:

The Natural Heritage & Endangered Species Program of the Massachusetts Division of Fisheries & Wildlife (the "Division") received the MESA Project Review Checklist and supporting documentation for review pursuant to the Massachusetts Endangered Species Act (MESA) (MGL c.131A) and its implementing regulations (321 CMR 10.00).

The MESA is administered by the Division, and prohibits the Take of state-listed species. The Take of state-listed species is defined as "in reference to animals...harm...kill...disrupt the nesting, breeding, feeding or migratory activity...and in reference to plants...collect, pick, kill, transplant, cut or process...Disruption of nesting, breeding, feeding, or migratory activity may result from, but is not limited to, the modification, degradation, or destruction of Habitat" of state-listed species (321 CMR 10.02).

The Division has determined that this Project, as currently proposed, will occur **within** the actual habitat of the following species:

<u>Scientific Name</u>	<u>Common Name</u>	<u>Taxonomic Group</u>	<u>State Status</u>
<i>Glyptemys insculpta</i>	Wood Turtle	Reptile	Special Concern
<i>Strophitus undulatus</i>	Creeper	Mussel	Special Concern

These species and their habitats are protected in accordance with the MESA.

Based on the information provided and the information contained in our database, the Division finds that a portion of this project, as currently proposed, **must be conditioned to avoid a prohibited Take of state-listed**

MASSWILDLIFE

species (321 CMR 10.18(2)(a)). To avoid a prohibited Take of state-listed species, the conditions attached to this letter must be met.

Provided the attached conditions are fully implemented and there are no changes to the project plans, this project will not result in a Take of state-listed species. We note that all work is subject to the anti-segmentation provisions (321 CMR 10.16) of the MESA. This determination is a final decision of the Division of Fisheries and Wildlife pursuant to 321 CMR 10.18. Any changes to the proposed project or any additional work beyond that shown on the site plans may require an additional filing with the Division pursuant to the MESA. This project may be subject to further review if no physical work is commenced within five years from the date of issuance of this determination, or if there is a change to the project.

Please note that this determination addresses only the matter of state-listed species and their habitats. If you have any questions regarding this letter please contact Melany Cheeseman, Endangered Species Review Assistant, at Melany.Cheeseman@mass.gov, (508) 389-6357.

Sincerely,



Everose Schlüter, Ph.D.
Assistant Director

cc: david paulson, Massachusetts Department of Transportation
Julia Hoozeboom, Massachusetts Department of Transportation
New Braintree Conservation Commission

Attachment: List of Conditions

List of Conditions

Applicant: Julia Hoogeboom
Project Location: Creamery Road Bridge (H-08-003=N-07-002) over Ware River
Project Description: 608851 - HARDWICK- NEW BRAINTREE- BRIDGE REPLACEMENT, H-08-003=N-07-002, CREAMERY ROAD OVER WARE RIV
NHESP File No.: 23-8704
Heritage Hub Form ID: RC-74162
Approved Plan: Creamery Road Bridge Replacement Over Ware River
Plan date: 9/22/23 Revised Date: N/A

To avoid a prohibited Take of state-listed species, the following condition(s) must be met:

1. **Mussel Protection:** A one-time mussel sweep shall be conducted immediately prior to the work. The purpose of the sweep is for a qualified biologist to search the work area and vicinity for mussels and translocate them outside of area subject to alteration.
 - a. State Listed Mussel Sweep: Mussels shall be located, identified, and moved to suitable habitat away from impacts associated with the project immediately prior to work within habitat.
 - b. Pre-Approval: The Division must pre-approve the candidate biologist(s) prior to any Work subject to this condition. The ability to locate and identify state-listed mussels requires significant experience with the target mussel species. The resume/curriculum vitae of the candidate biologist, demonstrating extensive experience locating state-listed mussels, shall be sent to the Division for written pre-approval.
 - c. Collection Permit: The biologist must obtain a Commercial Scientific Collection Permit for this project site prior to conducting mussel sweeps. Commercial Scientific Collection Permit Application & filing fee information can be found at: <https://www.mass.gov/doc/commercial-scientific-collection-permit-application/download>.
 - d. Survey Timing: Survey and relocation of mussels shall only occur between June 1 and October 1.
 - e. Reporting: The survey report, reporting positive or negative finding (aka 'fail to find') shall be submitted to the Division as outlined in the survey guidelines reporting all state-listed and watch-listed species. Please note that survey data must be submitted via the Heritage Hub (www.mass.gov/heritagehub) within 10 days of the completion of the survey.
2. **Turtle Protection Plan:** The applicant shall implement the Wood Turtle Protection Plan included as part of this submittal prior to the start of work (including vegetation clearing or soil disturbance). The Division-approved Plan shall be implemented as written; any proposed changes to the Plan must be submitted to the Division for review and written approval prior to implementation of said changes. By December 31st of any year in which work occurs, the qualified biologist shall submit: a) a summary report to the Division detailing project status and compliance with the Plan; and b) any observations of state-listed turtles at <https://www.mass.gov/how-to/report-rare-species-vernal-pool-observations>.

WOOD TURTLE (*Glyptemys insculpta*) PROTECTION PLAN

General

This section outlines the requirements of the Natural Heritage and Endangered Species Program (NHESP) of the Division of Fisheries and Wildlife (DFW) for projects that occur in the vicinity of high-priority wood turtle (*Glyptemys insculpta*) populations. The work to be done consists of the monitoring and protection of turtles during the replacement of Creamery Road Bridge over the Ware River in the Towns of Hardwick and New Braintree, Massachusetts.

One Time Sweeps – Prior to Vegetation Clearing and In-water Cofferdam Installation

The Turtle Monitor (the Monitor) shall be a MassDOT biologist (David J. Paulson, (857) 262-3378, david.paulson@state.ma.us; or a representative from MassDOT Wildlife and Endangered Species Unit) approved by the Natural Heritage and Endangered Species Program (NHESP). The Monitor shall obtain a scientific collecting permit from the NHESP to handle wood turtles. The Monitor shall visit the site prior to the start of work, and the Contractor and/or Resident Engineer shall coordinate this site visit with the Monitor at least 60 days prior to construction commencement. The Monitor shall sweep the site prior to any site clearing, grubbing, earth disturbance, or site preparations. The Monitor shall inspect vegetation within 200-feet of the stream, prior to the establishment of the limit of work line and Turtle Exclusion Fence Barrier.

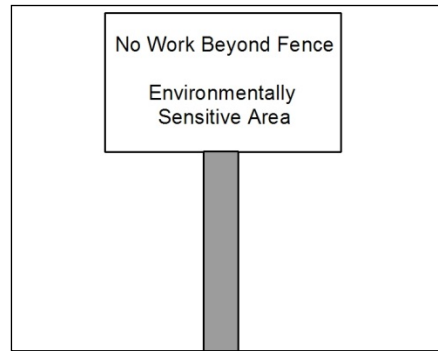
In addition, the Monitor shall provide a sweep of the site prior to any work in water. The Monitor shall inspect all areas of land under water where cofferdams are to be installed, paying close attention to overhanging banks and in water coarse woody debris.

The Monitor shall visually sweep the described areas immediately before machines enter the area and relocate any turtles to suitable habitat immediately beyond the construction site. The Monitor shall provide contact information to the project supervisor in the event a wood turtle is discovered on-site. The Monitor may visit the site on only one day if the vegetation clearing and in-water work are initiated on the same day. Upon completion of the monitoring, the Monitor shall provide the NHESP with a summary of activities at the construction site. This report shall include the number and duration of visits and rare species observation forms for all state-listed species encountered. In the event of finding an injured turtle, the turtle shall be transported to a suitable veterinarian. In the event of finding a turtle with a radio transmitter, the NHESP and the contact on the transmitter shall be alerted immediately.

All state-listed species encountered in or near the project shall be reported to the NHESP through a Rare Animal/Plant Observation Report with the required supporting materials within 10 days of the observation. No state-listed species may be removed from the project site unless under the direct supervision of the Monitor or the NHESP.

Establishment of a Limit of Work Barrier

Following the sweep of the work site, a limit of work barrier shall be installed. This line shall consist of staked compost filter tubes and Turtle Exclusion Fence Barrier (silt fence as the outer boundary) and shall contain signage clearly identifying it as the limits of work in all four quadrants. Refer to the attached sketch for the approximate location of the Turtle Exclusion Fence Barrier.



Example limit of work sign.

Installation of the barrier must be conducted using methods that result in a minimum of disturbance (i.e., hand-dug, “2-man” trencher or auger). It is not appropriate to clear large access paths prior to sweeps for turtle. No clearing may occur outside the limit of work approved by the NHESP without additional review and approval by the NHESP.

1. The barrier must be composed of at least 2 1/2 feet of vertical barrier above ground and an additional 4-6 inches buried below ground.
2. The face of the material must be relatively smooth. Materials commonly used are staked at 6 - 10 foot intervals and include tightly woven geotextile, aluminum flashing, or other such materials stapled or tacked to stakes. Loosely woven geotextile fabrics, hay/straw bales, wattles or tubular materials are not generally sufficient.
3. The bottom of the silt fencing must be carefully buried in a 4-6 inch deep trench. The trench must be backfilled and compacted. If it is not possible to dig a trench, then the bottom of the barrier must be affixed to the surface.
4. If project phasing and the traffic management plan allow, the barrier shall only include a single gap at each limit of the project large enough for vehicle passage to access the construction area. These gaps must be closed each night during the turtle active season (March 15 – October 31) with a gate and/or silt fence barrier, and the bottom of the silt barrier weighted down with a solid wood post or sand bags. A solid wooden, plastic or metal turtle barrier gate may be furnished by the contractor in order to close the gap locations. The turtle barrier gate must be keyed into the barrier so that turtles cannot enter the construction area.
5. If hay or straw bales are to be used with silt fencing, they shall be installed on the work-side of the silt fence to avoid turtles using these to breach the barrier.
6. Once installed, the barrier shall be taut between the stakes. Slumps or loose materials will undermine the effectiveness of the barrier. In some circumstances, geotextile fabrics may need to be reinforced with backer material to ensure integrity. Backer material is typically similar to hardware cloth.

Once per week, a person familiar with silt barrier maintenance and installation shall inspect the barrier and facilitate any repairs or alterations. The limit of work barrier should remain taut between stakes and any holes along the bottom repaired. MassDOT shall provide the NHESP with the name and contact information of the Resident Engineer responsible for coordinating necessary sweeps and maintaining appropriate barriers.

Construction Worker Training:

The Monitor shall provide to the construction foreperson wood turtle identification and handling pamphlets. All construction, landscaping, and other sub-contractors associated with the Project shall be informed in writing of the likely presence of State-listed Species on the Property and what measures (observation and injury protection) should be implemented to minimize direct harm to State-listed Species.

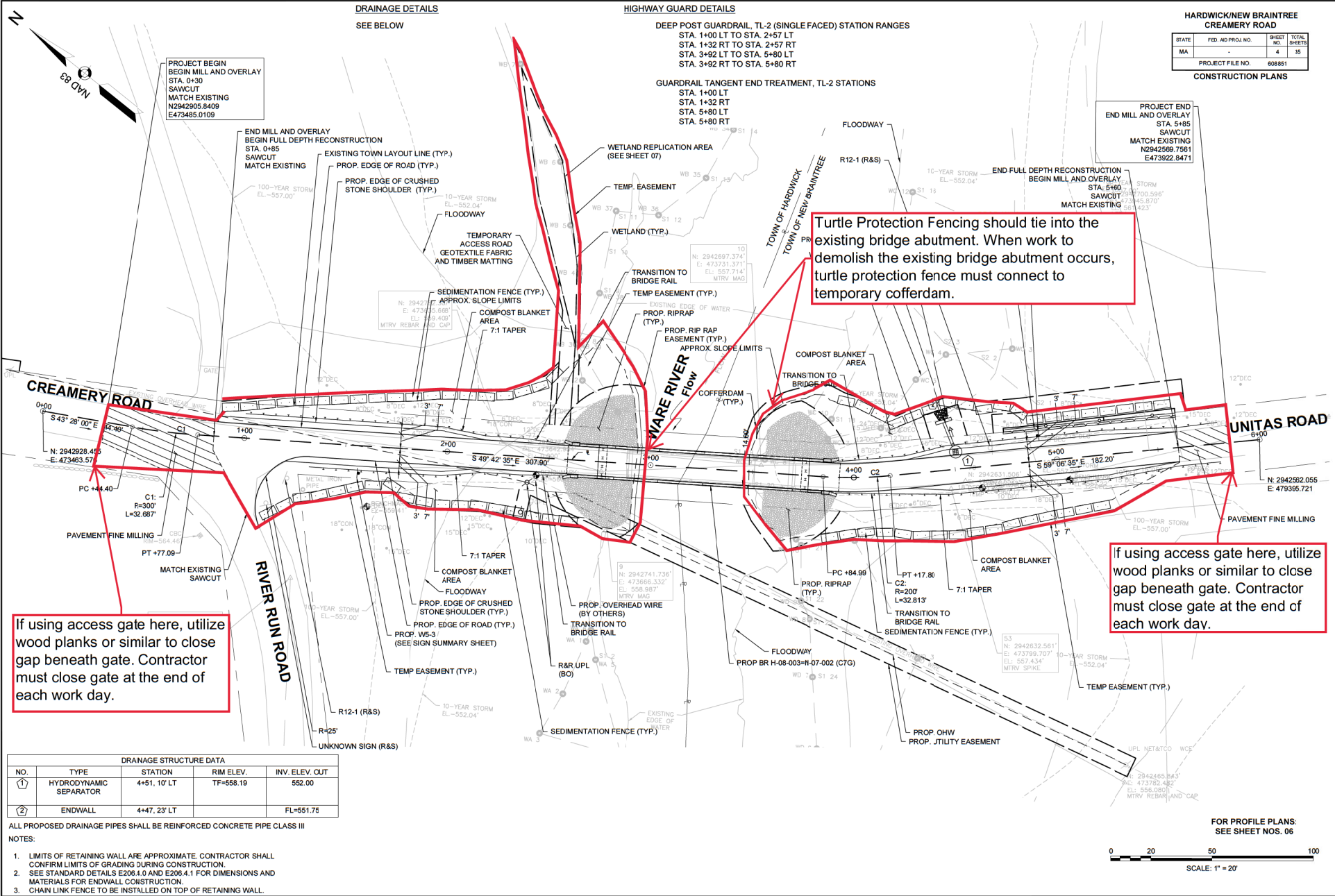
Further, no wildlife shall be removed from the Property without approval of a qualified wildlife biologist or the Division except as necessary to receive veterinary treatment in the case of harm during construction.

This protocol may require only one to three days of labor, including field surveys and correspondence with the NHESP.

Basis of Payment:

There will be no payment for the work conducted by the Turtle Monitor, as the Monitor will be provided to the Contractor as a free service by MassDOT.

Installation of a limit of work barrier, turtle barrier gates, and limit of work signage shall be considered incidental under ITEM 767.121 SEDIMENT CONTROL BARRIER.



MUSSEL TRANSLOCATION

In accordance with the MESA Determination Letter dated November 16, 2023, issued by the Natural Heritage & Endangered Species Program (NHESP) of the Massachusetts Division of Fisheries & Wildlife (the “Division”), a Mussel Sweep and Translocation plan must be completed by MassDOT’s on-call mussel biologist prior to any work in water.

The MESA Determination Letter (the “Letter”) is to be considered part of this contract and a copy of the Letter shall be on-site while activities regulated by the Letter are being performed. MassDOT’s on-call biologist will perform the required Mussel Sweep and Translocation Plan, however, the contractor shall inform all contractors and sub-contractors associated with the project of the likely presence of State-listed species on the property and indicate that no work in water may commence until authorized.

The Mussel Sweep and Translocation Plan must be conducted as close as possible to the start of any work in water and only during suitable weather conditions for mussel relocation (i.e., within the **June 1 to October 1** timeframe, water temperature >60.0F, high water clarity, average to below-average river flows, and fair weather). Once the mussel translocation is complete, work in water can proceed.

The Contractor and/or Resident Engineer must contact MassDOT’s Wildlife and Endangered Species Unit (**WESU contact: David Paulson, 857-262-3378, david.j.paulson@dot.state.ma.us**) once the construction schedule is drafted, and no later than 90 days prior to the start of work, to ensure that the mussel relocation can be conducted during the **June 1 to October 1** timeframe. If there are questions or concerns regarding the mussel relocation timing, the Resident Engineer can contact WESU.

Basis of Payment:

There will be no payment for the work conducted by the Mussel Biologist, as the Biologist will be provided to the Contractor as a free service by MassDOT.

Attachment F – Stormwater Management Memorandum





To: MassDOT

Date: December 19, 2023

Project #: 608851

From: BL Companies

Re: Creamery Road Bridge Replacement over Ware River

Project Description

The Applicant, Massachusetts Department of Transportation (MassDOT), is proposing Project 608851 to construct a bridge replacement (the Project) located in the Town of Hardwick and Town of New Braintree, MA. The proposed Project replaces the bridge along Creamery Road over the Ware River. Creamery Road is paved with bituminous concrete and has no shoulders or curbing. The roadway is ± 15 feet wide but narrows to ± 12 feet wide at the bridge abutments. The existing bridge is ± 11 feet wide. The proposed project will widen both the bridge and the roadway to 14 feet. The proposed roadway will also include a ± 3 -foot crushed stone shoulder on both sides leading up to the bridge and dumped riprap is proposed on each embankment.

Existing and Proposed Drainage Conditions

The existing driving surface of Creamery Road, including the bridge, is bituminous concrete with grassed and wooded areas adjacent to the pavement. The surrounding area is residential to the west and agricultural to the north, south, and east. At the project limit to the west, Creamery Road is at elevation ± 568 and slopes down to the bridge to elevation ± 558 . At the project limit to the east, the roadway is at elevation ± 560 . On either side of the roadway on both approaches, the land slopes down steeply towards the Ware River.

The project is located within the Chicopee River watershed and the receiving waterbody is the Ware River. Stormwater sheet flows off the roadway and through the vegetation along the side of the road before discharging to the river. Vegetation along the side of the road comprised of woods, grass, and brush acts as a vegetated filter strip and provides some treatment prior to the runoff discharging to the river. There is no existing drainage infrastructure within the project area.

The Project will include the replacement of the bridge and widening of Creamery Road. The bridge will be expanded in width from ± 11 feet wide to 14 feet wide. Creamery Road approaching the bridge will be widened to 14 feet with a ± 3 -foot crushed stone shoulder. This widening will result in ± 630 square feet of new pavement. Stormwater will continue to sheet flow off the roadway through the woods and brush acting as a vegetated filter strip before discharging into the river.

The roadway will be regraded to slope to a low point at approximately elevation 558 just to the east of the bridge. An inlet is proposed to collect rainwater/snowmelt during the winter months when the snowbanks create a gutter.

The road widening will require regrading on either side of the roadway between the roadway surface and the river bank. This graded embankment will have a 2:1 slope with rip rap installed for slope protection against erosion.

Massachusetts Department of Environmental Protection (MassDEP) – Stormwater Management Standards

The proposed Project complies with the MassDEP Stormwater Management Standards (the Standards) as described below. Under the Stormwater Management Standards, the Project is considered a redevelopment project because it involves maintenance and improvement of an existing roadway as well as the replacement of an existing bridge. The Project has been designed to meet the Stormwater Management Standards to the maximum extent practicable and to improve upon existing conditions.

Standard 1: No New Untreated Discharges

No new stormwater conveyance (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.

The Project has been designed to comply with Standard 1 to the maximum extent practical. The existing drainage conditions are maintained in the proposed condition. No curbing is proposed along the roadway and stormwater will continue to sheet flow off the road through woods and grass acting as a vegetated filter strip and providing some treatment before the runoff discharges to the Ware River.

Standard 2: Peak Rate Attenuation

Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR 10.04.

The Project has been designed to comply with Standard 2 to the maximum extent practicable. A minimal amount of additional pavement is proposed, which does not substantially increase post-development discharge rates. Stormwater will continue to sheet flow off the roadway through woods and grass providing a vegetated filter strip prior to discharging to the river. The project area has a narrow right of way, and the proposed disturbance area is further constrained to minimize the disturbance of wetlands in the area. The slight increase in impervious area does not increase the peak rate of runoff for the drainage area because the increased pavement surface area and decreased water surface area have the same runoff coefficient and there is no change to drainage patterns or watershed areas.

Table 1: Existing and proposed impervious (pavement) cover

Existing Impervious Area (sq. ft)	Proposed Impervious Area (sq. ft)	Change (sq. ft)
±9,590	±10,220	+630

Standard 3: Stormwater Recharge

Loss of annual recharge to groundwater shall be eliminated or minimized through the use of environmentally sensitive site design, low impact development techniques, stormwater management practices and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil types. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.

The Project has been designed to comply with Standard 3 to the maximum extent practicable. The purpose of this standard is to replenish groundwater baseflows by ensuring that the infiltration volume of precipitation into the ground under post-development conditions is at least as much as the infiltration volume under pre-development conditions.

The slope of the embankments on either side of the existing road varies from approximately 10% to 50% (2:1) slopes and do not support much infiltration. The velocity of the runoff is slowed somewhat by the embankment vegetation, but, generally, the roadway and bridge runoff flows directly to the river without much of the runoff infiltrating the ground. Proposed conditions will be like the existing condition with steep embankments that do not support infiltration. The graded area outside the bridge area will be vegetated and some residual infiltration will occur. Also, the rip rap slows runoff and creates small puddles that will promote a small amount of infiltration and groundwater recharge. The groundwater recharge for the project area will be similar to existing conditions.

Standard 4: Water Quality

Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). This Standard is met when:

- a) Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained;*
- b) Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and*
- c) Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.*

The Project has been designed to comply with Standard 4 to the maximum extent practicable. The existing drainage conditions are maintained in the proposed condition. No curbing is proposed along the roadway and stormwater will continue to sheet flow off the road through grass acting like a vegetated filter strip before discharging to the Ware River.

Standard 5: Land Uses with Higher Potential Pollutant Loads (LUHPPLs)

For Land Uses with Higher Potential Pollutant Loads (LUHPPLs), source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all LUHPPLs cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from LUHPPLs shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.

Standard 5 does not apply to the Project. There are no Land Uses with Higher Potential Pollutant Loads within the project area.

Standard 6: Critical Areas

Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply and stormwater discharges near or to any other critical area require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "stormwater discharge" as defined in 314 CMR 3.04(2)(a)1 or (b), to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of a public water supply.

Standard 6 does not apply to the Project. There are no Critical Areas near the project area.

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the Maximum Extent Practicable

A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.

The Project has been designed to comply with Standard 7. The Project is considered a redevelopment and has been designed to comply with the Stormwater Management Standards 7, 8, 9 and 10 and to comply to the maximum extent practicable for standards 1, 2, 3 and 4. Standards 5 and 6 are not applicable to the project.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Controls

The Project has been designed to comply with Standard 8. *A plan to control construction-related impacts, including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented.*

The implementation of erosion and sediment (E&S) controls during construction is considered a standard practice for all MassDOT projects. E&S controls will be installed before any land disturbance begins for the Project and will remain in place for the duration of the Project. The E&S controls for the Project are shown on the project plans and include sedimentation fence along the limits of grading.

Standard 9: Operation and Maintenance Plan

A Long-Term Operation and Maintenance (O&M) Plan shall be developed and implemented to ensure that stormwater management systems function as designed.

The roadway and bridge included in this project is not owned by MassDOT. The O&M Plan will be implemented by the municipality. The Town of New Braintree will be responsible for the operation and maintenance of all stormwater management systems within the project area. Questions or concerns regarding activities associated with this O&M Plan should be addressed to the Town of New Braintree Highway Department.

Long-term pollution prevention for the Project includes litter pick-up, inspection and maintenance of stormwater assets, maintenance of landscaped areas, snow and ice management, street sweeping, prohibition of illicit discharges, and spill prevention and response. The Project has been designed to comply with Standard 9.

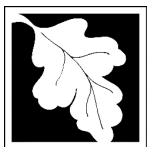
Standard 10: Prohibition of Illicit Discharges

All illicit discharges to the stormwater management system are prohibited.

Illicit Discharge Statement

The project's stormwater management system, as shown on the plans submitted with this report, have been designed in full compliance with Standard 10. The project area does not have any known illicit connections. Any illicit connections to the stormwater management system found in the project limit of work during construction will be removed and/or resolved through MassDOT's Illicit Discharge Detention and Elimination (IDDE) Program.

Attachments: Appendix A – Stormwater Checklist
 Appendix B – Operation and Maintenance Plan



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the [Massachusetts Stormwater Handbook](#). The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.¹ This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8²
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

¹ The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

² For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.



Massachusetts Department of Environmental Protection
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Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

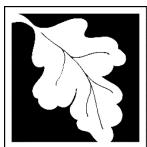
Registered Professional Engineer Block and Signature

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

- ☐ New development
- ☒ Redevelopment
- ☐ Mix of New Development and Redevelopment



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Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

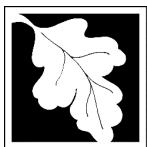
Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☐ No disturbance to any Wetland Resource Areas
- ☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☐ Reduced Impervious Area (Redevelopment Only)
- ☒ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
 - ☐ Credit 1
 - ☐ Credit 2
 - ☐ Credit 3
- ☒ Use of "country drainage" versus curb and gutter conveyance and pipe
- ☐ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☐ Water Quality Swale
- ☐ Grass Channel
- ☐ Green Roof
- ☐ Other (describe): _____

Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☐ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.



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Checklist for Stormwater Report

Checklist (continued)

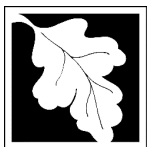
Standard 2: Peak Rate Attenuation

- ☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.
- ☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.
- ☐ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

- ☐ Soil Analysis provided.
- ☐ Required Recharge Volume calculation provided.
- ☐ Required Recharge volume reduced through use of the LID site Design Credits.
- ☐ Sizing the infiltration, BMPs is based on the following method: Check the method used.
 - ☐ Static
 - ☐ Simple Dynamic
 - ☐ Dynamic Field¹
- ☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.
- ☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.
- ☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.
- ☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:
 - ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
 - ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
 - ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
 - ☒ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.
- ☐ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.
- ☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

¹ 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.



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Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

- ☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.
- ☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
 - Provisions for storing materials and waste products inside or under cover;
 - Vehicle washing controls;
 - Requirements for routine inspections and maintenance of stormwater BMPs;
 - Spill prevention and response plans;
 - Provisions for maintenance of lawns, gardens, and other landscaped areas;
 - Requirements for storage and use of fertilizers, herbicides, and pesticides;
 - Pet waste management provisions;
 - Provisions for operation and management of septic systems;
 - Provisions for solid waste management;
 - Snow disposal and plowing plans relative to Wetland Resource Areas;
 - Winter Road Salt and/or Sand Use and Storage restrictions;
 - Street sweeping schedules;
 - Provisions for prevention of illicit discharges to the stormwater management system;
 - Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
 - Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
 - List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.
- ☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.
 - ☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:
 - ☐ is within the Zone II or Interim Wellhead Protection Area
 - ☐ is near or to other critical areas
 - ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
 - ☐ involves runoff from land uses with higher potential pollutant loads.
 - ☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.
 - ☐ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.



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Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

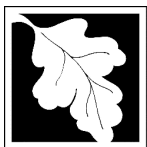
- ☐ The BMP is sized (and calculations provided) based on:
 - ☐ The ½" or 1" Water Quality Volume or
 - ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.
- ☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.
- ☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

- ☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.
- ☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted **prior to** the discharge of stormwater to the post-construction stormwater BMPs.
- ☐ The NPDES Multi-Sector General Permit does **not** cover the land use.
- ☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.
- ☐ All exposure has been eliminated.
- ☐ All exposure has **not** been eliminated and all BMPs selected are on MassDEP LUHPPL list.
- ☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

- ☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.
- ☐ Critical areas and BMPs are identified in the Stormwater Report.



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Checklist for Stormwater Report

Checklist (continued)

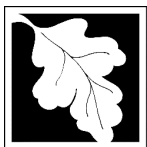
Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

- ☒ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:
 - ☐ Limited Project
 - ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
 - ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
 - ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
 - ☐ Bike Path and/or Foot Path
 - ☒ Redevelopment Project
 - ☐ Redevelopment portion of mix of new and redevelopment.
- ☒ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.
- ☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
 - Construction Period Operation and Maintenance Plan;
 - Names of Persons or Entity Responsible for Plan Compliance;
 - Construction Period Pollution Prevention Measures;
 - Erosion and Sedimentation Control Plan Drawings;
 - Detail drawings and specifications for erosion control BMPs, including sizing calculations;
 - Vegetation Planning;
 - Site Development Plan;
 - Construction Sequencing Plan;
 - Sequencing of Erosion and Sedimentation Controls;
 - Operation and Maintenance of Erosion and Sedimentation Controls;
 - Inspection Schedule;
 - Maintenance Schedule;
 - Inspection and Maintenance Log Form.
- ☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

- ☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has **not** been included in the Stormwater Report but will be submitted **before** land disturbance begins.
- ☒ The project is **not** covered by a NPDES Construction General Permit.
- ☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.
- ☐ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

- ☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:
 - ☒ Name of the stormwater management system owners;
 - ☒ Party responsible for operation and maintenance;
 - ☒ Schedule for implementation of routine and non-routine maintenance tasks;
 - ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
 - ☒ Description and delineation of public safety features;
 - ☒ Estimated operation and maintenance budget; and
 - ☒ Operation and Maintenance Log Form.
- ☐ The responsible party is **not** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:
 - ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
 - ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

- ☐ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;
- ☒ An Illicit Discharge Compliance Statement is attached;
- ☐ NO Illicit Discharge Compliance Statement is attached but will be submitted **prior to** the discharge of any stormwater to post-construction BMPs.

Creamery Road Bridge Replacement over Ware River

Stormwater Management System
Operation and Maintenance Plan and
Long-Term Pollution Prevention Plan
Town of Hardwick/Town of New Braintree

PREPARED FOR



10 Park Plaza
Boston, MA 02116

PREPARED BY



BL Companies
220 Norwood Park South, Suite 201
Norwood, MA 02062

December 19, 2023

Table of Contents

1	Stormwater Management System Operation and Maintenance (O&M) Plan	1
1.1	Responsible Party	1
1.2	Inspection and Maintenance Measures and Record-Keeping	1
1.3	Erosion and Sediment Control Measures during Maintenance Activities.....	2
2	Long-Term Pollution Prevention Plan	3
2.1	Practices for Long-Term Pollution Prevention	3
2.1.1	Litter Pick-up.....	3
2.1.2	Inspection and Maintenance of Stormwater Assets	3
2.1.3	Snow and Ice Management.....	3
2.1.4	Street Sweeping.....	4
2.1.5	Prohibition of Illicit Discharges.....	4

1

Stormwater Management System Operation and Maintenance (O&M) Plan

This Stormwater Management System Operation and Maintenance (O&M) Plan describes the approach for inspection and maintenance of drainage infrastructure and structural stormwater control measures (SCMs) to minimize contaminant loading for the Creamery Road bridge replacement over the Ware River in the Towns of Hardwick and New Braintree. In general, inspection and maintenance activities will be conducted consistent with the National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer System (MS4) and MassDOT's anticipated NPDES Transportation Separate Storm Sewer System (TS4) Permit.

This document has been prepared per the requirements of Massachusetts Department of Environmental Protection (MassDEP) Regulations 310 CMR 10.05 (6)(k)(9) and satisfies the requirements of Massachusetts Stormwater Standard 9.

1.1 Responsible Party

The Town of New Braintree will be responsible for the operation and maintenance of all stormwater management systems within the project area. Questions or concerns regarding activities associated with this O&M Plan should be address to the Town of New Braintree Highway Department.

1.2 Inspection and Maintenance Measures and Record-Keeping

See the attached O&M Plan for the proposed stormwater system within the project limits. The stormwater management system covered by this O&M Plan consists of the following measures:

- Catch Basin

The table below summarizes data that is generally collected for each asset type. For all assets, the inspector and inspection date are recorded. Photo documentation of structure condition is taken and attached to the inspection record.

Inspection Form	Applicable Stormwater Assets	Information Collected
Inlets	› Catch basins	› Sediment accumulation › Trash/Debris accumulation › Signs of contamination › Frame and grate condition › Overall structure condition

Maintenance actions will not occur at any set frequency, but rather will be based on condition and impact to functionality. Maintenance to be performed on the stormwater system includes clearing the inlet and removing and properly disposing of sediment, trash, leaf litter, debris, and vegetation.

1.3 Erosion and Sediment Control Measures during Maintenance Activities

If the project is owned by a municipality and funded and/or constructed by MassDOT, then revise this section to reflect the DPW's approach to erosion and control measures during maintenance activities.

For maintenance activities that could result in discharges of sediments or other contaminants into wetlands, waterways, or other resource areas regulated under 310 CMR 10.00, the responsible maintenance personnel will employ measures to prevent migration of these sediments/contaminants. Such temporary measures may include, but are not necessarily limited to, the use of siltation barriers, catch basin silt sacks/filter bags, or other practices designed to prevent such discharges.

Where maintenance occurs in areas that are confined, with no risk of discharge to adjacent water bodies, no special measures may be needed. Examples include catch basin cleaning where the activity is limited to removing material from a sump below the elevation of the outlet pipe.

2

Long-Term Pollution Prevention Plan

This Long-Term Pollution Prevention Plan (LTPPP) describes the approach for pollution prevention and related maintenance activities for the Creamery Road bridge replacement over the Ware River in the Towns of Hardwick and New Braintree. In general, long-term pollution prevention and related maintenance activities will be conducted consistent with:

- The National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer System (MS4),
- MassDOT's anticipated NPDES Transportation Separate Storm Sewer System (TS4) Permit, and
- Measures outlined in MassDOT's Stormwater Management Plan (SWMP).

This LTPPP satisfies the requirements related to pollution prevention under Massachusetts Stormwater Standards 4, 5, 6, and 10.

2.1 Practices for Long-Term Pollution Prevention

For the facilities covered, long-term pollution prevention includes the following measures.

2.1.1 Litter Pick-up

The Town of New Braintree will conduct litter pick-up from the stormwater management facilities in conjunction with routine road maintenance activities.

2.1.2 Inspection and Maintenance of Stormwater Assets

The Town of New Braintree will conduct inspection and maintenance of drainage infrastructure in accordance with the O&M Plan, as described in Section 1.

2.1.3 Snow and Ice Management

Snow and Ice Management will be conducted consistent with the practices outlined in the MassDOT Snow and Ice Control Program Environmental Status and Planning Report (ESPR), formerly known as the Snow and Ice Control Generic Environmental Impact Report (GEIR).

2.1.4 Street Sweeping

Routine highway cleaning, with a brush-type street sweeper, will be conducted in accordance with standard Town of New Braintree practices.

2.1.5 Prohibition of Illicit Discharges

The MassDEP Stormwater Management Standard 10 prohibits illicit discharges to the stormwater management system. Illicit discharges are discharges that do not consist entirely of stormwater, except for certain specified non-stormwater discharges.

In accordance with the existing MS4 permit and anticipated TS4 permit requirements, examples of discharges from the following sources are not considered illicit discharges:

- › Firefighting activities*
- › Foundation drains
- › Water line flushing
- › Footing drains
- › Landscape irrigation
- › Individual residential car washing
- › Uncontaminated groundwater
- › Rising groundwater
- › Diverted stream flows
- › Flows from riparian habitats/wetlands
- › Potable water sources
- › Dechlorinated swimming pool water
- › Street wash waters
- › Wash water from residential buildings (no detergents)
- › Condensation from air conditioning units
- › Run-on from private driveways caused by precipitation
- › Lawn watering
- › Water from crawl space pumps

*Water from firefighting activities is allowed and need only be addressed where they are identified as significant sources of pollutants to waters of the United States.

Based on plan review and confirmation in the field, there are no known or proposed illicit connections associated with the Creamery Road bridge replacement project. Should an interconnection to the stormwater management system be identified, the MassDOT PM will coordinate with the District Permits Engineer to confirm if the connections are authorized. For unauthorized connections, the MassDOT PM and/or MassDOT Environmental Services Section will investigate the connections and if they are determined to be illicit, the connections will be managed through MassDOT's Illicit Discharge Detection and Elimination (IDDE) program and/or through other agencies.

Catch Basin Inspection Checklist

Project: Bridge Replacement – Creamery Road over Ware River

Location: South Side of Bridge

Site Status: _____

Date: _____

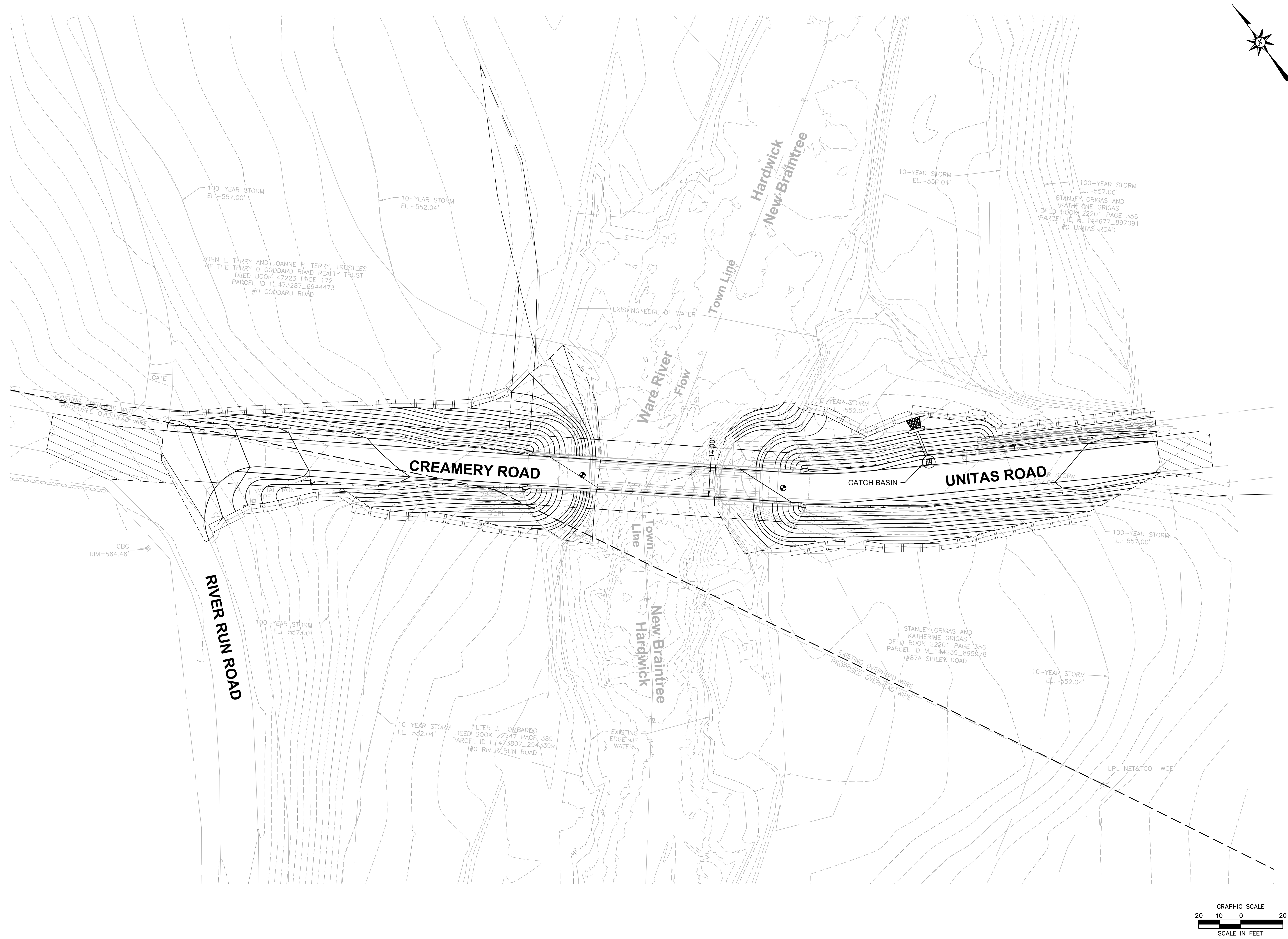
Time: _____

Inspector: _____

MAINTENANCE ITEM	SATISFACTORY / UNSATISFACTORY	COMMENTS
Inlet (Annual)		
Sediment accumulation		
Trash/Debris accumulation		
Signs of contamination		
Frame and grate condition		
Overall structure condition		

Comments:

Actions to be Taken:



REVISIONS		Date	Desc.
No.			
Designed			T.R.J.
Drawn			T.R.J.
Reviewed			S.M.K.
Scale		AS SHOWN	
Project No.		2100472	
Date		05/11/2023	
CAD File: QM210047201			
Title			
OPERATION & MAINTENANCE PLAN			
Sheet No.			

OM-1

Attachment G – WQC/ACOE Submission Plans



MASSACHUSETTS DEPARTMENT OF TRANSPORTATION HIGHWAY DIVISION

Proposal No. 608851-12386

HARDWICK/NEW BRAINTREE CREAMERY ROAD			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	1	35
PROJECT FILE NO.		608851	
TITLE SHEET & INDEX			

PLAN AND PROFILE OF CREAMERY ROAD BRIDGE REPLACEMENT OVER WARE RIVER (BRIDGE NO. H-08-003=N-07-002 (C7G))

IN THE CITY/TOWN OF HARDWICK/NEW BRAINTREE WORCESTER

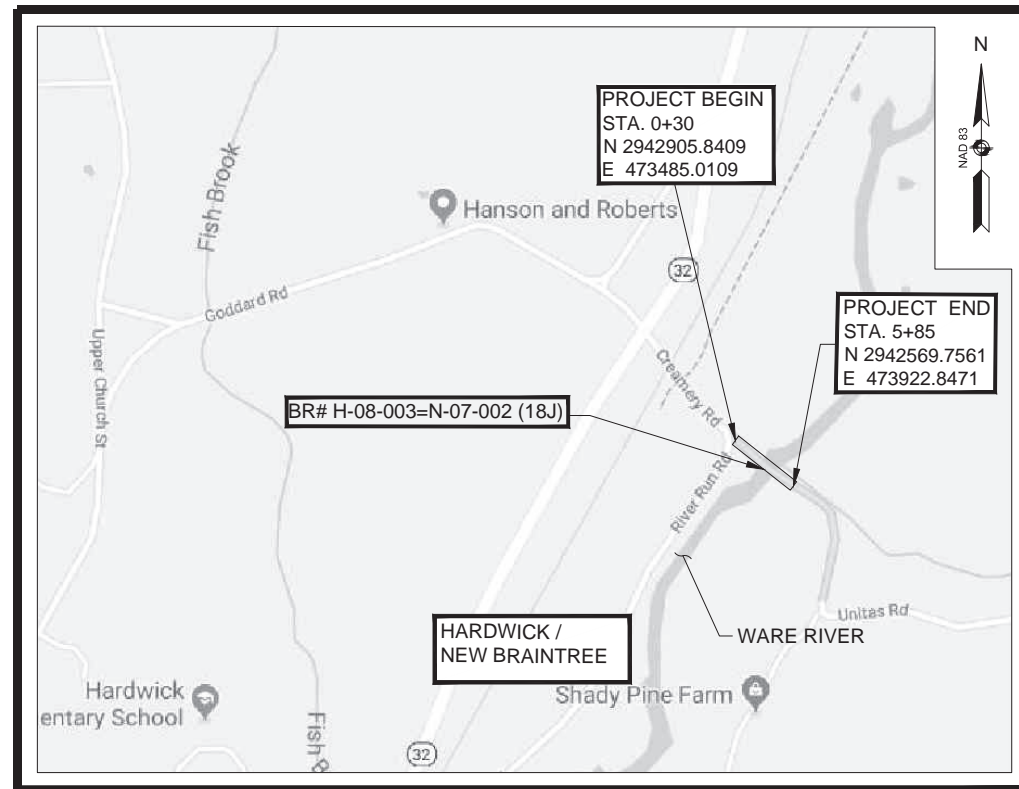
FEDERAL AID PROJECT NO. 608851

THE MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES DATED 2022, AS AMENDED, THE SUPPLEMENTAL SPECIFICATIONS DATED JUNE 30, 2022, THE OCTOBER 2017 CONSTRUCTION STANDARD DETAILS, THE 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, THE LATEST MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS WITH MASSACHUSETTS AMENDMENTS, THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS, THE 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING, AND THE LATEST EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK, WILL GOVERN.

WQC/ACOE PLANS
SUBMITTAL DATE: 12/26/2023

PS&E SUBMITTAL

INDEX	
SHEET NO.	DESCRIPTION
1	TITLE SHEET & INDEX
2	LEGEND & ABBREVIATIONS
3	TYPICAL SECTIONS
4	CONSTRUCTION PLANS & WQC/ACOE IMPACTS
5	PROFILE
6	GRADING PLAN
7-8	WETLAND REPLICATION PLAN
9	TRAFFIC SIGN SUMMARY SHEET
10-14	TEMPORARY TRAFFIC CONTROL PLANS
12	RETAINING WALL DETAILS
13	CONSTRUCTION DETAILS
14-31	BRIDGE PLANS (SELECTED SHEETS)
32-35	CROSS SECTIONS






0 500 1000 1500 2000
SCALE: 1" = 1000'




















































































































































LENGTH OF PROJECT = 490.85 FEET = 0.09 MILES

DESIGN DESIGNATION (CREAMERY ROAD)

DESIGN SPEED	25 MPH
ADT	109

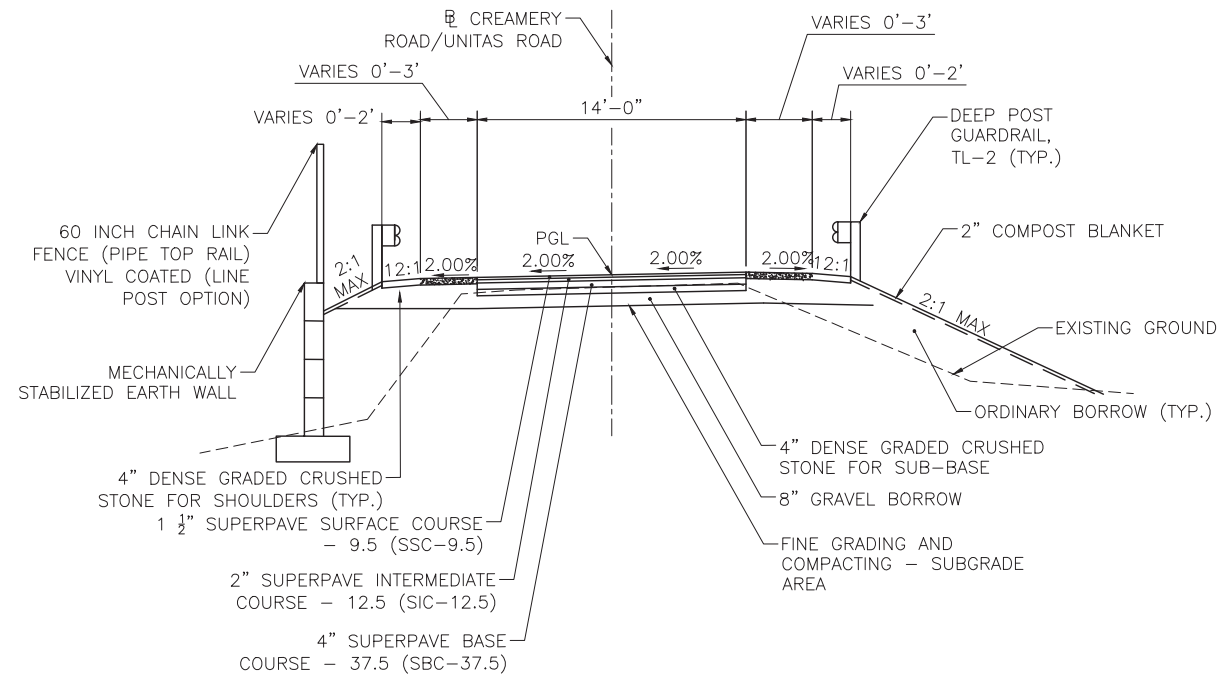
DATE	DESCRIPTION	REV #

 	 RECOMMENDED FOR APPROVAL	
	CHIEF ENGINEER	DATE
DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION APPROVED:	APPROVED	
DIVISION ADMINISTRATOR	DATE	HIGHWAY ADMINISTRATOR
		DATE

GENERAL SYMBOLS			TRAFFIC SYMBOLS			ABBREVIATIONS		HARDWOOD/NEW BRAINTREE CREAMERY ROAD													
EXISTING	PROPOSED	DESCRIPTION	EXISTING	PROPOSED	DESCRIPTION	GENERAL		LEGEND & ABBREVIATIONS													
 JB	 JB	JERSEY BARRIER	 1	 1	CONTROLLER PHASE ACTUATED	AADT	ANNUAL AVERAGE DAILY TRAFFIC	<table><tr><th>STATE</th><th>FED. AID PROJ. NO.</th><th>SHEET NO.</th><th>TOTAL SHEETS</th></tr><tr><td>MA</td><td>-</td><td>2</td><td>35</td></tr><tr><td colspan="2">PROJECT FILE NO.</td><td colspan="2">608851</td></tr></table> LEGEND & ABBREVIATIONS		STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS	MA	-	2	35	PROJECT FILE NO.		608851	
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS																		
MA	-	2	35																		
PROJECT FILE NO.		608851																			
 CB	 CB	CATCH BASIN			TRAFFIC SIGNAL HEAD (SIZE AS NOTED)	ABAN	ABANDON														
		CATCH BASIN CURB INLET			WIRE LOOP DETECTOR (6' x 6' TYP UNLESS OTHERWISE SPECIFIED)	ADJ	ADJUST														
 FP	 FP	FLAG POLE			VIDEO DETECTION CAMERA	APPROX.	APPROXIMATE	ABBREVIATIONS (cont.) <u>GENERAL</u>													
 GP	 GP	GAS PUMP			MICROWAVE DETECTOR	A.C.	ASPHALT CONCRETE														
 MB	 MB	MAIL BOX			PEDESTRIAN PUSH BUTTON, SIGN (DIRECTIONAL ARROW AS SHOWN) AND SADDLE	ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE														
		POST SQUARE			EMERGENCY PREEMPTION CONFIRMATION STROBE LIGHT	BIT.	BITUMINOUS														
		POST CIRCULAR			VEHICULAR SIGNAL HEAD	BC	BOTTOM OF CURB	<u>GENERAL</u>													
 WELL	 WELL	WELL			VEHICULAR SIGNAL HEAD, OPTICALLY PROGRAMMED	BD.	BOUND														
 EHH	 EHH	ELECTRIC HANDHOLE			FLASHING BEACON	BL	BASELINE														
		FENCE GATE POST			RAILROAD SIGNAL	BLDG	BUILDING														
 GG	 GG	GAS GATE			SIGNAL POST AND BASE (ALPHA-NUMERIC DESIGNATION NOTED)	BM	BENCHMARK	PWW	PAVED WATER WAY												
 BHL #	 BHL #	BORING HOLE			MAST ARM, SHAFT AND BASE (ARM LENGTH AS NOTED)	BO	BY OTHERS	R	RADIUS OF CURVATURE												
 MW #	 MW #	MONITORING WELL			HIGH MAST POLE OR TOWER	BOS	BOTTOM OF SLOPE	R&D	REMOVE AND DISPOSE												
 TP #	 TP #	TEST PIT			SIGN AND POST	BR.	BRIDGE	RCP	REINFORCED CONCRETE PIPE												
		HYDRANT			SIGN AND POST (2 POSTS)	CB	CATCH BASIN	RD	ROAD												
		LIGHT POLE			MAST ARM WITH LUMINAIRE	CBCI	CATCH BASIN WITH CURB INLET	RDWY	ROADWAY												
 CO.BD.		COUNTY BOUND			OPTICAL PRE-EMPTION DETECTOR	CC	CEMENT CONCRETE	REM	REMOVE												
		GPS POINT			CONTROL CABINET, GROUND MOUNTED	CEM	CEMENT CONCRETE MASONRY	RET	RETAIN												
		CABLE MANHOLE			CONTROL CABINET, POLE MOUNTED	CI	CURB INLET	RET WALL	RETAINING WALL												
		DRAINAGE MANHOLE			FLASHING BEACON CONTROL AND METER PEDESTAL	CIP	CAST IRON PIPE	ROW	RIGHT OF WAY												
		ELECTRIC MANHOLE			LOAD CENTER ASSEMBLY	CLF	CHAIN LINK FENCE	RR	RAILROAD												
		GAS MANHOLE			PULL BOX 12"x12" (OR AS NOTED)	CL	CENTERLINE	R&R	REMOVE AND RESET												
		MISC MANHOLE			ELECTRIC HANDHOLE 12"x24" (OR AS NOTED)	CMP	CORRUGATED METAL PIPE	R&S	REMOVE AND STACK												
		SEWER MANHOLE			TRAFFIC SIGNAL CONDUIT	CSP	CORRUGATED STEEL PIPE	RT	RIGHT												
		TELEPHONE MANHOLE				CO.	COUNTY	SB	STONE BOUND												
		WATER MANHOLE				CONC	CONCRETE	SHLD	SHOULDER												
 MHB	 MHB	MASSACHUSETTS HIGHWAY BOUND				CONT	CONTINUOUS	SMH	SEWER MANHOLE												
		MONUMENT				CONST	CONSTRUCTION	ST	STREET												
		STONE BOUND				CR GR	CROWN GRADE	STA	STATION												
 TB		TOWN OR CITY BOUND				DHV	DESIGN HOURLY VOLUME	SSD	STOPPING SIGHT DISTANCE												
		TRAVERSE OR TRIANGULATION STATION				DI	DROP INLET	SHLO	STATE HIGHWAY LAYOUT LINE												
 TPL or GUY	 TPL or GUY	TROLLEY POLE OR GUY POLE				DIA	DIAMETER	SW	SIDEWALK												
		TRANSMISSION POLE				DIP	DUCTILE IRON PIPE	T	TANGENT DISTANCE OF CURVE/TRUCK %												
 UFB	 UFB	UTILITY POLE W/ FIREBOX				DW	STEADY DON'T WALK - PORTLAND ORANGE	TAN	TANGENT												
 UPDL	 UPDL	UTILITY POLE WITH DOUBLE LIGHT				DWY	DRIVEWAY	TEMP	TEMPORARY												
 ULT	 ULT	UTILITY POLE W / 1 LIGHT				ELEV (or EL.)	ELEVATION	TC	TOP OF CURB												
 UPL	 UPL	UTILITY POLE				EMB	EMBANKMENT	TOS	TOP OF SLOPE												
		BUSH				EOP	EDGE OF PAVEMENT	TYP	TYPICAL												
		TREE				EXIST (or EX)	EXISTING	UP	UTILITY POLE												
		STUMP				EXC	EXCAVATION	VAR	VARIES												
		SWAMP / MARSH				F&C	FRAME AND COVER	VERT	VERTICAL												
 WG	 WG	WATER GATE				F&G	FRAME AND GRATE	VC	VERTICAL CURVE												
 PM	 PM	PARKING METER				FDN.	FOUNDATION	WG	WATER GATE												
		OVERHEAD CABLE/WIRE				FLDSTN	FIELDSTONE	WIP	WROUGHT IRON PIPE												
		CURBING				GAR	GARAGE	WM	WATER METER/WATER MAIN												
		CONTOURS (ON-THE-GROUND SURVEY DATA)				GD	GROUND	X-SECT	CROSS SECTION												
		CONTOURS (PHOTOGRAMMETRIC DATA)				GG	GAS GATE														
		UNDERGROUND DRAIN PIPE (DOUBLE LINE 24 INCH AND OVER)				GI	GUTTER INLET														
		UNDERGROUND ELECTRIC DUCT (DOUBLE LINE 24 INCH AND OVER)				GIP	GALVANIZED IRON PIPE														
		UNDERGROUND GAS MAIN (DOUBLE LINE 24 INCH AND OVER)				GRAN	GRANITE														
		UNDERGROUND SEWER MAIN (DOUBLE LINE 24 INCH AND OVER)				GRAV	GRAVEL														
		UNDERGROUND TELEPHONE DUCT (DOUBLE LINE 24 INCH AND OVER)				GRD	GUARD														
		UNDERGROUND WATER MAIN (DOUBLE LINE 24 INCH AND OVER)				HDW	HEADWALL														
		BALANCED STONE WALL				HMA	HOT MIX ASPHALT														
		GUARD RAIL - STEEL POSTS				HOR	HORIZONTAL														
		GUARD RAIL - WOOD POSTS				HYD	HYDRANT														
		GUARD RAIL - DOUBLE FACE - STEEL POSTS				INV	INVERT														
		GUARD RAIL - DOUBLE FACE - WOOD POSTS				JCT	JUNCTION														
		CHAIN LINK OR METAL FENCE				L	LENGTH OF CURVE														
		WOOD FENCE				LB	LEACH BASIN														
		SEDIMENTATION FENCE				LP	LIGHT POLE														
		TREE LINE				LT	LEFT														
		SAWCUT LINE				MAX	MAXIMUM														
		TOP OR BOTTOM OF SLOPE				MB	MAILBOX														
		LIMIT OF EDGE OF PAVEMENT OR COLD PLANE AND OVERLAY				MH	MANHOLE														
		BANK OF RIVER OR STREAM				MHB	MASSACHUSETTS HIGHWAY BOUND														
		BORDER OF WETLAND				MIN	MINIMUM														
		100 FT WETLAND BUFFER				NIC	NOT IN CONTRACT														
		200 FT RIVERFRONT BUFFER				NO.	NUMBER														
		STATE HIGHWAY LAYOUT				PC	POINT OF CURVATURE														
		TOWN OR CITY LAYOUT				PCC	POINT OF COMPOUND CURVATURE														
		COUNTY LAYOUT																			

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	3	35
PROJECT FILE NO.		608851	

608851 HD3-TYPICAL SECTION\ DWG Plotted on 19-May-2023 2:50 PM



TYPICAL SECTION - FULL DEPTH RECONSTRUCTION
CREAMERY ROAD/UNITAS ROAD

SCALE: 1" - 10'
STA. 4+75 TO STA. 5+60



SURFACE:	2" SUPERPAVE SURFACE COURSE 9.5 (SSC - 9.5) OVER 2" SUPERPAVE INTERMEDIATE COURSE 12.5 (SIC - 12.5) OVER 4" SUPERPAVE BASE COURSE 37.5 (SBC - 37.5)
SUBBASE:	4" DENSE GRADED CRUSHED STONE FOR SUB-BASE OVER 8" GRAVEL BORROW

PROPOSED PAVEMENT FINE MILLING
2" DEPTH

ASPHALT EMULSION FOR TACK COAT APPLIED AT A RATE OF 0.07 TO 0.09 GAL/SY OVER MILLED SURFACE.



A00830 - 198

CONSTRUCTION PLANS & WQC/ACOE IMPACTS

0 20 50 100

SCALE: 1" = 40'

1. LIMITS OF RETAINING WALL ARE APPROXIMATE. CONTRACTOR SHALL CONFIRM LIMITS OF GRADING DURING CONSTRUCTION.
2. SEE STANDARD DETAILS E206.4.0 AND E206.4.1 FOR DIMENSIONS AND MATERIALS FOR ENDWALL CONSTRUCTION.
3. CHAIN LINK FENCE TO BE INSTALLED ON TOP OF RETAINING WALL.
4. SEE STANDARD DETAIL E201.12.0 FOR DIMENSIONS AND MATERIALS FOR CATCH BASIN HOOD.
5. PROPOSED CATCH BASIN AT STA. 4+51, 10' LT. SHALL BE DEEP SUMP.

10

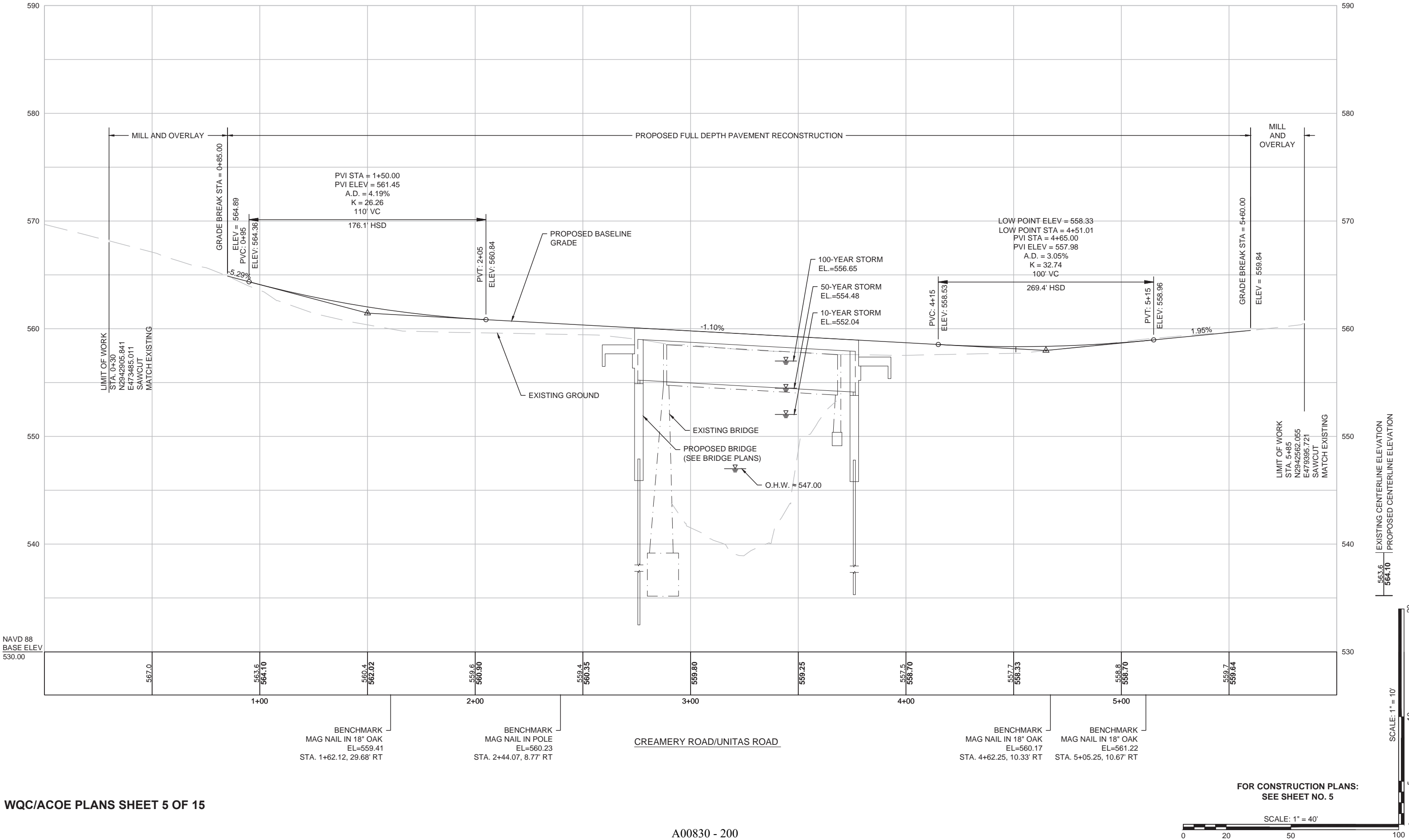
NOTE: AVERAGE BANK WIDTH UNDER BRIDGE STRUCTURE IS APPROXIMATELY 65'

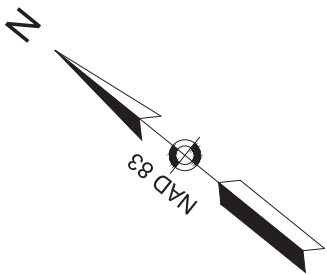
Proposal No. 608851-126586

HARDWICK/NEW BRAINTREE
CREAMERY ROAD

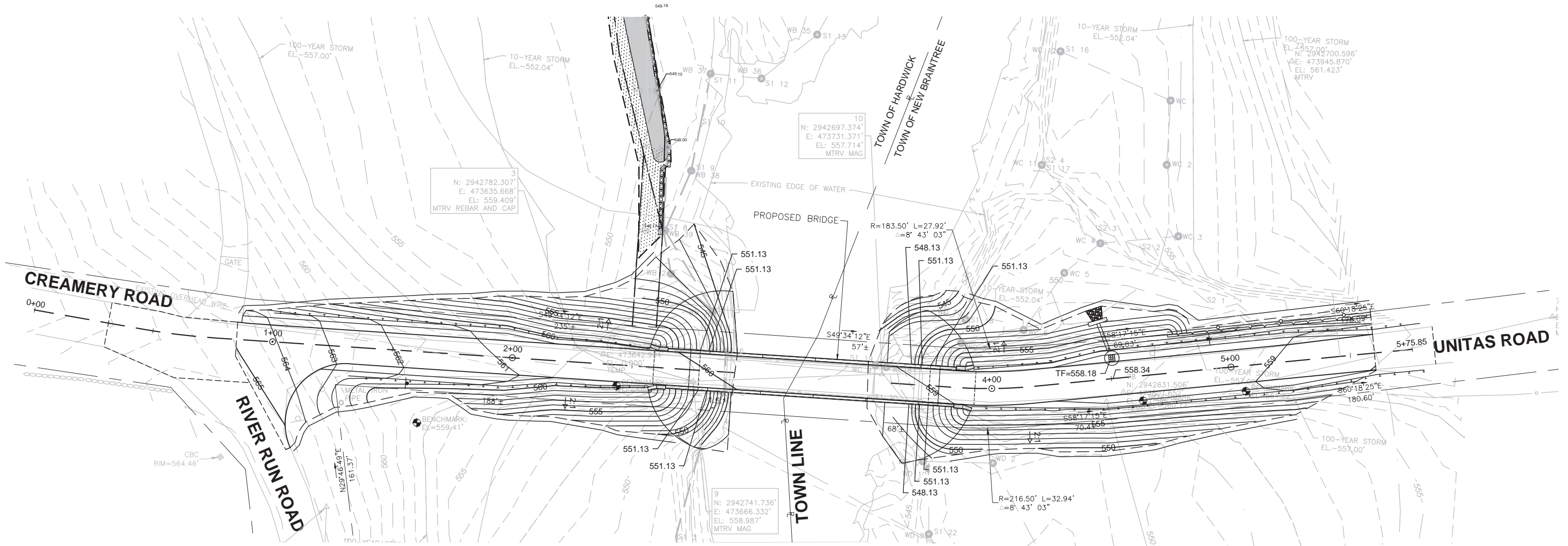
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MA	-	5	35
PROJECT FILE NO.		608851	

PROFILE



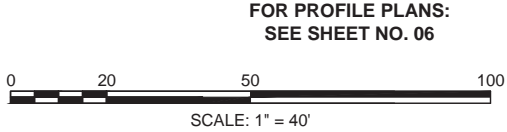


HARDWICK/NEW BRAINTREE CREAMERY ROAD			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	6	35
PROJECT FILE NO.		608851	
GRADING PLAN			



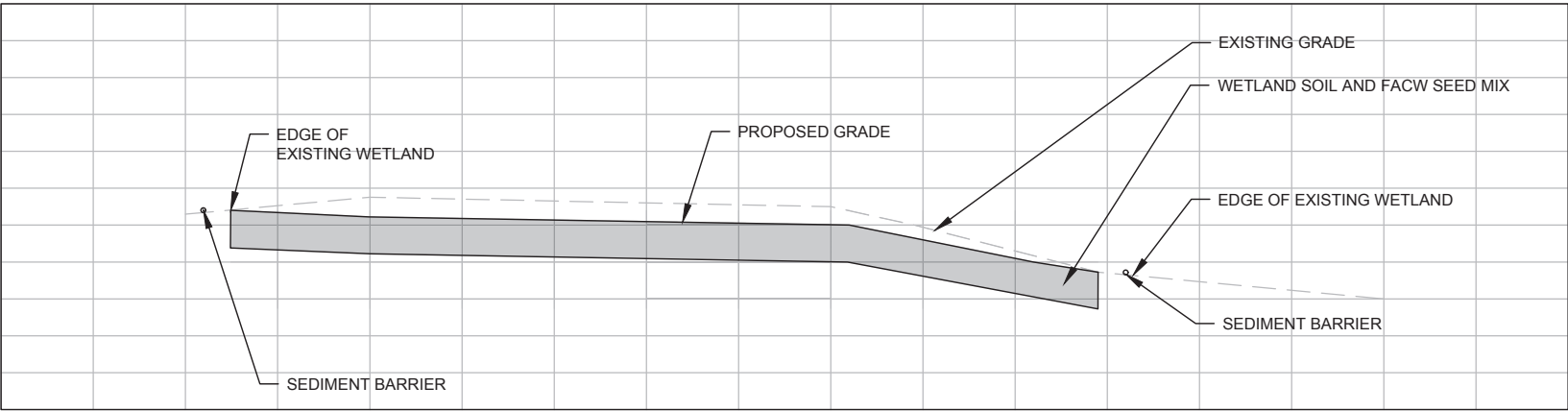
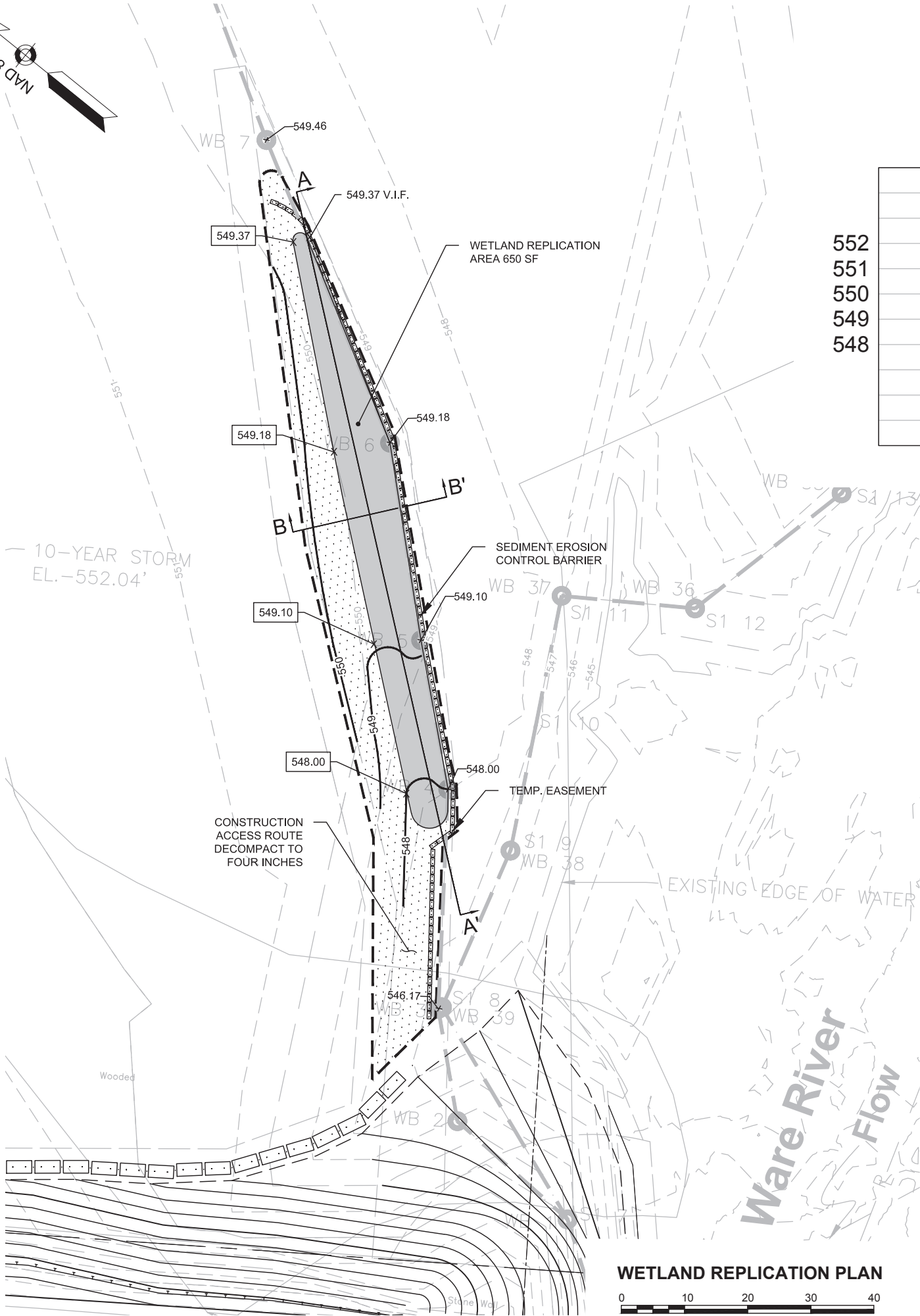
Curve Table: Alignments						
Curve #	Radius	Tangent	Delta	Length	PC	PT
C1	300.00'	16.360	6°14'34.09"	32.687	N:2942896.228 E:473494.123	N:2942873.775 E:473517.856
C2	200.00'	16.443	9°24'00.76"	32.813	N:2942674.669 E:473752.714	N:2942655.593 E:473779.368

- NOTES:
- LIMITS OF RETAINING WALL ARE APPROXIMATE. CONTRACTOR SHALL CONFIRM LIMITS OF GRADING DURING CONSTRUCTION.

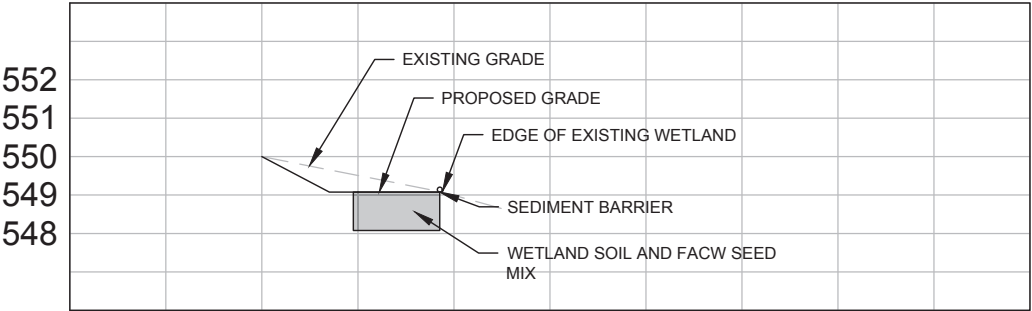


STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	7	35
PROJECT FILE NO.		608851	

WETLAND REPLICATION PLAN



SECTION (A-A')
(HOR. SCALE 1"= 10', VERT. SCALE 1"=5')



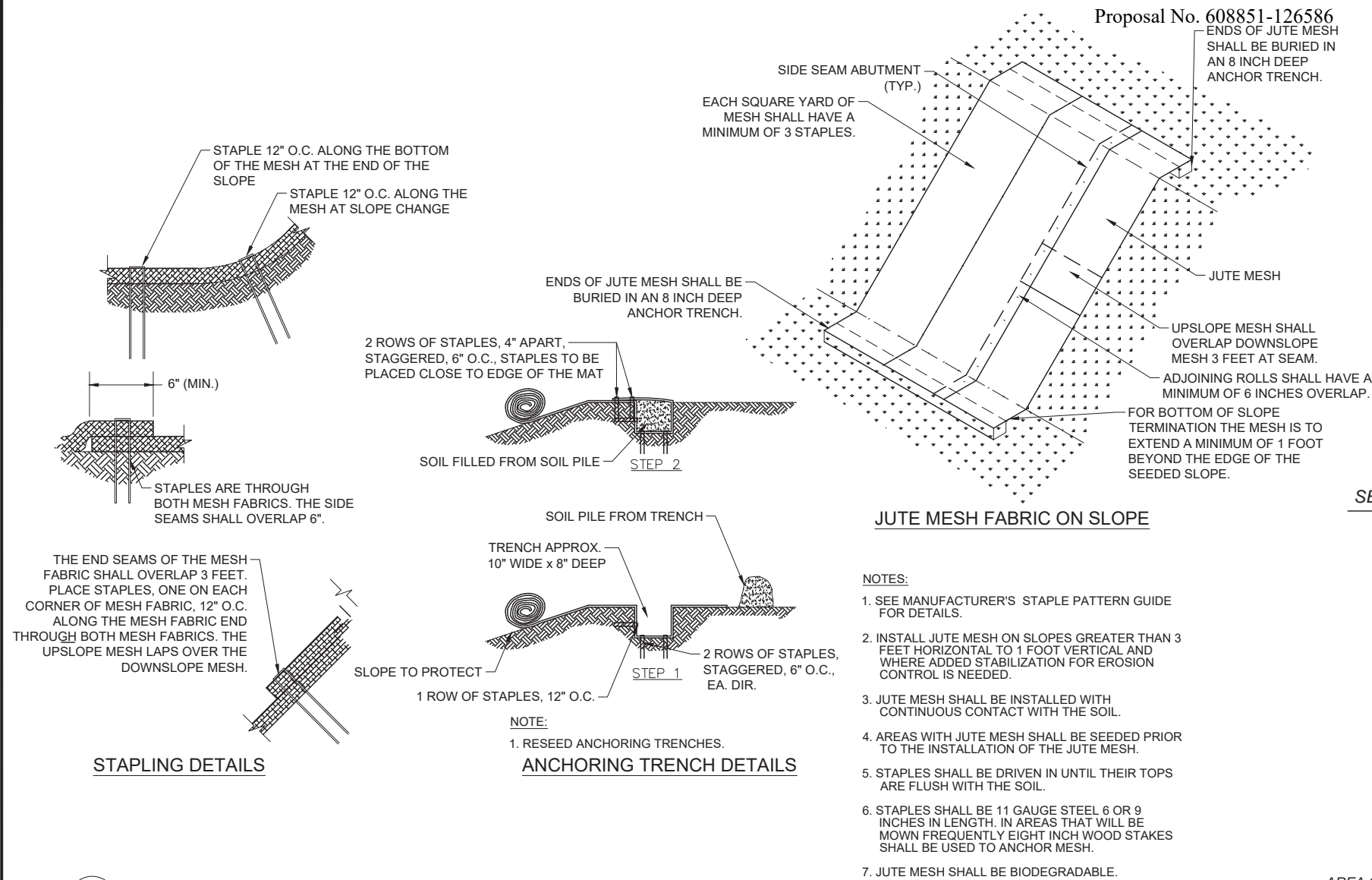
SECTION (B-B')
(HOR. SCALE 1"= 10', VERT. SCALE 1"=5')

- NOTES:**
1. COIR FIBER ROLL SHALL BE USED IN LIEU OF SEDIMENT CONTROL BARRIER WHERE ADJACENT SOILS ARE SATURATED, OR IF THERE IS A POTENTIAL FOR STANDING WATER AT THE LOCATION OF THE BARRIER.
 2. SEED MIXES IN AND AROUND THE WETLAND REPLICATION SHALL BE HAND BROADCAST.
 3. FINAL GRADES TO BE SET APPROXIMATELY 6-12 INCHES ABOVE GROUNDWATER ELEVATION. MINOR ADJUSTMENTS IN FINAL GRADES SHALL BE MADE IN THE FIELD BY THE WETLAND SPECIALIST.
 4. REPLICATION AREA SHALL BE EXCAVATED TO A DEPTH BETWEEN TWELVE (12) AND EIGHTEEN (18) INCHES BELOW THE FINAL DESIGN ELEVATIONS. THE SALVAGED TOPSOIL MATERIAL AND B-HORIZON SUBSOIL MATERIAL EXCAVATED FROM THE WETLAND IMPACT AREAS SHALL BE PLACED IN SEPARATE STOCKPILES TO BE REUSED IN THE PROPOSED REPLICATION AREA IF SUITABLE.
 5. REPLICATION AREA GRADING SHOULD MATCH THE ELEVATIONS OF THE ABUTTING WETLAND TO MAINTAIN A HYDROLOGIC CONNECTION. WETLAND SPECIALIST SHALL INSPECT THE SUB-GRADE OF THE REPLICATION AREA TO ENSURE THAT THE PROPER HYDROLOGY HAS BEEN ESTABLISHED. MINOR MODIFICATIONS TO THIS GRADING PLAN MAY BE MADE IN THE FIELD BY THE QUALIFIED WETLAND SPECIALIST IN RESPONSE TO SUBSURFACE HYDROLOGIC CONDITIONS.
 6. WETLAND REPLICATION AREA SHALL BE SEEDED. NO TREE OR SHRUB PLANTINGS ARE PROPOSED.

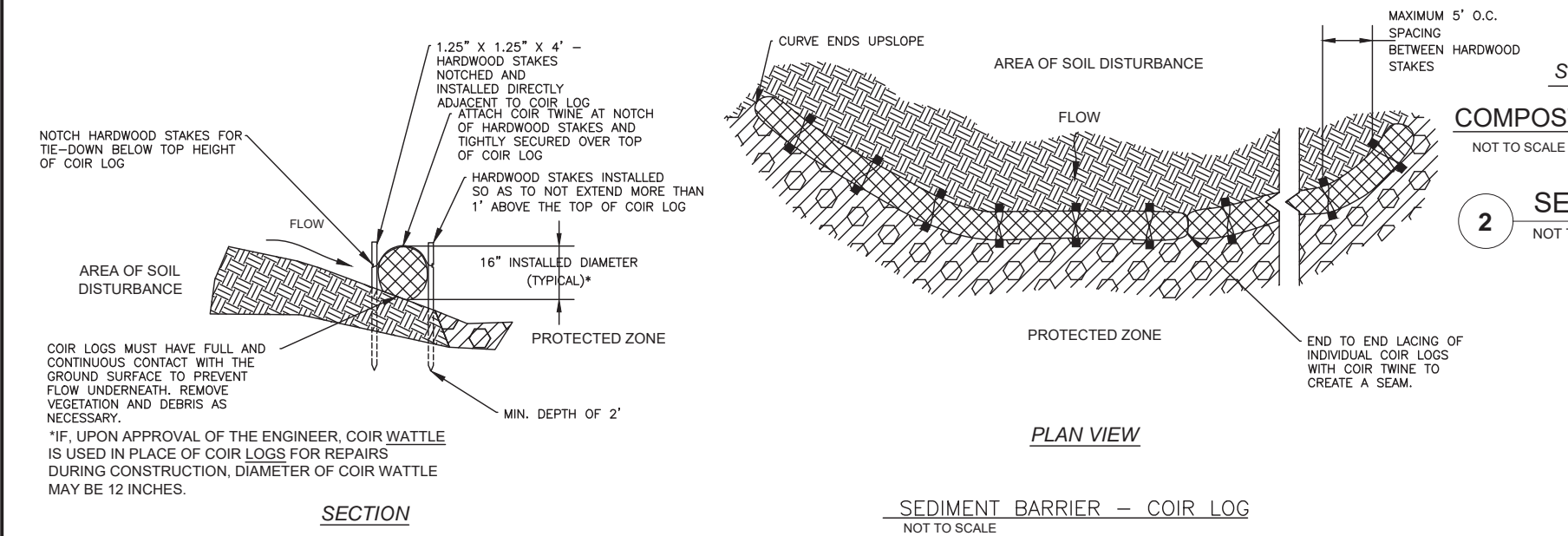
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	8	35
PROJECT FILE NO.		608851	

LANDSCAPE AND WETLAND
REPLICATION DETAILS

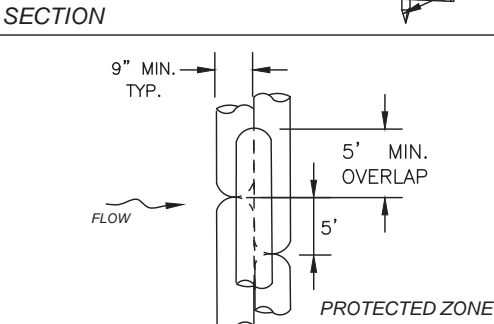
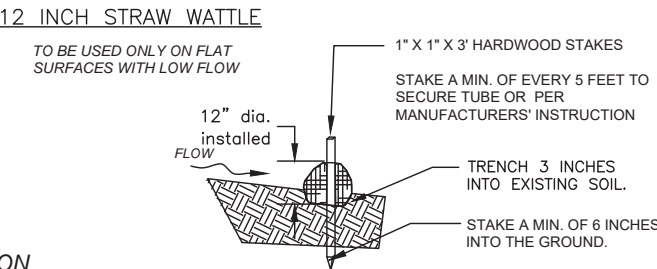
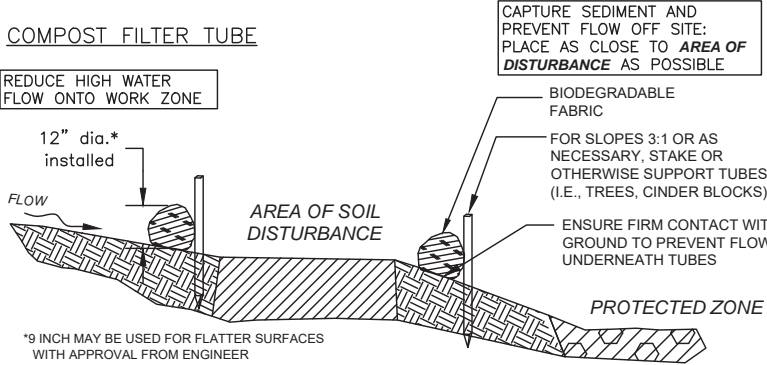
608851_WETLAND REPLICATION PLAN.DWG
Plotted on 10-May-2023 5:10 PM



1 JUTE MESH
NOT TO SCALE

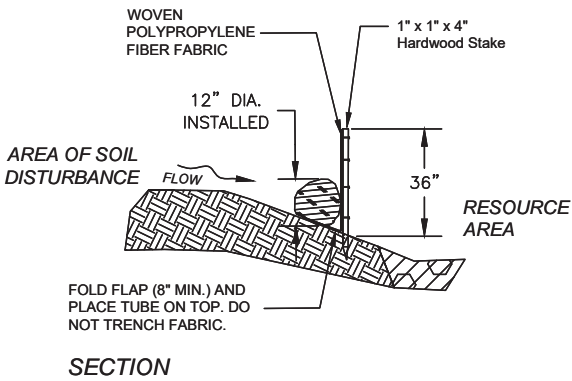
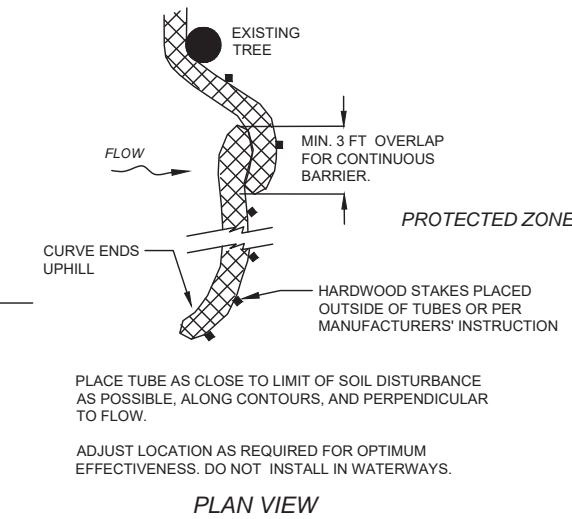


3 COIR FIBER ROLL
NOT TO SCALE

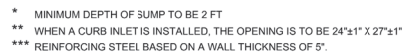


COMPOST FILTER TUBE BERM (SLOPES 2:1 OR STEEPER)
NOT TO SCALE

2 SEDIMENT CONTROL BARRIERS - COMPOST FILTER TUBE & STRAW WATTLES
NOT TO SCALE



COMPOST FILTER TUBE & SILT FENCE
NOT TO SCALE

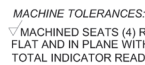


NOTES:

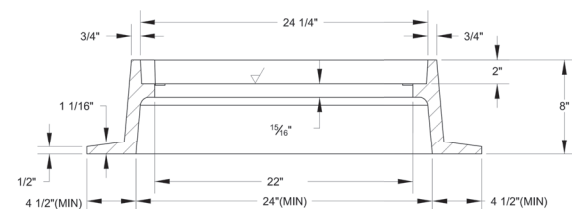
1. DETAILS NOT INDICATED ABOVE ARE TO BE SIMILAR TO THOSE SHOWN ON E 201.3.0
2. FACE OF PIPE FLUSH OR NOT TO PROJECT MORE THAN 4" FROM FACE CF WALL
ALONG CENTERLINE OF PIPE.
3. FOR DESCRIPTION, MATERIALS AND CONSTRUCTION METHOD, SEE STANDARD SPECIFICATIONS.
4. ALL CONCRETE TO BE AIRENTRAINED



DATE OF ISSUE	OCTOBER 2017
DRAWING NUMBER	E 201.4.0



CLASSIFICATION:
CAST IRON - SEE STANDARD SPECIFICATIONS
WITH NO BLACK ASPHALT COATING ALLOWED



WEIGHTS:

3-FLANGE FRAME	240 LBS. MIN
4-FLANGE FRAME	270 LBS. MIN

CASTING TOLERANCES:
SHALL CONFORM TO AASHTO
M306

AASHTO HS 20 LOAD RATED



CATCH BASIN FRAME

DATE OF ISSUE	OCTOBER 2017
DRAWING NUMBER	E 201.6.0



NOTES:

1. MATERIAL - CAST IRON; SEE STANDARD SPECIFICATIONS
2. MINIMUM MASS - 210LBS.



DROP INLET GRATE

DATE OF ISSUE	OCTOBER 2017
DRAWING NUMBER	E 201.11.0



1" (APPROX.)



CORRUGATED METAL PIPE UNDER FILL SLOPES

DATE OF ISSUE
OCTOBER 2017

DRAWING NUMBER
E 206.3.0



1. THE PLATE TO BE PUNCHED TO MATCH HOLES IN SKIRT LIP. 3/8" Ø GALVANIZED BOLTS TO BE FURNISHED.
2. LENGTH OF THE PLATE TO BE W-10" FOR 12" TO 30" DIA. PIPE AND W-22" FOR 36" TO 48" DIA.
3. SKIRT SECTION FOR 12" TO 24" DIA. PIPE TO BE MADE IN ONE PIECE. SKIRT SECTION FOR 12" TO 30" DIA. PIPE MAY BE MADE FROM TWO SHEETS JOINED BY RIVETING OR BOLTING ON CENTER LINE WITH 3/8" DIA. FASTENERS.
4. CONNECTOR SECTION, THE PLATE AND SKIRT TO BE OF SAME THICKNESS METAL, EACH TO BE GALVANIZED AND COATED WITH A TAR BASE PAINT.
5. FOR DESCRIPTION, MATERIALS AND CONSTRUCTION METHOD, SEE LATEST STANDARD SPECIFICATIONS.

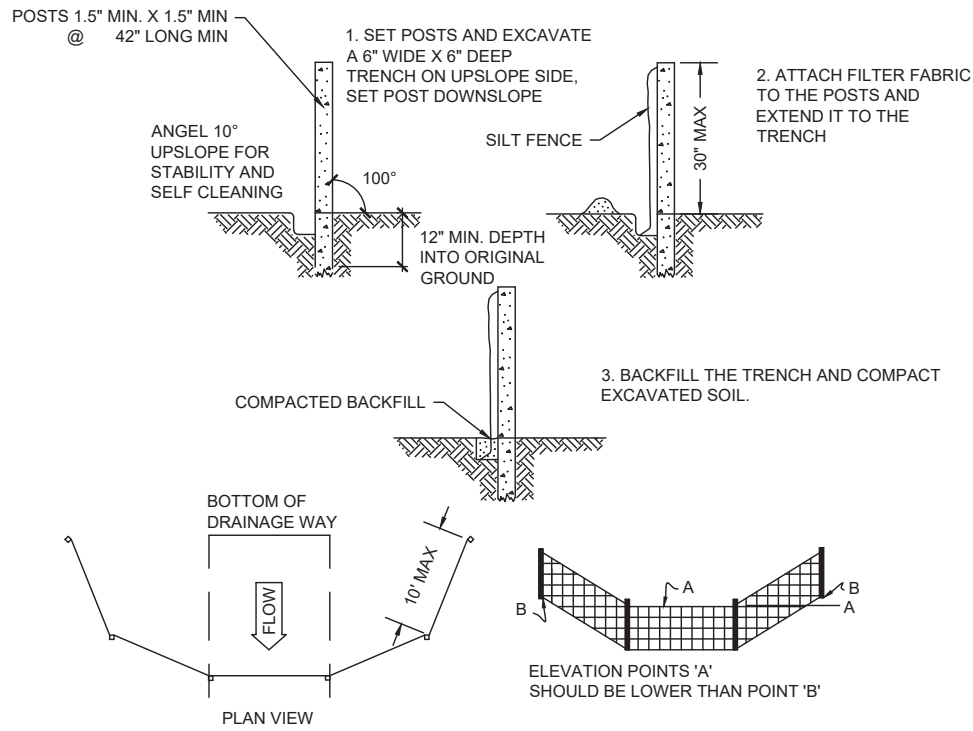


STANDARD METAL END

DATE OF ISSUE	OCTOBER 2017
DRAWING NUMBER	E 206.9.0

SEDIMENTATION CONTROL SYSTEM

N.T.S.



GENERAL NOTES:

DESIGN:

IN ACCORDANCE WITH THE 2020 AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS LRFD BRIDGE DESIGN SPECIFICATIONS, FOR HL–93 LOADING.

MASSDOT BENCH MARK:

MAG NAIL IN 18" OAK: ELEV = 559.41
N = 2942796.18
E = 473563.59

MAG NAIL IN POLE: ELEV = 560.23
N = 2942759.12
E = 473639.59

MAG NAIL IN 18" OAK: ELEV = 560.17
N = 2942623.86
E = 473812.19

MAG NAIL IN 18" OAK: ELEV = 561.22
N = 2942601.57
E = 473848.96

ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988.

DATE:

TO BE PLACED ON THE INSIDE FACE OF THE NORTHEASTERN AND SOUTHWESTERN HIGHWAY GUARDRAIL TRANSITIONS. A SHEET SHOWING SIZE AND CHARACTER OF NUMERALS WILL BE FURNISHED. THE DATE USED SHALL BE THE LATEST YEAR OF CONTRACT COMPLETION AS OF THE DATE THE FIRST HIGHWAY GUARDRAIL TRANSITION IS CONSTRUCTED. BOTH HIGHWAY GUARDRAIL TRANSITIONS SHALL FEATURE THE SAME DATE.

MASSDOT SURVEY NOTES:

ELECTRONIC SURVEY PERFORMED BY BL COMPANIES WAS USED IN THE PREPARATION OF THESE CONSTRUCTION PLANS.

SCALES:

SCALES NOTED ON THE PLANS ARE NOT APPLICABLE TO REDUCED SIZE PRINTS. DIVIDE SCALES BY 2 FOR HALF SIZE PRINTS (A3).

FOUNDATIONS:

FOUNDATIONS MAY BE ALTERED, IF NECESSARY, TO SUIT CONDITIONS ENCOUNTERED DURING CONSTRUCTION, WITH THE APPROVAL OF THE ENGINEER. THE CONTRACTOR SHALL BE PREPARED TO PRE–DRILL THROUGH POTENTIAL OBSTRUCTIONS, AS DEFINED IN ITEMS 944.2 AND 944.3 IN THE SPECIAL PROVISIONS. IT IS UP TO THE MEANS AND METHODS OF THE CONTRACTOR TO REMOVE OBSTRUCTIONS AND KEEP THE HOLE FROM COLLAPSING. CASING MAY BE NEEDED TO KEEP THE PRE–DRILL HOLE FROM COLLAPSING. ADDITIONALLY, THE CONTRACTOR SHALL PROVIDE CASING AT THE DISCRETION OF THE RESIDENT ENGINEER.

UNSUITABLE MATERIAL:

ALL UNSUITABLE MATERIAL SHALL BE REMOVED WITHIN THE LIMITS OF THE FOUNDATIONS OF THE STRUCTURE, AS DIRECTED BY THE ENGINEER.

ANCHOR BOLTS:

ALL ANCHOR BOLTS SHALL BE SET BY TEMPLATE BEFORE THE CONCRETE IS PLACED.

CONCRETE:

4000 PSI, 1½ IN., 565 CEMENT CONCRETE SHALL BE PROVIDED FOR THE ABUTMENT STEMS, WINGWALL STEMS AND APPROACH SLABS.

4000 PSI, ¾ IN., 610 CEMENT CONCRETE SHALL BE PROVIDED FOR THE PEDESTALS.

4000 PSI, ¾ IN., 585 HP CEMENT CONCRETE SHALL BE PROVIDED FOR THE DECK AND CAST IN PLACE DIAPHRAGMS.

5000 PSI, ¾ IN., 685 HP CEMENT CONCRETE SHALL BE PROVIDED FOR THE PRECAST HIGHWAY GUARDRAIL TRANSITIONS.

5000 PSI, ⅝" IN., 710 HP CEMENT CONCRETE SHALL BE PROVIDED FOR THE CT–TL2 BARRIER.

REINFORCEMENT:

REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M 31 GRADE 60. UNLESS OTHERWISE NOTED ON THE CONSTRUCTION DRAWINGS, ALL BARS SHALL BE LAPPED AS FOLLOWS:

MODIFICATION CONDITION #4 BARS #5 BARS #6 BARS
1. NONE 16" 19" 23"

WQC/ACOE PLANS SHEET 11 OF 15

2. 12" OF CONCRETE BELOW BAR	23"	29"	30"
3. EPOXY COATED BARS, COVER < 3d _b , OR CLEAR SPACING < 6d _b			34"
4. COATED BARS, ALL OTHER CASES	18"	23"	27"
5. CONDITION 2 AND 3	26"	32"	39"
6. CONDITION 2 AND 4	24"	30"	36"

NOTE: BARS ARE TO BE EPOXY COATED

ALL OTHER BARS SHALL BE LAPPED AS SHOWN ON THE CONSTRUCTION DRAWINGS.

MEMBRANE WATERPROOFING:

ALL MEMBRANE WATERPROOFING USED ON BRIDGE DECKS SHALL BE MEMBRANE WATERPROOFING FOR BRIDGE DECKS – SPRAY APPLIED.

EXISTING BRIDGE PLANS:

PLANS FOR EXISTING BRIDGE (H–08–003), DATED AUGUST 1961 MAY BE SEEN AT THE OFFICE OF PLANS AND RECORDS, MASSACHUSETTS DEPARTMENT OF TRANSPORTATION, 10 PARK PLAZA, BOSTON, MASSACHUSETTS. DIMENSIONS AND DETAILS OF THE EXISTING STRUCTURE ARE NOT GUARANTEED AND SHALL BE VERIFIED BY THE CONTRACTOR.

BRIDGE DEMOLITION:

THE DEMOLITION OF THE BRIDGE IS PAID UNDER PAY ITEM 115.1. SEE SPECIAL PROVISION.

THE DISPOSAL OF THE WOOD RAILINGS IS PAID FOR UNDER "DISPOSIAL OF TREATED WOOD PRODUCTS.

ESTIMATED BRIDGE QUANTITIES		
ITEMS	UNITS	QUANTITY
DEMOLITION OF BRIDGE NO. H-08-003=N-07-002 (18J)	LS	1
BRIDGE EXCAVATION	CY	340
CLASS B ROCK EXCAVATION	CY	70
GRAVEL BORROW FOR BRIDGE FOUNDATION	CY	150
CONTROLLED DENSITY FILL - NON-EXCAVATABLE	CY	5
CRUSHED STONE	TON	170
CRUSHED STONE FOR BRIDGE FOUNDATIONS	TON	20
DISPOSAL OF TREATED WOOD PRODUCTS	TON	3
SUPERPAVE BRIDGE SURFACE COURSE - 9.5 (SSC-B - 9.5)	TON	60
SUPERPAVE BRIDGE PROTECTIVE COURSE - 9.5 (SSC-B - 9.5)	TON	20
GEOTEXTILE FABRIC FOR PERMANENT EROSION CONTROL	SY	530
STEEL PILE HP 12 X 84	FT	360
PRE-DRILLING FOR PILES	FT	210
DRILLING FOR PILE OBSTRUCTIONS	FT	23
DYNAMIC LOAD TEST BY CONTRACTOR	EA	2
PILE SHOES	EA	8
DUMPED RIPRAP	TON	490
STREAMBED/BANK RESTORATION	TON	390
CONTROL OF WATER - STRUCTURE NO. H-08-003=N-07-002 C7G	LS	1
BRIDGE STRUCTURE, BRIDGE NO. H-08-003=N-07-002 C7G	LS	1

Proposal No. 608851-126586

HARDWICK-NEW BRAINTREE
CREAMERY ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#	15	35
PROJECT FILE NO.		608851	

GENERAL NOTES

TRAFFIC DATA

	ROADWAY OVER	ROADWAY UNDER
DESIGN YEAR	2025	
AVERAGE DAILY TRAFFIC – PRESENT	100	
AVERAGE DAILY TRAFFIC – DESIGN YEAR	107	
DESIGN HOURLY VOLUME	11	
DIRECTIONAL DISTRIBUTION	50%	
TRUCK PERCENTAGE – AVERAGE DAY	6%	
TRUCK PERCENTAGE – PEAK HOUR	6%	
DESIGN SPEED	25 MPH	
DIRECTIONAL DESIGN HOURLY VOLUME	6	

SEISMIC DESIGN CRITERIA

DESIGN RETURN PERIOD:	1,000 YRS
DESIGN SPECTRA	
As	0.097
SDs	0.213
SD1	0.093
SITE CLASS	D
SEISMIC DESIGN CATEGORY (SDC)	A

HYDRAULIC DESIGN DATA

DRAINAGE AREA (SQ. MILES)	148
DESIGN FLOOD DISCHARGE (C.F.S.)	3,690
DESIGN FLOOD FREQUENCY (YEARS)	10
DESIGN FLOOD VELOCITY (F.P.S.)	5.8
DESIGN FLOOD ELEVATION (FEET, NAVD)	552.04

BASE (100–YEAR) FLOOD DATA

BASE FLOOD DISCHARGE (C.F.S.)	7,820
BASE FLOOD ELEVATION (FEET, NAVD)	556.65

DESIGN AND CHECK SCOUR DATA

DESIGN SCOUR FLOOD EVENT	
RETURN FREQUENCY (YEARS)	25
DESIGN FLOOD ABUTMENT SCOUR DEPTH (FEET)	1.38
DESIGN FLOOD PIER SCOUR DEPTH (FEET)	N/A
CHECK SCOUR FLOOD EVENT	
RETURN FREQUENCY (YEARS)	50
CHECK FLOOD ABUTMENT SCOUR DEPTH (FEET)	1.13
CHECK FLOOD PIER SCOUR DEPTH (FEET)	N/A

FLOOD OF RECORD

DISCHARGE (C.F.S.)	~18,300
FREQUENCY (IF KNOWN, YEARS)	>500
MAXIMUM ELEVATION (FEET, NAVD)	N/A
DATE (MM/YYYY)	09/1938
HISTORY OF ICE FLOES	N/A
EVIDENCE OF SCOUR AND EROSION	6 FEET

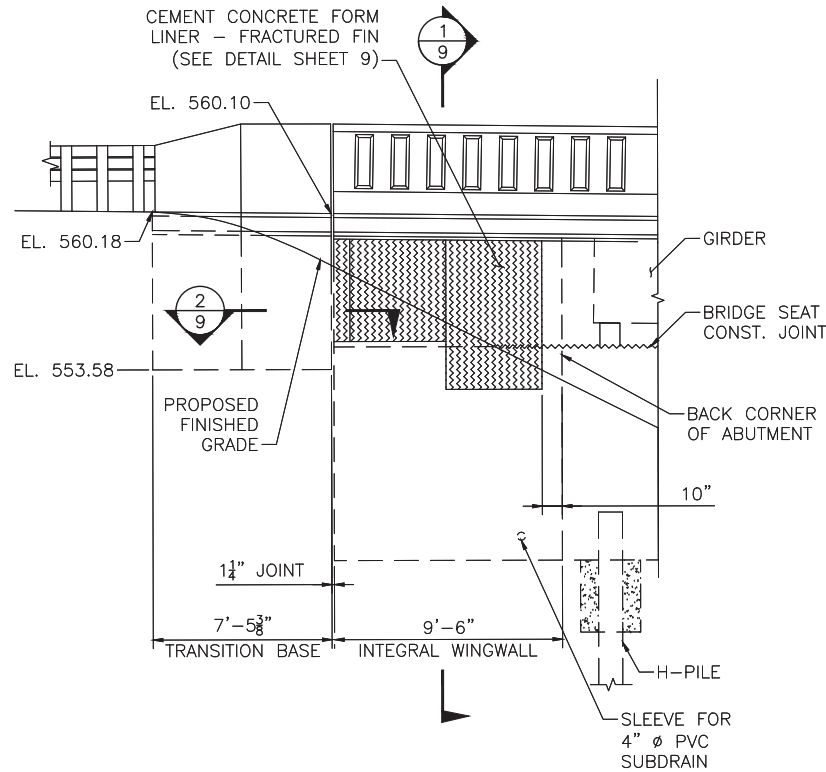
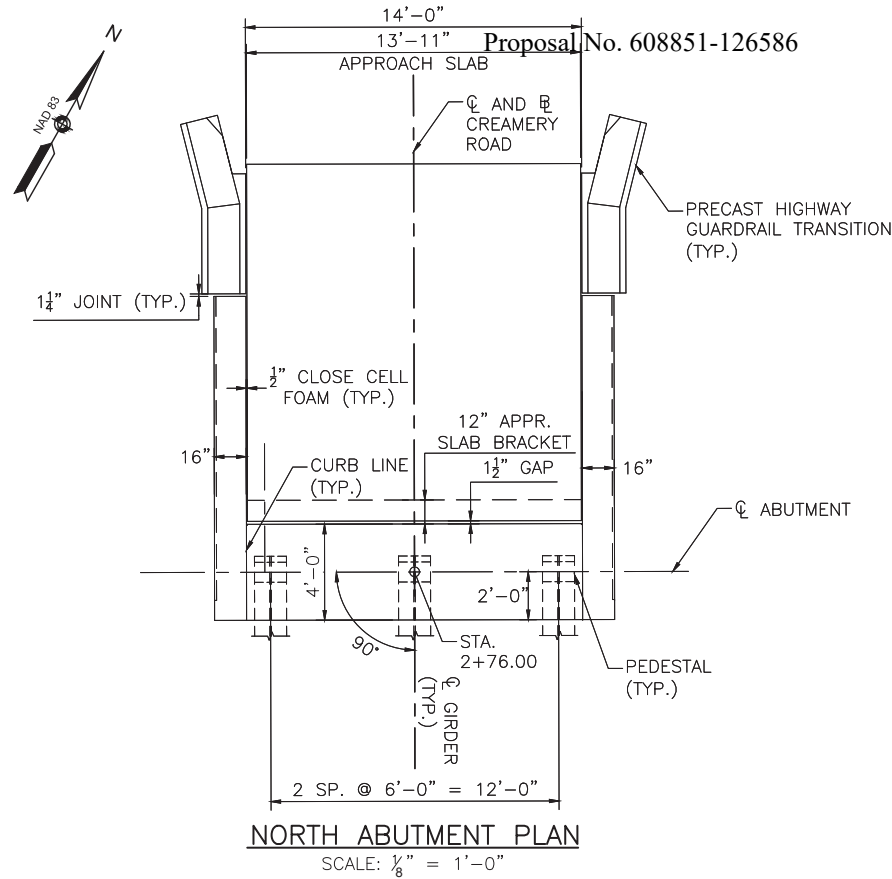
TEMPORARY WATER CONTROL
DESIGN DATA

DESIGN FLOOD DISCHARGE (C.F.S.)	1,780
DESIGN FLOOD FREQUENCY (YEARS)	2
DESIGN FLOOD VELOCITY (F.P.S.)	3.9
DESIGN FLOOD ELEVATION (FEET, NAVD)	549.04

MAY 22, 2023	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT	
AUTHORIZED SIGNATORY:	STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE	

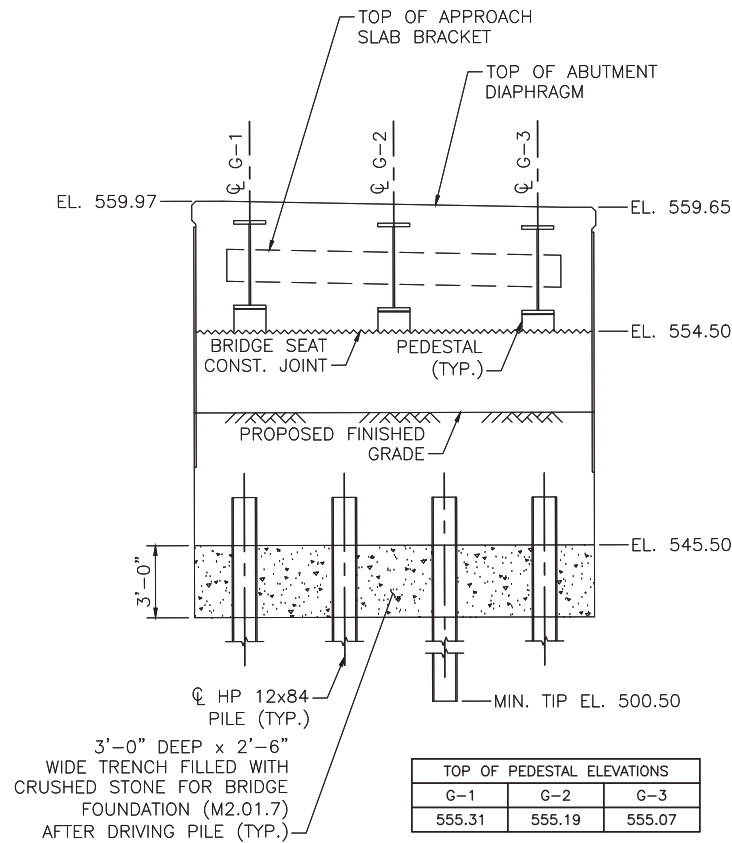
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#	19	35
PROJECT FILE NO.		608851	

NORTH ABUTMENT



NORTHWEST WINGWALL ELEVATION

SCALE: 1/8" = 1'-0"

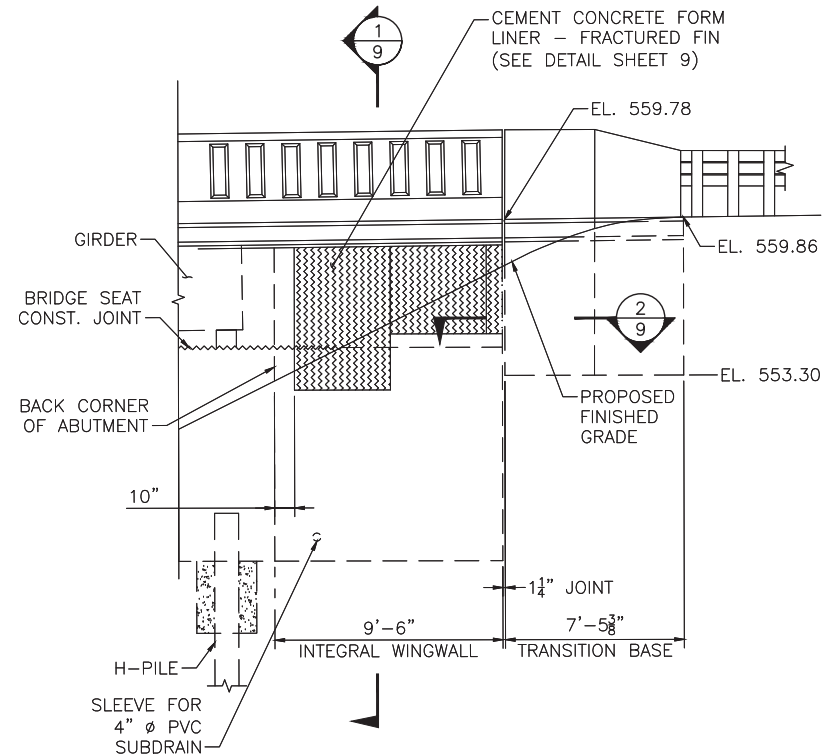


NOTES:

- ALL ELEVATIONS ARE SHOWN AT ABUTMENT CENTERLINE.
- DETAILS ABOVE DECK LEVEL AND INDEPENDENT WINGWALLS OMITTED FOR CLARITY.
- ELEVATIONS DO NOT INCLUDE ERECTION PAD THICKNESS.

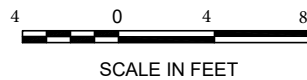
NORTH ABUTMENT ELEVATION

SCALE: 1/8" = 1'-0"



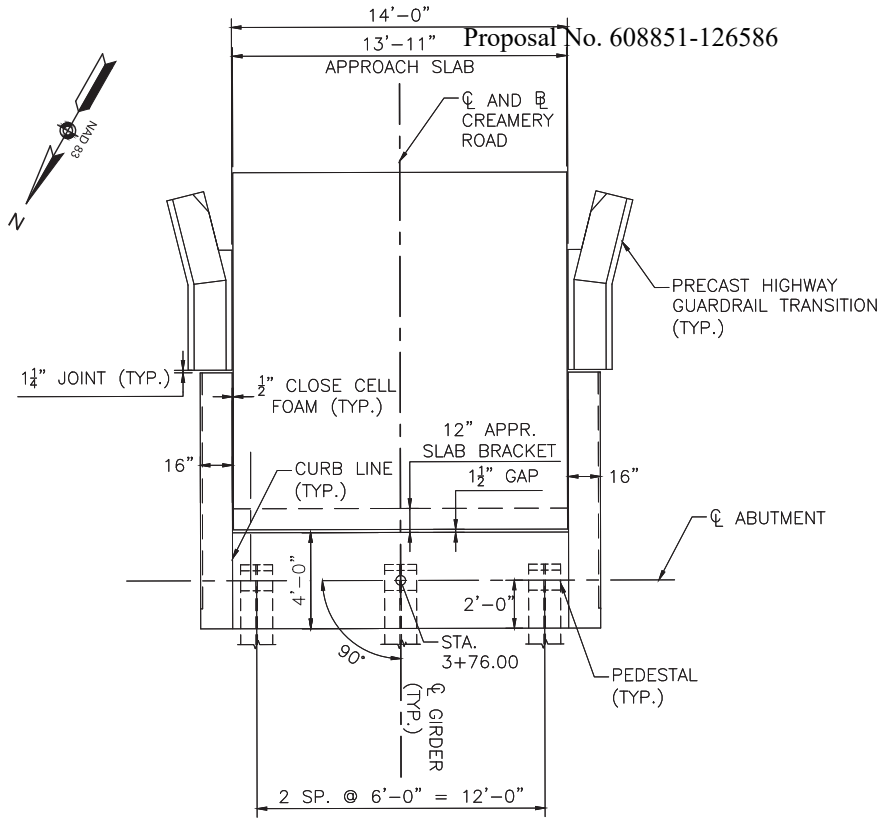
NORTHEAST WINGWALL ELEVATION

SCALE: 1/8" = 1'-0"

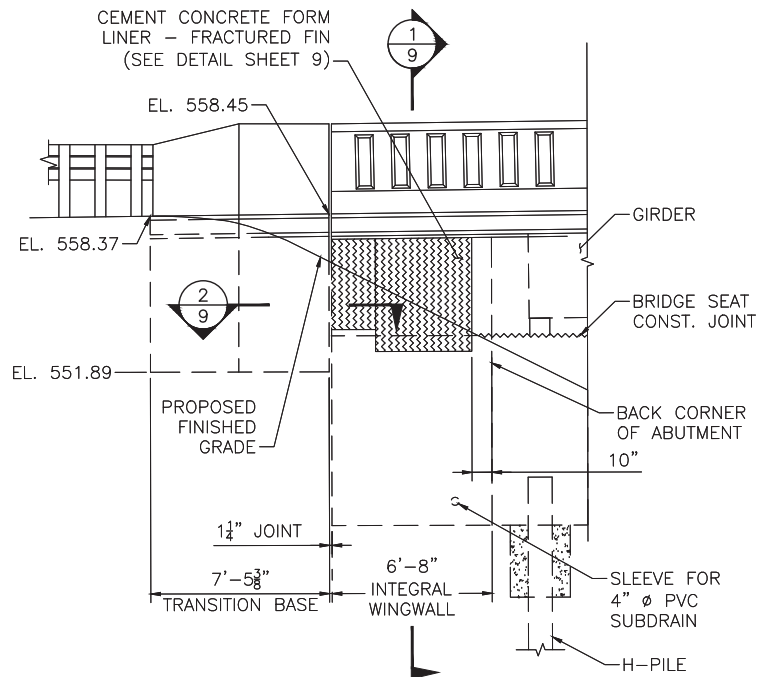


SCALE IN FEET

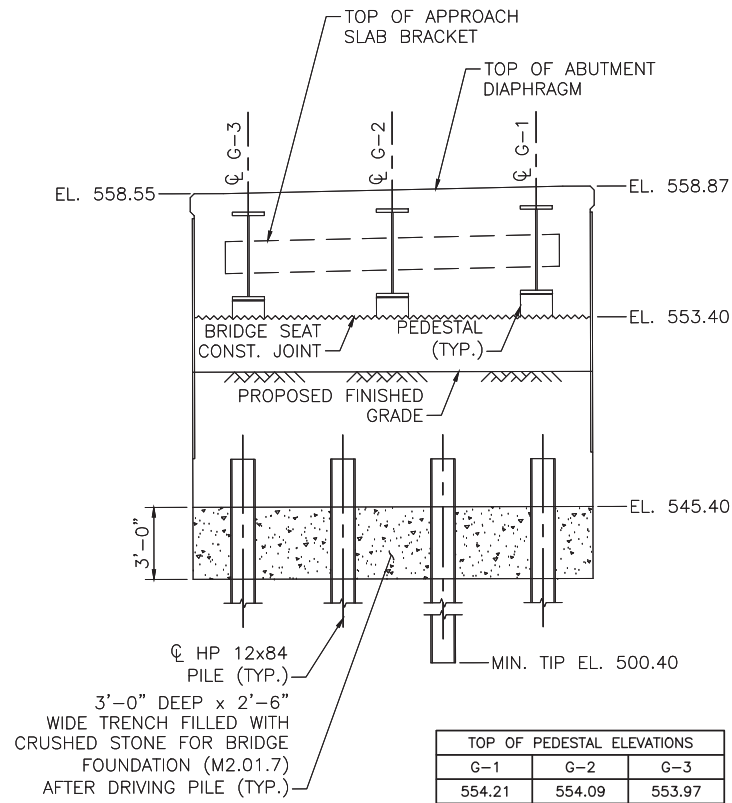
MAY 22, 2023	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT	
AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER	
USE ONLY PRINTS OF LATEST DATE	



SOUTH ABUTMENT PLAN
SCALE: 1/8" = 1'-0"



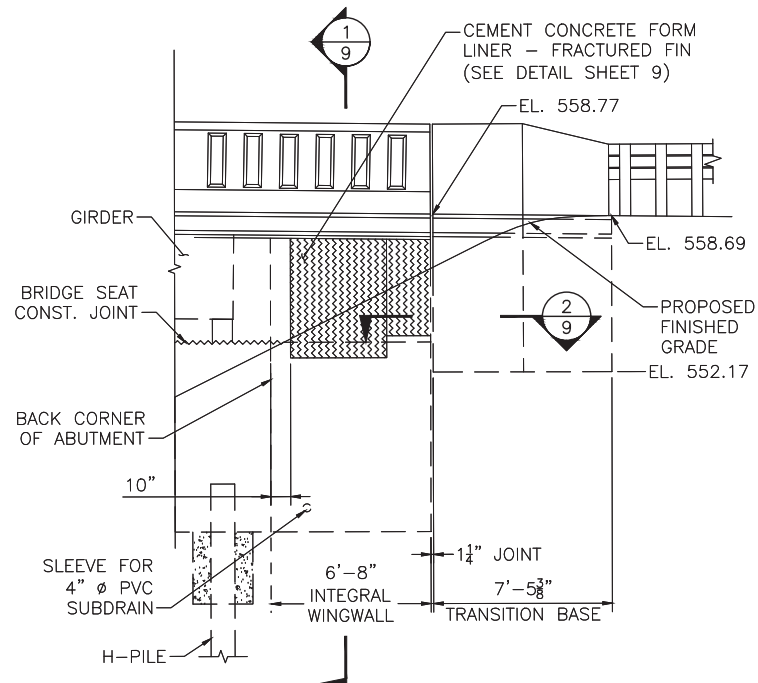
SOUTHEAST WINGWALL ELEVATION
SCALE: 1/8" = 1'-0"



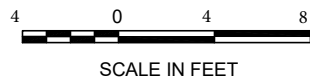
NOTES:

- ALL ELEVATIONS ARE SHOWN AT ABUTMENT CENTERLINE.
- DETAILS ABOVE DECK LEVEL AND INDEPENDENT WINGWALLS OMITTED FOR CLARITY.
- ELEVATIONS DO NOT INCLUDE ERECTION PAD THICKNESS.

SOUTH ABUTMENT ELEVATION
SCALE: 1/8" = 1'-0"



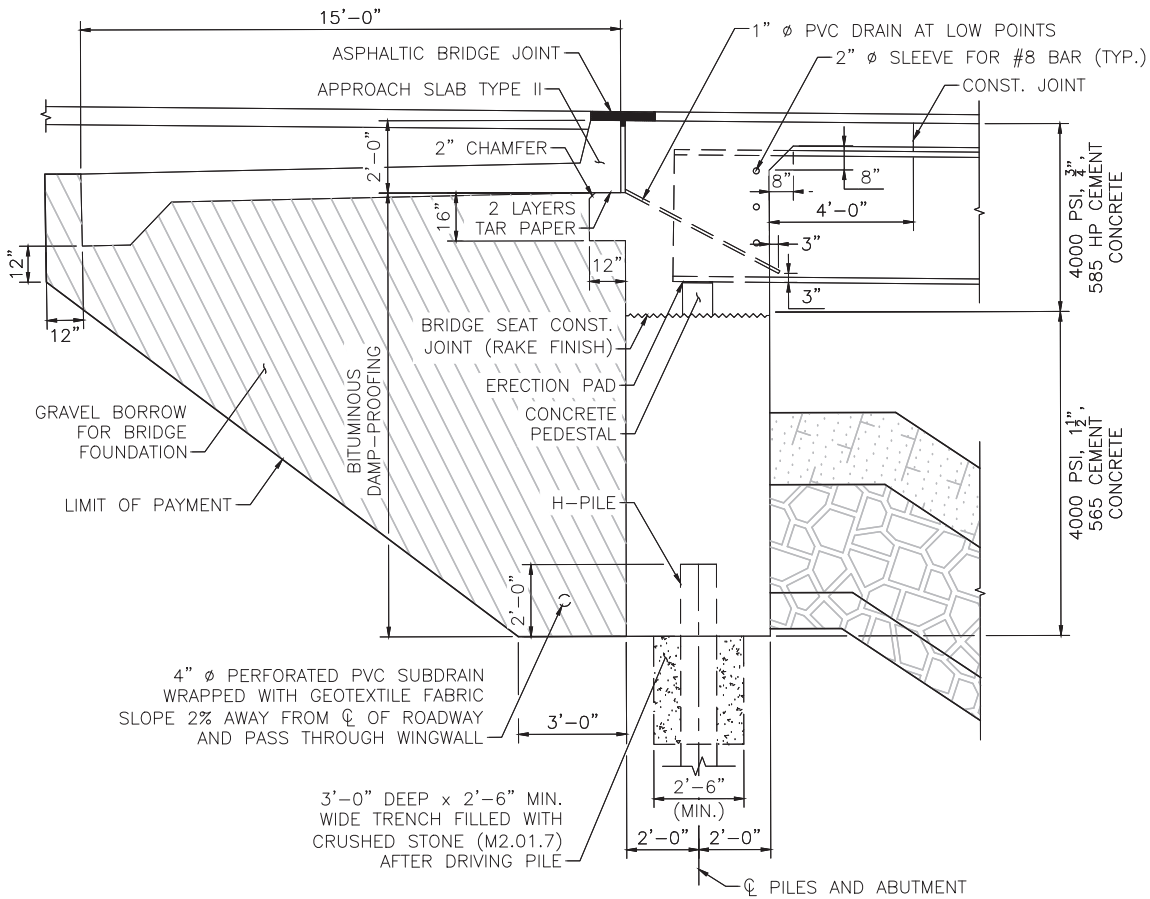
SOUTHWEST WINGWALL ELEVATION
SCALE: 1/8" = 1'-0"



MAY 22, 2023	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT	
AUTHORIZED SIGNATORY:	STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE	

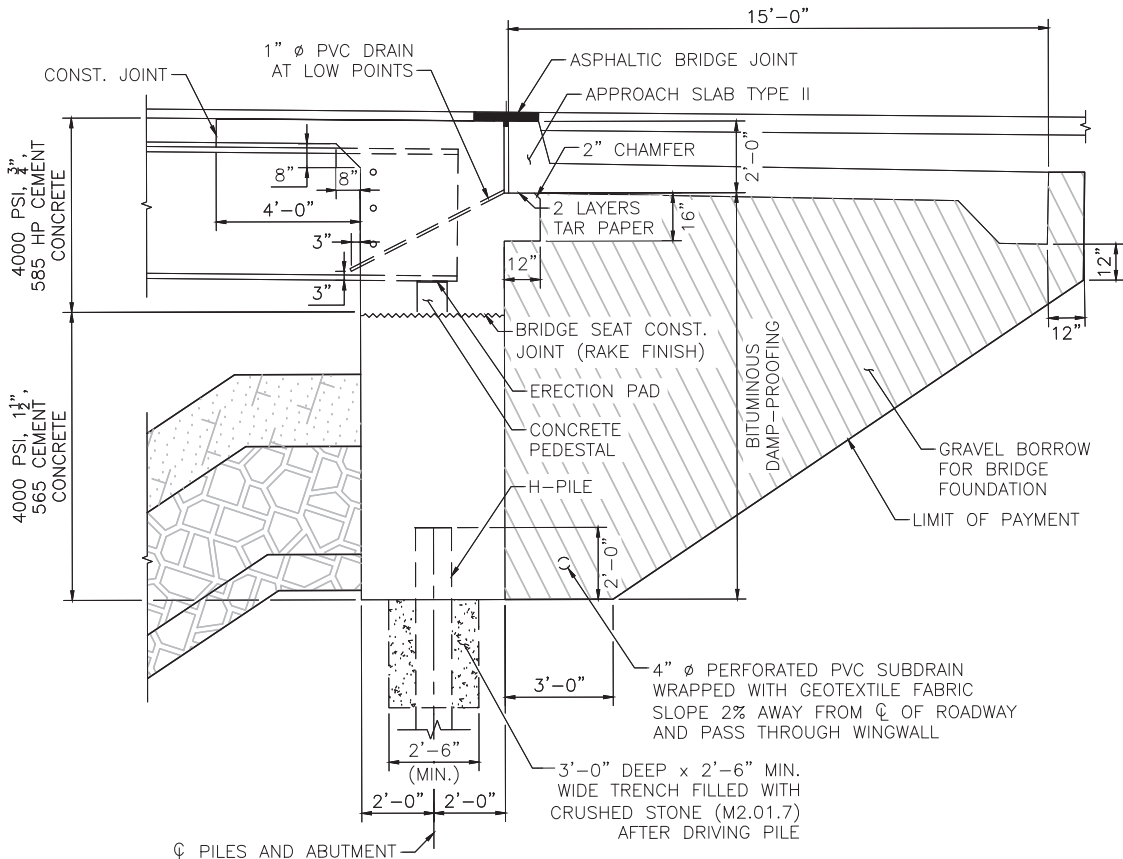
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#	21	35
PROJECT FILE NO. 608851			

ABUTMENT SECTIONS



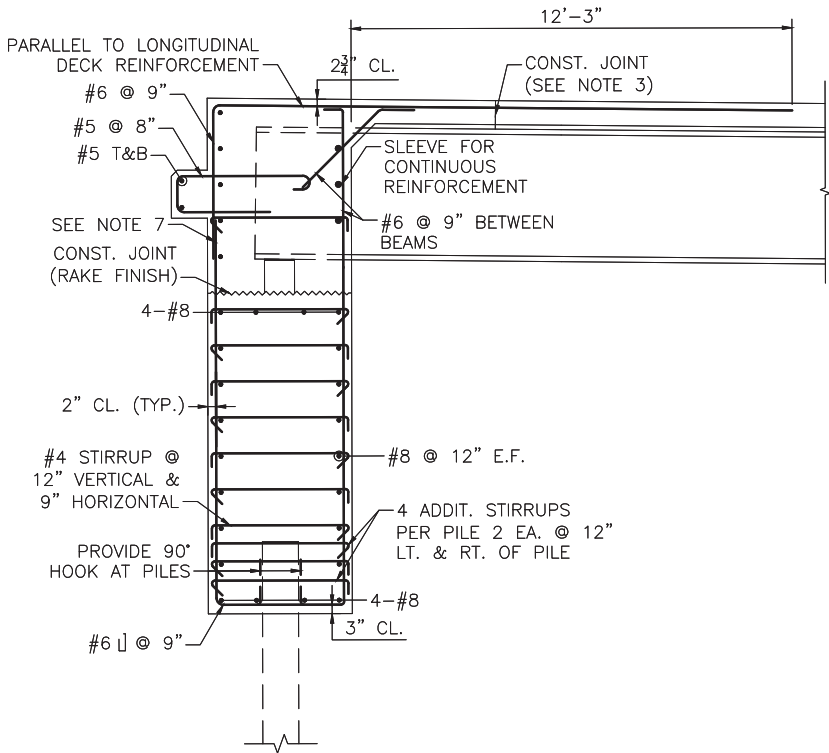
NORTH ABUTMENT SECTION

SCALE: 3/16" = 1'-0"



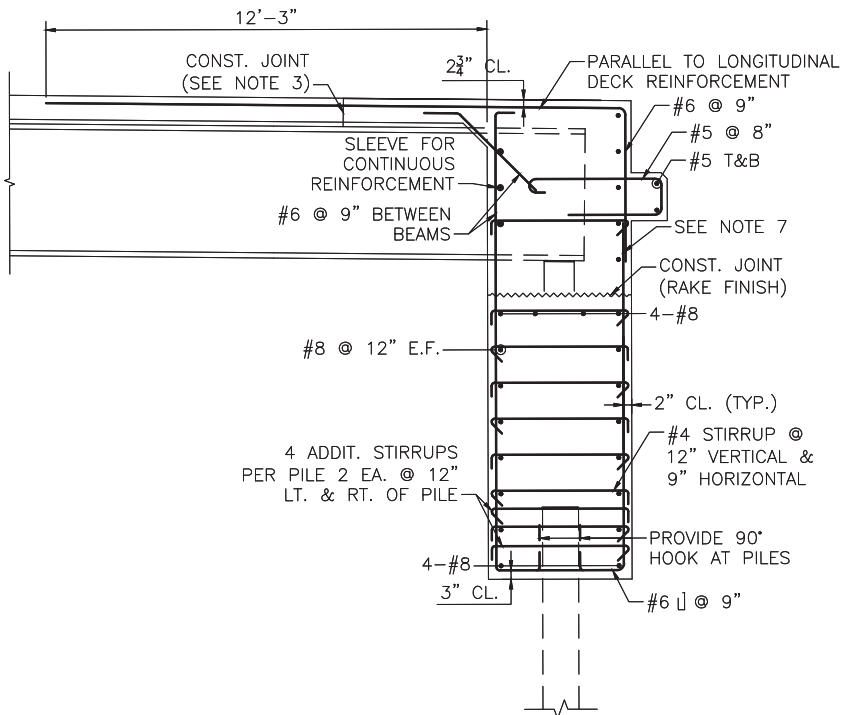
SOUTH ABUTMENT SECTION

SCALE: 3/16" = 1'-0"



NORTH ABUTMENT REINFORCEMENT

SCALE: 3/16" = 1'-0"

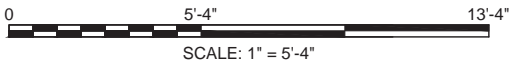


SOUTH ABUTMENT REINFORCEMENT

SCALE: 3/16" = 1'-0"

NOTES:

1. ALL REINFORCEMENT SHALL BE EPOXY COATED.
2. DECK SLAB REINFORCEMENT NOT SHOWN FOR CLARITY. CONTINUE DECK SLAB REINFORCEMENT TO BACK OF ABUTMENT.
3. THE CONTRACTOR SHALL FOLLOW THE DECK PLACEMENT SEQUENCE AS SHOWN ON THESE CONSTRUCTION DRAWINGS REFERENCED ON SHEET 16.
4. ALL CONCRETE SHALL CONTAIN SUPERPLASTICIZER TO ENSURE ADEQUATE CONSOLIDATION.
5. BOTH ABUTMENTS SHALL BE BACKFILLED SIMULTANEOUSLY. NO MORE THAN TWO (2) FEET OF DIFFERENTIAL BACKFILL HEIGHT SHALL BE PERMITTED. BACKFILLING SHALL NOT BEGIN UNTIL THE ABUTMENT AND DECK CONSTRUCTION IS COMPLETE.
6. THE CONTRACTOR MAY USE MECHANICAL REINFORCING BAR SPLICERS IN LIEU OF TENSION LAP SPLICES TO FACILITATE CONSTRUCTION. HOWEVER, NO ADDITIONAL COMPENSATION WILL BE PROVIDED FOR THE USE OF MECHANICAL REINFORCING BAR SPLICERS.
7. THE TOP OF THE APPROACH SLAB SHALL MATCH THE TOP OF THE ABUTMENT DIAPHRAGM.



SCALE: 1" = 5'-4"

MAY 22, 2023	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT	
AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER	
USE ONLY PRINTS OF LATEST DATE	

DOCUMENT A00831

ARMY CORPS OF ENGINEERS

GENERAL PERMIT

AND

NAE VERIFICATION LETTER

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General Permit No.: NAE-2022-02649

Final Effective Date: June 2, 2023

Applicant: General Public, Commonwealth of Massachusetts

Expiration Date: June 1, 2028

Department of the Army
General Permits for the Commonwealth of Massachusetts

The New England District of the U.S. Army Corps of Engineers (USACE) hereby issues twenty-five (25) regional general permits (GPs) for activities subject to USACE jurisdiction in waters of the U.S., including wetlands, navigable waters within the Commonwealth of Massachusetts and adjacent ocean waters to the seaward limit of the outer continental shelf. The Massachusetts GPs (hereafter referred to as the MA GP or GP) are issued in accordance with USACE regulations at 33 CFR 320 – 332 [see 33 CFR 325.5(c)(1)]. These GPs establish criteria and contain permit conditions to ensure that the authorized activities have no more than minimal individual and cumulative adverse impacts to the environment.

This document contains the following sections:Pages

SECTION I	Statutory Authorities & Regulated Activities	2
SECTION II	Review Categories & Application Procedures	3-7
SECTION III	Massachusetts General Permits	8-34
SECTION IV	General Conditions	35-51
SECTION V	Mitigation Standards	52-54
SECTION VI	Federal & State Agency Contact Information & Websites	55-56
SECTION VII	Definitions & Acronyms	57-66
APPENDIX A	Guidance for Section 106 NHPA Compliance in Massachusetts	67-71
APPENDIX B	Pre-Construction Notification	72-77
APPENDIX C	Self-Verification Notification	78-81
APPENDIX D	Pre-Construction Notification Application Checklist	82-88

In issuing these GPs, the Federal Government does not assume any liability for the following:

(a) damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes; (b) damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the U.S. in the public interest; (c) damages to persons, property or to other permitted or unpermitted activities or structures caused by the activity authorized by any of the GPs; (d) design or construction deficiencies associated with the permitted work; or (e) damage claims associated with any future modification, suspension or revocation of these permits.

Tammy R. Turley 02 June 2023

 Tammy R. Turley Date
 Chief, Regulatory Division

SECTION I. STATUTORY AUTHORITIES & REGULATED ACTIVITIES

1. Work Requiring USACE Authorization

- a. Section 10: Work and structures that are located in, over, under or that affect navigable waters of the United States (U.S.) (see 33 CFR 329). The USACE regulates these activities under section 10 of the Rivers and Harbors Act of 1899 (see 33 CFR 322).
- b. Section 404: The discharge of dredged or fill material into waters of the U.S (see 33 CFR 328). The USACE regulates these activities under Section 404 of the Clean Water Act (CWA). The term “discharge of dredged or fill material” also includes certain discharges resulting from excavation. Applicants should contact USACE to determine if a particular excavation discharge occurring within waters of the U.S., is a regulated activity. See 33 CFR 323.4 of the CWA for exempted activities.

For additional information on the limits of USACE jurisdiction, please see:

https://www.nae.usace.army.mil/Portals/74/docs/regulatory/JurisdictionalLimits/Jurisdictional_Limits_Brochure.pdf

2. Authority to Issue General Permits

- a. In accordance with 33 CFR 322.2(f), 325.2(e)(2), and 325.5(c), USACE may issue regional general permits authorizing activities under Section 10 of the RHA.
- b. In accordance with Section 404(e) of the CWA, 33 USC 1344(e), and 33 CFR 323.2(h), 325.2(e)(2), and 325.5(c), after notice and opportunity for public hearing, USACE may issue regional general permits for any category of activities involving discharges of dredged or fill material if the activities in such category are similar in nature, will cause only minimal adverse environmental effects when performed separately, and will only have minimal cumulative adverse effect on the environment.

3. Related Laws

33 CFR 320.3 includes a list of related laws including, but not limited to, Section 408 of the Rivers and Harbors Act of 1899, Section 401 of the Clean Water Act, Section 402 of the Clean Water Act, Section 307(c) of the Coastal Zone Management Act of 1972, Section 106 of the National Historic Preservation Act of 1966, Section 7 of the Endangered Species Act, the Fish and Wildlife Coordination Act of 1956, the Magnuson-Stevens Fishery Conservation and Management Act, the Fish and Wildlife Coordination Act, Section 302 of the Marine Protection, Research and Sanctuaries Act of 1972, Section 7(a) of the Wild and Scenic Rivers Act, the Golden Eagle Protection Act, and the Migratory Bird Treaty Act.

SECTION II. REVIEW CATEGORIES & APPLICATION PROCEDURES

To qualify under these GPs, the design, construction, and maintenance associated with each proposed activity must meet the terms and eligibility criteria listed in Section III, all applicable general conditions (GCs) in Section IV, and any specific mitigation requirements in Section V. Applicants should first review the GPs to see if a project is eligible for authorization under one or more of the GPs within this document. Any activity not specifically listed may still be eligible for authorization under these GPs; applicants are advised to contact USACE for specific eligibility determination.

Please note that these GPs allow for Self-Verification (SV) contingent upon meeting all criteria and with full adherence to all GCs. Projects that do not qualify for SV, may meet criteria for Pre-Construction Notification (PCN). Tables are provided under each activity, which outline criteria for SV and PCN. Activities that do not meet criteria for SV or PCN may require review as an Individual Permit (IP). Activities may require a PCN or IP as noted in Sections III and/or IV of this GP. Notwithstanding compliance with the terms of these GPs, USACE retains discretionary authority to require either PCN review or IP review on a case-by-case basis for any project based on concerns for the environment or for any of the other public interest factors found in 33 CFR 320.4(a). These GPs also do not replace or change those activities identified as exempt from USACE regulation (33 CFR 323.4).

1. Pre-Application Assistance

Prospective applicants may request a pre-application meeting to address any questions they may have. USACE may also request a pre-application meeting or additional information to facilitate review of the request. Pre-application meetings and/or site visits help streamline the authorization process by alerting the prospective applicant to potentially time-consuming factors that may arise during the evaluation of their project (e.g., avoidance, minimization and compensatory mitigation requirements, historic properties, endangered species, essential fish habitat, impacts to federal projects, and/or dredging of contaminated sediments).

To schedule a pre-application meeting, present questions, or if you need further assistance, please contact USACE at:

Email: cenae-r-ma@usace.army.mil (strongly preferred)

Phone: (978) 318-8338

Mail: U.S. Army Corps of Engineers
New England District
Regulatory Division, Massachusetts Section
696 Virginia Road
Concord, MA 01742

2. Submitting a Request

Please follow the procedures outlined in Sections II.2-5 when requesting an SV or applying for PCN authorization for activities covered by these GPs. The GPs are provided in Section III below. For SV-eligible projects, the Self-Verification Notification (SVN) must be submitted within 30 days of commencing work. Otherwise, a Pre-Construction Notification (PCN) must be submitted for work that is not SV-eligible. Please include appropriate drawings and attachments and submit your request using the mailbox identified in Section II.4 or II.5 below. USACE will promptly confirm receipt of your request and notify you in the event additional information is required. Guidance on

how to submit electronic correspondence is located on the NAE Regulatory website here:
<https://www.nae.usace.army.mil/Missions/Regulatory/Submitting-Electronic-Correspondence>.

3. Local, State & Federal Approvals

Applicants are responsible for applying for and obtaining any required local, state, and federal permits or approvals. These must be obtained prior to the commencement of work in waters. Such authorizations may include a Water Quality Certification, a Coastal Zone Management Act consistency determination, and other approvals as noted below. Authorization under these GPs does not obviate the need for the permittee to obtain other Federal, State, or local permits, approvals, or authorizations required by law.

I. Water Quality Certification under Section 401 of the Federal Clean Water Act (33 USC 1341).

Applicants are responsible for determining the appropriate 401 Water quality Certification (WQC) requirements and submitting this information to the USACE at the time of their PCN application or when completing their SVN. Applicants that are unsure of whether their activity has been certified should contact MassDEP, or EPA Region 1 when the activity is located on tribal lands, for a determination. The 401 WQC requirement must be satisfied by acquiring one of the following WQCs from MassDEP (see GC 8):

General 401 WQC: The MassDEP issued a WQC on April 21, 2023 conditionally certifies all activities in GPs 1 – 24 eligible for SV and PCN so long as the activity is described in 314 CMR 9.03, and is not an activity described in 314 CMR 9.04, and so long as the activity meets all other requirements, terms and conditions of this WQC. The MassDEP WQC also conditionally certifies activities described in GP 25 so long as the activity meets all other conditions of the WQC. Emergency projects described in GP 25 must obtain an emergency certification or otherwise be authorized pursuant to 310 CMR 10.06, qualify under a Severe Weather Emergency Declaration pursuant to 310 CMR 10.06(8) issued by the MassDEP, or meet the requirements of 9.12(2) or (3) in order to be certified under the WQC

Applicants should refer to the following link to determine if their activity is eligible:
<https://www.nae.usace.army.mil/Missions/Regulatory/State-General-Permits/Massachusetts-General-Permit/>. If eligible, you must comply with all applicable WQC conditions. Activities listed in 314 CMR 9.03 that are not exempt from the Wetland Protection Act must have a valid Final Order of Conditions (OOC) or Final Restoration Order of Conditions pursuant to 310 CMR 10.00 to be eligible under the General 401 WQC.

Individual 401 WQC: In the event the proposed activity is not covered by the general WQC, applicants shall contact MassDEP and apply for an individual 401 WQC if their activity does not qualify for a General 401 WQC as outlined above. MassDEP may issue, waive, or deny the individual 401 WQC on a case-by-case basis. All activities listed in 314 CMR 9.04 must obtain an individual 401 WQC from MassDEP to be eligible under these GPs. When an Individual 401 WQC is required for *PCN activities*, the applicant shall submit their Individual 401 WQC application concurrently to MassDEP and the USACE to comply with 40 CFR 121.

Activities Proposed on Tribal Lands: When an activity is proposed on Tribal lands, the applicant shall refer to the general 401 WQCs granted by the Environmental Protection Agency (EPA), Region 1 on May 15, 2023. These 401 WQCs are located on the USACE Regulatory website:
<https://www.nae.usace.army.mil/Missions/Regulatory/State-General-Permits/Massachusetts-General-Permit/>.

II. Coastal Zone Management Act Federal Consistency Concurrence pursuant to Section 307 of the CZMA of 1972, as amended. Federal consistency concurrence is required for all activities located within the coastal zone, unless determined otherwise by the Massachusetts Office of Coastal Zone Management (MA CZM) (see GC 9). As applicable, this requirement must be satisfied by acquiring one of the following from the MA CZM:

General CZM Federal Consistency Concurrence (General Concurrence): MA CZM has granted General Concurrence for all SV and PCN activities for GPs 1-25 and this can be found at: <https://www.nae.usace.army.mil/Missions/Regulatory/State-General-Permits/Massachusetts-General-Permit/>. The applicant must obtain all applicable permits and approvals prior to the commencement of work in USACE jurisdiction (i.e., construction begins on site). For SVs, General Concurrence is automatically granted and no further action is required from the applicant. For PCNs, the USACE will coordinate with MA CZM to acquire General Concurrence as part of the PCN application review. During review of the PCN application, USACE may request additional information from the applicant to support CZM's evaluation of the activity.

Individual CZM Federal Consistency Concurrence (Individual Concurrence): In certain cases, MA CZM may elevate any GP activity 1-25 to require Individual Concurrence. The applicant must contact MA CZM and follow the procedures to obtain Individual Concurrence as determined appropriate by MA CZM.

The MA CZM program includes five regional offices that serve 78 coastal municipalities. The following map provides more information about these offices: <https://www.mass.gov/service-details/czm-regions-coastal-communities-and-coastal-zone-boundary>

III. Other Approvals: Approvals typically required in Massachusetts include, but are not limited to, a Chapter 91 Permit/License, Massachusetts Environmental Protection Act (MEPA) review, Wetlands Protection Act Order of Conditions, and/or Aquaculture Certification. *Applicants should also be aware that USACE may not be able to render a permit decision in the event the proposed activity is denied by another local, state and/or federal agency.*

4. Procedures for Self-Verification (SV) Eligible Projects

If the activity is eligible for an SV, the Self-Verification Notification (SVN) must be completed prior to the start of project construction and submitted to USACE within 30 days of commencing work. The purpose of the SVN is to provide applicants with a tool to assist them when determining if the activity as proposed is SV-eligible. The following GPs do not require submission of the SVN: GP 1 (SV #1), GP 3 (SV #2-3), GP 4 (SV #2), GP 11, GP 12 (note #2), GP 14 (see note), GP 15 (see note), and GP 24 (SV #3). **For the activities not listed above, the SVN must be completed prior to the start of work and be kept on site at all times during project construction.** The applicant shall not begin work for SV-eligible activities until they have completely verified the bulleted items below.

Digital submittals by email are **strongly encouraged** to facilitate the most efficient processing of the SVN submittal. Please communicate with USACE staff if you are unable to provide a digital copy. Addresses are cenae-r-ma-sv@usace.army.mil (email) or Regulatory Division, U.S. Army Corps of Engineers, New England District, 696 Virginia Road, Concord, MA 01742-2751 (mail).

Eligible SV Activities:

- Are subject to USACE jurisdiction (see GC 2); and
- Qualify for one or more of the GPs within this document (Section III); and
- Meet the GCs within this document (Section IV); and

- When required, are supported by a complete SVN (Appendix C); and
- Receive all other required local, State, and/or Federal approvals.

5. Procedures for Pre-Construction Notification (PCN) Eligible Projects

For activities that require a PCN, an application to and written authorization from USACE is required. *No work requiring a PCN may proceed until the applicant receives written authorization from USACE verifying that the activity is authorized.* The verification letter may include special conditions that the applicant must comply with. When possible, it is *highly* recommended that PCN application materials are submitted at least 90 days before the target start date to allow for USACE evaluation and any necessary agency consultations. PCN applications shall demonstrate in writing how the proposed activity complies with all GCs, as applicable to their activity.

Digital submittals by email are **strongly encouraged** to facilitate the most efficient processing of the PCN application. Please communicate with USACE staff if you are unable to provide a digital copy. Addresses are cenae-r-ma@usace.army.mil or Regulatory Division, U.S. Army Corps of Engineers, New England District, 696 Virginia Road, Concord, MA 01742-2751 (mail).

Eligible PCN Activities:

- Are subject to USACE jurisdiction (see GC 2); and
- Qualify for one or more of the GPs within this document (Section III); and
- Meet the GCs within this document (Section IV); and
- Comply with the Mitigation Standards within this document (Section V); and
- Are supported by a complete PCN document (Appendix B); and
- When required, are supported by the submittal of project information to the appropriate parties identified in Appendix A; and
- Receive all other required local, State, and/or Federal approvals.

6. Interagency Review Procedures

The USACE reserves the opportunity to coordinate PCN activities with Federal and State agencies to ensure that the proposed activity results in no more than a minimal impact to the aquatic environment. In some cases, USACE may require project modifications involving avoidance, minimization, and/or compensatory mitigation for unavoidable impacts to ensure the net effects of a project are minimal. The USACE determines, after review and coordination with the agencies and/or the applicant, if PCN applications:

- Meet the terms and conditions of the GP as proposed;
- Require additional information;
- Require avoidance, minimization, compensatory mitigation, construction sequencing, project modification, or other special conditions to avoid or minimize adverse impacts to the aquatic environment;
- Require individual permit review regardless of whether the terms and GCs of these GPs are met, based on concerns for the aquatic environment or any other factor of the public interest (see Section 9 below).

For activities requiring a PCN, the applicant must wait for written authorization from USACE before commencing activities in waters of the U.S. Beginning work for PCN required activities without a USACE written authorization is a violation of these GPs, and the terms and conditions of this document. The applicant may be subjected to an enforcement action by USACE and/or the Environmental Protection Agency (EPA).

7. Construction of Solid Fill Structures and Fills Along the Coastline or Baseline from Which the Territorial Sea is Measured.

Projects involving the construction of solid fill structures or discharge of fill that may extend beyond the coastline or the baseline from which the territorial sea is measured (i.e., mean low water) will require a PCN. The USACE will submit a description of the proposed work and a copy of the plans to the Solicitor, Department of the Interior, Washington, DC 20240, and request comments concerning the effects of the proposed work on the outer continental rights of the United States. These comments will be included in the administrative record of the application. After completion of permit review, the record will be forwarded to the Chief of Engineers. The decision on the application will be made by the Secretary of the Army after coordination with the Attorney General.

8. Emergency Activities

Per 33 CFR 325.2(e)(4), an emergency is limited to a situation that would result in an unacceptable hazard to life, a significant loss of property, or an immediate, unforeseen, and significant economic hardship if corrective action requiring a permit is not undertaken within a time period less than the normal time needed to process an application under standard procedures. Emergency work shall be limited to that which is necessary to stabilize and secure the situation. Additional work needed for final repairs shall not be completed until approval is obtained through the appropriate, non-emergency process. Emergency work is subject to the same terms and conditions of these GPs as non-emergency work, and similarly, must qualify for authorization under these GPs; otherwise, an IP is required. *See GP 25 Emergency Situations for additional information.*

9. Individual Permit

Projects that do not meet the terms and conditions of this GP may require review as an IP (33 CFR 325.5 (b)). Proposed work in this category will require a separate Federal application for an individual permit from USACE (33 CFR 325.1). In addition, USACE retains discretionary authority on a case-by-case basis to elevate GP-eligible activities to an IP based on concerns for the environment or any other factor of the public interest (33 CFR 320.4 (a)). Applicants are required to submit the appropriate application materials directly to USACE as early as possible to expedite the permit review process. General information and application forms can be obtained at our website or by contacting our office at cenae-r-ma@usace.army.mil or (978) 318-8338. Individual 401 WQC and/or CZMA Federal consistency concurrence from the appropriate MA agencies are required before USACE can issue an individual permit. Applying for an IP does not relieve the applicant from their obligation to obtain all required Federal, State and/or local approvals.

10. Compliance

Applicants shall ensure compliance with all applicable GPs in Section III, GCs in Section IV, and any special conditions included in USACE verification letters. Noncompliance with these GPs, GCs, and special conditions may subject the applicant to criminal, civil, or administrative penalties, and/or an ordered restoration, and/or the permit may be modified, suspended or revoked by USACE. The USACE will consider any activity requiring USACE authorization to be noncompliant if that activity does not comply with all GP terms and conditions at all times, including while the project is under construction and when work is completed.

SECTION III. MASSACHUSETTS GENERAL PERMITS

Applicants are encouraged to review Sections I & II prior to submitting an application to confirm that the activity as proposed complies with all terms and conditions of the 2023 MA GPs.

Applicants are also encouraged to review the definitions in Section VII, Definitions & Acronyms, of this document. Several terms are frequently used throughout the GPs, and it is important for the reader to understand these terms. If seeking verification for an activity previously verified under the 2018 MA GPs, please contact the USACE to discuss permitting needs in advance of submitting an application.

General Permits

1. Aids to Navigation and Temporary Recreational Structures
2. Maintenance
3. Moorings
4. Structures in Navigable Waters of the U.S.
5. Boat Ramps and Marine Railways
6. Utility Lines, Oil or Natural Gas Pipelines, Outfall Or Intake Structures, and Appurtenant Features
7. Dredging, Disposal of Dredged Material, Beach Nourishment, Rock Removal and Rock Relocation
8. U.S. Coast Guard Approved Bridges
9. Bank and Shoreline Stabilization
10. Aquatic Habitat Restoration, Enhancement, and Establishment Activities
11. Fish and Wildlife Harvesting and Attraction Devices and Activities
12. Response Operations, Oil and Hazardous Substances
13. Cleanup of Hazardous and Toxic Waste
14. Scientific Measurement Devices
15. Survey Activities
16. Land and Water-Based Renewable Energy Generation Facilities and Hydropower Projects
17. Residential, Commercial and Institutional Developments, and Recreational Facilities
18. Aquaculture
19. Mining Activities
20. Living Shorelines
21. Agricultural Activities
22. Reshaping Existing Drainage Ditches, Construction of New Ditches, and Mosquito Management
23. Linear Transportation Projects and Wetland/Stream Crossings
24. Temporary Construction, Access, and Dewatering
25. Emergency Situations

GP 1. AIDS TO NAVIGATION AND TEMPORARY RECREATIONAL STRUCTURES (Authority: §10)

(a) The placement of aids to navigation and regulatory markers that are approved by and installed in accordance with the requirements of the U.S. Coast Guard (USCG). See 33 CFR, Part 66; and (b) Temporary buoys, markers, and similar structures placed for recreational use during specific events such as water skiing competitions and boat races or seasonal use. See GC 16.

Self-Verification Eligible

1. Aids to navigation and regulatory markers approved by and installed in accordance with the requirements of the USCG.
2. Temporary buoys, markers and similar structures that are: (a) placed for recreational use during specific events and removed within 30 days after event; or (b) placed during winter events on ice and removed before spring thaw. These structures must be authorized by the local harbormaster, not located within an FNP or its buffer zone, and not located in saltmarsh or tidal vegetated shallows.

Pre-Construction Notification Required

1. Impacts in saltmarsh or tidal vegetated shallows.
2. Activities that are not SV eligible.

Note: An SVN submittal to USACE is not required for work authorized under SV #1 above.

GP 2. MAINTENANCE (Authorities: §10 and §404)

Repair, rehabilitation, or replacement of any previously authorized¹, currently serviceable structure, or fill, or of any currently serviceable structure or fill authorized by 33 CFR 330.3 (activities occurring before certain dates), provided that the structure or fill is not to be put to uses differing from those uses specified or contemplated for it in the original permit or the most recently authorized modification. Minor deviations in the structure's configuration or filled area, including those due to changes in materials, construction technique requirements of other regulatory agencies, or current construction codes or safety standards that are necessary to make the repair, rehabilitation, or replacement are authorized. This GP also authorizes temporary structures, fills, and work, including the use of temporary mats, necessary to conduct the activities above. Maintenance dredging and beach nourishment are not eligible under GP 2 (see GP 7). Stream crossing modifications (including sliplining), replacements or extensions are not eligible under GP 2 (see GPs 6, 17, 23). See GP 25 Emergency Situations for expedited review of emergency activities.

Not authorized under GP 2 (IP required): (a) Permanent impacts in >1 acre in non-tidal waters and/or wetlands; or (b) Permanent impacts >1/2 acre in tidal waters; >1000 SF in saltmarsh, mud flats, riffle and pool complexes, or non-tidal vegetated shallows; or >100 SF in tidal vegetated shallows; or (c) Temporary impacts >1 acre in tidal waters; >5000 SF in saltmarsh, mud flats, riffle and pool complexes, or non-tidal vegetated shallows; or >1000 SF in vegetated shallows; (d) New stream channelization or stream relocation projects (e.g., those in response to storm or flood events).

Self-Verification Eligible

Maintenance activities that meet all of the following terms:

1. In non-tidal waters, the combined permanent and temporary impacts extending beyond the original footprint are ≤5,000 SF² and not located in vegetated shallows or riffle and pool complexes.
2. In tidal waters, the combined permanent and temporary impacts extending beyond the original footprint are ≤5,000 SF, ≤1,000 SF in mudflats and/or natural rocky habitat, and not located in saltmarsh and tidal vegetated shallows.
3. Minor deviations in the repair, rehabilitation, or replacement of previously authorized, currently serviceable structures or fills.
4. Bulkhead replacement in tidal and non-tidal waters via installation of new bulkhead within 18 inches of the existing bulkhead and associated backfill.
5. Drawdown of an impoundment for dam/levee repair provided it does not exceed 18 months and one growing season (April through September).

Pre-Construction Notification Required

1. Discharges associated with removal of accumulated sediments and debris in the vicinity of existing structures, including intake and outfall structures and associated canals.
2. The removal of sediment outside the immediate vicinity of existing structures (e.g., bridges, culverted road crossings, water intake structures, etc.) that is ≥200 linear feet. This activity is limited to the minimum necessary to restore the waterway in the vicinity of the structure to the approximate dimensions existing when the structure was built.
3. Dam and flood control or levee repair, rehabilitation, or replacement involves:
 - a. A change in the flood elevation or permanent water surface elevation of the impoundment; or
 - b. Drawdown of impoundment for construction exceeding one growing season (see SV eligible #5);
 - c. Any modification that changes the character, scope, or size of the original fill design; or
 - d. Does not meet SV eligible 1-7.
4. Installation of steel piles, including steel sheet piles, that cannot be done in the dry and where NOAA-ESA listed species are mapped as present.

¹ Some maintenance activities may not be subject to regulation under Section 404 of the CWA in accordance with 33 CFR 323.4(a)(2). Per 33 CFR 330.3, Vested dates are: a) Work performed and structures installed before December 18, 1968 (Section 10); and b) Fill placed before July 25, 1975 (Section 404).

² This excludes dam projects that may require a temporary drawdown with impacts >5,000 SF in non-tidal waters. Instead, the drawdown shall comply with SV #5 to be eligible under Self-Verification.

<p>6. Any stream channel modification is limited to the minimum necessary for the repair, rehabilitation, or replacement of the structure or fill; such modifications, including the removal of material from the stream channel, must be immediately adjacent to the project or within the boundaries of the structure or fill.</p> <p>7. Work to previously approved tide gates not affecting upstream tidal resource areas.</p>	<p>5. Activities located in the Connecticut River or Merrimack River, unless they are completed in the dry or when the tide is waterward of the work area.</p> <p>6. Activities on USACE properties & USACE-controlled easements.</p> <p>7. Activities that do not require an IP. Activities that do not require a PCN or an IP may be SV eligible.</p>
<p>Notes:</p> <p>1. This authorizes the repair, rehabilitation, or replacement of any previously authorized structure or fill that does not qualify for the CWA §404(f) exemption for maintenance. See 33 CFR 323.4(a)(2). Prior USACE permits may have included authorization to maintain the activity, in which case authorization under this GP is not necessary.</p> <p>2. See GC 22 for information on temporary construction mats.</p>	

GP 3. MOORINGS (Authority: §10)

New moorings and mooring fields; the relocation of previously authorized moorings; expansions, boundary reconfigurations or modifications of previously authorized mooring fields; and maintenance and replacement of moorings.

Not authorized under GP 3 (IP required): (a) Moorings or mooring fields converted to or associated with a new boating facility¹; or (b) Moorings in a USACE Federal Navigation Anchorage or USACE Federal Navigation Channel, except municipal-operated mooring fields.

Self-Verification Eligible

1. New or relocated moorings that meet all the following terms:
 - a. Authorized by a local harbormaster/ municipality under MGL Chapter 91 §10A; and
 - b. No interference with navigation; and
 - c. Single boat, single-point and non-commercial; and
 - d. Not associated with a boating facility, and
 - e. Neither placed within nor impact tidal vegetated shallows (e.g., eelgrass); and
 - f. Not located within a USACE Federal navigation project (FNP) or the FNP buffer zone.
2. Existing, authorized moorings are converted from traditional moorings to low impact mooring technology (see note below) and/or helical anchors.
3. Maintenance and replacement of moorings authorized by the USACE.

Pre-Construction Notification Required

1. New mooring fields; or expansions, boundary reconfigurations or modifications of existing, authorized mooring fields.
2. Moorings located such that they, and/or vessels docked or moored at them, are within the buffer zone of the horizontal limits of a Federal Anchorage. The buffer zone is equal to 3 times the authorized depth of that channel (see GC 15).
3. New individual moorings located in saltmarsh, mudflats, natural rocky habitat, and tidal vegetated shallows. Locating moorings these areas should be avoided to the maximum extent practicable. If these areas cannot be avoided, plans should show conservation mooring or low-impact mooring systems that prevent mooring chains from resting or dragging on the bottom substrate at all tides, where practicable. USACE may require a survey in areas previously mapped as containing eelgrass or within 100 ft. of existing eelgrass beds to document presence or absence of eelgrass and to determine the appropriate type and amount of compensatory mitigation for impacts to eelgrass.
4. Replacement moorings located in tidal vegetated shallows.
5. Moorings that are not SV eligible and do not require an IP.

Notes:

1. Low impact mooring systems, including conservation moorings, are encouraged to minimize impacts of chain scouring from conventional moorings during the tidal cycle.
2. An SVN submittal to USACE is not required for work authorized under SV #2-3 above.

¹ Boating facilities are marinas, yacht clubs, boat clubs, boat yards, dockominiums, town facilities, land/homeowner's associations, etc. that provide for a fee, rent or sell mooring or docking space. Not classified as boating facilities are municipal moorings or municipal mooring fields that charge an equitable user fee based only on the actual costs incurred.

GP 4. STRUCTURES IN NAVIGABLE WATERS OF THE U.S. (Authority: §10 & §404)

New, expansions, reconfigurations or modifications of structures for navigational access in waters of the U.S. including but not limited to temporary/seasonal or permanent pile and pole-supported piers, floats, stairs, shore out hauls, and boat and float lifts.

Not authorized under GP 4 (IP required): (a) Structures associated with a new boating facility; (b) Structures in a USACE Federal anchorage or channel; or (c) Artificial reefs.

Self-Verification Eligible

1. Private, non-commercial piers, floats and lifts that meet all the following terms:
 - a. Piers and floats in: (i) Tidal waters total ≤ 600 SF combined; and (ii) Non-tidal navigable waters of the U.S. total ≤ 600 SF combined; and
 - b. Piers are ≤ 4 feet wide and ≥ 6 feet above the marsh substrate (the height is measured from the marsh substrate to the bottom of the lowest longitudinal support); and
 - c. Floats and lifts in tidal waters and non-tidal navigable waters of the U.S. are ≥ 24 inches above the substrate during all tidal cycles. Float stops are preferred when site conditions warrant them (i.e., low tide exposes substrate), and skids can only be used in areas where piles are not feasible and on sandy or hard bottom substrates; and
 - d. Piers, floats and lifts: (i) Are ≥ 25 feet from previously mapped or existing vegetated shallows, or riparian property line extensions; (ii) Extend $\leq 25\%$ of the waterway width in non-tidal navigable waters of the U.S. or MHW in tidal navigable waters of the U.S.
 - e. Installation of ≤ 12 -inch diameter timber piles. Installation of ≥ 12 -inch diameter piles of any material type when installed in the dry.
2. Fenders and similar structures.

Pre-Construction Notification Required

1. Shore out hauls.
2. Expansions, modifications, or new reconfiguration zones at any authorized boating facility.
3. New, expansions, reconfigurations, reconfiguration zones, or modifications of structures that provide public, community or government recreational uses such as boating, fishing, swimming, access, etc.
4. Installation of steel piles, including steel sheet piles, that cannot be done in the dry and where NOAA-ESA listed species are mapped as present.
5. Located within the buffer zone of the horizontal limits of an FNP (GC 15).
6. Miscellaneous structures.
7. Impacts in tidal vegetated shallows.
8. Structures that are not SV eligible and do not require an IP.

Notes:

1. See GC 19 regarding pile driving and pile removal in navigable waters and
2. See GC 20 regarding time of year restrictions in tidal waters.
3. Boating facilities are facilities that provide for a fee, rent, or sell mooring space, such as marinas, yacht clubs, boat clubs, boat yards, town facilities, dockominiums, etc. Pile supported structures with no discharges of dredged or fill material are not regulated by USACE in non-navigable waters.
4. A SVN submittal to USACE is not required for SV #2 above.

GP 5. BOAT RAMPS AND MARINE RAILWAYS (Authorities: §10 and §404)

Activities required for the construction of boat ramps and marine railways, including excavation and fill.

Not authorized under GP 5 (IP required): (a) Permanent impacts that are >1 acre in non-tidal waters of the U.S., >½ acre in tidal waters; >1000 SF in saltmarsh, mud flats, riffle and pool complexes, or non-tidal vegetated shallows; or >100 SF in tidal vegetated shallows; (b) Temporary impacts in tidal waters that are >1 acre; >5000 SF in saltmarsh, mud flats, or riffle and pool complexes; or >1000 SF in vegetated shallows¹; or (c) dredging in navigable waters of the U.S. (see GP 7).

Self-Verification Eligible

1. In non-tidal waters, the combined permanent and temporary impacts are (a) ≤5,000 SF, and (b) not located in riffle and pool complexes and non-tidal vegetated shallows.

2. In tidal waters, the combined permanent and temporary impacts are (a) ≤5,000 SF, (b) ≤1,000 SF in mudflats and/or natural rocky habitat, and (c), not located in saltmarsh and tidal vegetated shallows.

Pre-Construction Notification Required

1. Boat ramps are located within 25 feet of property line extensions unless the properties are owned by the same owner. The USACE may require a letter of no objection from the abutter(s).

2. Activities that are not eligible for SV and do not require an IP.

GP 6. UTILITY LINES, OIL OR NATURAL GAS PIPELINES, OUTFALL OR INTAKE STRUCTURES, AND APPURTENANT FEATURES (Authorities: §10 & §404)

Activities required for: (a) The construction, maintenance, repair or removal of utility lines, oil or natural gas pipelines¹, outfall or intake structures², and appurtenant features including the associated excavation, backfill, or bedding for these structures. (b) The construction, maintenance, or expansion of substations and other appurtenant facilities associated with a utility line, oil or natural gas pipeline, and outfall or intake structure in non-tidal waters of the U.S.; and (c) The construction and maintenance of foundations for overhead utility line towers, poles, and anchors in tidal and non-tidal waters of the U.S., provided the foundations are the minimum size necessary and separate footings for each tower leg (rather than a larger single pad) are used where feasible. This GP authorizes the construction of access roads to facilitate construction of the above activities provided the activity, in combination with all other activities included in one single and complete project, does not exceed the thresholds identified below (IP required). Access roads used solely for construction of the utility line must be removed upon completion of the work. This GP also authorizes temporary structures, fills, and work, including the use of temporary mats, necessary to conduct the activities above.³

Not authorized under GP 6 (IP required): (a) Permanent impacts for any single and complete project that are >1 acre in non-tidal waters of the U.S.; >½ acre in tidal waters; >1000 SF in saltmarsh, mud flats, riffle and pool complexes, or non-tidal vegetated shallows; or >100 SF in tidal vegetated shallows; (b) Temporary impacts in tidal waters that are >1 acre; >5000 SF in saltmarsh, mud flats, or riffle and pool complexes; or >1000 SF in vegetated shallows; (c) Stormwater treatment or detention systems, or subsurface sewage disposal systems in waters of the U.S.; or (d) New tide gates that do not meet SV criteria below.

Self-Verification Eligible

1. In non-tidal waters, the combined permanent and temporary impacts are (a) ≤5,000 SF, and (b) not located in riffle and pool complexes and non-tidal vegetated shallows.
2. In tidal waters, the combined permanent and temporary impacts are (a) ≤5,000 SF, (b) ≤1,000 SF in mudflats and/or natural rocky habitat, and (c), not located in saltmarsh and tidal vegetated shallows.
3. Intake structures that are dry hydrants used exclusively for firefighting activities with no stream impoundments.
4. New tide gates on outfall structures for pipes conveying stormwater and/or industrial NPDES-permitted discharges from waters that are not waters of the U.S.

Pre-Construction Notification Required

1. New outfall and/or intake structures.
2. Unconfined work or silt producing activities in streams with diadromous fish.
3. Submarine cables, conduits, or pipelines that occur in, over or under navigable waters of the U.S.
4. Stream channelization, relocation, impoundment, or loss of streambed occurs.
5. The activity is placed within and runs parallel to or along a streambed within waters of the U.S.
6. There is a permanent change in preconstruction contours in waters of the U.S.
7. Installation of utility lines or gas/oil pipelines using trench excavation where material is temporarily sidecast into waters of the U.S. for >3 months. Applicants must demonstrate how the material would not be dispersed by currents or other forces.
8. Activities that are not SV eligible and do not require an IP.

¹ See the definitions of a “utility line” and “oil or natural gas pipeline” in Section VII.

² Outfall structures must be in compliance with regulations issued under the National Pollutant Discharge Elimination System Program (Section 402 of the Clean Water Act).

³ Temporary impacts shall comply with all GCs, including GC 32 Utility Line Installation and Removal.

GP 7. DREDGING (Authority: §10), DISPOSAL OF DREDGED MATERIAL (Authorities: §10, §404), BEACH NOURISHMENT (Authorities: §10 & §404), ROCK REMOVAL (Authority: §10) AND ROCK RELOCATION (Authorities: §10 & §404)

New, improvement and maintenance dredging (see notes below) including: (a) Disposal of dredged material at a confined aquatic disposal cell, beach nourishment location, near shore site, or ocean disposal site selected under Section 404 of the Clean Water Act pursuant to the 404(b)(1) Guidelines, provided the dredged material meets the requirements for such disposal; (b) Beach nourishment not associated with dredging; and (c) Rock removal and relocation for navigation.

Not authorized under GP 7 (IP required): (a) Dredging where ocean disposal is required for the disposal of dredged material (Section 103); New dredging >½ acre; ≥10,000 CY; >1000 SF permanent impacts to intertidal areas, saltmarsh, mud flats, riffle and pool complexes, or non-tidal vegetated shallows; or >100 SF permanent impacts to tidal vegetated shallows; (b) Maintenance or improvement dredging and/or disposal with >1 acre of impacts to intertidal areas, saltmarsh, mudflats, riffle and pool complexes, or non-tidal vegetated shallows; (c) New dredging where the primary purpose is sand mining for beach nourishment; (d) Beach scraping; (e) Boulder removal and relocation for navigation >½ acre; or (f) Blasting.

Self-Verification Eligible

1. Maintenance dredging of previously dredged areas, with upland disposal, that meet all of the following terms:
 - a. Dredged area ≤1/2 acre; and
 - b. Activities comply with GC 20, TOY Restrictions. The time-of-year restriction(s) stated in Appendix B of the MA Division of Marine Fisheries (DMF) Technical Report TR-47¹ can apply instead if the general TOY restriction if a TOY is provided for a specific waterbody and is less restrictive. This is to protect endangered species, EFH, and other species; and
 - c. The dredge footprint is located >25' from salt marsh or >100' from vegetated shallows; and
 - d. Combined permanent and temporary impacts that are (i) ≤1,000 SF in mudflats or natural rocky habitat, or (ii) ≤5,000 SF within intertidal habitat and areas containing shellfish (an area contains shellfish unless: it is verified that minimal shellfish are present per the local shellfish constable or a shellfish survey; or it is not mapped as a MassGIS shellfish suitability area).
 - e. No return water from upland disposal areas.
2. Boulder relocation with ≤1,000 SF of impacts, relocated to a similar depth and substrate.

Pre-Construction Notification Required

1. Maintenance dredging where the primary purpose is sand mining for beach nourishment.
2. New dredging and associated disposal ≤1/2 acre or <10,000 cubic yards.
3. Improvement dredging.
4. Beach nourishment in waters of the U.S. not associated with dredging.
5. Activities that are located in saltmarsh and tidal vegetated shallows.
6. Dredging in a Federal Navigation Project or within the buffer zone (see GC 15).
7. Activities that are not eligible for SV and do not require an IP.

Notes:

1. See Section VII for definitions of improvement and maintenance dredging.
2. For PCN activities, the USACE may waive or adjust the time of year requirement on a case-by-case basis after consultation with resource agencies.
3. Disposal site of any dredged material must be identified prior to obtaining USACE authorization.
4. Contact the USACE if a ten-year authorization to maintain an area is desired.

¹ The MA DMF Technical Report TR-47: <https://www.nae.usace.army.mil/Missions/Regulatory/State-General-Permits/Massachusetts-General-Permit/>

GP 8. U.S. COAST GUARD APPROVED BRIDGES (Authorities: §404)

Discharges of dredged or fill material incidental to the construction and modification of bridges across navigable waters of the U.S., including cofferdams, abutments, foundation seals, piers, and temporary construction and access fills provided that the USCG authorizes the construction of the bridge structure under Section 9 of the Rivers and Harbors Act of 1899 or other applicable laws. A USCG Authorization Act Exemption or a Surface Transportation and Uniform Relocation Assistance Act (STURRA) (144h) exemption do not constitute USCG authorization.

Not authorized under GP 8 (IP Required): Causeways and approach fills (see GP 23).

Self-Verification Eligible

1. Discharges of dredged or fill material that are incidental to the construction of bridges across navigable waters and meet all of the following:
 - a. Combined permanent and temporary impacts that are $\leq 5,000$ SF.
 - b. Combined permanent and temporary impacts that are $\leq 1,000$ SF in mudflats and natural rocky habitat.
 - c. Not located in saltmarsh and tidal vegetated shallows.

Pre-Construction Notification Required

1. Activities on USACE properties & USACE controlled easements.
2. Installation of steel piles, including steel sheet piles, that cannot be done in the dry and where NOAA-ESA listed species are mapped as present.
3. Activities that are not eligible for SV and do not require an IP.

Notes:

1. GP 8 is not applicable to bridges over inland waters or wetlands that are not tidally influenced or regulated as navigable under Section 10.
2. See eligibility criteria for GPs 2 & 23 for projects that are not subject to USCG regulations.

GP 9. BANK AND SHORELINE STABILIZATION (Authorities: §10 & §404)

Bank stabilization activities necessary for erosion protection along the banks of lakes, ponds, streams, estuarine and ocean waters, and any other open waters. Includes bulkheads, seawalls, riprap, revetments, living seawalls, or slope protection & similar structures, specifically for the purpose of shoreline protection. This GP also authorizes temporary structures, fills, and work, including the use of temporary mats, necessary to conduct the activities above.

Activities must meet the following criteria: (a) No material is placed in excess of the minimum needed for erosion protection; (b) No material is of a type, or is placed in any location, or in any manner, that will impair surface water flow into or out of any waters of the U.S.; (c) No material is placed in a manner that will be eroded by normal or expected high flows (properly anchored native trees and treetops may be used in low energy areas); (d) Native plants appropriate for current site conditions, including salinity, must be used for bioengineering or vegetative bank stabilization; (e) The activity is not a stream channelization activity; and (f) The activity must be properly maintained, which may require repairing it after severe storms or erosion events. This GP authorizes those maintenance and repair activities if they require authorization. This GP also authorizes temporary structures, fills, and work, including the use of temporary mats, necessary to construct the bank stabilization activity. See GP 20 for living shoreline stabilization structures or fills.

Not authorized under GP 9 (IP required): (a) New bank stabilization >500 feet in total length (>1,000 linear feet in total length when necessary to protect transportation infrastructure) or permanent loss of saltmarsh >1,000 SF, unless the District Engineer waives this criterion by making a written determination concluding that the discharge of dredged or fill material will result in no more than minimal adverse environmental effects (an exception is for bulkheads – the district engineer cannot issue a waiver for a new bulkhead that is >1,000 feet in length along the bank); (b) Stream channelization or relocation activities; or (c) Breakwaters, groins or jetties.

Self-Verification Eligible

1. Activities in tidal and non-tidal waters that are:
 - a. <200 feet in length.
 - b. <400 feet in length when necessary to protect transportation infrastructure.
 - c. ≤1 cubic yard of fill per linear foot average along the bank waterward of the plane of OHW or HTL.
 - d. Not located in non-tidal wetlands, saltmarsh, vegetated shallows.

Pre-Construction Notification Required

1. Activities in tidal and non-tidal waters that are:
 - a. ≥200 feet to ≤500 feet in total length. Activities >500 feet in total length must have a written waiver from USACE.
 - b. ≥400 feet to ≤1,000 feet in total length when necessary to protect transportation infrastructure. Activities >1,000 feet in total length must have a written waiver from USACE.
 - c. >1 cubic yard of fill per linear foot average along the bank waterward of the plane of OHW or HTL.
 - d. Located in non-tidal wetlands, saltmarsh, vegetated shallows.
2. Activities with permanent loss of tidal or non-tidal waters that is (a) ≥5,000 SF or (b) ≥1,000 SF in mudflats and natural rocky habitat.
3. Activities that are (a) located in the Connecticut River or Merrimack River and/or (b) require installation of steel piles/steel sheet piles that cannot be done in the dry where NOAA ESA-listed species are mapped as present.
4. Activities on USACE properties & USACE-controlled easements.
5. Activities that require grouted riprap and/or poured/unformed concrete.
6. Activities that are not eligible for SV and do not require an IP.

Note: The applicant shall comply with GC 24. This includes utilization of bioengineering techniques in lieu of hard armoring to the maximum extent practicable as site conditions allow.

GP 10. AQUATIC HABITAT RESTORATION, ENHANCEMENT, AND ESTABLISHMENT ACTIVITIES
(Authorities: §10 and §404)

Activities for the restoration, enhancement and establishment of non-tidal and tidal wetlands and riparian areas, including invasive, non-native or nuisance species control; the restoration and enhancement of non-tidal streams and other non-tidal open waters; the relocation of non-tidal waters, including non-tidal streams & associated wetlands for reestablishment of a natural stream morphology and reconnection of the floodplain; the restoration and enhancement of shellfish, finfish and wildlife; and the rehabilitation or enhancement of tidal streams, tidal wetlands and tidal open waters; provided those activities result in net increases in aquatic resource functions and services. See GP 9 for bank and shoreline stabilization. See GP 20 for living shorelines.

Not authorized under GP 10 (IP required): Stream channelization activities and artificial reefs.

Self-Verification Eligible

1. In tidal and non-tidal waters excluding tidal vegetated shallows, the combined permanent and temporary impacts are ≤5,000 SF.
2. Eelgrass (vegetated shallows) planting and transplanting ≤100 SF in tidal waters.

Pre-Construction Notification Required

1. In tidal and non-tidal waters excluding tidal vegetated shallows, the combined permanent and temporary impacts are >5,000 SF.
2. Eelgrass (vegetated shallows) planting and transplanting >100 SF in tidal waters.
3. Permanent water impoundments, dam removal, fish ladders, or tide gates.
4. Stream relocation, impoundment, or loss of streambed occurs.
5. Runneling projects with the purpose of restoring saltmarsh by removing excess water that ponds on the saltmarsh surface.
6. The conversion of: (a) a stream or natural wetlands to another aquatic habitat type (e.g., stream to wetland or vice versa, wetland to pond, etc.) or uplands, (b) one wetland type to another (e.g., forested wetland to an emergent wetland).
7. Activities in the Connecticut River from the Turners Falls Dam to the MA/CT border, or Merrimack River from the Essex Dam to the mouth, involving permanent or temporary impacts unless they are performed <5 feet waterward from OHW or HTL and in the dry. This is to protect endangered species.
8. Activities on USACE properties & USACE-controlled easements.
9. Activities that are not eligible for SV and do not require an IP.

Notes:

1. Changes in wetland plant communities that occur when wetland hydrology is more fully restored during wetland rehabilitation activities are not considered a conversion to another aquatic habitat type.
2. See RGL 18-01 for guidance on removal of obsolete dams and other structures from rivers and streams. <https://www.usace.army.mil/missions/civil-works/regulatory-program-and-permits/guidance-letters/>
3. An ecological reference site may be used for a design basis of the restoration activity. The reference site should possess characteristics of an intact aquatic habitat or riparian area that exists in the region. The reference site shall represent the target habitat type of the proposed activity. A reference site may be required at the discretion of USACE.

GP 11. FISH AND WILDLIFE HARVESTING AND ATTRACTION DEVICES AND ACTIVITIES

(Authorities: §10 and §404)

Fish and wildlife harvesting and attraction devices and activities in waters of the U.S. such as pound nets, crab traps, crab and shellfish dredging, eel pots, lobster traps, duck blinds, clam and oyster digging, fish aggregating devices, and small fish attraction devices such as open-water fish concentrators (sea kites, etc.).

Not authorized under GP 11 (IP required): Artificial reefs; or new, or expansions of, impoundments and semi-impoundments of waters of the U.S. for the culture or holding of motile species such as lobster with an impounded area $> \frac{1}{2}$ acre.

Self-Verification Eligible

1. In non-tidal waters, the combined permanent and temporary impacts are (a) $\leq \frac{1}{2}$ acre, and (b) not located in riffle and pool complexes and non-tidal vegetated shallows.
2. Fish and wildlife harvesting and attraction devices and activities that do not require a PCN or IP.

Pre-Construction Notification Required

1. Pound nets, impoundments or semi-impoundments of waters of the U.S. for the culture or holding of motile species such as lobster with an impounded area $\leq \frac{1}{2}$ acre, fish aggregating devices, or small fish attraction devices.
2. Devices and activities that are located in tidal vegetated shallows, mud flats, or saltmarsh.
3. Devices and activities that do not require an IP.

Note: An SVN submittal to USACE is not required for work authorized under GP 11.

GP 12. RESPONSE OPERATIONS, OIL AND HAZARDOUS SUBSTANCES (Authorities: §10 & §404)

(a) Activities conducted in response to a discharge or release of oil and hazardous substances that are subject to the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR 300) including containment, cleanup, and mitigation efforts, provided that the activities are done under either: (i) The Spill Prevention, Control and Countermeasure Plan required by 40 CFR 112.3; (ii) The direction or oversight of the Federal on-scene coordinator designated by 40 CFR 300; or (iii) Any approved existing State, regional or local contingency plan provided that the Regional Response Team concurs with the proposed response efforts or does not object to the response effort; (b) Activities required for the cleanup of oil releases in waters of the U.S. from electrical equipment that are governed by EPA's polychlorinated biphenyl (PCB) spill response regulations at 40 CFR 761; (c) Booms placed in navigable waters of the U.S. for oil and hazardous substance containment, absorption and prevention; and (d) The use of structures and fills for spill response training exercises. Wetlands, vegetated shallows, mudflats, and riffle and pool complexes should be restored in place at the same elevation.

Self-Verification Eligible

1. Activities are conducted in accordance with (a) or (b) above that are not planned or scheduled, but an emergency response (see Note 1).
2. Booms placed in navigable waters of the U.S. for oil and hazardous substance containment, absorption and prevention.
3. Temporary impacts for spill response training exercises ≤5000 SF in non-tidal waters and ≤1000 SF in tidal waters with no impacts to wetlands, saltmarsh, mudflats, or vegetated shallows.
4. Temporary structures in tidal waters with no impacts to wetlands, saltmarsh, mudflats, vegetated shallows, or riffle and pool complexes and in place ≤30 days.

Pre-Construction Notification Required

1. Activities (a) or (b) above are planned or scheduled, not an emergency response; or
2. Activities that are not eligible for SV and do not require an IP.

Notes:

1. For emergency response activities in the Connecticut River from the Turners Falls Dam to the MA/CT border, Merrimack River from the Essex Dam to the mouth, and remaining tidal waters that are not rivers, the permittee must contact the USACE at (978) 318-8338 before or as soon as possible after the work authorized under GP 12(a) - (c) commences for the USACE to address effects under the Endangered Species Act.
2. An SVN submittal to USACE is not required for booms used for spill prevention, or properly contained and cleaned de minimus oil or hazardous substance discharges into navigable waters of the U.S.

GP 13. CLEANUP OF HAZARDOUS AND TOXIC WASTE (Authorities: §10 and §404)

Specific activities required to affect the containment, stabilization, or removal of hazardous or toxic waste materials, including court ordered remedial action plans or related settlements, which are performed, ordered or sponsored by a government agency with established legal or regulatory authority.

Not authorized under GP 13: (a) Establishment of new disposal sites; or (b) Expansion of existing sites used for the disposal of hazardous or toxic waste.

Self-Verification Eligible

1. In non-tidal waters, the combined permanent and temporary impacts are (a) $\leq 5,000$ SF, and (b) not located in vegetated shallows and riffle and pool complexes.

Pre-Construction Notification Required

1. In non-tidal waters, the combined permanent and temporary impacts are (a) $> 5,000$ SF, and (b) located in vegetated shallows and riffle and pool complexes.
 2. Permanent and temporary impacts in tidal waters or navigable waters of the U.S.
 3. Stream channelization, relocation, impoundment, or loss of streambed occurs.
 4. Activities that are not eligible for SV and do not require an IP.

Notes:

1. Wetlands, vegetated shallows, mudflats, and riffle and pool complexes should be restored in place at the same elevation to the maximum extent practicable.
 2. Activities undertaken entirely on a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) site by authority of CERCLA, are not required to obtain permits under Section 404 of the CWA or Section 10 of the Rivers and Harbors Act.

GP 14. SCIENTIFIC MEASUREMENT DEVICES (Authorities: §10 and §404)

Scientific measurement devices for measuring and recording scientific data, such as staff gauges, tide and current gauges, meteorological stations, water recording and biological observation devices, water quality testing and improvement devices, and similar structures. Also eligible are small weirs and flumes constructed primarily to record water elevation, flow and/or velocity. Upon completion of the use of the device to measure and record scientific data, the measuring device and any other structures or fills associated with that device (e.g., foundations, anchors, buoys, lines, etc.) must be removed to the maximum extent practicable and the site restored to preconstruction elevations.

Not authorized under GP 14 (IP required): (a) Permanent impacts that are >5,000 SF in tidal and non-tidal waters of the U.S.; >1000 SF in tidal saltmarsh, mud flats, riffle and pool complexes; or >100 SF in tidal vegetated shallows; or (b) Temporary impacts in tidal waters that are >1 acre, unless the District Engineer waives this criterion by making a written determination concluding that the discharge of dredged or fill material will result in no more than minimal adverse environmental effects; >5000 SF in saltmarsh, mud flats, or riffle and pool complexes; or >1000 SF in vegetated shallows.

Self-Verification Eligible

1. In non-tidal waters, the combined permanent and temporary impacts are (a) ≤5,000 SF, (b) not located in riffle and pool complexes and non-tidal vegetated shallows.
2. In tidal waters, the combined permanent and temporary impacts are (a) ≤5,000 SF, (b) ≤1,000 SF in mudflats and/or natural rocky habitat, (c) not located in saltmarsh and tidal vegetated shallows.
3. Temporary, non-biological sampling devices in waters that do not restrict or concentrate movement of aquatic organisms and will not adversely affect the course, condition, or capacity of a waterway for navigation.
4. Scientific measurement devices, and small weirs and flumes constructed primarily to record water quantity and velocity provided the discharge of fill is limited to 25 cubic yards. These cannot obstruct or restrict the waterway course, condition, capacity, and location.
5. Temporary measuring devices and associated structures (e.g., anchors, buoys, etc.) in tidal and non-tidal waters that do not require a PCN or IP.

Pre-Construction Notification Required

1. Biological sampling devices, weirs or flumes, or the activity restricts or concentrates movement of aquatic organisms.
2. Permanent towers located in navigable waters that record and measure scientific data.
3. Devices that are not eligible for SV and do not require an IP.

Note: An SVN submittal to USACE is not required for temporary measuring devices with a footprint of <10 SF, with a profile of <3 feet high measured from the substrate and located in water deeper than -10 feet MLW.

GP 15. SURVEY ACTIVITIES (Authorities: §10 and §404)

Survey activities such as soil borings, core sampling, seismic exploratory operations, plugging of seismic shot holes and other exploratory-type bore holes, exploratory trenching, soil surveys, sampling, sample plots or transects for wetland delineations, and historic resources surveys.

Not authorized under GP 15 (IP required): (a) Permanent impacts that are >1 acre in tidal and non-tidal waters; >1000 SF in tidal saltmarsh, mud flats, or riffle and pool complexes; or >100 SF in tidal vegetated shallows; or (b) Temporary impacts in tidal waters that are >1 acre, unless the District Engineer waives this criterion by making a written determination concluding that the discharge of dredged or fill material will result in no more than minimal adverse environmental effects; >5000 SF in saltmarsh, mud flats, or riffle and pool complexes; or >1000 SF in vegetated shallows.

Self-Verification Eligible

1. In non-tidal waters, the combined permanent and temporary impacts are (a) ≤5,000 SF, (b) not located in riffle and pool complexes and non-tidal vegetated shallows.
2. In tidal waters, the combined permanent and temporary impacts are (a) ≤5,000 SF, (b) ≤1,000 SF in mudflats and/or natural rocky habitat, (c) not located in saltmarsh and tidal vegetated shallows.

Pre-Construction Notification Required

1. Exploratory trenching (see Note 2) occurs in waterways (e.g., streams, tidal waters).
2. Activities associated with the recovery of historic resources, and the drilling and discharge of excavated material from test wells for oil and gas exploration.
3. Seismic exploratory operations occur in tidal waters, the Connecticut River from the Turners Falls Dam to the MA/CT border, or the Merrimack River from the Essex Dam to the mouth. This is to protect endangered species.
4. Activities that are not eligible for SV and do not require an IP.

Notes:

1. An SVN submittal is not required for wetland delineations, and core sampling conducted for preliminary evaluation of dredge project analysis.
2. For the purposes of GP 15, the term “exploratory trenching” means mechanical land or underwater clearing of the upper soil profile to expose bedrock or substrate for the purpose of mapping or sampling the exposed material.
3. The discharge of drilling mud and cuttings may require a permit under §402 of the CWA.

GP 16. LAND AND WATER-BASED RENEWABLE ENERGY GENERATION FACILITIES (Authorities: §10 and §404), AND HYDROPOWER PROJECTS (Authority: §10 and §404)

Structures and work in tidal waters and discharges of dredged or fill material into tidal and non-tidal waters for the construction, expansion, modification or removal of: (a) Land-based renewable energy production facilities (e.g., solar, wind, biomass, geothermal) and their attendant features; (b) Water-based wind or hydrokinetic renewable energy generation projects and their attendant features; and (c) Discharges of dredged or fill material associated with hydropower projects. Attendant features may include, but are not limited to, land-based collection and distribution facilities, control facilities, and parking lots. For each single and complete project in (b) above, no more than 10 generation units (e.g., wind turbines or hydrokinetic devices) are authorized in navigable waters of the U.S. Upon completion of the pilot project (see note 2), the generation units, transmission lines, and other structures or fills associated with the pilot project must be removed to the maximum extent practicable.

Not authorized under GP 16 (IP required): (a) Permanent impacts that are >1 acre in non-tidal waters, >½ acre in tidal waters; >1000 SF in saltmarsh, mud flats, riffle and pool complexes, or non-tidal vegetated shallows; or >100 SF in vegetated shallows; or (b) Temporary impacts in tidal waters that are >1 acre; >5000 SF in saltmarsh, mud flats, or riffle and pool complexes; or >1000 SF in vegetated shallows.

Self-Verification Eligible

In non-tidal waters, the combined permanent and temporary impacts for land-based activities are (a) ≤5,000 SF, (b) not located in riffle and pool complexes and non-tidal vegetated shallows.

Pre-Construction Notification Required

1. In non-tidal waters, the combined permanent and temporary impacts for land-based activities are (a) >5000 SF, or (b) located in vegetated shallows or riffle and pool complexes.
2. Permanent and temporary impacts in tidal waters.
3. Water-based wind or hydrokinetic renewable energy generation projects, and hydropower projects.
4. For all activities eligible for authorization under GP 16:
 - a. The activity occurs in tidal waters or in, over or under navigable waters.
 - b. Stream channelization, relocation, impoundment, or loss of streambed occurs.
5. Activities that are not eligible for SV and do not require an IP.

Notes:

1. Utility lines constructed to transfer the energy from the land-based renewable generation or collection facility to a distribution system, regional grid, or other facility may be authorized by GP 6.
2. For the purposes of this GP, the term “pilot project” means an experimental project where the renewable energy generation units will be monitored to collect information on their performance and environmental effects at the project site.

GP 17. RESIDENTIAL, COMMERCIAL AND INSTITUTIONAL DEVELOPMENTS AND RECREATIONAL FACILITIES (AUTHORITIES: §404)

Discharges of dredged or fill material into non-tidal waters for the construction or expansion of: (a) Residences and residential subdivisions; (b) Residential, commercial and institutional building foundations and building pads; and (c) Recreational facilities such as playgrounds, playing fields, bikeways, trails, etc. This GP also authorizes attendant features that include, but are not limited to, roads, parking lots, garages, yards, and utility lines, and stormwater management facilities. This GP authorizes attendant features if they are necessary for the use of the project purpose.

Not authorized under GP 17 (IP required): (a) Permanent impacts that result in loss of non-tidal waters >1/2 acre; >1000 SF in riffle and pool complexes or vegetated shallows; or (b) Subsurface sewerage disposal systems in non-tidal waters.

Self-Verification Eligible

1. In non-tidal waters, the combined permanent and temporary impacts are (a) <5,000 SF, and (b) not located in riffle and pool complexes and non-tidal vegetated shallows.

2. Stream channelization or relocation resulting in loss of streambed that is <200 LF.

Pre-Construction Notification Required

1. In non-tidal waters, the combined permanent and temporary impacts are (a) ≥5,000 SF, or (b) located in riffle and pool complexes or non-tidal vegetated shallows.

2. Stream and wetland crossings that require a PCN per GCs 20 TOY Restrictions and GC 31 Stream Work and Crossings & Wetland Crossings.

3. Stream channelization or relocation resulting in loss of streambed that is ≥200 LF. Stream impoundment activities of any kind.

4. Activities on USACE properties & USACE-controlled easements.

5. Activities that are not SV eligible and do not require an IP.

Notes:

1. Stream and wetland crossings (permanent and temporary), including those built with construction mats; and modifications (including sliplining), replacements or extensions to existing crossings.
2. See GC 22 for information on temporary construction mats.
3. Subdivisions: For residential subdivisions, the aggregate total loss of waters of United States authorized by this GP cannot exceed 1/2-acre. This includes any loss of waters of the United States associated with development of individual subdivision lots.

GP 18. AQUACULTURE (Authorities: §10 and §404)

(a) The installation of buoys, floats, racks, trays, nets, lines, tubes, containers, and other structures into navigable waters of the U.S.; (b) Discharges of dredged or fill material into tidal and non-tidal waters necessary for shellfish seeding, rearing, cultivating, transplanting, and harvesting activities; and (c) Shellfish seeding or brushing the flats projects. Any fill material imported to the project from offsite (this is limited to mineral growth medium used in culture trays) shall be clean and of comparable grain size to the native substrate. Activities authorized under this GP must have (a) their MA DMF Aquaculture Certificate letter for licensed shellfish aquaculture sites, (b) documentation that the applicant has coordinated with the U.S. Coast Guard regarding USCG Private Aids to Navigation standards, (c) their MEPA Certificate (if required), and (d) documentation that the applicant has contacted their local authorities (ex. harbormaster, select board, shellfish constable) for authorization of their facility.

Not authorized under GP 18 (IP required): (a) New, or expansions of, impoundments and semi-impoundments of tidal and non-tidal waters for the culture or holding of motile species such as lobster with an impounded area $> \frac{1}{2}$ acre; (b) Cultivation of a nonindigenous species (see Note 1) unless that species has been previously cultivated in the waterbody; (c) Cultivation of an aquatic nuisance species (see Note 1); (d) Attendant features such as docks, piers, boat ramps (see GP 4); (e) stockpiles, staging areas, or the deposition of shell material back into tidal and non-tidal waters as waste.

Self-Verification Eligible

1. In tidal waters, a new lease site area is (a) ≤ 2 -acre, (b) not located in salt marsh, natural rocky habitat, or tidal vegetated shallows.
2. In tidal waters, expansions of existing lease sites not to exceed 2 acres for the entire site (e.g. 1 acre lease site increasing to a 2 acre lease site may qualify as SV). A PCN is required for expansions in salt marsh, natural rocky habitat, and tidal vegetated shallows.
3. Cages, racks that are elevated ≥ 2 feet above the ocean floor with legs within a lease site with ≤ 4 buoys marking the corners.
4. Floating cage strings with a single connecting line, ≤ 2 anchors and ≤ 2 end marker buoys per string within a lease site with ≤ 4 buoys marking the corners.
5. No activities located within 25 feet of tidal vegetated shallows.
6. Culture only indigenous species.
7. Not located in FNP or within a distance of three times the authorized depth of an FNP (see GC 15).
8. Not located in or impinge upon the value of any National Lands or Federal Properties.
9. Floating upweller docks that total ≤ 600 SF in area.

Pre-Construction Notification Required

1. Discharges of fill material associated with aquaculture $> 5,000$ SF.
2. Research, educational, commercial-viability or experimental aquaculture gear activities $> 1,000$ SF.
3. Kelp or finfish aquaculture.
4. Land-based hatchery intakes > 3 inches in diameter.
5. Activities in water depths > 10 feet mean low lower water (MLLW).
6. Activities with in-water lines, ropes or chains that are not SV eligible (see #3-4).
7. Activities occur in the Connecticut River from the Turners Falls Dam to the MA/CT border or the Merrimack River from the Essex Dam to the mouth. This is to protect endangered species.
8. New, or expansions of, impoundments and semi-impoundments for the culture or holding of motile species such as lobster with an impounded area $\leq \frac{1}{2}$ acre.
9. Activities that do not require an IP. Activities that do not require a PCN or an IP may be SV eligible.

Note: The Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 defines: (a) nonindigenous species as “any species or other viable biological material that enters an ecosystem beyond its historic range, including any such organism transferred from one country into another”; and (b) aquatic nuisance species as “a nonindigenous species that threatens the diversity or abundance of native species or the ecological stability of infested waters, or commercial, agricultural, aquacultural, or recreational activities dependent on such waters.”

GP 19. MINING ACTIVITIES (Authorities: §10 and §404)

Discharges of dredged or fill material into non-tidal waters for mining activities, except for coal mining and metallic mineral mining activities.

Not authorized under GP 19 (IP required): (a) Permanent impacts >1 acre in non-tidal waters; or (b) Activities in tidal waters.

Self-Verification Eligible

In non-tidal waters, the combined permanent and temporary impacts are (a) ≤5,000 SF, and (b) not located in riffle and pool complexes, non-tidal vegetated shallows, and streams.

Pre-Construction Notification Required

1. In non-tidal waters, the combined permanent and temporary impacts are (a) >5,000 SF, or (b) located in riffle and pool complexes, non-tidal vegetated shallows, and streams.
2. The activity occurs in non-tidal navigable waters of the U.S.
3. Stream channelization, relocation, impoundment, loss of streambed, or discharge of tailings into streams occurs.
4. Work on USACE properties & USACE-controlled easements.
5. Activities that are not eligible for SV and do not require an IP.

GP 20. LIVING SHORELINES¹ (Authorities: §10 and §404)

Construction and maintenance of living shorelines to stabilize banks and shores in tidal waters. In non-tidal waters that are not subject to the ebb and flow of the tide, nature-based bank stabilization techniques such as bioengineering and vegetative stabilization may be authorized by GP 9. This GP authorizes those maintenance and repair activities in-kind that are necessary to address changing environmental conditions.

The following terms must be met for both SVs and PCNs as applicable: (a) Coir logs, coir mats, stone, native oyster shell, native wood debris, and other structural materials must be adequately anchored, of sufficient weight, or installed in a manner that prevents relocation in most wave action or water flow conditions, except for extremely severe storms; (b) For living shorelines consisting of tidal fringe wetlands, native plants appropriate for current site conditions, including salinity and elevation, must be used if the site is planted by the permittee; (c) Discharges of dredged or fill material into waters of the U.S., and oyster or mussel reef structures in navigable waters, must be the minimum necessary for the establishment and maintenance of the living shoreline; (d) If sills or other structural materials per PCN #4 must be constructed to protect fringe wetlands for the living shoreline, those structures must be the minimum size necessary to protect those fringe wetlands; (e) The activity must be designed, constructed, and maintained so that it has no more than minimal adverse effects on water and sediment movement between the waterbody and the shore and the movement of aquatic organisms between the waterbody and the shore; and (f) The living shoreline must be properly maintained and monitored, which may require periodic repair of sills, bioengineered components, or replacing sand fills after severe storms or erosion events. Vegetation may be replanted to maintain the living shoreline.

Not authorized under GP 20 (IP required): (a) The activity is ≥1000 feet in length along the bank (≥2000 LF both banks) unless waived by the District Engineer; or (b) The activity is >30 feet channel ward of mean low water in tidal waters; or (c) Upland reclamation activities; or (d) Stream channelization or relocation activities; or (e) Breakwaters, groins, jetties, or artificial reefs; or (f) Permanent impacts >1,000 SF in existing saltmarsh; >100 SF in existing tidal vegetated shallows.

Self-Verification Eligible

1. Tidal and non-tidal living shorelines ≤100 LF for each bank (≤200 LF for both banks).
2. Combined permanent and temporary impacts ≤5,000 SF in tidal waters, excluding existing salt marsh, tidal vegetated shallows, natural rocky habitat, and mudflats.

Pre-Construction Notification Required

1. Tidal and non-tidal living shorelines >100 LF to <1000 LF (>200 LF to <2000 LF for both banks).
2. Permanent and temporary impacts in existing salt marsh, tidal vegetated shallows, or mudflats.
3. Work on USACE properties & USACE-controlled easements.
4. Use of stone sills, native oyster shell, native wood debris, or other structural materials.

Notes:

1. PCNs require monitoring for a minimum of 5 years in accordance with an approved restoration plan, unless otherwise determined by the USACE. The first year of monitoring will be the first year that the site has been through a full growing period after completion of construction and planting.
2. Applicants are encouraged to obtain a MEPA certificate prior to submitting a USACE permit application.

¹ A living shoreline has a footprint that is made up mostly of native material. It incorporates vegetation or other living, natural “soft” elements alone or in combination with some type of harder shoreline structure (e.g., oyster or mussel reefs or rock sills) for added protection and stability. Living shorelines should maintain the natural continuity of the land-water interface and retain or enhance shoreline ecological processes. Living shorelines must have a substantial biological component, either tidal or lacustrine fringe wetlands or oyster or mussel reef structures.

GP 21. AGRICULTURAL ACTIVITIES (Authority: §404)

Discharges of dredged or fill material in non-tidal waters for agricultural activities, including the construction of building pads for farm buildings. Authorized activities include: (a) installation, placement, or construction of drainage tiles, ditches, or levees; mechanized land clearing; land leveling; the relocation of existing serviceable drainage ditches; and similar activities; (b) construction of farm ponds, excluding perennial streams, provided the farm pond is used solely for agricultural purposes; and (c) discharges of dredged or fill material to relocate existing serviceable drainage ditches constructed in non-tidal streams.

Not authorized under GP 21 (IP required): (a) Permanent impacts that are >1 acre in non-tidal waters; or >1000 SF in riffle and pool complexes, or non-tidal vegetated shallows; (b) Work in tidal waters; or (c) Construction of farm ponds in perennial streams.

Self-Verification Eligible

In non-tidal waters, the combined permanent and temporary impacts are (a) ≤5,000 SF, and (b) not located in riffle and pool complexes and non-tidal vegetated shallows.

Pre-Construction Notification Required

1. In non-tidal waters, the combined permanent and temporary impacts are (a) >5,000 SF, or (b) located in riffle and pool complexes and non-tidal vegetated shallows.
2. Activities occur in non-tidal navigable waters of the U.S.
3. Stream channelization, relocation, impoundment, loss of streambed, or farm ponds in non-perennial streams occurs.
4. Activities that are not eligible for SV and do not require an IP.

Note: Some discharges for agricultural activities may qualify for an exemption under Section 404(f) of the CWA (see 33 CFR 323.4). This GP authorizes the construction of farm ponds that do not qualify for the CWA §404(f)(1)(C) exemption because of the recapture provision at §404(f)(2).

GP 22. RESHAPING EXISTING DRAINAGE DITCHES, CONSTRUCTION OF NEW DITCHES, AND MOSQUITO MANAGEMENT (Authorities: §10 and §404)

Discharges to modify the cross-sectional configuration of currently serviceable drainage ditches constructed in tidal and non-tidal waters, for the purpose of improving water quality by regrading the drainage ditch with gentler slopes, which can reduce erosion, increase growth of vegetation, and increase uptake of nutrients and other substances by vegetation. Also authorized are mosquito reduction activities.

Not authorized under GP 22 (IP required): Stream channelization, relocation, impoundments, or loss of streambed.

Self-Verification Eligible

≤500 linear feet of drainage ditch will be reshaped provided excavated material is deposited in an upland area.

Pre-Construction Notification Required

1. >500 linear feet of drainage ditch will be reshaped, excavated material is deposited in a water of the U.S., or the reshaping of the ditch increases the drainage capacity beyond the original as-built capacity or expands the area drained by the ditch as originally constructed (i.e., the capacity of the ditch is not the same as originally constructed or drains additional wetlands or other waters of the U.S.).
2. Permanent and temporary impacts in tidal vegetated shallows.
3. New ditches or relocation of drainage ditches constructed in waters of the U.S. (i.e., the location of the centerline of the reshaped drainage ditch is not approximately the same as the location of the centerline of the original drainage ditch).
4. Activities that are not eligible for SV and do not require an IP.

Note: Some ditch activities are exempt under Section 404(f) of the CWA (see 33 CFR 323.4).

GP 23. LINEAR TRANSPORTATION PROJECTS AND WETLAND/STREAM CROSSINGS (Authorities: §10 & §404)

Activities¹ required for the construction, expansion, modification, or improvement of linear transportation projects (e.g., driveways, roads, highways, railways, trails, airport runways, and taxiways) and attendant features. This GP also authorizes temporary structures, fills, and work, including the use of temporary mats (see Note 1), necessary to construct the linear transportation project.

Not authorized under GP 23 (IP required): (a) Permanent impacts for any single and complete project that are >1 acre in non-tidal waters; >½ acre in tidal waters; >1000 SF in saltmarsh, mud flats, riffle and pool complexes, or non-tidal vegetated shallows; or >100 SF in tidal vegetated shallows; (b) Temporary impacts in tidal waters that are >1 acre; >5000 SF in saltmarsh, mud flats, or riffle and pool complexes; or >1000 SF in vegetated shallows; (c) Non-linear features commonly associated with transportation projects, such as vehicle maintenance or storage buildings, parking lots, train stations, or aircraft hangars (see GP 17); or (d) New tide gates.

Self-Verification Eligible

1. In non-tidal waters, the combined permanent and temporary impacts are a) ≤5,000 SF; b) not located in riffle and pool complexes and non-tidal vegetated shallows; and c) meet the Massachusetts River and Stream Crossing Standards
2. Existing crossings (e.g., culverts, elliptical or arch pipes, etc.) are not modified by (a) decreasing the diameter of the crossing or (b) changing the friction coefficient, such as through slip lining (retrofitting an existing culvert by inserting a smaller diameter pipe), culvert relining or invert lining.
3. Stream channelization or relocation resulting in loss of streambed that is <200 LF.

Pre-Construction Notification Required

1. In non-tidal waters, the combined permanent and temporary impacts are a) >5,000 SF; b) located in vegetated shallows or riffle and pool complexes; or c) do not meet the Massachusetts River and Stream Crossing Standards (see note 4).
2. The activity occurs in tidal waters, salt marsh, or in, over or under navigable waters of the U.S.
3. Stream and wetland crossings that require a PCN per GC 20 TOY Restrictions and GC 31 Stream Work and Crossings & Wetland Crossings.
4. Stream channelization or relocation resulting in loss of streambed that is ≥200 LF. Stream impoundment activities of any kind.
5. Work on USACE properties & USACE-controlled easements.
6. Activities that are not eligible for SV and do not require an IP.

Notes:

1. See GC 22 for information on temporary construction mats.
2. Discharges of dredged or fill material incidental to the construction of bridges across navigable waters of the U.S. may be authorized under GP 8.
3. Loss of streambed does not require a PCN when bridge piers or similar supports are used.
4. In their PCN application submission to the USACE, applicants must explain why they are unable to meet the Massachusetts River and Stream Crossing Standards.
5. For tidal crossings, modeling is encouraged as a method to verify the proposed crossing would not be undersized and resilient to the effects of sea level rise.

¹ Stream crossings must conform with the MA Stream Crossing Guidelines when practicable and comply with all applicable GCs of this document (Section IV).

GP 24. TEMPORARY CONSTRUCTION, ACCESS, AND DEWATERING (Authorities: §10 and §404)

Temporary structures, work, and discharges, including cofferdams, necessary for construction activities or access fills or dewatering of construction sites that are not authorized under another GP activity.

Not authorized under GP 24 (IP required): (a) Permanent structures or impacts; (b) Temporary impacts in tidal waters that are >1 acre; >5000 SF in saltmarsh, mud flats, or riffle and pool complexes; or >1000 SF in vegetated shallows; (c) Use of cofferdams to dewater wetlands or other aquatic areas to change their use; (d) Temporary stream crossings (see GPs 6, 17, 23); (e) Structures or fill left in place after construction is completed.

Self-Verification Eligible

1. In non-tidal waters, temporary impacts are a) ≤5,000 SF; b) not located in riffle and pool complexes and non-tidal vegetated shallows.
2. In tidal waters, temporary impacts are a) ≤5,000 SF, b) ≤1,000 SF in mudflats and/or natural rocky habitat, and c) not located in saltmarsh and tidal vegetated shallows.
3. Structures in navigable waters of the U.S. provided impacts do not require a PCN and they are left in place ≤30 days.

Pre-Construction Notification Required

1. In non-tidal waters, temporary impacts are a) >5,000 SF; b) located in riffle and pool complexes or non-tidal vegetated shallows.
2. In tidal waters, temporary impacts are a) >5,000 SF; b) >1,000 SF in mudflats and/or natural rocky habitat, or (c) located in saltmarsh and tidal vegetated shallows.
3. Activities in the Connecticut River from the Turners Falls Dam to the MA/CT border, or Merrimack River from the Essex Dam to the mouth, involving temporary impacts unless they are performed <5 feet waterward from OHW or HTL and in the dry. This is to protect endangered species; or
4. Activities not eligible for SV and do not require an IP.

Notes:

1. Turbidity or sediment resuspension is generally not considered to occur when properly using management techniques to work in dry conditions. See GC 25.
2. Total impact areas under SV Eligible 1-2 exclude use of temporary construction mats. See GC 22 for information on temporary construction mats.
3. An SVN submittal to USACE is not required for SV #3 above.

GP 25. EMERGENCY SITUATIONS (Authorities: §10 and §404)

Structures or work in or affecting navigable waters of the U.S. and the discharge of dredged or fill material into waters of the U.S., including wetlands, necessary for repair or protection measures associated with an emergency situation¹, MassDEP Emergency Declaration/Certification, or FEMA Declared Disaster. The activity shall be the minimum necessary to alleviate the immediate emergency unless that additional work would result in no more than minimal effects to aquatic environment and is necessary to reduce the potential for future failure or loss of the structure or site. Typical activities authorized under this GP include, but are not limited to, restoration of damaged areas; bank stabilization; temporary fills for staging, access, and dewatering; and, repair, replacement, or rehabilitation of existing structures and/or fills (i.e., roads, bridges, utility pipelines and flood control structures, including attendant features, and other existing structures located in waters of the U.S.).

For the restoration of areas damaged by storms floods, or other discrete events: (a) The restored area must not extend waterward of the ordinary high-water mark or high tide line that existed prior to the damage. (b) The slope of the restored area below the ordinary high-water mark or high tide line must not exceed the slope that existed prior to the damage. (c) The bottom elevation of the restored area must not exceed the bottom elevation that existed prior to the damage (i.e., the restored area must not result in a reduction in the depth of the waterbody that existed prior to the damage). (d) Except in cases of FEMA reimbursement, the activity must be initiated, under contract to commence, or funds shall be allocated for the activity within 30 days of authorization under GP 25.

Not authorized under GP 25 (IP required): (a) Permanent impacts for a single and complete project >1/2 acre in tidal waters, unless the district engineer waives this criterion by making a written determination concluding that the activity will result in no more than minimal adverse environmental effects; >1,000 SF in saltmarsh, mud flats, riffle and pool complexes, or non-tidal vegetated shallows; or >100 SF in tidal vegetated shallows; (b) Temporary impacts in tidal waters that are >5,000 SF in saltmarsh, mud flats, or riffle and pool complexes; or >1,000 SF in vegetated shallows; (c) New structures or fills that did not previously exist before the storm event or other discrete event (see other GPs).

Self-Verification Eligible

1. Activities that qualify under a Severe Weather Emergency Declaration pursuant to 310 CMR 10.06(8) and/or receive an Emergency Certification pursuant to 310 CMR 10.06 and/or meet the requirements of 314 CMR 9.12(2) or (3); and
2. Activities eligible under a FEMA Declared Disaster that also comply with #1 above.

Pre-Construction Notification Required

1. Activities that are eligible under a FEMA Declared Disaster and do not qualify under SV #1.
2. Minor deviations in the structure or fill area, including those to existing structures or fills are authorized due to changes in materials, construction techniques, requirements of other regulatory agencies, or current construction codes or safety standards that are necessary to alleviate the emergency.
3. Activities that are not eligible for SV and do not require an IP.

Notes:

1. Review the GCs (Section IV) to confirm if a PCN is not required elsewhere in this document.
2. If the activity is not a MassDEP Emergency Declaration/Certification, does not meet the requirements of 314 CMR 9.12(2) or (3), or is not a FEMA Declared Disaster, applicants must explain in writing why their activity qualifies as an emergency (see footnote) to be eligible under GP 25.
3. SV eligible activities qualify under the general 401 WQC MassDEP issued for the 2023 MA GPs (GC 9).

¹ An emergency, as determined by this office and 33 CFR 325.2(e)(4), is one which would result in an unacceptable hazard to life, a significant loss of property, or an immediate, unforeseen, and significant economic hardship if corrective action requiring a Department of the Army permit is not undertaken within a time period less than the normal time to process the request under standard processing procedures.

SECTION IV. GENERAL CONDITIONS:

To qualify for GP authorization, the applicant must comply with the following general conditions, as applicable, in addition to authorization-specific conditions imposed by the division or district engineer.

1. Other Permits
2. Federal Jurisdictional Boundaries
3. Single and Complete Projects
4. Use of Multiple General Permits
5. Suitable Material
6. Tribal Rights & Burial Sites
7. Avoidance, Minimization, and Compensatory Mitigation
8. Water Quality & Stormwater Management
9. Coastal Zone Management
10. Federal Threatened and Endangered Species
11. Essential Fish Habitat
12. National Lands
13. Wild and Scenic Rivers
14. Historic Properties
15. USACE Property and Federal Projects (§408)
16. Navigation
17. Permit/Authorization Letter On-Site
18. Storage of Seasonal Structures
19. Pile Driving and Pile Removal in Navigable Waters
20. Time of Year Restrictions
21. Heavy Equipment in Wetlands
22. Temporary Fill & Construction Mats
23. Restoration of Wetland Areas
24. Bank Stabilization
25. Soil Erosion and Sediment Controls
26. Aquatic Life Movements and Management of Water Flows
27. Spawning, Breeding, and Migratory Areas
28. Vernal Pools
29. Invasive Species
30. Fills Within 100-Year Floodplains
31. Stream Work and Crossings & Wetland Crossings
32. Utility Line Installation and Removal
33. Water Supply Intakes
34. Coral Reefs
35. Blasting
36. Inspections
37. Maintenance
38. Property Rights
39. Transfer of GP Verifications
40. Modification, Suspension, and Revocation
41. Special Conditions
42. False or Incomplete Information
43. Abandonment
44. Enforcement Cases
45. Previously Authorized Activities
46. Duration of Authorization

1. Other Permits. Authorization under these GPs does not obviate the need for the permittee to obtain other Federal, State, or local permits, approvals, or authorizations required by law. Permittees are responsible for obtaining all required permits, approvals, or authorizations. Activities that are not regulated by the State, but subject to USACE jurisdiction, may still be eligible for these GPs.

2. Federal Jurisdictional Boundaries.

a. Applicability of these GPs shall be evaluated with reference to Federal jurisdictional boundaries. Activities shall be evaluated with reference to “waters of the U.S.” under the CWA (33 CFR 328) and “navigable waters of the U.S.” under §10 of the Rivers and Harbors Act of 1899 (33 CFR 329).

Permittees are responsible for ensuring that the boundaries used satisfy the Federal criteria defined at 33 CFR 328-329. These sections prescribe the policy, practice, and procedures to be used in determining the extent of the USACE jurisdiction. Note: Waters of the U.S. includes all waters pursuant to 33 CFR 328.3(a), and adjacent wetlands as the term is defined in 33 CFR 328.3(c).

b. Wetlands shall be delineated in accordance with the USACE Wetlands Delineation Manual and the most recent Northcentral/Northeast Regional Supplement. Wetland delineation and jurisdiction information is located at: www.nae.usace.army.mil/missions/regulatory/jurisdiction-and-wetlands and maps are located at www.nae.usace.army.mil/missions/regulatory/state-general-permits/massachusetts-general-permit.

c. Vegetated shallows shall be delineated when present on the project site. Vegetated shallow survey guidance and maps are located at: www.nae.usace.army.mil/missions/regulatory/state-general-permits/massachusetts-general-permit.

d. Natural rocky habitats shall be delineated when present on the project site. The definition of natural rocky habitats is in Section VII of the MA GP. Natural rocky habitat survey guidance and maps are located at: www.nae.usace.army.mil/missions/regulatory/state-general-permits/massachusetts-general-permit.

3. Single and Complete Projects. The MA GP shall not be used for piecemeal work and shall be applied to single and complete projects. The term “single and complete project” is defined at 33 CFR 330.2(i) as the total project proposed or accomplished by one owner/developer or partnership or other association of owners/developers.

a. For non-linear projects, a single and complete project must have independent utility. Portions of a multi-phase project that depend upon other phases of the project do not have independent utility. Phases of a project that would be constructed, even if the other phases were not built, can be considered as separate single and complete projects with independent utility.

b. Unless USACE determines the activity has independent utility, all components of a single project and/or all planned phases of a multi-phased project (e.g., subdivisions should include all work such as roads, utilities, and lot development) shall be evaluated as one single and complete project.

c. For linear projects such as power lines or pipelines with multiple crossings, a “single and complete project” is all crossings of a single water of the U.S. (i.e., single waterbody) at a specific location. For linear projects crossing a single waterbody several times at separate and distant locations, each crossing is considered a single and complete project. However, individual channels in a braided stream or river, or individual arms of a large, irregularly shaped wetland or lake, etc., are not separate waterbodies, and crossings of such features cannot be considered separately. If any crossing requires a PCN review or an individual permit review, then the entire linear project shall be reviewed as one project under PCN or the individual permit procedures.

4. Use of Multiple General Permits. The use of more than one GP for a single and complete project is prohibited, except when the acreage loss of waters of the U.S. authorized by the GPs does not exceed the acreage limit of the GPs with the highest specified acreage limit. For example, if a road crossing over waters is constructed under GP 23, with an associated utility line

crossing authorized by GP 6, if the maximum acreage loss of waters of the U.S. for the total project is ≥ 1 acre it shall be evaluated as an IP.

5. Suitable Material & Discharge of Pollutants. No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). All activities involving any discharge into waters of the U.S. authorized under these GPs shall be consistent with applicable water quality standards, effluent limitations, standards of performance, prohibitions, and pretreatment standards and management practices established pursuant to the CWA (33 U.S.C. 1251), and applicable state and local laws. If applicable water quality standards, limitations, etc., are revised or modified during the term of this GP, the authorized work shall be modified to conform with these standards within six months from the effective date of such revision or modification, or within a longer period of time deemed reasonable by the District Engineer in consultation with the Regional Administrator of the EPA. Unless monitoring data indicates otherwise, applicants may presume that their activity complies with state water quality standards provided they are in compliance with the Section 401 WQC (Applicable only to the Section 404 activity).

6. Tribal Rights & Burial Sites

- a. For all SV and PCN applications, prospective permittees shall follow the guidance set forth in Appendix A, Guidance for NHPA Section 106 Compliance in Massachusetts.
- b. No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.
- c. Many tribal resources are not listed on the National Register of Historic Places (NRHP) and may require identification and evaluation in collaboration with the identifying tribe and by qualified professionals. The Tribal Historic Preservation Officer (THPO) and State Historic Preservation Officer (SHPO) may be able to assist with locating information on:
 - i. Previously identified tribal resources; and
 - ii. Areas with potential for the presence of tribal resources.
- d. Discovery of Previously Unknown Remains and Artifacts: If any previously unidentified human remains, cultural deposits, or artifacts are discovered while accomplishing the activity authorized by this permit, you must immediately notify the USACE of what you have found, and to the maximum extent practicable, cease work and avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The USACE will initiate the appropriate the Federal, Tribal, and state coordination required to determine if the items or remains are eligible for listing in the NRHP and warrant a recovery effort or can be avoided.
- e. Burial Sites: Burial sites, marked or unmarked, are subject to state law (Massachusetts Unmarked Burial Law). Native American burial sites on federal or tribal land are subject to the provisions of Native American Graves Protection and Repatriation Act (NAGPRA). Regulated activities may not result in disturbance or removal of human remains until disposition of the remains has been determined by the appropriate authority under these laws, and the work is authorized by the USACE. Regulated activities which result in an inadvertent discovery of human remains must stop immediately, and the USACE, as well as the appropriate state and tribal authority, must be notified. Regulated work at inadvertent discovery sites requires compliance with state law or NAGPRA, as appropriate, prior to re-starting work.

7. Avoidance, Minimization, and Compensatory Mitigation. To qualify under the MA GP, activities must comply with Section V Mitigation Standards and the following as applicable:

- a. Avoid and Minimize: Activities must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the U.S. to the maximum extent practicable at the project site. Avoidance and minimization are required to the extent necessary to ensure that the adverse effects to the aquatic environment (both area and function) are no more than minimal.

- b. Compensatory mitigation for unavoidable impacts to waters of the U.S., including direct, indirect, secondary, and temporal loss, will generally be required for permanent impacts that exceed the thresholds identified in Section V, and may be required for temporary impacts, to offset unavoidable impacts which remain after all appropriate and practicable avoidance and minimization has been achieved and to ensure that the adverse effects to the aquatic environment are no more than minimal. Proactive restoration projects or temporary impact work with no secondary effects may generally be excluded from this requirement.
- c. Mitigation proposals shall follow the guidelines found in the Compensatory Mitigation for Losses of Aquatic Resources; Final Rule April 10, 2008; 33 CFR 332. Prospective permittees may purchase mitigation credits in-lieu of permittee-responsible mitigation as compensation for unavoidable impacts to waters of the U.S. in the Commonwealth of Massachusetts.

8. Water Quality & Stormwater Management. The 401 WQC requirement applies to all activities listed under GPs 1-25, unless determined otherwise by MassDEP. Permittees shall also satisfy stormwater management requirements in Massachusetts.

- a. General 401 WQC: MassDEP issued a WQC on April 21, 2023 which conditionally certifies all activities in GPs 1 – 24 eligible for SV and PCN so long as the activity is described in 314 CMR 9.03, and is not an activity described in 314 CMR 9.04, and so long as the activity meets all other requirements, terms and conditions of the WQC. The MassDEP WQC also conditionally certifies activities described in GP 25 so long as the activity meets all other conditions of the WQC. Emergency projects described in GP 25 must obtain an emergency certification or otherwise be authorized pursuant to 310 CMR 10.06, qualify under a Severe Weather Emergency Declaration pursuant to 310 CMR 10.06(8) issued by the MassDEP, or meet the requirements of 9.12(2) or (3) in order to be certified under the WQC. Prospective permittees may refer to the following link to determine if their activity is eligible: <https://www.nae.usace.army.mil/Missions/Regulatory/State-General-Permits/Massachusetts-General-Permit/>. The General 401 WQC is located here, and it provides detailed information regarding what activities are certified and the conditions for certification. Activities listed in 314 CMR 9.03 that are not exempt from the Wetland Protection Act must have a valid Final Order of Conditions (OOC) or Final Restoration Order of Conditions pursuant to 310 CMR 10.00 to be eligible under the General 401 WQC.
- b. Individual 401 WQC: Prospective permittees shall contact MassDEP and apply for an individual 401 WQC if their activity does not qualify for a General 401 WQC as outlined above. MassDEP may issue, waive, or deny the individual 401 WQC on a case-by-case basis. All activities listed in 314 CMR 9.04 must obtain an individual 401 WQC from MassDEP to be eligible under these GPs. When an Individual 401 WQC is required for *PCN activities*, the prospective permittee shall submit their Individual 401 WQC application concurrently to MassDEP and USACE to comply with 40 CFR 121.
- c. The prospective permittee is responsible for determining the appropriate 401 WQC requirement and submitting this information to the USACE at the time of their PCN application or when completing their SVN. Prospective permittees that are unsure of whether their activity has been certified should contact MassDEP for a determination.
- d. As applicable, all activities shall be compliant with the Massachusetts Stormwater Handbook. The Stormwater Handbook can be accessed on the NAE Regulatory website here: <https://www.nae.usace.army.mil/Missions/Regulatory/State-General-Permits/Massachusetts-General-Permit/>.
- e. No work requiring authorization under Section 404 of the CWA may be performed unless (1) the prospective permittee qualifies for coverage under the April 21, 2023 General 401 WQC, (2) the prospective permittee receives an individual Section 401 WQC from the MassDEP, or (3) the MassDEP waives individual Section 401 WQC.

9. Coastal Zone Management. The permittee must obtain CZM consistency concurrence when an activity is located in the coastal zone in order to be eligible under the MA GP. This requirement

shall be satisfied by acquiring one of the following from the Massachusetts Office of Coastal Zone Management (MA CZM):

- a. General CZM Federal Consistency Concurrence (General Concurrence): MA CZM has granted General Concurrence for all SV and PCN activities for GPs 1-25. The prospective permittee must obtain all applicable permits and approvals before construction of the authorized activity begins (e.g., before work begins on site). For SVs, General Concurrence is automatically granted and no further action is required from the prospective permittee. For PCNs, the USACE will coordinate with MA CZM to acquire General Concurrence as part of the PCN application review.
- b. Individual CZM Federal Consistency Concurrence (Individual Concurrence): In certain cases, MA CZM may elevate any GP activity 1-25 and require Individual Concurrence. The prospective permittee must contact MA CZM and follow the procedures to obtain Individual Concurrence as determined appropriate by MA CZM.
- c. Permittees must obtain CZM consistency concurrence as outlined above before commencing work authorized under these GPs.

10. Federal Threatened and Endangered Species

- a. No activity is authorized under any GP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify designated critical habitat or critical habitat proposed for such designation. No activity is authorized under any GP which “may affect” a listed species or critical habitat, unless ESA section 7 consultation addressing the consequences of the proposed activity on listed species or critical habitat has been completed. See 50 CFR 402.02 for the definition of “effects of the action” for the purposes of ESA section 7 consultation, as well as 50 CFR 402.17, which provides further explanation under ESA section 7 regarding “activities that are reasonably certain to occur” and “consequences caused by the proposed action.”
- b. Other Federal agencies should follow their own procedures for complying with the requirements of the ESA (see 33 CFR 330.4(f)(1)). If a PCN is required for the proposed activity, the Federal permittee must provide USACE with the appropriate documentation to demonstrate compliance with those requirements. The USACE will verify that the appropriate documentation has been submitted. If the appropriate documentation has not been submitted, additional ESA section 7 consultation may be necessary for the activity and the respective federal agency would be responsible for fulfilling its obligation under section 7 of the ESA.
- c. USFWS ESA-Listed Species: Non-federal applicants shall use the USFWS website, Information for Planning and Consultation (IPAC), to determine if their activity is located within the ESA-listed species range. The IPAC website can be accessed on the NAE Regulatory website: <https://www.nae.usace.army.mil/Missions/Regulatory/State-General-Permits/Massachusetts-General-Permit/>. Applicants shall ensure they have an updated, valid species list before construction begins. This may require applicants to update their species list in IPAC before the start of construction. Note: Applicants should refer to the NAE Regulatory Website at the link above to determine if they have been designated as a non-federal representative. Applicants shall complete Section 7 consultation according to the guidance document located on the NAE Regulatory Website. After completing the Rangewide Determination Key and reaching the outcome “may affect, not likely to adversely affect”, you may be required to wait up to 15 days before that outcome is final and compliance under Section 7 of the ESA is fulfilled.
 - i. *Self-Verification Criteria*: The activity is SV-eligible if:
 - 1) The activity is not located within the ESA-listed species range;
 - 2) Another (lead) Federal agency has completed Section 7 consultation; or
 - 3) The activity is located within the ESA-listed species range and USACE has designated the applicant as a non-federal representative under 50 CFR 402.08 of the ESA for all

species within the project's action area. As the non-federal representative, the applicant shall complete consultation through IPAC and reach the outcome of "no effect" or "not likely to adversely affect".

ii. *Pre-Construction Notification Criteria*: The activity requires a PCN if:

- 1) The activity is located within the ESA-listed species range and USACE has NOT designated the applicant as a non-federal representative under 50 CFR 402.08 of the ESA for all species within the project's action area;
- 2) The activity is located in designated or proposed critical habitat; or
- 3) The activity is located within the ESA-listed species range and completion of the IPAC determination key has resulted in the outcome of "may affect" or "may affect, likely to adversely affect"; or
- 4) A PCN is required elsewhere in this document.

d. NOAA-Listed Species: Non-federal applicants shall refer to the Section 7 Mapper for federally listed species to determine if any species are mapped as present. When NOAA-listed species are present, the applicant shall generate a species report through the mapper and submit this document as part of their PCN or SVN submission. The NOAA Fisheries' Section 7 Mapper can be accessed here on the NAE Regulatory website here: <https://www.nae.usace.army.mil/Missions/Regulatory/State-General-Permits/Massachusetts-General-Permit/>.

e. Authorization of an activity by an GP does not authorize the "take" of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the FWS or the NMFS, the Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word "harm" in the definition of "take" means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

11. Essential Fish Habitat (EFH).

a. SV eligible activities have been determined to result in no more than minimal adverse effects, provided the permittee complies with all terms and conditions of the MA GP as applicable to the activity. NMFS has granted General Concurrence [50 CFR 600.920(g)] for all SV eligible activities. These activities do not require project specific EFH consultation.

b. For PCN required activities, the applicant is required to describe and identify potential adverse effects to EFH and should refer to NOAA Fisheries' EFH Mapper (<http://www.fisheries.noaa.gov/resource/map/essential-fish-habitat-mapper>) and Omnibus Essential Fish Habitat Amendment 2 Volume 2: EFH and HAPC Designation Alternatives and Environmental Impacts (https://www.habitat.noaa.gov/application/efhmapper/oa2_efh_hapc.pdf). If an activity is located within EFH, the PCN application must contain:

1. A description of the action located in EFH.
2. An analysis of the potential adverse effects of the action on EFH and the managed Species.
3. Conclusions regarding the effects of the action on EFH.
4. Proposed mitigation, if applicable (refer to the mitigation thresholds located in Section V).

c. Federal agencies shall follow their own procedures for complying with the EFH requirements of the Magnuson-Stevens Fishery Conservation and Management Act. For activities requiring a PCN, the applicant is responsible for furnishing documentation that demonstrates consultation for EFH has been completed.

d. For PCN activities, no work may commence until EFH consultation as required by the Magnuson-Stevens Act has been completed.

12. National Lands. Activities that impinge upon the value of any National Wildlife Refuge, National Forest, National Marine Sanctuary, National Historic Landmarks or any other area administered by the National Park Service, U. S. Fish and Wildlife Service (USFWS) or U.S. Forest Service (USFS) require a PCN or Individual Permit. Federal land managers seeking authorization for activities located in the above listed National Lands may proceed under SV, unless a PCN is required elsewhere in this document.

13. Wild and Scenic Rivers. The following activities in designated river or study river segments in the National Wild and Scenic River (WSR) System require a PCN unless the Federal agency with direct management responsibility for such river, in Massachusetts this is generally the National Park Service, has determined in writing to the proponent that the proposed work will not adversely affect the WSR designation or study status:

- a. Activities that occur in WSR segments, in and 0.25 miles up or downstream of WSR segments, or in tributaries within 0.25 miles of WSR segments;
- b. Activities that occur in wetlands within 0.25 miles of WSR segments;
- c. Activities that have the potential to alter free-flowing characteristics in WSR segments.

No GP activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status.

As of May 10, 2023, affected rivers in Massachusetts include: the Taunton River (40 miles), Sudbury River (16.6 miles), Assabet River (4.4 miles), Concord River (8 miles), Nashua River (27 miles), Squannacook River (16.3 miles), Nissitissit River (4.7 miles), and the Westfield River, including West Branch, Middle Branch, Gendale Brook, East Branch, Drowned Land Brook, Center Brook, Windsor Jambs Brook, Shaker Mill Brook, Depot Brook, Savary Brook, Watson Brook, Center Pond Brook (78.1 miles). The most up to date list of designated and study rivers and their descriptions may be obtained from the appropriate Federal land management agency responsible for the designated Wild and Scenic River or study river (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service). Information on these rivers is also available at: <http://www.rivers.gov/>.

14. Historic Properties

- a. For all SV and PCN applications, permittees shall follow the guidance set forth in Appendix A, Guidance for NHPA Section 106 Compliance in Massachusetts.
- b. No undertaking authorized by these GPs shall cause effects¹ (defined in 36 CFR Part 800 and 33 CFR Part 325, Appendix C, and its Interim Guidance) on properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places (NRHP)², including previously unknown historic properties within the permit area, unless the USACE or another Federal action agency has satisfied the consultation requirements of Section 106 of the National Historic Preservation Act (Section 106). If another Federal agency is determined the lead federal agency for compliance with Section 106, applicant must obtain the appropriate documentation and provide this information to the USACE to demonstrate compliance with Section 106. The applicant shall not begin the activity until the USACE notifies them in writing that the documentation provided satisfies Section 106 requirements.

¹ Effect means the alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register of Historic Properties.

² See the NAE Regulatory website, National Register of Historic Places link here: <https://www.nae.usace.army.mil/Missions/Regulatory/State-General-Permits/Massachusetts-General-Permit/>.

- c. Many historic properties are not listed on the NRHP and may require identification and evaluation by qualified historic preservation and/or archaeological consultants. The State Historic Preservation Officer (SHPO), Massachusetts Board of Underwater Archaeological Resources (BUAR), local historical societies, certified local governments, general public, and NRHP may also be able to assist with locating information on:
 - i. Previously identified historic properties; and
 - ii. Areas with potential for the presence of historic properties.
- d. Discovery of Previously Unknown Remains and Artifacts: If any previously unidentified human remains, cultural deposits, or artifacts are discovered while accomplishing the activity authorized by this permit, you must immediately notify the USACE of what you have found, and to the maximum extent practicable, cease work and avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The USACE will initiate the Federal, State and tribal coordination required to determine if the items or remains warrant a recovery effort and/or if the site is eligible for listing in the National Register of Historic Places.
- e. Section 110k: Prospective permittees should be aware that section 110k of the NHPA (54 U.S.C. § 306113) prevents the USACE from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of Section 106, has intentionally significantly adversely effected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the USACE, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the USACE is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties effected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or effects historic properties on tribal lands or effects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.
- f. Underwater Archaeological Resources: Under Massachusetts General Law Ch. 6, s.'s 179-180, and Ch. 91, s. 63, the BUAR has statutory jurisdiction within state waters and is the sole trustee of the Commonwealth's underwater heritage, charged with the responsibility of encouraging the discovery and reporting, as well as the preservation and protection, of underwater archaeological resources. Underwater archaeological resources located within the waters of the Commonwealth of Massachusetts are property of the Commonwealth, which holds title to these resources and retains regulatory authority over their use. Under Massachusetts General Law, no person, organization or corporation may "remove, displace, damage, or destroy" any underwater archaeological resources located within the Commonwealth's submerged lands except through consultation with the BUAR and in conformity with the permits it issues. <https://www.mass.gov/orgs/board-of-underwater-archaeological-resources>.

15. USACE Property and Federal Projects. (33 USC §408)

- a. USACE projects and property can be found at: <https://www.nae.usace.army.mil/Missions/Civil-Works/>.
- b. In addition to any authorization under these GPs, prospective permittee shall contact the USACE Real Estate Division (<https://www.nae.usace.army.mil/Missions/Real-Estate-Division/>) at (978) 318-8585 for work occurring on or potentially affecting USACE properties and/or USACE-controlled easements. Work may not commence on USACE properties and/or USACE-controlled easements until they have received any required USACE real estate documents evidencing site-specific permission to work.
- c. Any proposed temporary or permanent occupation or alteration of a Federal project (including, but not limited to, a levee, dike, floodwall, channel, anchorage, breakwater, seawall, bulkhead, jetty, wharf, pier, or other work built or maintained but not necessarily owned by the United States),

is not eligible for SV and requires a PCN. This includes all proposed structures and work in, over, or under a USACE federal navigation project (FNP) or in the FNP's buffer zone. The buffer zone is an area that extends from the horizontal limits of the FNP to a distance of three times the FNP's authorized depth. The activity also requires review and approval by the USACE pursuant to 33 USC 408 (Section 408 Permission). The prospective permittee may reach out to the POCs located here: <https://www.nae.usace.army.mil/Missions/Section-408/>.

d. Any structure or work constructed in a FNP or its buffer zone shall be subject to removal at the owner's expense prior to any future USACE dredging or the performance of periodic hydrographic surveys.

e. Where a Section 408 permission is required, written verification for the PCN will not be issued prior to the decision on the Section 408 permission request.

16. Navigation

a. No activity may cause more than a minimal adverse effect on navigation.

b. Any safety lights and signals prescribed by the U.S. Coast Guard, must be installed, and maintained at the permittee's expense on authorized facilities in navigable waters of the U.S.

c. There shall be no unreasonable interference with navigation by the existence or use of the activity authorized herein, and no attempt shall be made by the permittee to prevent the full and free use by the public of all navigable waters at or adjacent to the activity authorized herein.

d. The permittee understands and agrees that if future U.S. operations require the removal, relocation, or other alteration of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from USACE, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the U.S. No claim shall be made against the U.S. on account of any such removal or alteration.

17. Permit/Authorization Letter On-Site. For PCNs, the permittee shall ensure that a copy of these GPs and the accompanying authorization letter are at the work site (and the project office) whenever work is being performed, and that all personnel with operational control of the site ensure that all appropriate personnel performing work are fully aware of its terms and conditions. The entire permit authorization shall be made a part of any and all contracts and sub-contracts for work that affects areas of USACE jurisdiction at the site of the work authorized by these GPs. This shall be achieved by including the entire permit authorization in the specifications for work. The term "entire permit authorization" means these GPs, including GCs and the authorization letter (including its drawings, plans, appendices, special conditions, and other attachments), and any permit modifications. If the authorization letter is issued after the construction specifications, but before receipt of bids or quotes, the entire permit authorization shall be included as an addendum to the specifications. If the authorization letter is issued after receipt of bids or quotes, the entire permit authorization shall be included in the contract or sub-contract as a change order. Although the permittee may assign various aspects of the work to different contractors or sub-contractors, all contractors and sub-contractors shall be obligated by contract to comply with all environmental protection provisions contained within the entire authorization letter, and no contract or sub-contract shall require or allow unauthorized work in areas of USACE jurisdiction. For SVs, the permittee shall ensure that a complete and signed copy of the SVN is present on site during construction and is made available for review at any time by USACE and other Federal, State, & Local regulatory agencies. A complete and signed copy of the SVN must be submitted to USACE Regulatory within 30 days of initiating construction of the authorized activity, unless stated otherwise in the applicable GP.

18. Storage of Seasonal Structures. Coastal structures such as pier sections, floats, etc., that

are removed from the waterway for a portion of the year (often referred to as seasonal structures) shall be stored in an upland location, located above MHW and not in tidal wetlands. These seasonal structures may be stored on the fixed, pile-supported portion of the structure that is seaward of MHW. This is intended to prevent structures from being stored on the marsh substrate and the substrate seaward of MHW.

19. Pile Driving and Pile Removal in Navigable Waters.

- a. Derelict, degraded or abandoned piles and sheet piles in navigable waters of the U.S., except for those inside existing work footprints for piers, must be completely removed, cut and/or driven to 3 feet below the substrate to prevent interference with navigation, and existing creosote piles that are affected by project activities shall be completely removed if practicable. In areas of fine-grained substrates, piles must be removed by the direct, vibratory or clamshell pull method¹ to minimize sedimentation and turbidity impacts and prevent interference with navigation from cut piles. Removed piles shall be disposed of in an upland location landward of MHW or OHW and not in wetlands, tidal wetlands or mudflats.
- b. A PCN is required for the installation or removal of structures with jetting techniques.
- c. A PCN is required for the installation of >12 inch-diameter piles of any material type or steel piles of any size in tidal waters, unless they are installed in the dry. If piles are not installed in the dry:
 - i. Impact pile driving shall commence with an initial set of three strikes by the hammer at 40% energy, followed by a one-minute wait period, then two subsequent 3-strike sets at 40% energy, with one minute waiting periods, before initiating continuous impact driving.
 - ii. Vibratory pile driving shall be initiated for 15 seconds at reduced energy followed by a one-minute waiting period. This sequence of 15 seconds of reduced energy driving, one-minute waiting period shall be repeated two more times, followed immediately by pile-driving at full rate and energy.
 - iii. In addition to using a soft start at the beginning of the workday for pile driving as described in 19c(i-ii), a soft start must also be used at any time following a cessation of pile driving for a period of 30 minutes or longer.
- d. Bubble curtains may be used to reduce sound pressure levels during vibratory or impact hammer pile driving.

20. Time-of-Year (TOY) Restrictions. Activities that include in-water work must comply with the TOY Restrictions below to be SV eligible, otherwise a PCN is required. PCN submittals shall contain written justification for deviation from the TOY Restrictions. The term “in-water work” does not include conditions where the work site is “in-the-dry” (e.g., intertidal areas exposed at low tide). The term “in-the-dry” includes work contained within a cofferdam so long as the cofferdam is installed and subsequently removed outside the TOY Restriction. The TOY restrictions stated in Appendix B of the MA DMF Technical Report TR-47² can apply instead for activities in tidal waters if (1) TOYs are provided for a specific waterbody where the activity is proposed and (2) the TOYs are less restrictive than below. The activity must also not require a PCN elsewhere in this document to be SV eligible.

¹ Direct Pull: Each piling is wrapped with a choker cable or chain that is attached at the top to a crane. The crane then pulls the piling directly upward, removing the piling from the sediment. Vibratory Pull: The vibratory hammer is a large mechanical device (5-16 tons) that is suspended from a crane by a cable. The vibrating hammer loosens the piling while the crane pulls up. Clamshell Pull: This can remove intact, broken or damaged pilings. The clamshell bucket is a hinged steel apparatus that operates like a set of steel jaws. The bucket is lowered from a crane and the jaws grasp the piling stub as the crane pulls up. The size of the clamshell bucket is minimized to reduce turbidity during piling removal.

² The MA DMF Technical Report TR-47: <https://www.nae.usace.army.mil/Missions/Regulatory/State-General-Permits/Massachusetts-General-Permit/>

TOY Restriction (No work)**Non-tidal Waters**

Defer to TR-47

Tidal Waters

January 15 – November 15

Alternate work windows proposed under a PCN will generally be coordinated with the USFWS and NMFS. Resulting written verifications may include species-specific work allowed windows.

21. Heavy Equipment in Wetlands. Operating heavy equipment (drill rigs, fixed cranes, etc.) within wetlands shall be minimized, and such equipment shall not be stored, maintained, or repaired in wetlands, to the maximum extent practicable. Where construction requires heavy equipment operation in wetlands, the equipment shall:

- i. Have low ground pressure (typically ≤ 3 psi);
- ii. Be placed on swamp/construction/timber mats (herein referred to as “construction mats” or “mats”) that are adequate to support the equipment in such a way as to minimize disturbance of wetland soil and vegetation. See GC 22 for information on the placement of construction mats; or
- iii. Be operated on adequately dry or frozen wetlands such that shear pressure does not cause subsidence of the wetlands immediately beneath the equipment and upheaval of adjacent wetlands. Construction mats are to be placed in the wetland from the upland or from equipment positioned on mats if working within a wetland. Dragging construction mats into position is prohibited. Other support structures that are capable of safely supporting equipment may be used with written USACE authorization.

22. Temporary Fill, Work & Construction Mats.

a. Construction mats in non-tidal waters: Temporary construction mats shall be in place ≤ 1 year and for one growing season or less to be SV eligible. A PCN is required if construction mats are in place > 1 year or for more than one growing season. Construction mats can be placed in an area of any size in non-tidal waters. The activity may occur in segments to ensure the requirements for SV above are met, otherwise a PCN is required.

b. Construction mats in tidal waters: Temporary construction mats placed in an area $< 5,000$ SF in tidal waters are SV eligible, provided those mats are in place ≤ 6 months. Temporary construction mats placed in an area $\geq 5,000$ SF or in place > 6 months in tidal waters require a PCN.

c. Management of construction mats: At a minimum, construction mats shall be managed in accordance with the following construction mat best management practices (BMPs):

1. Mats shall be in good condition to ensure proper installation, use, and removal.
2. As feasible, mats shall be placed in a location that will minimize the amount of mats needed for the wetland crossing(s).
3. Inspect mats prior to their re-use and remove any plant debris. Mats are to be thoroughly cleaned before re-use to prevent the spread of invasive plant species.
4. Impacts to wetland areas shall be minimized during installation, use, and removal of the mats.
5. Adequate erosion & sediment controls shall be installed at approaches to mats to promote a smooth transition to, and minimize sediment tracking onto, the mats.
6. In most cases, mats should be placed along the travel area so that the individual boards are resting perpendicular to the direction of traffic. No gaps should exist between mats. Place mats far enough on either side of the resource area to rest on firm ground.

d. A PCN is required for temporary fills in place > 2 years. All temporary fills and disturbed soils shall be stabilized to prevent the material from eroding into waters of the U.S. where it is not authorized. Work shall include phased or staged development to ensure only areas under active development are exposed and to allow for stabilization practices as soon as practicable. Temporary fill must be placed in a manner that will prevent it from being eroded by expected high flows.

- e. Activities that require unconfined temporary fill and are authorized for discharge into waters of the U.S. shall consist of material that minimizes effects to water quality.
- f. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable when temporary structures, work, and discharges of dredged or fill material, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Materials shall be placed in a location and manner that does not adversely impact surface or subsurface water flow into or out of the wetland. Temporary fill authorized for discharge into wetlands shall be placed on geotextile fabric or other appropriate material laid on the pre-construction wetland grade where practicable to minimize impacts and to facilitate restoration to the original grade. Construction mats are excluded from this requirement.
- g. Construction debris and deteriorated materials shall not be located in waters of the U.S.
- h. Temporary fills, construction mats, and corduroy roads shall be entirely removed as soon as they are no longer needed to construct the authorized activity and the disturbed areas be restored to pre-construction contours and conditions.
- i. Construction equipment, such as temporary barges in tidal waters, shall provide clearance above the substrate to avoid grounding onto the substrate during all tides.

23. Restoration of Wetland Areas.

- a. Upon completion of construction, all disturbed wetland areas shall be stabilized with a wetland seed mix or plant plugs containing only plant species native to New England, and be appropriate for site conditions, including salinity and frequency of inundation, and shall not contain any species listed in the "Invasive and Other Unacceptable Plant Species" Appendix K of the New England District "Compensatory Mitigation Standard Operating Procedures" found at <https://www.nae.usace.army.mil/Missions/Regulatory/Mitigation.aspx>.
- b. The introduction or spread of invasive plant species in disturbed areas shall be prevented and controlled. Equipment shall be thoroughly cleaned before and after project construction to prevent the spread of invasive species. This includes, but is not limited to, tire treads and construction mats.
- c. In areas of authorized temporary disturbance, if trees are cut in USACE jurisdiction, they shall be cut at or above ground level and not uprooted in order to prevent disruption of any kind to the wetland soil structure and to allow stump sprouts to revegetate the work area, unless otherwise authorized.
- d. Wetland areas where permanent disturbance is not authorized shall be restored to their original condition and elevation, which under no circumstances shall be higher than the pre-construction elevation. Original condition means careful protection and/or removal of existing soil and vegetation, and replacement back to the original location such that the original soil layering and vegetation schemes are approximately the same, unless otherwise authorized.

24. Bank Stabilization.

- a. Projects involving construction or reconstruction/maintenance of bank stabilization within USACE jurisdiction shall be designed to minimize environmental effects, effects to neighboring properties, scour, conversion of natural shoreline to hard armoring, etc. to the maximum extent practicable.
- b. Projects involving the construction of new bank stabilization within USACE jurisdiction shall use bioengineering techniques and natural materials in the project design to the maximum extent practicable. Use of hard structures shall be eliminated or minimized unless the prospective permittee can demonstrate that use of bioengineering techniques is not practicable due to site conditions.
- c. Where possible, bank stabilization projects shall optimize the natural function of the shoreline, including self-sustaining stability to attenuate flood flows, fishery, wildlife habitat and water quality protection, while protecting upland infrastructure from storm events that can cause erosion as well as impacts to public and private property.
- d. No material shall be placed in excess of the minimum needed for erosion protection.
- e. No material shall be placed in a manner that will be eroded by normal or expected high flows (properly anchored native trees and treetops may be used in low energy areas).

- f. Native plants appropriate for current site conditions, including salinity, must be used for bioengineering or vegetative bank stabilization.
- g. The activity must be properly maintained, which may require repairing it after severe storms or erosion events.

25. Soil Erosion and Sediment Controls.

- a. Appropriate soil erosion and sediment controls¹ (hereinafter referred to as “controls”) must be installed prior to earth disturbance and maintained in effective operating condition during construction. Biodegradable wildlife friendly erosion controls should be used whenever practicable to minimize effects to water quality.
- b. Activities in streams (rivers, streams, brooks, etc.) and tidal waters that are capable of producing sedimentation or turbidity should be done during periods of low-flow or no-flow, when the stream or tide is waterward of the work area. Controls may also be used to obtain dry work conditions (e.g., coffer dam, turbidity curtain). The prospective permittee must demonstrate in the project plans where the controls are proposed and how these controls would avoid and/or minimize turbidity or sedimentation.
- c. A PCN is required for controls that encroach: i) >25% of the stream width measured from OHW in non-tidal diadromous streams from March 15 to June 30; or ii) >25% of the waterway width measured from MHW in tidal waters from Feb. 1 to June 30, or >50% of the waterway width measured from MHW in tidal waters from July 1 to Jan. 14. This is to protect upstream fish passage. Proponents must also maintain downstream fish passage throughout the project.
- d. No dewatering shall occur with direct discharge to waters or wetlands. Excess water in isolated work areas shall be pumped or directed to a sedimentation basin, tank or other dewatering structures in an upland area adequately separated from waters or wetlands. Suspended solids shall be removed prior to discharge back into waters or wetlands from these dewatering structures. All discharge points back into waters and wetlands shall use appropriate energy dissipaters and erosion and sedimentation control BMPs.
- e. Temporary controls shall be removed upon completion of work, but not until all exposed soil and other fills, as well as any work waterward of OHW or the HTL, are permanently stabilized at the earliest practicable date. Sediment and debris collected by these devices shall be removed and placed at an upland location in a manner that will prevent its later erosion into a waterway or wetland. Controls may be left in place if they are biodegradable and flows and aquatic life movements are not disrupted.

26. Aquatic Life Movements and Management of Water Flows.

- a. No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity’s primary purpose is to impound water. All permanent and temporary crossings of waterbodies and wetlands shall be:
 - i. Suitably spanned, bridged, culverted, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species; and
 - ii. Properly aligned and constructed to prevent bank erosion or streambed scour both adjacent to and inside the crossing.

¹ Appropriate soil erosion, sediment and turbidity controls include cofferdams, bypass pumping around barriers immediately up and downstream of the work footprint (i.e., dam and pump), installation of sediment control barriers (i.e., silt fence, vegetated filter strips, geotextile silt fences, filter tubes, erosion control mixes, hay bales or other devices) downhill of all exposed areas, stream fords, retention of existing vegetated buffers, application of temporary mulching during construction, phased construction, and permanent seeding and stabilization, etc.

- b. To avoid adverse impacts on aquatic organisms, the low flow channel/thalweg shall remain unobstructed during periods of low flow, except when necessary to perform the authorized work.
- c. For work in tidal waters, in-stream controls (e.g., cofferdams) should be installed in such a way as to not obstruct fish passage.
- d. Riprap and other stream bed materials shall be installed in a manner that avoids organism entrapment in rock voids or water displaced to subterranean flow with crushed stone and riprap.
- e. To the maximum extent practicable, the preconstruction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization, storm water management activities, and temporary and permanent road crossings, except as provided below. The activity must be constructed to withstand expected high flows. The activity shall not restrict or impede the passage of normal or high flows unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

27. Spawning, Breeding, and Migratory Areas.

- a. Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized under these GPs.
- b. Activities in waters of the U.S. that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.
- c. The applicant is responsible for obtaining any “take” permits required under the USFWS’s regulations governing compliance with the Migratory Bird Treaty Act or the Bald and Golden Eagle Protection Act. The applicant should contact the appropriate local office of the USFWS to determine if such “take” permits are required for a particular activity.
- d. Information on spawning habitat for species managed under the Magnuson-Stevens Fishery Conservation and Management Act (i.e., EFH for spawning adults) can be obtained from NAE Regulatory website, Essential Fish Habitat section, at: <https://www.nae.usace.army.mil/Missions/Regulatory/State-General-Permits/Massachusetts-General-Permit/>.
- e. Information regarding diadromous fish habitat can be obtained from the following DMF website at: <https://www.mass.gov/info-details/massgis-data-diadromous-fish>.

28. Vernal Pools.

- a. A PCN is required if a discharge of dredged or fill material is proposed within a vernal pool depression that is also a water of the U.S.
- b. Vernal pools must be identified on the plans that show aquatic resource delineations.
- c. Adverse impacts to vernal pools shall be avoided & minimized to the maximum extent practicable.

29. Invasive Species.

- a. The introduction, spread or the increased risk of invasion of invasive plant or animal species on the project site, into new or disturbed areas, or areas adjacent to the project site caused by the site work shall be avoided. Construction mats shall be thoroughly cleaned before reuse to avoid spread of invasive species.
- b. Unless otherwise directed by USACE, all applications for PCN non-tidal projects proposing fill in USACE jurisdiction shall include an Invasive Species Control Plan. Additional information can be found at: <https://www.nae.usace.army.mil/Missions/Regulatory/Invasive-Species/>, <https://www.nae.usace.army.mil/Missions/Regulatory/Mitigation/>.

30. Fills Within 100-Year Floodplains. The activity shall comply with applicable Federal Emergency Management Agency (FEMA) approved, Massachusetts Emergency Management

Agency (MEMA) approved and/or local floodplain management requirements. Applicants should contact FEMA and/or MEMA regarding floodplain management requirements.

31. Stream Work and Crossings & Wetland Crossings.

- a. When feasible, all temporary and permanent crossings of waterbodies and wetlands (hereinafter referred to as “crossings”) shall conform to the “Massachusetts River and Stream Crossing Standards” located at: <https://www.mass.gov/doc/massachusetts-river-and-stream-crossing-standards/download> or <https://www.nae.usace.army.mil/Missions/Regulatory/State-General-Permits/Massachusetts-General-Permit/>. Projects that do not conform to these guidelines shall be reviewed under PCN or IP procedures.
- b. Crossings shall be suitably culverted, bridged, or otherwise designed to withstand and to prevent the restriction of high flows, to maintain existing low flows, maintain water quality, and not obstruct the movement of aquatic life indigenous to the waterbody beyond the duration of construction.
- c. Crossings shall be installed in such a manner as to preserve hydraulic capacity and flow, sediment transport, and organism passage at its present level, between the wetlands on either side of the road. The applicant shall take necessary measures to correct any wetland damage resulting from deficiencies in hydraulic capacity, sediment transport and organism passage.
- d. Stream crossings shall utilize a natural mixed grain-size streambed material composition that matches upstream and downstream substrates to create a stable streambed. Substrate should function appropriately during normal and high flows without washing out. If natural streambed material is not utilized, a PCN is required.
- e. Activities involving open trench excavation in flowing waters require a PCN. Work should not occur in flowing waters (requires using management techniques such as temporary flume pipes, culverts, cofferdams, etc.). Normal flows should be maintained within the stream boundary’s confines when practicable. Projects utilizing these management techniques must meet all applicable terms and conditions of the GP, including the GCs in Section IV.

32. Utility Line Installation and Removal

- a. Subsurface utility lines must be installed at a sufficient depth to avoid damage from anchors, dredging, etc., and to prevent exposure from erosion and stream adjustment.
- b. When utility lines are installed via horizontal directional drilling, a frac-out contingency plan shall be present on site for the duration of construction. As necessary, the applicant shall immediately contain, control, recover, and remove drilling fluids released into the environment.
- c. Abandoned or inactive utility lines must be removed and faulty lines (e.g., leaking hazardous substances, petroleum products, etc.) must be removed or repaired. A written verification from the USACE is required if they are to remain in place, e.g., to protect sensitive areas or ensure safety.
- d. Utility lines shall not adversely alter existing hydrology, and trenches cannot be constructed or backfilled in such a manner as to drain waters of the U.S. (e.g., backfilling with extensive gravel layers, creating a French drain effect). In wetland areas, structures such as ditch plugs, cut-off walls, clay blocks, bentonite, or other suitable material shall be used within utility trenches to ensure that the trench through which the utility line is installed does not drain waters of the U.S. including wetlands.
- e. Stockpiling of tree debris, to the extent where it has the effect of fill material, shall not occur in waters of the U.S. Tree debris shall be removed from waters of the U.S. and placed in uplands without causing additional disturbance to aquatic resources. Failure to meet this condition could change the bottom elevation of the wetland and be considered a discharge of fill material, and depending on the area of alteration, may require a PCN or IP.

33. Water Supply Intakes. No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

34. Coral Reefs. Impacts to coral reefs are not authorized under these GPs. Coral reefs consist of the skeletal deposit, usually of calcareous or siliceous materials, produced by the vital activities of anthozoan polyps or other invertebrate organisms present in growing portions of the reef.

35. Blasting. Blasting in waters of the U.S. associated with work such as dredging, trenching, pile installation, etc. is not authorized under these GPs.

36. Inspections. The permittee shall allow USACE to make periodic inspections at any time deemed necessary to ensure that the work is being or has been performed in accordance with the terms and conditions of this permit. To facilitate these inspections, for activities requiring a PCN, the permittee shall complete and return the Certificate of Compliance when it is provided with a PCN verification letter. For SV-eligible activities, the permittee shall complete and submit the SVN to USACE within 30 days of initiating project construction, at which point, USACE may opt to inspect the activity to verify compliance with the terms and conditions of the GP. Post-construction engineering drawings may be required by USACE for completed work. This includes post-dredging survey drawings for any dredging work.

37. Maintenance. The permittee shall maintain the activity authorized by these GPs in good condition and in conformance with the terms and conditions of this permit. Some maintenance activities may not be subject to federal regulation under Section 404 in accordance with 33 CFR 323.4(a)(2). This condition is not applicable to maintenance of dredging projects. Prospective permittees should contact USACE to inquire about maintenance of dredging projects, and its eligibility under these GPs. Maintenance dredging is subject to the review thresholds in GP #7 as well as any conditions included in a written USACE authorization. Maintenance dredging includes only those areas and depths previously authorized and dredged.

38. Property Rights. Per 33 CFR 320.4(g)(6), these GPs do not convey any property rights, either in real estate or material, or any exclusive privileges, nor do they authorize any injury to property or invasion of rights or any infringement of Federal, State, or local laws or regulations.

39. Transfer of GP Verifications. When the work authorized by these GPs is still in existence at the time the property is transferred, the terms and conditions of these GPs, including any special conditions, will continue to be binding on the entity or individual who received the GP authorizations, as well as the new owner(s) of the property. If the permittee sells the property associated with a GP authorization, the applicant may transfer the GP authorization to the new owner by submitting a letter to USACE to validate the transfer. A copy of the GP authorization letter must be attached to the letter, and the letter must include the following statement: "The terms and conditions of these general permits, including any special conditions, will continue to be binding on the new owner(s) of the property." This letter shall be signed by both the seller and new property owner(s).

40. Modification, Suspension, and Revocation. These GPs and any individual authorization issued thereof may be either modified, suspended, or revoked in whole or in part pursuant to the policies and procedures of 33 CFR 325.7; and any such action shall not be the basis for any claim for damages against the U.S.

41. Special Conditions. The USACE may impose other special conditions on a project authorized pursuant to these GPs that are determined necessary to minimize adverse navigational and/or environmental effects or based on any other factor of the public interest. Failure to comply with all conditions of the authorization, including special conditions, constitutes a permit violation and may subject the applicant to criminal, civil, or administrative penalties or restoration.

42. False or Incomplete Information. If USACE makes a determination regarding the eligibility of a project under these GPs, and subsequently discovers that it has relied on false, incomplete, or inaccurate information provided by the applicant, the authorization will not be valid, and the U.S. Government may institute appropriate legal proceedings.

43. Abandonment. If the permittee decides to abandon the activity authorized under these GPs, unless such abandonment is merely the transfer of property to a third party, he/she/they may be required to restore the area to the satisfaction of USACE.

44. Enforcement cases. These GPs do not apply to any existing or proposed activity in USACE jurisdiction associated with an on-going USACE or EPA enforcement action, until such time as the enforcement action is resolved or USACE or EPA determines that the activity may proceed independently without compromising the enforcement action.

45. Previously Authorized Activities.

- a. Completed projects that received prior authorization from USACE (SV or PCN), shall remain authorized in accordance with the original terms and conditions of those authorizations, including their terms, GCs, and any special conditions provided in a written verification.
- b. Activities authorized pursuant to 33 CFR 330.3 (activities occurring before certain dates) are not affected by these GPs.

46. Duration of Authorization.

These GPs expire on June 1, 2028. Activities authorized under these GPs will remain authorized until the GPs expire, unless discretionary authority has been exercised on a case-by-case basis to modify, suspend, or revoke the authorization in accordance with 33 CFR 325.2(e)(2). Activities authorized under GPs 1-25 that have either commenced (i.e., are under construction) or are under contract to commence in reliance upon this authorization will have until June 1, 2029 to complete the work. If requested by USACE, the permittee shall furnish documentation that demonstrates the project was under construction or under contract to commence by June 1, 2028. If work is not completed before June 1, 2029, the permittee must contact USACE. The USACE may issue a new authorization provided the project meets the terms and conditions of the MA GPs in effect at the time. Activities completed under the SV or PCN authorizations of these GPs will continue to be authorized after their expiration date.

SECTION V: MITIGATION STANDARDS

1. Mitigation Types

For all activities, applicants must (a) demonstrate how the project has been designed to avoid or minimize impacts to aquatic resources; and (b) describe measures taken to avoid or minimize impacts to aquatic resources through construction techniques and/or site access. Please see <https://www.nae.usace.army.mil/Missions/Regulatory/Mitigation/> for assistance with preparing mitigation in accordance with the 2008 Compensatory Mitigation for Losses of Aquatic Resources; Final Rule (33 CFR 332.3), hereafter referred to as “2008 Mitigation Rule.”

Avoidance - Avoidance of impacts (direct and indirect) to aquatic resources means that project activities would not result in the placement of fill material or installation of a structure that could impact the resource area. Avoidance can include, but is not limited to, designing the project to avoid impacts to all or a portion of the aquatic resource areas.

Minimization - Minimization of impacts (direct and indirect) to aquatic resources means that measures are taken to ensure the amount and duration of impacts are limited to the maximum extent practicable. There are many minimization measures that could be implemented, prior to, during, or after the proposed activity, to ensure impacts are minimized. Examples include, but are not limited to:

- Permanent preservation of avoided aquatic features and buffer zone, in perpetuity. In these cases, the preserved area would be under a conservation easement and managed by conservation oriented third-party manager.
- Utilization of best management practices (BMPs) to ensure impacts are limited, and do not result in adverse impacts to the integrity and long-term functions of preserved/avoided features.

Compensatory Mitigation - Compensatory mitigation is generally required for PCN activities in which the impacts to the aquatic resources have been avoided and minimized to the maximum extent practicable but would still result in unavoidable adverse effects to the environment that are considered more than minimal or are contrary to the public interest. *Whatever the case may be, compensatory mitigation is no substitute for avoidance and minimization.*

2. Thresholds for Compensatory Mitigation

The basic objective of compensatory mitigation in the USACE Regulatory Program is to offset environmental losses resulting from unavoidable impacts to waters of the U.S. authorized by Department of the Army permits. **The following compensatory mitigation thresholds apply to all PCN activities that result in loss¹ of the resource area types listed below. Activities² in waters of the U.S. associated with the restoration, enhancement, and establishment of tidal and non-tidal aquatic resources are not considered loss and are not subject to the thresholds below.** Thresholds for different resource areas may not be combined to exceed 5,000 SF of total loss of all waters. The USACE will continue to evaluate projects on a case-by-case basis, and may in some cases require compensatory mitigation below these thresholds (e.g. minor impacts that add to a cumulative loss).

¹ See definition of loss in Section VII.

² These activities must result in net increases in aquatic resource functions and services to be exempted from the thresholds above.

Compensatory Mitigation Thresholds in Massachusetts		
Resource Area	Non-Tidal Threshold	Tidal Threshold
Stream	200 LF	200 LF
Bank Stabilization	500 LF	500 LF
Open Water	Project Dependent	Project Dependent
Wetland	5,000 SF	500 SF
Vernal Pool	All	N/A
SAV	Project dependent	25 SF
Mudflat	N/A	1,000 SF
Intertidal	N/A	1,000 SF

These thresholds can be utilized to determine at what point compensatory mitigation is required but are not used to determine how much mitigation may be needed to offset impacts to resources. Per the 2008 Mitigation Rule (33 CFR 332.3(f)(1)) “the amount of required compensatory mitigation must be, to the extent practicable, sufficient to replace lost aquatic resource functions. In cases where appropriate functional or condition assessment methods or other suitable metrics are available, these methods should be used where practicable to determine how much compensatory mitigation is required. If a functional or condition assessment or other suitable metric is not used, a minimum one-to-one acreage or linear foot compensation ratios must be used.”

3. Compensatory Mitigation Hierarchy

Compensatory mitigation should follow the hierarchy as outlined in 33 CFR 332.3(b)(2-6) or current regulation. This hierarchy in order of preference includes: (1) Mitigation Bank credits, (2) In-Lieu Fee program credits, (3) permittee-responsible mitigation under a watershed approach, (4) permittee-responsible mitigation through on-site and in-kind mitigation, and (5) permittee-responsible mitigation through off-site and/or out-of-kind mitigation. If the proposed mitigation deviates from this mitigation hierarchy, the applicant **must** justify in writing why the proposed mitigation is environmentally preferable to the preferred method of compensatory mitigation (See 2008 Mitigation Rule). **In order for your application to be considered complete, you must provide a statement that discusses how your project will compensate for the loss or impact to aquatic resources.** If you are proposing permittee responsible mitigation, the 12 components of a mitigation plan (33 CFR 332.4(c)(2-14) must be addressed for your application to be considered complete. Prospective applicants are encouraged to contact USACE with questions at any time. Addressing the 12 components of a mitigation plan is commensurate with the amount of compensatory mitigation required, and USACE can assist prospective applicants with the level of information needed to satisfy each component.

For activities resulting in the loss of marine or estuarine resources, permittee-responsible mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee.

4. In-Lieu Fee (ILF)

The purchase of credits from the Massachusetts In-Lieu Fee Program (MA ILFP) is the **preferred** method of compensatory mitigation in Massachusetts since, as of the issuance date of this GP, there are no mitigation banks available in Massachusetts. The applicant shall develop a mitigation plan that addresses the baseline conditions at the impact site and the number of credits to be provided (see 33 CFR 332.4(c)(1)(ii)).

The MA ILFP is administered by the Massachusetts Department of Fish & Game (DFG) in accordance with the 2008 Mitigation Rule at 33 CFR 332. The Mitigation Rule governs in-lieu fee compensatory mitigation associated with USACE permits under §404 of the Clean Water Act and/or §9 or §10 of the Rivers and Harbors Act of 1899.

MA ILFP Website: <https://www.mass.gov/in-lieu-fee-program>

Acceptance of an ILF payment into the ILFP established by the 2014 MA ILFP Instrument (link below) is an acknowledgement by DFG that it assumes all legal responsibility for satisfying the mitigation requirements of the USACE (i.e., the implementation, performance, and long-term management and monitoring of the compensatory mitigation project(s) approved under this Instrument and subsequent Compensatory Mitigation Plans). This transfer of legal responsibility is established by: 1) the approval of this In-Lieu Fee Instrument; 2) receipt by the district engineer of a Notice of Credit Sale and Transfer of Legal Responsibility to DFG that is signed by the DFG and the permittee and dated; and 3) the transfer of fees from the permittee to DFG.

MA ILFP Fact Sheet: <https://www.mass.gov/files/documents/2017/01/sj/ilfp-fact-sheet-ma-ilfp-fees.pdf>

MA ILFP Instrument: <https://www.mass.gov/files/documents/2016/08/nd/ilfp-final-instrument-dfg.pdf>

5. Permittee-Responsible

The USACE may determine that the proposed permittee-responsible compensatory mitigation is appropriate on a case-by-case basis. As described in the Compensatory Mitigation Hierarchy section above, applicants must justify in writing why the proposed mitigation is environmentally preferable to the purchase of ILF credits. Applicants are encouraged to contact the USACE prior to submission of a permit application to seek further guidance regarding USACE mitigation requirements.

Applicants will demonstrate their proposed compensatory mitigation in writing by addressing the 12 components of a mitigation plan (33 CFR 332.4(c)(2-14)). *Please note that all elements must be addressed, or the permit application will be deemed incomplete.* In certain circumstances, the district engineer may determine that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation (see 33 CFR 332.3(k)(3)). Guidance on how to address these components can be found on the New England District Mitigation webpage: <https://www.nae.usace.army.mil/Missions/Regulatory/Mitigation/>

Performance standards will be used to measure the successfulness of the mitigation project. A successful mitigation project is one that is self-sustaining. For a mitigation project that will restore, enhance, or create wetlands, proper performance standards must address hydrology, hydric soils, and hydrophytic vegetation. The mitigation proposal must include an explanation of quantitative methods used to measure the success of performance standards (i.e., percent cover may be measured using vegetation plots, hydrology may be measured using data loggers, soil cores may be taken and evaluated for hydric soil indicators).

Monitoring methods should include quantitative sampling methods following established, scientific protocols. Sampling documentation, as part of monitoring reports, should include maps and coordinates (also shapefiles, if available) showing locations of sampling points, transects, quadrats, etc. In addition, permanent photo stations should be established coincident with sampling locations.

SECTION VI: FEDERAL & STATE AGENCY CONTACT INFORMATION & ORGANIZATIONAL WEBSITES

Federal Agencies

U.S. Army Corps of Engineers

Regulatory Division
696 Virginia Road
Concord, Massachusetts 01742-2751
(978) 318-8338 (phone); (978) 318-8303 (fax)
www.nae.usace.army.mil/missions/regulatory

National Marine Fisheries Service

55 Great Republic Drive
Gloucester, Massachusetts 01930
(978) 281-9300 (phone)
(*Federal endangered species & EFH*)

National Park Service

15 State Street
Boston, Massachusetts 02109
(617) 223-5191 (phone)
(*Wild and Scenic Rivers*)

Chief, Risk Analysis Branch

FEMA Region 1
99 High Street, 6th Floor
U.S. Department of Homeland Security
Boston, Massachusetts 02110
(617) 956-7576 (phone)

U.S. Environmental Protection Agency

5 Post Office Square
Suite 100 (OEP06-3)
Boston, Massachusetts 02109-3912
(617) 918-1692 (phone)

U.S. Army Corps of Engineers

Navigation Division – Section 408
696 Virginia Road
Concord, Massachusetts 01742-2751
See link below for contact information:
<https://www.nae.usace.army.mil/Missions/Section-408/>

U.S. Fish & Wildlife Service

70 Commercial Street, Suite 300
Concord, New Hampshire 03301
(603) 223-2541 (phone)
(*Federal endangered species*)

Bureau of Ocean and Energy Management

1849 C Street, NW
Washington D.C. 20240
202-208-6474 (phone)
(*Offshore Wind Facilities*)

Commander (dpb)

First Coast Guard District
Battery Building
One South Street
New York, New York 10004-1466
(212) 514-4331 (phone); (212) 514-4337 (fax)
(*Bridge permits*)

State Agencies in Massachusetts

<u>Massachusetts Department of Environmental Protection (MassDEP)</u>	
<u>DEP Division of Wetlands & Waterways</u>	100 Cambridge Street, Suite 900 Boston, Massachusetts 02114 (617) 292-5695
<u>Northeast Region</u>	150 Presidential Way, Suite 300 Woburn, Massachusetts 01801 (978) 694-3200
<u>Southeast Region</u>	20 Riverside Drive, Route 105 Lakeville, Massachusetts 02347 (508) 946-2800
<u>Central Region</u>	8 New Bond Street Worcester, Massachusetts 01606 (508) 792-7650
<u>Western Region</u>	436 Dwight Street Springfield, Massachusetts 01103 (413) 784-1100

<u>Massachusetts Office of Coastal Zone Management (CZM)</u>	
Emails may be sent to: czm@mass.gov	
<u>MA Office of Coastal Zone Management</u>	100 Cambridge Street, Suite 900 Boston, Massachusetts 02114 (617) 626-1200
<u>North Shore Region</u>	2 State Fish Pier Gloucester, Massachusetts 01930 (978) 281-3972
<u>South Shore Region</u>	175 Edward Foster Road Scituate, Massachusetts 02066
<u>Cape Cod and Islands Region</u>	3195 Main Street, P.O. Box 220 Barnstable, MA 02630
<u>South Coastal Region</u>	81-B County Road, Suite E Mattapoisett, MA 02739

<u>Massachusetts Historical Commission (MHC)</u>	
Office Location:	220 Morrissey Boulevard Boston, Massachusetts 02125 (617) 727-8470

<u>Massachusetts Board of Underwater Archaeological Resources (BUAR)</u>	
Emails may be sent to: david.s.robinson@mass.gov	
Office Location:	100 Cambridge Street, Suite 900 Boston, Massachusetts 02114 (617) 626-1014

SECTION VII: Definitions & Acronyms

Artificial or Living Reef: A structure which is constructed or placed in waters for the purpose of enhancing fishery resources and commercial and recreational fishing opportunities.

Attendant Features: Occurring with or as a result of; accompanying.

Biodegradable: A material that decomposes into elements found in nature within a reasonably short period of time and will not leave a residue of plastic or a petroleum derivative in the environment after degradation. In contrast, degradable plastics break down into plastic fragments that remain in the environment after degradation. Examples of biodegradable materials include jute, sisal, cotton, straw, burlap, coconut husk fiber (coir) or excelsior. In contrast, degradable plastics break down into plastic fragments that remain in the environment after degradation. Photodegradable, UV degradable or Oxo-(bio)degradable plastics are not considered biodegradable under this GP.

Boating facilities: These provide, rent or sell mooring space, such as marinas, yacht clubs, boat yards, dockominiums, municipal facilities, land/home owners, etc. Not classified as boating facilities are piers shared between two abutting properties or municipal mooring fields that charge an equitable user fee based on the actual costs incurred.

Compensatory mitigation: The restoration (re-establishment or rehabilitation), establishment (creation), enhancement, and/or in certain circumstances preservation of aquatic resources for the purposes of offsetting unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved. Must comply with the applicable provisions of 33 CFR 332. See also the New England District Compensatory Mitigation Guidance at <http://www.nae.usace.army.mil/Missions/Regulatory/Mitigation.aspx>.

Construction mats: Constructions, swamp and timber mats (herein referred to as “construction mats”) are generic terms used to describe structures that distribute equipment weight to prevent wetland damage while facilitating passage and providing work platforms for workers and equipment. They are comprised of sheets or mats made from a variety of materials in various sizes. A timber mat consists of large timbers bolted or cabled together. Corduroy roads, which are not considered to be construction mats, are cut trees and/or saplings with the crowns and branches removed, and the trunks lined up next to one another. Corduroy roads are typically installed as permanent structures. Like construction mats, they are considered as fill whether they are installed temporarily or permanently.

Cumulative Impacts: The impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.1). Although the impact of a particular discharge may constitute a minor change in itself, the cumulative effect of numerous such piecemeal changes can result in a major impairment of the water resources and interfere with the productivity and water quality of existing aquatic ecosystems. See 40 CFR 230.11(g).

Currently serviceable: Useable as is or with some maintenance, but not so degraded as to essentially require reconstruction.

Dredging:

Improvement Dredging: For the purposes of these GPs, this is dredging deeper than previously authorized by the USACE and dredged under that authorization.

Maintenance Dredging: For the purposes of these GPs, this is dredging from an area previously authorized by the USACE and dredged under that authorization. The USACE may require proof of authorization and dredging. Maintenance dredging typically refers to the routine removal of accumulated sediment to maintain the design depths of serviceable navigation channels, harbors, marinas, boat launches and port facilities. Maintenance dredging is conducted for navigational purposes and does not include any expansion of the previously dredged area. The USACE may

review a maintenance dredging activity as new dredging if sufficient time has elapsed to allow for the colonization of SAS, shellfish, etc.

New Dredging: For the purposes of these GPs, this is a) first time the USACE authorizes dredging of a particular location or b) dredging has not occurred for an extended period of time, and this has allowed for aquatic resources (i.e., eelgrass, shellfish, etc.) to redevelop in the area.

Dredged material & discharge of dredged material: These are defined at 33 CFR 323.2(c) and (d). The term dredged material means material that is excavated or dredged from waters of the U.S.

Enhancement: The manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s) but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area.

Ephemeral stream: A stream with flowing water only during, and for a short duration, after precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

Erosion Controls: Appropriate soil erosion, sediment and turbidity controls include cofferdams, bypass pumping around barriers immediately up and downstream of the work footprint (i.e., dam and pump), installation of sediment control barriers (i.e., silt fence, vegetated filter strips, geotextile silt fences, filter tubes, erosion control mixes, hay bales or other devices) downhill of all exposed areas, stream fords, retention of existing vegetated buffers, application of temporary mulching during construction, phased construction, and permanent seeding and stabilization, etc.

Establishment (creation): The manipulation of the physical, chemical, or biological characteristics present to develop an aquatic resource that did not previously exist at an upland site.

Establishment results in a gain in aquatic resource area (33 CFR 332.2).

Expansions: Work that increases the footprint of fill, structures, depth of basin or drainage features, or floats, or slip capacity.

Essential Fish Habitat (EFH): The Federal Magnuson-Stevens Fishery Management and Conservation Act broadly defines EFH to include those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. See

www.greateratlantic.fisheries.noaa.gov/habitat for more information.

Fill material & discharge of fill material: Material placed in waters of the U.S. where the material has the effect of either replacing any portion of a water of the U.S. with dry land or changing the bottom elevation of any portion of a water of the U.S. Fill material does not include any pollutant discharged into the water primarily to dispose of waste. These are defined at 33 CFR 323.2 (e) & (f).

Federal navigation projects (FNPs): These areas are maintained by the USACE; authorized, constructed and maintained on the premise that they will be accessible and available to all on equal terms; and comprised of USACE Federal anchorages, Federal channels and Federal turning basins. The buffer zone is equal to three times the authorized depth of a FNP. The following are FNPs in MA and more information, including the limits, is provided at

www.nae.usace.army.mil/missions/navigation >> Navigation Projects:

Andrews River, Harwich, MA	Cross Rip Shoals, Nantucket	Gloucester Harbor and
Aunt Lydia's Cove	Sound	Annisquam River
Beverly Harbor	Cuttyhunk Harbor	Green Harbor
Boston Harbor	Dorchester Bay and Neponset	Hingham Harbor
Buttermilk Bay Channel	River	Hyannis Harbor
Canapitsit Channel	Duxbury Harbor	Ipswich River
Cape Cod Canal	Edgartown Harbor	Island End River (Chelsea, MA)
Chatham Harbor	Essex River	Kingston Harbor
Cohasset Harbor	Fall River Harbor	Lagoon Pond
	Falmouth Harbor	Little Harbor Woods Hole

Lynn Harbor	Plymouth Harbor	Taunton River
Malden River	Pollock Rip Shoals, Nantucket Sound	Vineyard Haven Harbor
Menemsha Creek	Provincetown Harbor	Wareham Harbor
Merrimack River	Red Brook Harbor	Wellfleet Harbor
Mystic River	Rockport Harbor	Westport River and Harbor
Nantucket Harbor of Refuge	Salem Harbor	Weymouth Back River
New Bedford and Fairhaven Harbor	Sandy Bay Harbor of Refuge	Weymouth Fore and Town Rivers
Newburyport Harbor	Saugus River	Winthrop Harbor
Oak Bluffs Harbor	Scituate Harbor	Woods Hole Channel
Pigeon Cove Harbor	Sesuit Harbor	

Flume: An open artificial water channel, in the form of a gravity chute, which leads water from a diversion dam or weir alongside a natural flow. A flume can be used to measure the rate of flow.

FNP buffer zone: The buffer zone of a USACE Federal Navigation Project (FNP) is equal to three times the authorized depth of the FNP.

Frac out: During horizontal directional drilling (HDD) operations, drilling fluid travels up the borehole into a pit. When the borehole becomes obstructed or the pressure becomes too great inside the borehole, the ground fractures and fluid escapes to the surface and may affect surface waters.

Ground disturbance: Any activity that compacts, relocates, overturns, removes, mixes, or otherwise disturbs the ground, including under water. Ground disturbance can be caused by the use of hand tools (shovels, pick axe, posthole digger, etc.), heavy equipment (excavators, backhoes, bulldozers, dredgers, trenching and earthmoving equipment, etc.), and heavy trucks (large four wheel drive trucks, dump trucks and tractor trailers, etc.). Trenching, bulldozing, dredging, excavating, scraping, and plowing are typical examples of ground disturbance activities.

Height:width ratio: The height of structures shall at all points be equal to or exceed the width of the deck. For the purpose of this definition, height shall be measured from the marsh substrate to the bottom of the longitudinal support beam.

High Tide Line (HTL): The line of intersection of the land with the water's surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high tides 58 that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds. (33 CFR 328). Refer to the highest predicted tide for the current year at the nearest NOAA tide gage. <https://tidesandcurrents.noaa.gov/map/index.html>

Historic Property: Any prehistoric or historic site (including archaeological sites), district, building, structure, or other object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria (36 CFR part 60).

Impacts:

Direct Impacts: Effects that are caused by the activity and occur at the same time and place (40 CFR 1508.7).

Indirect impacts: Effects that are caused by the activity and are later in time or farther removed in distance, but are still reasonably foreseeable.

Secondary impacts: Effects on an aquatic ecosystem that are associated with a discharge of dredged or fill materials, but do not result from the actual placement of the dredged or fill material.

Information about secondary effects on aquatic ecosystems shall be considered prior to the time final section 404 action is taken by permitting authorities. Some examples of secondary effects on an aquatic ecosystem are: aquatic areas drained, flooded, fragmented; fluctuating water levels in an impoundment and downstream associated with the operation of a dam; septic tank leaching and surface runoff from residential or commercial developments on fill; and leachate and runoff from a sanitary landfill located in waters of the U.S. See 40 CFR 230.11(h).

Incidental Fallback: Incidental fallback is the redeposit of small volumes of dredged material that is incidental to excavation activity in waters of the U.S. when such material falls back to substantially the same place as the initial removal (33 CFR 323.2(d)(2)(iii)).

In the dry: Work that is done under dry conditions, e.g., work behind cofferdams or when the stream or tide is waterward of the work.

Independent utility: A test to determine what constitutes a single and complete non-linear project in the USACE Regulatory Program. A project is considered to have independent utility if it would be constructed absent the construction of other projects in the project area. Portions of a multi-phase project that depend upon other phases of the project do not have independent utility. Phases of a project that would be constructed even if the other phases were not built can be considered as separate single and complete projects with independent utility.

Individual permit: A Department of the Army authorization that is issued following a case-by-case evaluation of a specific structure or work in accordance with the procedures of 33 CFR 322, or a specific project involving the proposed discharge(s) in accordance with the procedures of 33 CFR 323, and in accordance with the procedures of 33 CFR 325 and a determination that the proposed discharge is in the public interest pursuant to 33 CFR 320.

Intermittent stream: An intermittent stream has flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow.

Intertidal: The area in between mean low water and the high tide line.

Living reef: See the definition of “artificial or living reef.”

Living shoreline: A term used to describe a low-impact approach with a substantial biological component to shoreline protection and restoration along coastal shores, riparian zones, lacustrine fringe wetlands, or oyster or mussel reef structures. This approach integrates natural features to restore, enhance, maintain, or create habitat, functions, and processes while also functioning to mitigate flooding or shoreline erosion. Living shorelines may stabilize banks and shores with small fetch and gentle slopes that are subject to low-to mid-energy waves. A living shoreline has a footprint that is made up mostly of native material. It incorporates vegetation or other living, natural “soft” elements alone or in combination with some type of harder shoreline structure (e.g., oyster or mussel reefs or rock sills) for added protection and stability. Living shorelines should maintain the natural continuity of the land-water interface and retain or enhance shoreline ecological processes.

Loss of waters of the United States: Waters of the U.S. that are permanently adversely affected by filling, flooding, excavation, or drainage because of the regulated activity. The loss of stream bed includes the acres of stream bed that are permanently adversely affected by filling or excavation because of the regulated activity. Permanent adverse effects include permanent discharges of dredged or fill material that change an aquatic area to dry land, increase the bottom elevation of a waterbody, or change the use of a waterbody. The acreage of loss of waters of the U.S. is a threshold measurement of the impact to jurisdictional waters or wetlands for determining whether a project may qualify for a GP; it is not a net threshold that is calculated after considering compensatory mitigation that maybe used to offset losses of aquatic functions and services. Waters of the U.S. temporarily filled, flooded, excavated, or drained, but restored to pre-construction contours and elevations after construction, are not included in the measurement of loss of waters of the U.S. Impacts resulting from activities that do not require Department of the Army authorization, such as activities eligible for exemptions under section 404(f) of the Clean Water Act, are not considered when calculating the loss of waters of the U.S.

Maintenance: The repair, rehabilitation, or in-kind replacement of any previously authorized, currently serviceable structure or fill, or of any currently serviceable structure or fill authorized by 33 CFR 330.3 – “Activities occurring before certain dates,” provided that the structure or fill is not to be put to uses differing from those uses specified or contemplated for it in the original permit or the most recently authorized modification. Maintenance includes minor deviations in the structure’s configuration or filled area, including those due to changes in materials, construction techniques, or current construction codes or safety standards that are necessary to make repair, rehabilitation, or replacement are authorized. Currently serviceable means useable as is or with some maintenance, but not so degraded as to essentially require reconstruction.

Maintenance Exemption: In accordance with 33 CFR 323.4(a)(2), any discharge of dredged or fill material that may result from any of the following activities is not prohibited by or otherwise subject to regulation under Section 404 of the CWA: “Maintenance, including emergency reconstruction of recently damaged parts, of currently serviceable structures such as dikes, dams, levees, groins, riprap, breakwaters, causeways, bridge abutments or approaches, and transportation structures. Maintenance does not include any modification that changes the character, scope, or size of the original fill design.”

Mean high water: Line on the shore reached by the plane of the average high water. Where precise determination of the actual location of the line becomes necessary, it must be established by survey with reference to the available tidal datum, preferably averaged over a period of 18.6 years. Less precise methods, such as observation of the “apparent shoreline” which is determined by reference to physical markings, lines of vegetation, or changes in type of vegetation, may be used only where an estimate is needed of the line reached by the mean high water.

Mechanized land clearing: Land clearing activities using mechanized equipment such as backhoes or bulldozers with sheer blades, rakes or discs constitute point source discharges and are subject to section 404 jurisdiction when they take place in wetlands or waters of the U.S (Regulatory Guidance Letter 90-05).

Metallic mineral: Any ore or material to be excavated from the natural deposits on or in the earth for its metallic mineral content to be used for commercial or industrial purposes. “Metallic mineral” does not include thorium or uranium.

Minor deviations: Deviations in the structure’s configuration or filled area, including those due to changes in materials, construction techniques, or current construction codes or safety standards, which are necessary to make repair, rehabilitation, or replacement are permitted, provided the adverse environmental effects resulting from such repair, rehabilitation, or replacement are minimal.

Natural Rocky Habitats: Intertidal and subtidal substrates of pebble-gravel, cobble, boulder, or rock ledge and outcrops. Manufactured stone (e.g., cur or engineered riprap) is not considered a natural rocky habitat. Natural rocky habitats are either found as pavement (consolidated pebble-gravel, cobble, or boulder areas) or as a mixture with fines (i.e., clay and sand) and other substrates. Rocky habitats as EFH are defined as follows: (1) All pebble-gravel, cobble, or boulder pavements; (2) Pebble-gravel mixed with fines: mixed substrate of pebble-gravel and fines where pebble-gravel is an evident component of the substrate (either through visual observation or within sediment samples). Sediment samples with a content of 10% or more of pebble-gravel in the top layer (6-12 inches) should be delineated; (3) Scattered cobble, scattered boulder, scattered cobble/boulder: mixed substrate of cobble and/or boulder and other substrates. The aerial extent of cobbles and/or boulders should be delineated; and (4) All rock ledge outcrops: area should be delineated along the edge of the ledge/outcrop (as defined by NMFS Habitat and Ecosystems Services Branch, Gloucester, MA).

Navigable waters or Navigable waters of the U.S.: These waters are subject to section 10 of the Rivers and Harbors Act of 1899 and are defined as those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce (33 CFR Part 329). Work or structures in navigable

waters require permits pursuant to §9 and §10 of the Rivers and Harbors Act of 1899. Also see the definition of “waters of the U.S.” below.

Note: Currently the following non-tidal waters have been determined to be navigable waters of the U.S. subject to permit jurisdiction in Massachusetts: Merrimack River, Connecticut River, and Charles River to the Watertown Dam.

Nearshore disposal: This is defined in the USACE Coastal Engineering Manual as “(1) In beach terminology an indefinite zone extending seaward from the shoreline well beyond the breaker zone. (2) The zone which extends from the swash zone to the position marking the start of the offshore zone, typically at water depths of the order of 20m.” A nearshore berm is an artificial berm built in shallow water using dredged material. Often, the berm is intended to renourish the adjacent and downdrift shore over time under the influence of waves and currents.

Non-regulated activity: Only structures or fills that were previously authorized and are in compliance with the terms and condition of the original authorization can be maintained as a non-regulated activity under 33 CFR 323.4(a)(2). Minor deviations from the previously authorized footprint do not qualify as a non-regulated activity and require new authorization from the USACE. The state’s maintenance provisions may differ from the USACE and a project may require reporting and written authorization from the state.

Non-tidal wetlands: A non-tidal wetland is a wetland that is not subject to the ebb and flow of tidal waters. Non-tidal wetlands contiguous to tidal waters are located landward of the HTL (*i.e.*, spring HTL). Also see the definition of “Waters of the U.S.” below.

Oil or natural gas pipeline: Any pipe or pipeline for the transportation of any form of oil or natural gas, including products derived from oil or natural gas, such as gasoline, jet fuel, diesel fuel, heating oil, petrochemical feedstocks, waxes, lubricating oils, and asphalt.

Ordinary High Water Mark (OHWM): A line on the shore established by the fluctuations of water and indicated by physical characteristics, or by other appropriate means that consider the characteristics of the surrounding areas. See 33 CFR 328.3(e).

Overall project: The overall project, for purposes of these GPs, includes all regulated activities that are reasonably related and necessary to accomplish the project purpose. Also see the definition of “single and complete linear project.”

Perennial stream: A perennial stream has flowing water year-round during a typical year. The water table is located above the stream bed for most of the year. Groundwater is the primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow.

Practicable: Available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

Permanent impacts: Permanent impacts means waters of the U.S. that are permanently affected by filling, flooding, excavation, or drainage because of the regulated activity. Permanent impacts include permanent discharges of dredged or fill material that change an aquatic area to dry land, increase the bottom elevation of a waterbody, or change the use of a waterbody.

Preconstruction notification (PCN): A request submitted by the applicant to the USACE for confirmation that a particular activity is authorized by these GPs. The request may be a permit application, letter, or similar document that includes information about the proposed work and its anticipated environmental effects. Preconstruction notification may be required by the terms and conditions of these GPs. A PCN may be voluntarily submitted in cases where PCN is not required and the applicant wants confirmation that the activity is authorized under these GPs.

Preservation: The removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms. Preservation does not result in a gain of aquatic resource area or functions (33 CFR 332.2).

Real estate subdivision: Includes circumstances where a landowner or developer divides a tract of land into smaller parcels for the purpose of selling, conveying, transferring, leasing, or

developing said parcels. This would include the entire area of a residential, commercial or other real estate subdivision, including all parcels and parts thereof

Reconfiguration zone: A USACE authorized area in which permittees may rearrange pile-supported structures and floats without additional authorizations. A reconfiguration zone does not grant exclusive privileges to an area or an increase in structure or float area.

Re-establishment: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/ historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in again in aquatic resource area and functions (33 CFR 332.2).

Reference Site: Reference sites - Compensatory restoration, rehabilitation, and creation mitigation projects should seek to duplicate the features of reference aquatic resources or enhance connectivity with adjacent natural upland and aquatic resource landscape elements. Performance standards related to reference sites are encouraged. Mitigation project sites must be selected based on their ability to be, and continue to be, resistant to disturbance from the surrounding landscape, by locating them adjacent to refuges, buffers, green spaces, and other preserved natural elements of the landscape. In general, aquatic resource mitigation projects must be designed to be self-sustaining, natural systems within the landscape and climate in which they are located, with little or no ongoing maintenance and/or hydrologic manipulation.

Rehabilitation: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource area (33 CFR 332.2).

Restoration: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: re-establishment and rehabilitation (33 CFR 332.2).

Riffle and pool complex: Riffle and pool complexes are special aquatic sites under the 404(b)(1) Guidelines. Riffle and pool complexes sometimes characterize steep gradient sections of streams. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of water over a coarse substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. A slower stream velocity, a streaming flow, a smooth surface, and a finer substrate characterize pools.

Sedimentation: Sedimentation is defined as the process of deposition of a solid material from a state of suspension. Deposited sediments may accumulate and have temporal impacts to aquatic resource areas. See secondary effects definition above. For the purposes of this document, “greater than minimal sedimentation” is generally not considered to occur when using proper erosion controls (GC 25) or when sedimentation is considered “de minimis” 33 CFR 323.2(d)(5).

Single and complete linear project: A linear project is a project constructed for the purpose of getting people, goods, or services from a point of origin to a terminal point, which often involves multiple crossings of one or more waterbodies at separate and distant locations. The term “single and complete project” is defined as that portion of the total linear project proposed or accomplished by one owner/ developer or partnership or other association of owners/developers that includes all crossings of a single water of the U.S. (i.e., a single waterbody) at a specific location. For linear projects crossing a single or multiple waterbodies several times at separate and distant locations, each crossing is considered a single and complete project for the purposes of these GPs. However, individual channels in a braided stream or river, or individual arms of a large, irregularly shaped wetland or lake, etc., are not separate waterbodies, and crossings of such features cannot be considered separately.

Single and complete non-linear project: For non-linear projects, the term “single and complete project” is defined at 33 CFR 330.2(i) as the total project proposed or accomplished by one owner/developer or partnership or other association of owners/developers. A single and complete

non-linear project must have independent utility (see the definition of “independent utility”). Single and complete non-linear projects may not be “piecemealed” to avoid the limits in a GP authorization.

Special aquatic sites (SAS): These include inland and saltmarsh wetlands, mud flats, vegetated shallows, sanctuaries and refuges, coral reefs, and riffle and pool complexes. These are defined at 40 CFR 230.3 and listed in 40 CFR 230 Subpart E.

Streambed: The stream substrate between the OHW marks on each side. The substrate may be bedrock or inorganic particles that range in size from clay to boulders. Wetlands contiguous to the streambed, but outside of the OHW marks, are not considered part of the streambed.

Stream channelization: The manipulation of a stream’s course, condition, capacity, or location that causes more than minimal interruption of normal stream processes. A channelized stream remains a water of the U.S.

Structure: An object that is arranged in a definite pattern of organization. Examples of structures include, without limitation, any pier, boat dock, boat ramp, wharf, dolphin, weir, boom, breakwater, bulkhead, revetment, riprap, jetty, artificial island, artificial reef, permanent mooring structure, power transmission line, permanently moored floating vessel, piling, aid to navigation, or any other manmade obstacle or obstruction.

Temporal loss: The time lag between the loss of aquatic resource functions caused by the permitted impacts and the replacement of aquatic resource functions at the compensatory mitigation site(s) (33 CFR 332.2).

Temporary impacts: Temporary impacts include, but are not limited to, jurisdictional waters that are temporarily filled, flooded, excavated, or drained because of the regulated activity. Impacts are considered temporary when they are removed immediately upon completion of the activity. Note: An impact is considered temporary when the aquatic resource is restored to pre-project conditions, but effects to archaeological and/or cultural resources may be permanent in duration.

Tidal wetlands: A wetland that is subject to the ebb and flow of the tide. See the definition of “Waters of the U.S.” below.

Tide gates: Structures such as duckbills, flap gates, manual and self-regulating tide gates, etc. that regulate or prevent upstream tidal flows.

Turbidity: A measure of the level of particles such as sediment, plankton, or organic by-products, in a body of water. As the turbidity of water increases, it becomes denser and less clear due to a higher concentration of these light-blocking particles. Suspended solids are more likely to carry toxic chemicals, and can also negatively affect aquatic organisms, water temperature, and dissolved oxygen levels.

Utility line: Any pipe or pipeline for the transportation of any gaseous, liquid, liquescent, or slurry substance, for any purpose that is not oil, natural gas, or petrochemicals. A utility line also includes any cable, line, or wire for the transmission for any purpose of electrical energy, telephone, and telegraph messages, and radio and television communication. The term ‘utility line’ does not include activities that drain a water of the U.S., such as drainage tile or French drains, but it does apply to pipes conveying drainage from another area.

Vegetated shallows: Permanently inundated areas that under normal circumstances support communities of rooted aquatic vegetation, such as eelgrass (*Zostera marina*) and widgeon grass (*Ruppia maritima*) in marine systems (does not include salt marsh) as well as a number of freshwater species in rivers and lakes. These are a type of SAS defined at 40 CFR 230.43. Vegetated shallows are commonly referred to as submerged aquatic vegetation or SAV. Vegetated shallow survey guidance is located at www.nae.usace.army.mil/missions/regulatory/jurisdiction-and-wetlands. Maps of vegetated shallows in Massachusetts are located at www.nae.usace.army.mil/missions/regulatory/state-general-permits/massachusetts-general-permit.

Vernal pools: For the purposes of these GPs, vernal pools are depressional wetland basins that typically dry up in most years and may contain inlets or outlets, typically of intermittent flow. Vernal pools range in both size and depth depending upon landscape position and parent material(s). In

most years, vernal pools support one or more of the following obligate indicator species: wood frog, spotted salamander, blue-spotted salamander, marbled salamander, Jefferson's salamander and fairy shrimp. However, they should preclude sustainable populations of predatory fish.

Water diversions: Water diversions are activities such as bypass pumping (e.g., "dam and pump") or water withdrawals. Temporary flume pipes, culverts or cofferdams where normal flows are maintained within the stream boundary's confines aren't water diversions. "Normal flows" are defined as no change in flow from pre-project conditions.

Waters of the United States (U.S.) These waterbodies are the waters where permits are required for the discharge of dredged or fill material pursuant to §404 of the CWA. These waters include but are not limited to navigable waters of the U.S. and tidal wetlands and include many non-tidal wetlands and other waterbodies. See definitions for navigable waters of the U.S., tidal wetlands, waterbody, and non-tidal wetlands. (33 CFR 328)

Waterbody: Examples of "waterbodies" include oceans, coastal waters, rivers, streams, ditches, lakes, ponds, and wetlands. If a wetland is adjacent to a waterbody determined to be a water of the U.S., that waterbody and any adjacent wetlands are considered together as a single aquatic unit (see 33 CFR 328.4(c)(2)).

Weir: A barrier across a river designed to alter the flow characteristics. In most cases, weirs take the form of a barrier, smaller than most conventional dams, across a river that causes water to pool behind the structure and allows water to flow over the top. Weirs are commonly used to alter the flow regime of a river, prevent flooding, measure discharge and help render a river navigable.

Wetland: Wetlands are areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. The Corps of Engineers Wetlands Delineation Manual in conjunction with the associated regional supplement should be used to determine if a wetland is present and delineate wetland boundaries.

Acronyms

BMPs	Best Management Practices
BUAR	Massachusetts Board of Underwater Archaeological Resources
CWA	Clean Water Act
CZM	Coastal Zone Management
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
EFH	Essential Fish Habitat
FNP	Federal Navigation Project
GC	General Condition
GP	General Permit
HTL	High Tide Line
IP	Individual Permit
LID	Low impact development
MassDEP	Massachusetts Department of Environmental Protection
MA DMF	Massachusetts Division of Marine Fisheries
MHC	Massachusetts Historical Commission
MHW	Mean High Water
MLLW	Mean Lower Low Water
MLW	Mean Low Water
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
OHW	Ordinary High Water Mark
PCN	Preconstruction Notification
SAS	Special Aquatic Sites
SF	Square Feet
SV	Self-Verification
SHPO	State Historic Preservation Officer
THPO	Tribal Historic Preservation Officer
USFWS	U.S. Fish and Wildlife Service
USCG	U.S. Coast Guard
USFS	U.S. Forest Service
USGS	U.S. Geological Service
WQC	Water Quality Certification

Appendix A: Guidance for NHPA Section 106 Compliance in Massachusetts

1. Purpose & Applicability

Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA) (54 U.S.C § 306108), requires Federal agencies to take into account the effects of their undertakings on Historic Properties and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings. Therefore, in order for an activity to be eligible for authorization under the 2023 Massachusetts General Permit, the USACE must consider the effect the activity may have on historic properties. Historic properties may include, but are not limited to, historic districts, archaeological districts, sites, buildings, structures, objects, sacred sites, traditional cultural places, and traditional cultural landscapes that are included in, or eligible for inclusion in, the National Register of Historic Places (NRHP).

This guidance applies to projects that require authorization under Section 404 of the Clean Water Act (33 U.S.C. § 1344) and/or Section 10 of the Rivers and Harbors Act (33 U.S.C. §403) and will assist applicants when evaluating and documenting the presence of historic properties within or near their project site(s). The prospective applicant will evaluate their proposed project using the criteria below to determine if their project has the potential to affect historic properties and if so, whether or not historic properties are present or are likely to be present. All activities authorized under these GPs shall follow the terms outlined in General Condition 14: Historic Properties and General Condition 6: Tribal Rights & Burial Sites. Prospective applicants shall complete their due diligence according to the procedures below for their application to be deemed complete.

2. No Potential to Affect Historic Properties

Certain activities do not have the potential to cause effects on historic properties, assuming such historic properties were present, based on the nature of the activity and site-specific conditions. Therefore, these activities **do not** require historic property identification efforts or notification of the SHPO, THPOs, and/or BUAR under Section 106. The USACE has determined the following activities within the stated parameters have no potential to affect historic properties:

General Permit	Activity Parameters
1	Temporary buoys, markers and similar structures that are placed during winter events on ice and removed before spring thaw.
2	Repair or rehabilitation of structures that are less than 45 years in age. Any temporary structures or fills or work necessary to complete repairs or rehabilitation must not result in any ground disturbance.
3	Maintenance and replacement of moorings that are less than 45 years in age.
6	Maintenance, repair, replacement, or removal of utility lines, oil or natural gas pipelines, outfall or intake structures, and/or appurtenant features that are less than 45 years in age when all access, staging, and ground disturbance is strictly limited to previously disturbed areas (including any previous ground disturbance). Replacement must be in kind or smaller in size. Installation of tide gates on outfall structures that are less than 45 years in age.
7	Maintenance dredging of previously dredged areas where dredging does not extend beyond the original bottom elevations.

	Disposal of dredged material at an existing established and USACE-approved confined aquatic disposal cell. Beach nourishment in ongoing existing nourishment areas.
11	Fish and wildlife harvesting and attraction devices and activities.
13	Cleanup of hazardous and toxic waste materials, including contaminated sediments, that are less than 45 years in age.
16	Removal of land-based and water-based renewable energy generation facilities and hydropower projects that are less than 45 years in age.
18	Installation of buoys, floats, racks, trays, nets, lines, tubes, containers, and other structures for previously authorized by the USACE and ongoing aquaculture activities. Discharges of dredged or fill material into tidal or non-tidal waters necessary for shellfish seeding, rearing, cultivating, transplanting, and harvesting activities for previously authorized and ongoing aquaculture activities.
20	Maintenance activities for existing living shorelines <u>excluding</u> maintenance activities that require new ground disturbance such as excavation or re-sloping of the bank/shoreline.
22	Reshaping or maintenance of existing drainage ditches less than 45 years in age <u>excluding</u> ditch enlargement.
23	Placement of temporary and removable linear transportation and wetland/stream crossings that have no ground disturbance prior to placement, during placement, and during removal (i.e., placed on the surface and subsequently removed within one year of placement).
24	Placement of temporary and removable crossings and cofferdams that have no ground disturbance prior to placement, during placement, and during removal (i.e., placed on the surface and subsequently removed within one year of placement).
25	Emergency repair of existing structures and/or fills less than 45 years in age.

3. Historic Property Identification

If the activity does not fit under the criteria above, the following historic property identification efforts must be completed to demonstrate compliance with Section 106 of the NHPA. This includes documenting previously identified and unidentified historic properties in the project area.

a. Previously Identified Historic Properties: The prospective applicant shall document if previously identified historic properties are present on or adjacent to the project site by notifying the Massachusetts Historical Commission (MHC) and the Massachusetts Board of Underwater Archaeological Resources (BUAR), as appropriate, of the proposed project. The MHC and BUAR will check their records for the presence of any previously identified historic properties. The following outlines how prospective applicants should notify the MHC and BUAR.

i. The prospective applicant will notify the SHPO and BUAR to identify any previously recorded cultural resources. Applicants shall mail a completed Project Notification Form¹⁸, project narrative, location (coordinates), plans, soil maps, and information on known cultural resources to the MHC. The MHC does not accept submissions via email. Applicants shall email or mail this information to the BUAR when the activity is located in lakes, ponds, rivers, and/or navigable waters in MA. Emailed file attachments should be <10MB. Any files >10MB shall be delivered via a file exchange system or the hard copy documents shall be mailed. Preferred contact information is listed below.

ii. **When sending this information, applicants must also document proof of receipt OR proof the information was delivered.** Proof of receipt constitutes a certified mail receipt, read email receipt, or other mail/email/online tracking services that document the information has reached the intended recipient(s). Proof the information was delivered constitutes a certificate of mailing, email delivery receipt, or other mail/email/online services that document the information was sent at a particular time. When using proof of delivery such (e.g., certificate of mailing), applicants should add 5 days to the 30-day notification period so the mail has time to reach its intended recipient. When using proof of receipt, the applicant may begin the 30-day notification period from the date received by the intended recipient.

iii. When mailing or emailing the application materials, applicants should include the following statement: "Please send responses to this notification directly to the USACE via email: cenae-r-ma@usace.army.mil or address regular mail responses to: Regulatory Division, U.S. Army Corps of Engineers, New England District, 696 Virginia Road, Concord, Massachusetts 01742-2751." Email responses to the USACE are strongly preferred. The SHPO and BUAR will contact the USACE and cc the applicant(s) within 30 days of receiving the notification if their records indicate that historic properties are located in the project vicinity, and if additional review and/or surveys are recommended to ensure NHPA compliance. If the SHPO and/or BUAR do not respond within 30 days of receiving the notification, it is presumed that no known historic properties are present.

b. Previously Unidentified Historic Properties: The prospective applicant shall evaluate the project site and determine the sensitivity for the presence of historic properties if the project site has not been previously surveyed for cultural resources within the last 10 years. If the sensitivity is determined to be moderate to high, an intensive archaeological and/or architectural survey is required to investigate the potential presence of historic properties. The individual conducting this survey must meet the Secretary of the Interior's Standards for Professional Qualifications (48 FR 44738-44739) in the discipline relevant to a particular resource type. For example, archeologists should not document and evaluate buildings or structures and architectural historians should not document and evaluate archaeological sites. The identification and qualifications for those participating in any survey and evaluation of resources should be included with the survey results. The criteria listed below are indicators of low sensitivity for the presence of historic properties for consideration when determining if an archaeological or architectural survey is needed.

Low sensitivity indicators:

- Previous archaeological and/or architectural survey within the last 10 years with negative results.
- In a location created in modern times (i.e., built on fill placed within the last 45 years or within an area excavated within the last 45 years).
- USACE has reviewed the project description and determined that a survey is not warranted based on the proposed activity and its location.

State survey guidance and standards are provided in the September 1995 Historic Properties Survey Manual Guidelines for the Identification of Historical and Archaeological Resources in Massachusetts available. State survey guidance and standards for underwater surveys are provided

¹⁸ <https://www.sec.state.ma.us/mhc/mhcform/formidx.htm>

in the Board of Underwater Archaeological Resources' 2022 Policy Guidance on Archaeological Investigations and Related Survey Standards for the Discovery of Underwater Archaeological Resources. This guidance is available on the NAE Regulatory website: <https://www.nae.usace.army.mil/Missions/Regulatory/State-General-Permits/Massachusetts-General-Permit/>.

Please note, a negative result from MHC and/or BUAR does not necessarily mean no historic properties are present. Often proposed project sites have not been previously subject to a survey, so historic properties which may be present have not been previously recorded.

4. Tribal Coordination

Prospective applicants shall mail the Project Notification Form, project narrative, location (coordinates), plans with locus map, soil maps, and information on cultural resources to the Wampanoag Tribe of Gay Head (Aquinnah), Mashpee Wampanoag Tribe, Narragansett Indian Tribe, and/or Stockbridge-Munsee Community Band of Mohican Indians with interests in the project location. Preferred tribal contact information, including their respective areas of interest, can be found below. Applicants shall follow the same procedures as identified in Section 3(a)i-iii above when notifying Tribes of the proposed activity. Applicants shall provide the USACE with any responses received from the tribe(s) with their PCN application. If a tribe does not respond within 30 days of receiving the notification, the applicant shall provide USACE with all documentation of tribal outreach with their SV or PCN submission (e.g., emails, letters, phone call log, etc.). If the tribe indicates the presence of a previously unrecorded cultural resource, including a traditional cultural property (TCP) or traditional cultural landscape (TCL), a PCN is required.

5. Effect Determination

The project may have the potential to affect historic properties and/or tribal resources if 1) notification recipients respond within 30 calendar days of notification with concerns, 2) historic properties eligible for listing, or potentially eligible for listing in the NRHP, are present or 3) tribal resources are known to be present. The USACE may need to further review the project to confirm potential effects to historic properties and/or tribal resources. A PCN is required for any activity that may affect a historic property.

The USACE may determine the project will have 'no effect' on historic properties (i.e., no historic properties affected) when procedures outlined in Section 3 above are followed and no cultural resources are identified. Similarly, if historic properties are identified and will be completely avoided, the USACE may determine 'no effect.'

6. Contact Information:

Massachusetts Historical Commission

The Massachusetts Archives Building
220 Morrissey Boulevard
Boston, Massachusetts 02125

No email. Applicants or their representatives must send project information via certified mail and submit the certified mail receipt to the USACE or send via regular mail and submit proof of delivery.

Area of concern: All of Massachusetts.

Massachusetts Board of Underwater Archaeological Resources (BUAR)

100 Cambridge Street, Suite 900
Boston, Massachusetts 02114
Email: david.s.robinson@mass.gov

Applicants or their representatives must send project information via email (***strongly preferred***) or regular mail and provide proof of receipt or proof of delivery.

Area of concern: All waterbodies in Massachusetts.

Wampanoag Tribe of Gay Head (Aquinnah)

Bettina Washington
Tribal Historic Preservation Officer (THPO)
20 Black Brook Road
Aquinnah, Massachusetts 02535
Email: thpo@wampanoagtribe-nsn.gov

Applicants or their representative must send project information via email (***preferred***) or regular mail and provide proof of receipt or proof of delivery.

Area of concern: All of Massachusetts.

Mashpee Wampanoag Tribe

ATTN: David Weeden
Tribal Historic Preservation Officer (THPO)
483 Great Neck Road South
Mashpee, Massachusetts 02649
Email: 106review@mwtribe-nsn.gov
Cc: David.weeden@mwtribe-nsn.gov

Applicants or their representative must send project information via email (***preferred***) or regular mail and provide proof of receipt or proof of delivery.

Area of concern: All of Massachusetts.

Narragansett Indian Tribe

ATTN: John Brown
Tribal Historic Preservation Officer (THPO)
Narragansett Indian Longhouse
4425 South County Trail
Charlestown, Rhode Island 02813
Email: tashtesook@aol.com

Applicants or their representative must send project information via email (***preferred***) or regular mail and provide proof of receipt or proof of delivery.

Area of concern: Massachusetts east of the Connecticut River.

Stockbridge-Munsee Community Band of Mohican Indians

ATTN: Jeff Bendremer
Tribal Historic Preservation Manager
Stockbridge-Munsee Community
Tribal Historic Preservation Extension office
86 Spring Street
Williamstown, Massachusetts 01267
Email: thpo@mohican-nsn.gov

Applicants or their representative must send project information via email (***preferred***) or regular mail and provide proof of receipt or proof of delivery.

Area of concern: West of the Connecticut River and Northfield, Montague, Miller's Falls, Turner's Falls, Sunderland, Amherst, Hadley, South Hadley, Chicopee, Springfield and Longmeadow.

APPENDIX B PRE-CONSTRUCTION NOTIFICATION

U.S. Army Corps of Engineers (USACE), New England District (NAE)
PRE-CONSTRUCTION NOTIFICATION (PCN)

DATA REQUIRED BY THE PRIVACY ACT OF 1974

Authority	Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332.
Principal Purpose	The information provided will be used in evaluating activities under Pre-Construction Notification procedures within New England.
Routine Uses	This information may be shared with other federal, state, and local government agencies during the application review process. Submission of requested information is voluntary. However, if information is not provided the PCN application cannot be fully evaluated nor can USACE render a permit decision.
Instructions	The applicant must complete ALL required sections of this document before their submission to USACE. The PCN submission to USACE shall include one set of drawings which show the location and character of the proposed activity, statements that address each required field below, and documentation that supports each field (e.g., emails, letters, description/narrative, phone calls, surveys, reports, etc.). Electronic submissions to the following address are strongly preferred: cenae-r-ma@usace.army.mil . The email subject line shall contain the following: General Permit #, PCN, City/Town, and date submitted. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY USACE)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE
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(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME First - Middle - Last - Company - E-mail Address -	8. AUTHORIZED AGENT'S NAME AND TITLE (<i>agent is not required</i>) First - Middle - Last - Company - E-mail Address -
6. APPLICANT'S ADDRESS: Address- City - State - Zip - Country -	9. AGENT'S ADDRESS: Address- City - State - Zip - Country -
7. APPLICANT'S PHONE NOs. with AREA CODE a. Residence b. Business c. Fax d. Mobile	10. AGENT'S PHONE NOs. with AREA CODE a. Residence b. Business c. Fax d. Mobile

STATEMENT OF AUTHORIZATION

11. I hereby authorize, _____ to act on my behalf as my agent in the processing of this general permit PCN application and to furnish, upon request, supplemental information in support of this general permit PCN application.

SIGNATURE OF APPLICANT

DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME or TITLE (*see instructions*)

13. NAME OF WATERBODY, IF KNOWN (*if applicable*)

14. PROPOSED ACTIVITY STREET ADDRESS (*if applicable*)

15. LOCATION OF PROPOSED ACTIVITY (*see instructions*)

Latitude: °N Longitude: °W

City: State: Zip:

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (*see instructions*)

State Tax Parcel ID:

Municipality:

Section:

Township:

Range:

17. DIRECTIONS TO THE SITE.

18. IDENTIFY THE SPECIFIC GENERAL PERMIT(S) YOU PROPOSE TO USE:

19. DESCRIPTION OF PROPOSED GENERAL PERMIT ACTIVITY (*see instructions*)

20. DESCRIPTION OF PROPOSED MITIGATION MEASURES (*see instructions*)

21. PURPOSE OF GENERAL PERMIT ACTIVITY (*Describe the reason or purpose of the project, see instructions*)

22. Quantity of Wetlands, Streams, or Other Types of Waters Directly Affected by Proposed General Permit Activity (*see instructions*)

Area (square feet)	Length (linear feet)	Volume (cubic yards)	Duration	Purpose

Each PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site.

23. List any other GP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project on any related activity (*see instructions*)

24. If the proposed activity will result in the loss of aquatic resources that exceed those identified in the New England District Compensatory Mitigation Thresholds, explain how the compensatory mitigation requirement will be satisfied. (*see instructions*)

25. Is Any Portion of the General Permit Activity Already Complete? <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, describe the completed work:			
26. List the name(s) of any species listed as endangered or threatened under the Endangered Species Act that might be affected by the proposed GP activity or utilize the designated critical habitat that might be affected by the proposed GP activity. (<i>see instructions</i>)			
27. List any historic properties that have the potential to be affected by the proposed GP activity or include a vicinity map indicating the location of the historic property or properties. Attach relevant project information, along with any responses received from project notifications to this submittal. (<i>see instructions</i>)			
28. For a proposed GP activity that will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, identify the Wild and Scenic River or the "study river":			
29. If the proposed GP activity also requires permission from the USACE pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers federally authorized civil works project, have you submitted a written request for section 408 permission from the USACE district having jurisdiction over that project? <input type="checkbox"/> Yes <input type="checkbox"/> No If "yes", please provide the date your request was submitted to the USACE District:			
30. Does the activity require a 401 Water Quality Certification (WQC)? If so, specify the type of 401 WQC that is required (general or individual). In cases where an individual 401 WQC is required, provide the date the 401 WQC certification request was submitted to the certifying authority and their contact information.			
31. If the terms of the GP(s) you want to use require additional information to be included in the PCN (i.e. sampling and analysis plan), please include that information in this space or provide it on an additional sheet of paper marked Block 30. (<i>see instructions</i>)			
32. I certify that the information in this pre-construction notification is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.			
SIGNATURE OF APPLICANT		DATE	
SIGNATURE OF AGENT		DATE	
The Pre-Construction Notification must be signed by the person who desires to undertake the proposed activity (applicant) and, if the statement in block 11 has been filled out and signed, the authorized agent. 18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than \$10,000 or imprisoned not more than five years or both.			

**Instructions for Preparing a
Department of the Army
General Permit (GP) Pre-Construction Notification (PCN)**

Blocks 1 through 4. To be completed by the U.S. Army Corps of Engineers.

Block 5. Applicant' Name. Enter the name and the e-mail address of the responsible party or parties. If the responsible party is an agency, company, corporation, or other organization, indicate the name of the organization and responsible officer and title. If more than one party is associated with the PCN, please attach a sheet of paper with the necessary information marked Block 5.

Block 6. Address of Applicant. Please provide the full address of the party or parties responsible for the PCN. If more space is needed, attach an extra sheet of paper marked Block 6.

Block 7. Applicant Telephone Number(s). Please provide the telephone number where you can usually be reached during normal business hours.

Blocks 8 through 11. To be completed, if you choose to have an agent.

Block 8. Authorized Agent's Name and Title. Indicate name of individual or agency, designated by you, to represent you in this process. An agent can be an attorney, builder, contractor, engineer, consultant, or any other person or organization. Note: An agent is not required.

Blocks 9 and 10. Agent's Address and Telephone Number. Please provide the complete mailing address of the agent, along with the telephone number where they can be reached during normal business hours.

Block 11. Statement of Authorization. To be completed by the applicant, if an agent is to be employed.

Block 12. Proposed General Permit Activity Name or Title. Please provide a name identifying the proposed GP activity, e.g., Windward Marina, Rolling Hills Subdivision, or Smith Commercial Center.

Block 13. Name of Waterbody. Please provide the name (if it has a name) of any stream, lake, marsh, or other waterway to be directly impacted by the GP activity. If it is a minor (no name) stream, identify the waterbody the minor stream enters.

Block 14. Proposed Activity Street Address. If the proposed GP activity is located at a site having a street address (not a box number), enter it in Block 14.

Block 15. Location of Proposed Activity. Enter the latitude and longitude of where the proposed GP activity is located. Indicate whether the project location provided is the center of the project or whether the project location is provided as the latitude and longitude for each of the "corners" of the project area requiring evaluation. If there are multiple sites, please list the latitude and longitude of each site (center or corners) on a separate sheet of paper and mark as Block 15.

Block 16. Other Location Descriptions. If available, provide the Tax Parcel Identification number of the site, Section, Township, and Range of the site (if known), and / or local Municipality where the site is located.

Block 17. Directions to the Site. Provide directions to the site from a known location or landmark. Include highway and street numbers as well as names. Also provide distances from known locations and any other information that would assist in locating the site. You may also provide a description of the location of the proposed GP activity, such as lot numbers, tract numbers, or you may choose to locate the proposed GP activity site from a known point (such as the right descending bank of Smith Creek, one mile downstream from the Highway 14 bridge). If a large river or stream, include the river mile of the proposed GP activity site if known. If there are multiple locations, please indicate directions to each location on a separate sheet of paper and mark as Block 17.

Block 18. Identify the Specific General Permit(s) You Propose to Use. List the number(s) of the General Permit(s) you want to use to authorize the proposed activity (e.g., GP 4).

Block 19. Description of the Proposed General Permit Activity. Describe the proposed GP activity, including the direct and indirect adverse environmental effects of the proposed activity. The description of the proposed activity should be sufficiently detailed for USACE to determine that the adverse environmental effects of the activity will be no more than minimal. Identify the materials to be used in construction, as well as the methods by which the work is to be done.

Provide drawings to show that the proposed GP activity complies with the terms of the applicable GP(s). Drawings should contain sufficient detail to provide an illustrative description of the proposed GP activity, but do not need to be detailed engineering plans. The written descriptions and illustrations are an important part of the application. Please describe, in detail, what you wish to do. If more space is needed, attach an extra sheet of paper marked Block 19.

Block 20: Description of Proposed Mitigation Measures. Describe any proposed mitigation measures intended to reduce the adverse environmental effects caused by the proposed GP activity. The description of any proposed mitigation measures should be sufficiently detailed for USACE to determine how the measures would avoid and minimize adverse environmental effects. If adverse effects exceed the New England District compensatory mitigation thresholds, you must document how compensatory mitigation would be satisfied in Block 24.

Block 21. Purpose of General Permit Activity. Describe the purpose and need for the proposed GP activity. What will it be used for and why? Also include a brief description of any related activities associated with the proposed project. Provide the approximate dates you plan to begin and complete all work.

Block 22. Quantity of Wetlands, Streams, or Other Types of Waters Directly Affected by the Proposed General Permit Activity. For discharges of dredged or fill material into Waters of the U.S., provide the amount of wetlands, streams, or other types of waters filled, flooded, excavated, or drained by the proposed GP activity. For structures or work in Navigable Waters of the U.S. subject to Section 10 of the Rivers and Harbors Act of 1899, provide the amount of navigable waters filled, dredged, occupied by one or more structures (e.g., aids to navigation, mooring buoys) by the proposed GP activity. The area of impact includes the structures or fills with direct or indirect effects to waters of the U.S. The length of impact includes the length of a stream, including its banks, that are directly affected by the structures or fills. The duration of impact should be identified as temporary (xx days) or permanent. The impact purpose should briefly describe what structure or fill is responsible for the impact.

Block 23. Identify Any Other General Permit(s), Regional General Permit(s), or Individual Permit(s) Used to Authorize Any Part of Proposed Activity or Any Related Activity. List any other GP(s) or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. For linear projects, list other separate and distant crossings of waters and wetlands authorized by these GPs that do not require PCNs. If more space is needed, attach an extra sheet of paper marked Block 23.

Block 24. Compensatory Mitigation Statement for Losses Greater Than the New England District Compensatory Mitigation Thresholds. New England District requires compensatory mitigation at a minimum one for one replacement ratio or greater for all aquatic resource losses that require a PCN and exceed the New England District Compensatory Mitigation Thresholds, unless USACE determines in writing that either some other form of mitigation is more environmentally appropriate or the adverse environmental effects of the proposed GP activity are no more than minimal without compensatory mitigation, and provides an activity specific waiver of this requirement. Describe the proposed compensatory mitigation for wetland losses greater than the New England District Compensatory Mitigation Thresholds or provide an explanation of why USACE should not require wetland compensatory mitigation for the proposed GP activity. If more space is needed, attach an extra sheet of paper marked Block 24.

Block 25. Is Any Portion of the General Permit Activity Already Complete? Describe any work that has already been completed for the GP activity.

Block 26. List the Name(s) of Any Species Listed As Endangered or Threatened under the Endangered Species Act that Might be Affected by the General Permit Activity. If you are not a federal agency, and if any listed species or designated critical habitat might be affected or is in the vicinity of the proposed GP activity, or if the proposed GP activity is located in designated critical habitat, list the name(s) of those endangered or threatened species that might be affected by the proposed GP activity or utilize the designated critical habitat that might be affected by the proposed GP activity. If you are a Federal agency, and the proposed GP activity requires a PCN, you must provide documentation demonstrating compliance with Section 7 of the Endangered Species Act.

Block 27. List Any Historic Properties that Have the Potential to be Affected by the General Permit Activity. If you are not a federal agency, and if any historic properties have the potential to be affected by the proposed GP activity, list the name(s) of those historic properties that have the potential to be affected by the proposed GP activity. Provide all relevant documentation about these historic properties in the PCN submittal. If you are a Federal agency, and the proposed GP activity requires a PCN, you must provide documentation demonstrating compliance with Section 106 of the National Historic Preservation Act.

Block 28. List the Wild and Scenic River or Congressionally Designated Study River if the General Permit Activity Would Occur in such a River. If the proposed GP activity will occur in a river in the National Wild and Scenic River System or in a river officially designated by Congress as a "study river" under the Wild and Scenic Rivers Act, provide the name of the river. For a list of Wild and Scenic Rivers and study rivers, please visit <http://www.rivers.gov/>

Block 29. General Permit Activities that also Require Permission from the USACE Under 33 U.S.C. 408. If the proposed GP activity also requires permission from the USACE under 33 U.S.C. 408 because it will temporarily or permanently alter, occupy, or use a USACE federal authorized civil works project, indicate whether you have submitted a written request for section 408 permission from the USACE district having jurisdiction over that project.

Block 30. 401 Water Quality Certification. As described above, specify if the activity requires a 401 WQC from the certifying authority.

Block 31. Other Information Required For General Permit Pre Construction Notifications. The terms of some of the General Permits include additional information requirements for preconstruction notifications:

- * Maintenance – information regarding the original design capacities and configurations of the outfalls, intakes, small impoundments, and canals.
- * Temporary Construction, Access, and Dewatering – a restoration plan showing how all temporary fills and structures will be removed and the area restored to pre-project conditions.
- * Repair of Uplands Damaged by Discrete Events – documentation, such as a recent topographic survey or photographs, to justify the extent of the proposed restoration.
- * Commercial Shellfish Aquaculture Activities – (1) a map showing the boundaries of the project area, with latitude and longitude coordinates for each corner of the project area; (2) the name(s) of the species that will be cultivated during the period this GP is in effect; (3) whether canopy predator nets will be used; (4) whether suspended cultivation techniques will be used; and (5) general water depths in the project area (a detailed survey is not required). Dredging – (1) a proposed sampling and analysis plan shall be provided to USACE for approval prior to its execution. Pre-application meetings are encouraged.
- * Beach Nourishment – sediment grain size should be determined for the length of the beach where nourishment is proposed. The frequency and locations of sediment sampling shall be sufficient to identify the sediment composition of the beach profile. This data shall be consolidated to generate a sediment gradation curve for each sampled transect. Each sampled transect should also be identified on the project plans (drawings).

If more space is needed, attach an extra sheet of paper marked Box 31.

Block 32. Signature of Applicant or Agent. The PCN must be signed by the person proposing to undertake the GP activity, and if applicable, the authorized party (agent) that prepared the PCN. The signature of the person proposing to undertake the GP activity shall be an affirmation that the party submitting the PCN possesses the requisite property rights to undertake the GP activity (including compliance with special conditions, mitigation, etc.).

DELINEATION OF WETLANDS, OTHER SPECIAL AQUATIC SITES, AND OTHER WATERS

Each PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current wetland delineation manual and regional supplement published by the USACE. The permittee may ask the USACE to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the USACE does the delineation, especially if the project site is large or contains many wetlands, other special aquatic sites, and other waters. The 60-day PCN review period will not start until a delineation has been completed.

DRAWINGS AND ILLUSTRATIONS

General Information.

Three types of illustrations are needed to properly depict the work to be undertaken. These illustrations or drawings are identified as a Vicinity Map, a Plan View or a Typical Cross Section Map. Identify each illustration with a figure or attachment number. For linear projects (e.g. roads, subsurface utility lines, etc.) gradient drawings should also be included. Please submit one copy of all drawings on 8½ x 11 inch plain white paper (electronic submissions preferred). Use the fewest number of sheets necessary for your drawings or illustrations. Each illustration should identify the project, the applicant, and the type of illustration (vicinity map, plan view, or cross section). While illustrations need not be professional (many small, private project illustrations are prepared by hand), they should be clear, accurate, and contain all necessary information.

ADDITIONAL INFORMATION AND REQUIREMENTS

For proposed GP activities that involve discharges into waters of the United States, water quality certification from the State, Tribe, or EPA must be obtained or waived. Some States, Tribes, or EPA have issued water quality certification for one or more GPs. Please check the New England District website to see if water quality certification has already been issued for the GP(s) you wish to use. For proposed GP activities in coastal states, state Coastal Zone Management Act consistency concurrence must be obtained, or a presumption of concurrence must occur. Some States have issued Coastal Zone Management Act consistency concurrences for one or more GPs. Please check the New England District website to see if Coastal Zone Management Act consistency concurrence has already been issued for the GP(s) you wish to use.

APPENDIX C SELF-VERIFICATION NOTIFICATION

U.S. Army Corps of Engineers (USACE)
SELF-VERIFICATION NOTIFICATION (SVN)

DATA REQUIRED BY THE PRIVACY ACT OF 1974

Authority	Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332.
Principal Purpose	This information will be used in evaluating activities under Self-Verification procedures within Massachusetts.
Routine Uses	Routine uses will include: (1) Documenting compliance with the terms and conditions of the General Permit (GP) for activities that may require authorization pursuant to one or more of USACE's Regulatory authorities. (2) Records may be referred to other Federal, State, and local agencies for evaluation and enforcement purposes.
Disclosure	Failure to fully comply and abide by the GP terms and conditions prior to commencing work and after completion project may result in formal enforcement action, up to and including monetary penalties and/or legal action, pursuant to 33 CFR Part 326.
Instructions	The permittee must complete ALL required sections of this document before commencing USACE-regulated activities. A copy of this completed SVN must be kept on site during construction and be made available for review by USACE and other Federal, State, & Local regulatory authorities at any time. Within 30 days of initiating project construction, the permittee shall submit the completed SVN to USACE. The SVN shall be submitted to USACE as ONE signed document that includes project plans and documentation that supports each field (e.g., emails, letters, description, phone calls, surveys). Electronic submissions to the following address are strongly preferred: cenae-r-ma-sv@usace.army.mil . The email subject line shall contain the following: GP #, SVN, City/Town, and date submitted.

(ITEMS 1 THRU 3 TO BE FILLED BY USACE)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED
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APPLICANT AND AGENT INFORMATION

4. APPLICANT'S NAME First - Middle - Last - Company - E-mail Address -	7. AGENT'S ADDRESS: First - Middle - Last - Company - E-mail Address -
5. APPLICANT'S ADDRESS: Address- City - State - Zip - Country -	8. AGENT'S ADDRESS: Address- City - State - Zip - Country -
6. APPLICANT'S PHONE NOs. w/AREA CODE a. Residence b. Business c. Fax	9. AGENTS PHONE NOs. w/AREA CODE a. Residence b. Business c. Fax

NAME, LOCATION, AND DESCRIPTION OF PROJECT SITE

10. PROJECT NAME OR TITLE	
11. FILE NUMBER(S) OF PREVIOUS USACE ACTIONS ON THE SITE (if applicable)	12. NAME OF WATERBODY
13. PROJECT COORDINATES (in decimal degrees) Latitude: °N Longitude: °W	14. PROJECT STREET ADDRESS (if applicable) Address City - State - Zip -

ACTIVITY TYPE, PROJECT IMPACTS, AVOIDANCE & MINIMIZATION

15. GENERAL PERMIT ACTIVITIES (CHECK ALL THAT APPLY) <div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%;">1 _____</div> <div style="width: 50%;">6 _____</div> <div style="width: 50%;">11 _____</div> <div style="width: 50%;">16 _____</div> <div style="width: 50%;">21 _____</div> <div style="width: 50%;">2 _____</div> <div style="width: 50%;">7 _____</div> <div style="width: 50%;">12 _____</div> <div style="width: 50%;">17 _____</div> <div style="width: 50%;">22 _____</div> <div style="width: 50%;">3 _____</div> <div style="width: 50%;">8 _____</div> <div style="width: 50%;">13 _____</div> <div style="width: 50%;">18 _____</div> <div style="width: 50%;">23 _____</div> <div style="width: 50%;">4 _____</div> <div style="width: 50%;">9 _____</div> <div style="width: 50%;">14 _____</div> <div style="width: 50%;">19 _____</div> <div style="width: 50%;">24 _____</div> <div style="width: 50%;">5 _____</div> <div style="width: 50%;">10 _____</div> <div style="width: 50%;">15 _____</div> <div style="width: 50%;">20 _____</div> <div style="width: 50%;">25 _____</div> </div>	16. SUMMARY OF PROJECT IMPACTS (<i>see instructions</i>) <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Area (square feet)</th> <th style="width: 25%;">Length (linear feet)</th> <th style="width: 25%;">Volume (cubic yards)</th> <th style="width: 25%;">Duration</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	Area (square feet)	Length (linear feet)	Volume (cubic yards)	Duration																								
Area (square feet)	Length (linear feet)	Volume (cubic yards)	Duration																										

17. PROJECT PLANS (BY CHECKING THE BOXES BELOW, YOU CERTIFY THESE ITEMS ARE COMPLETE) (*see instructions*)

- a. Plans shall at least contain the following: Vicinity Map, Plan View, and Typical Cross Section View of the proposed activity.
- b. All direct, indirect and secondary impacts from USACE regulated activities are shown on the project plans.
- c. The size of the impact area for each activity (acre, square feet, linear feet) are shown on the project plans.
- d. For discharges of fill material (§404), the volume of fill material is identified on the project plans.
- e. The duration of each impact, permanent or temporary (X days), is identified on the project plans.
- f. Do activities with permanent impacts result in the loss of waters? If so, this is identified on the project plans.
- g. All aquatic resources in the vicinity of the USACE regulated activities are delineated on the project plans.

18. AVOIDANCE & MINIMIZATION (BY CHECKING THE BOXES BELOW, YOU CERTIFY THESE CRITERIA ARE MET) (*see instructions*)

- a. The project has been designed to avoid and minimize impacts to aquatic resources.
- b. The footprint of activities in waters of the U.S. has been reduced to only what is necessary to achieve the overall project purpose.
- c. All practicable measures have been taken to avoid and minimize impacts to aquatic resources through construction techniques and site access (e.g., Best Management Practices, Time of Year Restrictions).
- d. All temporary impacts from USACE regulated activities will be restored upon completion of construction and the project area will be returned to pre-construction contours and conditions.

COMPLIANCE WITH FEDERAL REGULATIONS & SUPPLEMENTAL INFORMATION

19. DUE DILIGENCE (*see instructions*)

Complete the entries below to document compliance with the following Federal requirements. Construction may NOT begin if a PCN is/may be required, and you must contact USACE to determine permitting requirements. Documentation that demonstrates how the activity complies with each field below shall be submitted to the USACE as noted in the instructions block. See each General Condition (GC) in the GP for how to comply with each requirement.

- a. State Historic Preservation Officer
- b. Massachusetts BUAR
- c. Tribal Historic Preservation Officers
- d. Endangered Species Act - NOAA
- e. Endangered Species Act - USFWS
- f. Northern Long Eared Bat (ESA)
- g. Essential Fish Habitat
- h. Wild & Scenic Rivers
- i. 401 Water Quality Certification 401

401 WQC/OOC File Number:

OOC issued:

401 issued:

- j. Section 408 Permission
- k. Coastal Zone
- l. Construction Mats
- m. Time of Year Restrictions
- n. Vernal Pools
- o. Sediment & Erosion Controls
- p. Stream/Wetland Crossings

20. AQUACULTURE ACTIVITIES - GP 18 (*see instructions*)

- a. If required, an Aquaculture Certification from the Massachusetts Division of Marine Fisheries was obtained prior to commencing work.
- b. Coordination with the U.S. Coast Guard pursuant to Private Aids to Navigation has occurred prior to commencing work.
- c. If required, a MEPA Certificate was obtained from the Massachusetts Environmental Protection Agency prior to commencing work.
- d. The prospective permittee contacted local authorities (e.g. harbormaster, select board, shellfish constable) for authorization of their facility prior to commencing work.

21. ADDITIONAL INFORMATION/ATTACHMENTS (*see instructions*)

- a. The project plans are enclosed in this SVN submittal (see block 17).
- b. The activity funded through the Bipartisan Infrastructure Bill (also known as the Infrastructure Investment and Jobs Act).
- c. All required state, local and federal approvals were acquired prior to starting construction in USACE jurisdiction.
- d. After construction of the activity is completed, a complete Certificate of Compliance will be submitted to USACE.

22. IS THERE ANOTHER LEAD FEDERAL AGENCY:

YES NO

23. STATEMENT OF AUTHORIZATION (*see instructions*)

I certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT

DATE

SIGNATURE OF AGENT

DATE

24. SIGNATURES (*see instructions*)

I hereby certify that the information in this Self-Verification Notification is complete and accurate. As the applicant or their duly authorized agent, I certify the activity was completed in accordance with the terms and conditions of the GP. This includes all applicable terms, general conditions, and activity-specific GP criteria. I agree to allow the duly authorized representatives of the Corps of Engineers Regulatory Program and other regulatory or advisory agencies to enter upon the premises of the project site at reasonable times to evaluate inspect and photograph site conditions. This consent to enter the property is superior to, takes precedence over, and waives any communication to the contrary. For example, if the property is posted as "no trespassing" this consent specifically supersedes and waives that prohibition and grants permission to enter the property despite such posting.

SIGNATURE OF APPLICANT

DATE

SIGNATURE OF AGENT

DATE

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than \$10,000 or imprisoned not more than five years or both.

**Instructions for Preparing a
Department of the Army
General Permit (GP) Self-Verification**

Blocks 1 through 3. To be completed by the Corps of Engineers.

Block 4. Applicant' Name. Enter the name and the e-mail address of the responsible party or parties. If the responsible party is an agency, company, corporation, or other organization, indicate the name of the organization and responsible officer and title. If more than one party is associated with the self-verification, please attach a sheet of paper with the necessary information marked Block 4.

Block 5. Address of Applicant. Please provide the full address of the party or parties responsible for the self-verification. If more space is needed, attach an extra sheet of paper marked Block 5.

Block 6. Applicant Telephone Number(s). Please provide the telephone number where you can usually be reached during normal business hours.

Blocks 7 through 9. To be completed, if you choose to have an agent.

Block 7. Authorized Agent's Name and Title. Indicate name of individual or agency, designated by you, to represent you in this process. An agent can be an attorney, builder, contractor, engineer, consultant, or any other person or organization. Note: An agent is not required.

Blocks 8 and 9. Agent's Address and Telephone Number. Please provide the complete mailing address of the agent, along with the telephone number where they can be reached during normal business hours.

Block 10. Proposed General Permit Activity Name or Title. Please provide a name identifying the proposed GP activity, e.g., Windward Marina, Rolling Hills Subdivision, or Smith Commercial Center.

Block 11. File Number(s) of Previous USACE Actions on the Site Please provide any known USACE file number. If the activity does not have a known USACE file number, you may state N/A.

Block 12. Name of Waterbody. Please provide the name (if it has a name) of any stream, lake, marsh, or other waterway to be directly impacted by the GP activity. If it is a minor (no name) stream, identify the waterbody the minor stream enters.

Block 13. Proposed Activity Coordinates. Please enter the latitude and longitude of where the proposed GP activity is located. Indicate whether the project location provided is the center of the project or whether the project location is provided as the latitude and longitude for each of the "corners" of the project area. If there are multiple sites, please list the latitude and longitude of each site (center or corners) on a separate sheet of paper and mark as Block 13.

Block 14. Proposed Activity Street Address. If the proposed activity is located at a site having a street address (not a box number), enter it in Block 14.

Block 15. General Permit Activity Type. Please select all GP activity types that apply to the proposed activity. A list of GP activity types can be found in Section III of the GP.

Block 16. Summary of Project Impacts. Please provide ALL proposed impacts, both temporary and permanent in duration, that are located in Waters of the United States. The area of impact shall be provided in square feet (SF). When applicable, impacts that result in conversion of stream bank or shoreline must also be identified in linear feet (LF). Dredging or the discharge of dredged or fill material shall also include the volume, cubic yards (CY), of material removed from or placed into Waters of the U.S. If more entries are required, please attach a table matching the desired format in Block 16.

Block 17. Project Plans. Please verify that items a-g are included in the project plans. Three types of illustrations are necessary to properly depict the proposed work. These illustrations or drawings are identified as a Vicinity Map, a Plan View (Aerial view) and a Cross Section Map. For linear projects (e.g. roads, subsurface utility lines, etc.) gradient drawings (longitudinal profile) should also be included. Plans must accurately depict the existing conditions and all aspects of the proposed activity located in waters of the U.S. Please submit one copy of all drawings formatted to print on 8½ x 11 inch or 11 x 17 inch plain white paper. Use the fewest number of sheets necessary for your drawings or illustrations. Each illustration should identify the project, the applicant, and the type of illustration (vicinity map, plan view, or cross section). While illustrations need not be certified engineering sheets; they should be clear, accurate, contain all necessary information, and depict all proposed work. Each submission must also include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current wetland delineation manual and regional supplement published by USACE.

Block 18. Avoidance & Minimization. Please verify that items a-d have been implemented for the proposed activity.

Block 19. Due Diligence. Please complete all the fields and submit documentation to USACE to demonstrate compliance with the above requirements. This Documentation may include emails, letters, meeting notes, phone call log, project narrative, project plans, a species list from the NOAA Section 7 Mapper, a completed copy of the IPAC determination keys, etc. Documentation should be limited to what is necessary to demonstrate how the proposed activity meets each requirement. Refer to the MA GP, Appendix A, for specific guidance on the identification of previously identified historic properties and previously unidentified historic properties. Endangered Species: *The applicant must be designated as the non-federal representative for the purposes of Section 7 consultation to select the Rangewide D-Key options. Otherwise, the applicant shall select the following option when IPAC indicates the NLEB is present: "The activity IS located within the NLEB Species Range (PCN Required)."

Block 20. Aquaculture Activities. Please verify that items a-d have been obtained or completed prior to commencing work in waters of the U.S.

Block 21. Additional Information/Attachments. Please verify that items a-d have been completed prior to commencing work in waters of the U.S.

Block 22. Lead Federal Agency. Please identify if there is another lead federal agency involved with the proposed activity. Enter the lead federal agency name (e.g., the Federal Emergency Management Agency, FEMA) and the agency's designated person of contact for the activity.

Block 23. Statement of Authorization. The applicant shall sign this section for all activities. If an agent is to be employed, the agent shall sign this section.

Block 24. Signatures. The SVN must be signed by the person proposing to undertake the GP activity, and if applicable, the authorized party (agent) that prepared the SVN. The signature of the person proposing to undertake the GP activity shall be an affirmation that the party submitting the SVN possesses the requisite property rights to undertake the GP activity.



**US Army Corps
of Engineers®**
New England District

APPENDIX D: PCN APPLICATION CHECKLIST

The following information shall be submitted for all PCNs for USACE to properly evaluate your application. Some applications may require more information and this checklist is offered as a tool to assist applicants with submitting a complete application.

SECTION 1: GENERAL APPLICATION INFORMATION

1. ☐ Complete the Pre-Construction Notification document (Appendix B).
2. ☐ Specify which local/state/federal authorizations are required for the project and if any have been obtained or applied for at the time of USACE application submittal.
3. ☐ Identify all funding sources the project will receive or has received to date. Provide any relevant information in the application submission.
4. ☐ Is this part of a larger project that is being implemented in phases? If so, describe the project schedule and how each phase will be implemented.
5. ☐ Describe the existing conditions on the site and the general land use in the vicinity of the project at the time application submittal.
6. ☐ Provide any historic information available that you may have of project area, e.g., existing USACE permit numbers, the names under which the permits were obtained if the permit numbers are unknown, construction dates and proof of prior existence (aerials, photos, town hall records, affidavits, state or local permits, etc.) to verify that the project predates regulation and is "vested".¹⁹
7. ☐ The anticipated start and end dates for construction.

SECTION 2: WETLAND DELINEATION

8. ☐ Data used to support aquatic resource boundary determinations (delineation forms, delineation map(s) that show the locations of each aquatic resource in the project area, aerial and ground photographs, LIDAR imagery, national wetland inventory maps, soil maps, national hydrography dataset maps, floodplain maps, historical imagery, etc.).
9. ☐ Photographs of the wetland(s) and/or waterway(s) where impacts are proposed. Photos at low tide are preferred for work in tidal waters.
10. ☐ Indicate the relationship of the project area to waters of the U.S., i.e., adjacent wetlands, tidal influence or hydraulic connectivity through culverts, or other conveyances, etc.
11. ☐ At minimum the delineation map/figure should include the following:
 - a. Contour lines showing topography.
 - b. North arrow.
 - c. Bar and text scale.
 - d. Legend.
 - e. Drawn project boundary.
 - f. High tide line, mean high water, mean low water, ordinary high water mark, and/or wetland boundaries.
 - g. Captions with a unique name for each aquatic resource and the area or length of the aquatic resource within the project area.

¹⁹ Vested is exempt (someone or something) from a new law or regulation.

- h. Appropriate landmarks and features (e.g., culverts, special aquatic sites, etc.).
- i. Points showing the paired upland and wetland delineation locations for tidal and non-tidal wetlands only.

SECTION 3: AVOIDANCE & MINIMIZATION

- 12. ☐ Describe specific measures taken to avoid impacts to aquatic resources or describe why aquatic resources could not be avoided while achieving the project purpose and need.
- 13. ☐ For impacts to aquatic resources that could not be avoided, describe specific considerations/ measures taken to minimize the area of proposed impacts to aquatic resources in designing the project.
- 14. ☐ Describe specific measures taken to avoid and minimize the proposed direct, indirect, and secondary impacts to aquatic resources and their functions through construction techniques and timing.
- 15. ☐ If applicable, provide a restoration plan that describes how all temporary fills and structures will be removed and the area restored to pre-impact conditions (see GC 22).
- 16. ☐ If applicable, provide an Invasive Species Control Plan (see GC 29). For sample control plans, see www.nae.usace.army.mil/missions/regulatory/invasive-species.
- 17. ☐ If applicable, describe how the proposed wetland/waterbody crossing is compliant with GC 31, Stream Work and Crossings, and Wetland Crossings.

SECTION 4A: PROJECT IMPACTS

- 18. ☐ Describe the overall project and the activities located in Waters of the U.S. (WOTUS) that you are seeking authorization for.
- 19. ☐ Identify the following for project impacts in WOTUS:
 - a. ☐ Direct, indirect, secondary impacts²⁰ within WOTUS.
 - b. ☐ The size of each impact (square feet or acres, or linear feet).
 - c. ☐ For discharges of fill material (§404), specify the volume of fill material to be discharged (cubic yards).
 - d. ☐ The impact duration from each activity, permanent or temporary (X days).

SECTION 4B: PROJECT PLANS

- 20. ☐ Submit project plans that depict all impacts in WOTUS. On the project plans, applicants shall provide:

General Information

- a. ☐ Plan view and typical cross-section view sheets that show the existing and proposed conditions. These illustrations should each be identified with a figure number, date of the map, the project title, the name of the applicant and the type of illustration (vicinity map, plan view, or cross section).
- b. ☐ Drawings, sketches, or plans that are legible, reproducible (color is encouraged, but features must be distinguishable in black and white), drawn to scale, and no larger than 11"x17" and 10 MB when submitted in digital format. Numeric and graphic/bar scales must agree, and plan details must be measurable using a standard engineer's scale on printed plans. Reduced plans are not acceptable.
- c. ☐ The north arrow and remove miscellaneous non-wetland or water project related features such as conduits, utility poles, guardrails, etc.

²⁰ See definitions section for the definitions of direct, indirect, secondary impacts.

- d. ☐ Clearly draw the overall limits of work, staging areas, disposal sites, access routes, and any permittee responsible mitigation sites. These areas may include both aquatic resources and upland areas.
- e. ☐ Names or numbers of all roads in the site's vicinity and ownership and numbers of abutting parcels.
- f. ☐ Datum in plan and elevation views. The horizontal datum shall be in the NAD 83 Massachusetts State Plane Coordinate System (INSERT) in U.S. survey feet. The vertical data in coastal projects shall be referenced to either MLLW or the North American Vertical Datum of 1988 (NAVD 88). Both the distance and depth units shall be U.S. survey feet and specified on the project plans.

Aquatic Resources & Project Impacts

- g. ☐ Delineation of all aquatic resource types on site including salt marsh; other special aquatic sites (vegetated shallows, mudflats, riffles and pools, coral reefs, and sanctuaries and refuges); other waters, such as lakes, ponds, vernal pools, natural rocky habitat (tidal only), and perennial, intermittent, and ephemeral streams.
- h. ☐ Identify the substrate type (cobble/gravel, organic detritus, sand/shell, silt, mud) and the approximate percentage of each substrate type on site. Grain sizes shall be based on Wentworth grain size classification scale for granules, pebbles, cobbles, and boulders. Sediment samples with a content of 10% or more of pebble-gravel-cobble and/or boulder in the top layer (6-12 inches) should be delineated and material with epifauna/macroalgae should be differentiated from bare pebble-gravel-cobble and boulder.
- i. ☐ The direction of ebb and flood in tidal waters and direction of flow in non-tidal waters.
- j. ☐ In tidal waters, the project boundary distance from special aquatic sites identified in 20g above if within 25 feet from that resource.
- k. ☐ USACE jurisdictional boundaries including ordinary high-water mark (OHWM), high tide line (HTL), mean high water (MHW). Other boundaries include mean low water (MLW), mean lower low water (MLLW), as applicable.
 - Non-tidal: OHWM and/or wetland boundaries.
 - Tidal (structures/work only): MHW, MLW.
 - Tidal (Fill and Structures/work): HTL, MHW, MLW.
 - Tidal (Dredging/Beach Nourishment): HTL, MHW, MLW, MLLW.
- l. ☐ Identification of each aquatic resource with a unique name (ex. Wetland 1, Wetland 2, Tributary 1, Beaver Brook, Atlantic Ocean) and the size of each aquatic resource within the project area (square feet or acres).
- m. ☐ Impacts to each aquatic resource with captions denoting the size of each impact (square feet, acres, or linear feet) and the duration of the impact (ex. Permanent, Temporary (X days)).

SECTION 4C: PROJECT PLANS - SPECIFIC PROJECT INFORMATION

- 21. ☐ For projects involving Navigation, Structures, Dredging, and/or Beach Nourishment, the applicant shall also address the following:

Navigation

- a. ☐ Identify the locations of adjacent Federal navigation project (FNP) and/or state/local navigation projects on the project plans.
- b. ☐ Specify the distance between the FNP and proposed project boundary, the authorized depths of the FNP, and state plane coordinates of seaward end(s) of project structures near an FNP.

Structures

- a. ☐ Identification of the piling type (steel, timber, concrete) and diameter to be removed and/or installed.
- b. ☐ Specify the minimal height of the structures' frame over saltmarsh. To meet the SV threshold, piers must be ≤ 4 feet in width and this minimal height must achieve a 1.5:1 ratio (i.e., a 4-foot-wide pier is 6 feet above a saltmarsh).
- c. ☐ For floats, the methods of securing them (piles, bottom anchors) and for keeping them off substrate (skids, stops) at low water. To meet the SV threshold, a minimum depth of 18-inches of water should be maintained below a floating dock/structure at lower tide levels.

Dredging

- a. ☐ The area (SF, acre) and volume (CY) of material to be dredged waterward of MHW for each dredge location.
- b. ☐ Dredge boundaries.
- c. ☐ Bathymetry for existing, proposed, and historical (include dates and USACE permits) dredge depths.
- d. ☐ The likely final angle of repose of the side cuts based on the physical characterization of the material to be dredged and based upon the high/ medium/low, wave or current energy of the location.
- e. ☐ Label area whether the dredging is new, maintenance, improvement, or a combination.
- f. ☐ Location of the disposal site (include location sheet). NOTE: For projects proposing open water, nearshore disposal, or beach nourishment, contact USACE as early as possible for sampling and testing protocols. Sediment testing, including physical (e.g., grain-size analysis), chemical and biological testing may be required. Sampling/testing of sediments without such contact should not occur and if done, will be at the applicant's risk.
- g. ☐ The methods and areas used to retain or prevent dredged material from running back into the wetland or waterway. Provide the capacity of the storage area and points of runback, including the overflow route, into the aquatic system.
- h. ☐ For open-water disposal, explain why inland or beneficial reuse sites are not practicable.
- i. ☐ Show the finished top elevation of the disposal site.

Beach Nourishment

- a. ☐ For beach nourishment, identify the disposal footprint, existing and proposed nourishment profiles (multiple profiles are appropriate if the site is more than 150 feet long or non-contiguous), total fill area (SF) and volume (CY), fill area and volume waterward of the HTL, and delineation of dunes, banks, existing beach vegetation, and contours.
- b. ☐ For beach nourishment identify the substrate type (fine sand, sand, cobble, boulder) and/or grain-size of existing material.

SECTION 5: STRUCTURES

22. ☐ For projects with the removal of existing pilings identify the number, type (steel, timber, concrete) and diameter of pilings to be removed and the methodology for removal (cut off at mud line, pulling, vibratory, etc.).
23. ☐ For projects with the installation of new pilings identify the number, type (steel, timber, concrete) and diameter of pilings to be installed and the methodology for installation (vibratory hammer, impact hammer etc.).
24. ☐ Identify any existing structures and moorings in waters adjacent to the proposed activity, their dimensions, and the distance to the limits and coordinates of any proposed mooring field or reconfiguration zone. For reconfiguration zone and mooring fields, provide the coordinates for all

corners based on the Massachusetts State Plane Coordinate System. Specify the maximum number of slips and/or moorings within proposed reconfiguration zones or anchorage areas.

25. ☐ The dimensions of the structure or work and extent of encroachment waterward of MHW and from affixed point on the shoreline or upland.
26. ☐ Shoreline of adjacent properties and property boundary offset for structures. In narrow waterbodies, the distance to opposite shoreline, waterway width, and structures across from proposed work.
27. ☐ For new commercial boating facilities, anchorage areas or reconfiguration zones, provide a description of the type of vessels that would use the facility, and any plans for sewage pump-out facilities, fueling facilities and contingency plans for oil spills.
28. ☐ See Sections 4A-C above.

SECTION 6: AQUACULTURE

29. ☐ Identify the coordinates for lease area corners and gear configuration area on the project plans.
30. ☐ Identify the proposed aquaculture gear type (buoys, floats, racks, trays, nets, lines, tubes, cages, containers, and other structures). Provide the impacts for each aquaculture gear type (see Section 4A 19a-d).
31. ☐ For a GP 18 to be valid, applicants must have (a) their MA DMF Aquaculture Certification letter for licensed shellfish aquaculture sites, (b) documentation that the applicant has coordinated with the U.S. Coast Guard regarding USCG Private Aids to Navigation standards, (c) their MEPA Certificate (if required), and (d) documentation that the applicant has contacted their local authorities (ex. harbormaster, select board, shellfish constable) for authorization of their facility.
32. Provide information on site the operation, maintenance, and access. Will the site be accessed via boat, kayak, etc.? Will cages be removed in the winter? How often will gear be checked on? Is there an operations plan for the proposed aquaculture area?
33. ☐ See Sections 4A-C above.

SECTION 7: DREDGING

34. ☐ Sampling plan requests for new, improvement or maintenance dredging must submit completed [Dredged Material Evaluation checklist found at Dredged Material Evaluation Checklist, Sampling and Analysis Plan Requirements from Applicant \(army.mil\)](#) and identify the method of handling/transporting the dredged material.
35. ☐ Identify grain-size of material to be dredged (e.g., silty sand) and provide any existing sediment grain size and bulk sediment chemistry data from the proposed project or nearby projects. Include information on any recent spills of oil and/or other hazardous materials and/or nearby outfalls. Document the information source, e.g., EPA database, the harbormaster or fire chief. If there are none, state "none".
36. ☐ See Section 4A, 4B and 4C, Dredging 21(a-i) above.

SECTION 8: WETLAND/WATERBODY CROSSINGS

37. ☐ For the stream crossing, identify the crossing methodology on the project plan (e.g., dam and pump, dry, wet, etc.). Submit a waterway crossing sequencing plan with the application.
38. ☐ If the project includes a permanent crossing of a tidal waterway, your project design should be modified to match the velocity, depth, cross-sectional area, and substrate of the existing waterbody adjacent to the crossing and provide documentation (hydraulic analysis including low lying property analysis) that the size of the crossing will not restrict tidal flow over the full natural tide range and will not adversely affect abutting infrastructure.

39. ☐ If the work includes a permanent crossing of a non-tidal stream, your project design should be modified to match the culvert gradient of the existing stream channel profile, provide clearance for ≥ 1.2 times bank full width and conveyance should be embedded ≥ 1 -2 feet for box culverts and pipe arches or ≥ 1 -2 feet and at least 25 percent for rounded pipes/culverts in accordance with the Massachusetts Stream Crossing Standards. Provide the basis for any variation to this requirement.
40. ☐ If the work includes a permanent crossing of a non-tidal stream, the structure should be designed to include a natural bottom substrate within the conveyance that matches the characteristics of the substrate in the natural stream channel and the character of the banks (mobility, slope, stability, confinement, grain and rock size). The conveyance should be designed with a minimum openness ratio ≥ 0.82 -feet (0.25-meters). For how to calculate openness ratio and stream simulation ecological approach for road and stream crossings, see <https://www.nae.usace.army.mil/Missions/Regulatory/Stream-and-River-Continuity/>.

SECTION 9: COMPENSATORY MITIGATION

41. ☐ Does the project require Compensatory Mitigation²¹ for impacts to Waters of the U.S.? (See Section V in the 2023 Massachusetts General Permit)
42. ☐ If the project requires mitigation, does the selected compensatory mitigation option (i.e., In-Lieu Fee, permittee-responsible mitigation) deviate from the order of the options presented in §332.3(b)(2)-(6)? If so, please explain why. <https://www.ecfr.gov/current/title-33/chapter-II/part-332/section-332.3>
43. ☐ For any compensatory mitigation that involves preservation, the applicant must use a site protection instrument to preserve the parcel in perpetuity. (Conservation Easement, Deed Restriction, etc.) <https://www.mass.gov/service-details/conservation-restriction-review-program>.

SECTION 10: HISTORIC PROPERTIES & NOTIFICATIONS TO SHPO, THPOs, BUAR

44. ☐ Notify the SHPO, Massachusetts Historical Commission, of the Project via Certified Mail and include proof of delivery or receipt in the application package (See Appendix A).
45. ☐ As applicable, notify the THPOs, Narragansett Indian Tribe, Wampanoag Tribe of Gay Head (Aquinnah), and Mashpee Wampanoag Tribe, of the Project via email OR mail and include proof of delivery or receipt in the application package (See Appendix A).
46. ☐ As applicable, notify the BUAR via email (*strongly preferred*) OR mail and include proof of delivery or receipt in the application package (See Appendix A).
47. ☐ Include responses to this notification in the permit application.
48. ☐ As applicable, information on historic properties (Tribal and Archaeological) within the project area should be provided in the permit application.

SECTION 11: ENDANGERED SPECIES & ESSENTIAL FISH HABITAT

49. ☐ Provide a USFWS Information for Planning and Consultation (IPaC) Official Species List from <https://ecos.fws.gov/ipac> and the email of the individual who generated the list (see GC 10 of the 2023 Massachusetts General Permit for more information).
50. ☐ Provide a species list from the NMFS Section 7 Endangered Species Act mapper at <https://noaa.maps.arcgis.com/apps/webappviewer/index.html>.
51. ☐ Provide a species list from the NMFS Essential Fish Habitat Mapper at https://www.habitat.noaa.gov/apps/efhmapper/?page=page_3.

²¹ Your mitigation proposal must be consistent with the December 29, 2020 Compensatory Mitigation Standard Operating Procedures at <https://www.nae.usace.army.mil/Portals/74/docs/regulatory/Mitigation/Compensatory-Mitigation-SOP-2020.pdf> and 2008 Mitigation Rule.

52. ☐ If the project will generate turbidity, describe the extent of turbidity and if erosion controls will be used to contain turbidity. If turbidity controls are not operationally feasible, explain the basis for your conclusion and identify any other measures that you will implement to minimize resuspension of sediment.
53. ☐ Identify the substrate type and any aquatic resources that will be affected by the proposed action. (SAV, salt marsh, sand, silt/clay, rocky/hard bottom)
54. ☐ For projects which will include the installation of pilings/sheet-piles, identify the substrate at the project site (sand, cobble, silt/mud/clay), the installation method (vibratory hammer, impact hammer, combination) and indicate whether the following “soft start” procedures at beginning of the workday and after a 30-minute period of rest will be deployed:
 - a. ☐ Vibratory Pile Installation: pile driving will be initiated for 15 seconds at reduced energy followed by a one-minute waiting period. This sequence of 15 seconds of reduced energy driving, one-minute waiting period will be repeated two additional times, followed immediately by pile-driving at full rate and energy.
 - b. ☐ Impact Pile Installation: pile driving will commence with an initial set of three strikes by the hammer at 40% energy, followed by a one-minute wait period, then two subsequent 3-strike sets at 40% energy, with one-minute waiting periods, before initiating continuous impact driving.
55. ☐ If the project involves dredging, describe any dredge history, number of dredge events to be covered by the permit, erosion/sediment controls, dredge type, intake structures (mesh screen size), dredged material disposal site.
56. ☐ For project activities associated with structures, identify the number, type (drill barge, work boat, tugboat, etc.), and size of any temporary vessels that will be used. Specify measures that will be implemented to ensure vessels are not berthed in shallow water or will “ground out” at low tide.
57. ☐ For aquaculture projects identify whether any component of the gear is seasonal (will be removed annually) or will be in place year-round. If gear will be present year-round and will be variably managed (e.g., floating in summer, bottom in winter) identify month/date for such configurations.
58. ☐ For aquaculture projects identify whether the project will involve use of an existing vessel or new vessel. Identify the length for all work vessels and identify the distance round trip from vessel berthing location and aquaculture area.
59. ☐ For project activities associated with docking structures (either commercial, industrial, or recreational) identify the number, type (motorized/non-motorized, jet-ski, sailboat, kayak, canoe, other that will be berthed there and the sizes of each.
60. ☐ Information required for Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act:
 - a. Results of an eelgrass survey completed per the INSERT.
 - b. Essential Fish Habitat Assessment to determine project-related impacts to essential fish habitat, using guidance developed by the National Marine Fisheries Service.
61. ☐ A document containing the following information (requirements of 50 CFR §600.920(e)(3)):
 - a. Description of proposed action.
 - b. Analysis of potential adverse effects on essential fish habitat.
 - c. Conclusions regarding the effects of the action on essential fish habitat.
 - d. If applicable, proposed mitigation.
 - e. Analysis of alternatives to the proposed action.
 - f. Other:



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, NEW ENGLAND DISTRICT
NEW ENGLAND DISTRICT OFFICE
696 VIRGINIA ROAD
CONCORD MASSACHUSETTS 01742-2751

March 11, 2024

Regulatory Division
Transportation & Utility Section
File Number: NAE-2024-00143

Courtney Walker
MassDOT - Highway Division
10 Park Plaza
Room 7360
Boston, MA 02116
Via Email: courtney.l.walker@dot.state.ma.us

Dear Ms. Walker:

This letter is in response to the application you submitted to the New England District on December 27, 2023, for a Department of the Army general permit verification. This project has been assigned the file number NAE-2024-00143. This file number should be referenced in all correspondence with this office. This letter follows a provisional notification letter from this office, dated February 29, 2024.

A review of the information provided indicates the proposed work includes the permanent discharge of fill material within 1,690 square feet below the Ordinary High Water (OHW) mark of the Ware River, and within 607 square feet of palustrine emergent (PEM) and scrub-shrub (PSS) wetlands, associated with the replacement of the bridge conveying Creamery Road over the Ware River, at Latitude 42.320830° and Longitude -72.174720°, in Hardwick and New Braintree, Worcester County, Massachusetts. The existing single-span bridge will be replaced with a new single-span bridge in the same location. The new abutments will be installed behind (landward of) the existing abutments, the existing southern abutment removed completely, and the existing northern abutment cut down 2 feet below the riverbed. Permanent impacts will result from installation of rip-rap overtopped with natural streambed material around the abutments, and side slope grading around the abutments and along the approaches. The project will also have temporary impacts within 1,165 square feet below OHW, and within 275 square feet of PEM/PSS wetlands, due to the installation of cofferdams around the abutment work areas and associated dewatering. The work is shown on the enclosed plans titled "MASSACHUSETTS DEPARTMENT OF TRANSPORTATION HIGHWAY DIVISION PLAN AND PROFILE OF CREAMERY ROAD BRIDGE REPLACEMENT OVER WARE RIVER (BRIDGE NO. H-08-003=N-07-002 (C7G)) IN THE CITY/TOWN OF HARDWICK/NEW BRAINTREE WORCESTER," on 15 sheets, and dated "19-May-2023."

Based on the information you have provided, we verify that the activity is authorized under General Permit 23 of the June 2, 2023, Federal Permit known as the Massachusetts General Permits (GPs). If the extent of the project area and/or nature of the authorized impacts to waters are modified, a revised application must be submitted to this office for written approval before work is initiated. A copy of these permits can be found at: <https://www.nae.usace.army.mil/Missions/Regulatory/State-General-Permits/>.

Any deviation from the terms and conditions of the permit, or your submitted plans, may subject the permittee to the enforcement provisions of our regulations. Therefore, in the event changes to this project are contemplated, it is recommended you coordinate with this office prior to proceeding with the work. This office must approve any changes before you undertake them. You must perform this work in compliance with the terms and conditions of the GPs listed above and also in compliance with the following special conditions:

Project Specific Special Conditions:

1. The permittee shall complete and return the enclosed Work-Start Notification Form to this office at least two weeks prior to the anticipated construction start date.
2. The permittee shall complete and return the enclosed Completion Certification Form to this office at least one month following the completion of the authorized work.
3. A conditioned Water Quality Certification (WQC) has been issued by the Massachusetts Department of Environmental Protection for your project and is attached. You must comply with the conditions specified in the WQC.

This verification is valid until June 1, 2028. You must commence or be 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 before beginning or continuing the activity. It is recommended that you contact this office before this authorization expires to discuss if permit reissuance is a possibility.

This general permit verification and any associated authorizations does not preclude the necessity to obtain any other Federal, State, or local permits, licenses, and/or certifications, which may be required.

If you have any questions related to this verification or have issues accessing documents referenced in this letter, please contact Daniel Vasconcelos, Project Manager, at 978-318-8653, or by email at daniel.b.vasconcelos@usace.army.mil. This agency continually strives to improve our customer service. In order to better serve you,

please complete the Customer Service Survey located at:
<https://regulatory.ops.usace.army.mil/customer-service-survey/>.

Sincerely,



Stephen Rochette
Chief, Technical Support Branch

Enclosures

cc (w/enclosures):

Danielle Spicer, Green International (via dspicer@greenintl.com)

Ed Reiner, U.S. EPA, Region 1 (via reiner.ed@epa.gov)

Rachel Croy, U.S. EPA, Region 1 (via croy.rachel@epa.gov)

Kerry Bogdan, FEMA, Region 1 (via Kerry.Bogdan@fema.dhs.gov)

Christopher Markesich, FEMA, Region 1 (via christopher.markesich@fema.dhs.gov)

Heidi Davis, MassDEP (via heidi.davis@mass.gov)

Ryan Morrison, MassDEP (via ryan.morrison@mass.gov)

Melissa Lenker, MassDOT – Highway Division (via melissa.lenker@dot.state.ma.us)

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION HIGHWAY DIVISION

PLAN AND PROFILE OF CREAMERY ROAD BRIDGE REPLACEMENT OVER WARE RIVER (BRIDGE NO. H-08-003=N-07-002 (C7G))

IN THE CITY/TOWN OF
HARDWICK/NEW BRAINTREE
WORCESTER

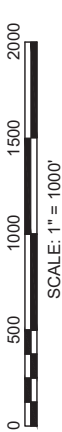
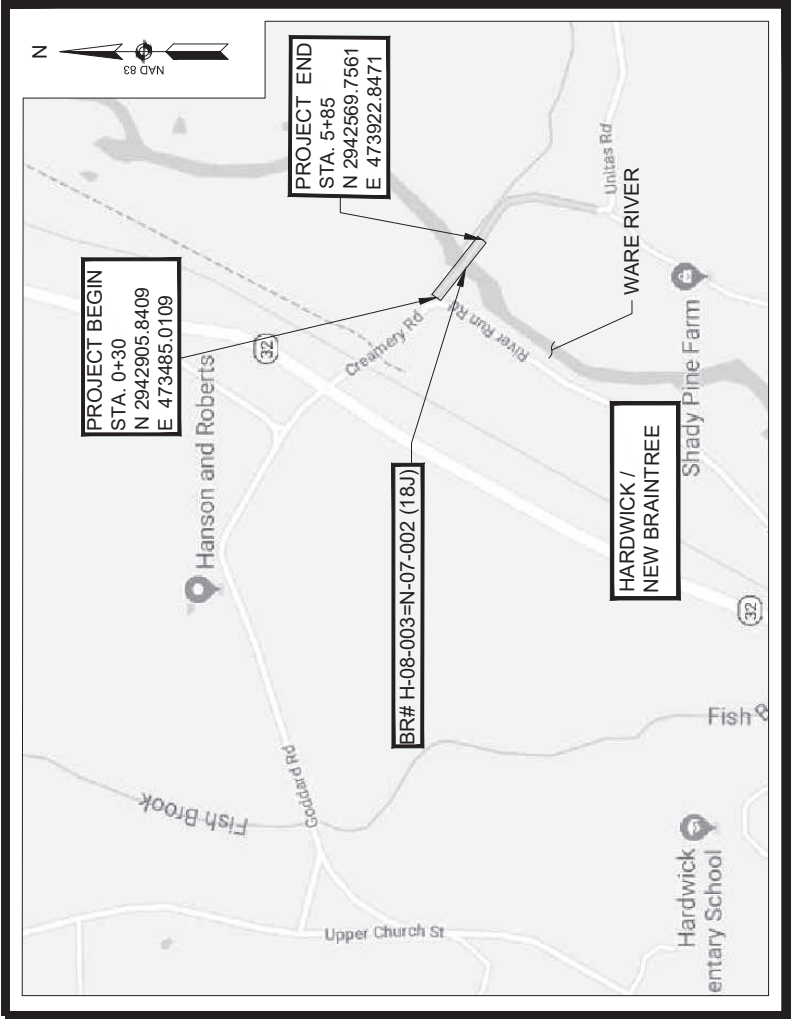
WQC/ACOE PLANS SUBMITTAL DATE: 12/26/2023

INDEX

SHEET NO.	DESCRIPTION
1	TITLE SHEET & INDEX
2	LEGEND & ABBREVIATIONS
3	TYPICAL SECTIONS
4	CONSTRUCTION PLANS & WQC/ACOE IMPACTS
5	PROFILE
6	GRADING PLAN
7-8	WETLAND REPLICATION PLAN
9	TRAFFIC-SIGN-SUMMARY-SHEET
10-11	TEMPORARY-TRAFFIC-CONTROL-PLANS
12	RETAINING-WALL DETAILS
13	CONSTRUCTION DETAILS
14-31	BRIDGE PLANS (SELECTED SHEETS)
32-35	CROSS-SECTIONS

FEDERAL AID PROJECT NO. 608851

PS&E SUBMITTAL



LENGTH OF PROJECT = 490.85 FEET = 0.09 MILES

HARDWICK/NEW BRAINTREE
CREAMERY ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	1	35
PROJECT FILE NO.		608851	

TITLE SHEET & INDEX

THE MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES DATED 2022, AS AMENDED, THE SUPPLEMENTAL SPECIFICATIONS DATED JUNE 30, 2022, THE OCTOBER 2017 CONSTRUCTION STANDARD DETAILS, THE 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, THE LATEST MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS WITH MASSACHUSETTS AMENDMENTS, THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS, THE 1988 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING, AND THE LATEST EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK, WILL GOVERN.



















































































































































DESIGN DESIGNATION (CREAMERY ROAD)

DESIGN SPEED 25 MPH
ADT 109





















































DATE	DESCRIPTION
REV #	

 	
DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION APPROVED:	RECOMMENDED FOR APPROVAL
DIVISION ADMINISTRATOR	CHIEF ENGINEER
DATE	DATE

GENERAL SYMBOLS

EXISTING		PROPOSED	DESCRIPTION
	JB		JERSEY BARRIER
	CB		CATCH BASIN
	JB		CATCH BASIN CURB INLET
	FP		FLAG POLE
	GP		GAS PUMP
	MB		MAIL BOX
	JB		POST SQUARE
	JB		POST CIRCULAR
	WELL		WELL
	EHH		ELECTRIC HANDHOLE
	EHH		FENCE GATE POST
	GG		GAS GATE
	BHL #		BORING HOLE
	MW #		MONITORING WELL
	TP #		TEST PIT
	JB		HYDRANT
	JB		LIGHT POLE
	JB		COUNTY BOUND
	CO.BD.		GPS POINT
	JB		CABLE MANHOLE
	JB		DRAINAGE MANHOLE
	JB		ELECTRIC MANHOLE
	JB		GAS MANHOLE
	JB		MISC MANHOLE
	JB		SEWER MANHOLE
	JB		TELEPHONE MANHOLE
	JB		WATER MANHOLE
	MHB		MASSACHUSETTS HIGHWAY BOUND
	MON		MONUMENT
	SB		STONE BOUND
	TB		TOWN OR CITY BOUND
	JB		TRAVERSE OR TRIANGULATION STATION
	TPL or GUY		TROLLEY POLE OR GUY POLE
	HTP		TRANSMISSION POLE
	UFB		UTILITY POLE W/ FIREBOX
	UPDL		UTILITY POLE WITH DOUBLE LIGHT
	ULT		UTILITY POLE W / 1 LIGHT
	UPL		UTILITY POLE
	JB		BUSH
	JB		TREE
	JB		STUMP
	JB		SWAMP / MARSH
	JB		WATER GATE
	JB		PARKING METER
	JB		OVERHEAD CABLE/WIRE
	JB		CURBING
	JB		CONTOURS (ON-THE-GROUND SURVEY DATA)
	JB		CONTOURS (PHOTOGRAMMETRIC DATA)
	JB		UNDERGROUND DRAIN PIPE (DOUBLE LINE 24 INCH AND OVER)
	JB		UNDERGROUND ELECTRIC DUCT (DOUBLE LINE 24 INCH AND OVER)
	JB		UNDERGROUND GAS MAIN (DOUBLE LINE 24 INCH AND OVER)
	JB		UNDERGROUND SEWER MAIN (DOUBLE LINE 24 INCH AND OVER)
	JB		UNDERGROUND TELEPHONE DUCT (DOUBLE LINE 24 INCH AND OVER)
	JB		UNDERGROUND WATER MAIN (DOUBLE LINE 24 INCH AND OVER)
	JB		BALANCED STONE WALL
	JB		GUARD RAIL - STEEL POSTS
	JB		GUARD RAIL - WOOD POSTS
	JB		GUARD RAIL - DOUBLE FACE - STEEL POSTS
	JB		GUARD RAIL - DOUBLE FACE - WOOD POSTS
	JB		CHAIN LINK OR METAL FENCE
	JB		WOOD FENCE
	JB		SEDIMENTATION FENCE
	JB		TREE LINE
	JB		SAWCUT LINE
	JB		TOP OR BOTTOM OF SLOPE
	JB		LIMIT OF EDGE OF PAVEMENT OR COLD PLANE AND OVERLAY
	JB		BANK OF RIVER OR STREAM
	JB		BORDER OF WETLAND
	JB		100 FT WETLAND BUFFER
	JB		200 FT RIVERFRONT BUFFER
	JB		STATE HIGHWAY LAYOUT
	JB		TOWN OR CITY LAYOUT
	JB		COUNTY LAYOUT
	JB		RAILROAD SIDELINE
	JB		TOWN OR CITY BOUNDARY LINE
	JB		PROPERTY LINE OR APPROXIMATE PROPERTY LINE
	JB		EASEMENT

TRAFFIC SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		CONTROLLER PHASE ACTUATED
		TRAFFIC SIGNAL HEAD (SIZE AS NOTED)
		WIRE LOOP DETECTOR (6' x 6' TYP UNLESS OTHERWISE SPECIFIED)
		VIDEO DETECTION CAMERA
		MICROWAVE DETECTOR
		PEDESTRIAN PUSH BUTTON, SIGN (DIRECTIONAL ARROW AS SHOWN) AND SADDLE
		EMERGENCY PREEMPTION CONFIRMATION STROBE LIGHT
		VEHICULAR SIGNAL HEAD
		VEHICULAR SIGNAL HEAD, OPTICALLY PROGRAMMED
		FLASHING BEACON
		PEDESTRIAN SIGNAL HEAD, (TYPE AS NOTED OR AS SPECIFIED)
		RAILROAD SIGNAL
		SIGNAL POST AND BASE (ALPHA-NUMERIC DESIGNATION NOTED)
		MAST ARM, SHAFT AND BASE (ARM LENGTH AS NOTED)
		HIGH MAST POLE OR TOWER
		SIGN AND POST
		SIGN AND POST (2 POSTS)
		MAST ARM WITH LUMINAIRE
		OPTICAL PRE-EMPTION DETECTOR
		CONTROL CABINET, GROUND MOUNTED
		CONTROL CABINET, POLE MOUNTED
		FLASHING BEACON CONTROL AND METER PEDESTAL
		LOAD CENTER ASSEMBLY
		PULL BOX 12"x12" (OR AS NOTED)
		ELECTRIC HANDHOLE 12"x24" (OR AS NOTED)
		TRAFFIC SIGNAL CONDUIT

ABBREVIATIONS

GENERAL		ANNUAL AVERAGE DAILY TRAFFIC
ADT	ANNUAL AVERAGE DAILY TRAFFIC	
ABAN	ABANDON	
ADJ	ADJUST	
APPROX.	APPROXIMATE	
A.C.	ASPHALT CONCRETE	
ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE	
BIT	BITUMINOUS	
BC	BOTTOM OF CURB	
BD	BOUND	
BL	BASELINE	
BLDG	BUILDING	
BM	BENCHMARK	
BO	BY OTHERS	
BOS	BOTTOM OF SLOPE	
BR	BRIDGE	
CB	CATCH BASIN	
CBCI	CATCH BASIN WITH CURB INLET	
CC	CEMENT CONCRETE	
CCM	CEMENT CONCRETE MASONRY	
CEM	CEMENT	
CI	CURB INLET	
CIP	CAST IRON PIPE	
CLF	CHAIN LINK FENCE	
CL	CENTERLINE	
CMP	CORRUGATED METAL PIPE	
CSP	CORRUGATED STEEL PIPE	
CO	COUNTY	
CONC	CONCRETE	
CONT	CONTINUOUS	
CONST	CONSTRUCTION	
CR GR	CROWN GRADE	
DHV	DESIGN HOURLY VOLUME	
DI	DROP INLET	
DIA	DIAMETER	
DIP	DUCTILE IRON PIPE	
DW	STEADY DON'T WALK - PORTLAND ORANGE	
DWY	DRIVEWAY	
ELEV (or EL.)	ELEVATION	
EMB	EMBANKMENT	
EOP	EDGE OF PAVEMENT	
EXIST (or EX)	EXISTING	
EXC	EXCAVATION	
F&C	FRAME AND COVER	
F&G	FRAME AND GRATE	
FDN.	FOUNDATION	
FLDSTN	FIELDSTONE	
GAR	GARAGE	
GD	GROUND	
GG	GAS GATE	
GI	GUTTER INLET	
GIP	GALVANIZED IRON PIPE	
GRAN	GRANITE	
GRAV	GRAVEL	
GRD	GUARD	
HDW	HEADWALL	
HMA	HOT MIX ASPHALT	
HOR	HORIZONTAL	
HYD	HYDRANT	
INV	INVERT	
JCT	JUNCTION	
L	LENGTH OF CURVE	
LB	LEACH BASIN	
LP	LIGHT POLE	
LT	LEFT	
MAX	MAXIMUM	
MB	MAILBOX	
MH	MANHOLE	
MHB	MASSACHUSETTS HIGHWAY BOUND	
MIN	MINIMUM	
NIC	NOT IN CONTRACT	
NO.	NUMBER	
PC	POINT OF CURVATURE	
PCC	POINT OF COMPOUND CURVATURE	
PCR	PEDESTRIAN CURB RAMP	
P.G.L.	PROFILE GRADE LINE	
PI	POINT OF INTERSECTION	
POC	POINT ON CURVE	
POT	POINT ON TANGENT	
PRC	POINT OF REVERSE CURVATURE	
PROJ	PROJECT	
PROP	PROPOSED	
PSB	PLANTABLE SOIL BORROW	
PT	POINT OF TANGENCY	
PVC	POINT OF VERTICAL CURVATURE	
PVI	POINT OF VERTICAL INTERSECTION	
PVT	POINT OF VERTICAL TANGENCY	
PVMT	PAVEMENT	

ABBREVIATIONS

HARDWICK/NEW BRAINTREE CREAMERY ROAD		
STATE	FED.AID PROJ. NO.	SHEET NO.
MA	-	2
PROJECT FILE NO.		TOTAL SHEETS
608851		35

LEGEND & ABBREVIATIONS

ABBREVIATIONS (cont.)

GENERAL		PAVED WATER WAY
PWW	PAVED WATER WAY	
R	RADIUS OF CURVATURE	
R&D	REMOVE AND DISPOSE	
RCP	REINFORCED CONCRETE PIPE	
RD	ROAD	
RDWY	ROADWAY	
REM	REMOVE	
RET	RETAIN	
RET WALL	RETAINING WALL	
ROW	RIGHT OF WAY	
RR	RAILROAD	
R&R	REMOVE AND RESET	
R&S	REMOVE AND STACK	
RT	RIGHT	
SB	STONE BOUND	
SHLD	SHOULDER	
SMH	SEWER MANHOLE	
ST	STREET	
STA	STATION	
SSD	STOPPING SIGHT DISTANCE	
SHLO	STATE HIGHWAY LAYOUT LINE	
SW	SIDEWALK	
T	TANGENT DISTANCE OF CURVE/TRUCK %	
TAN	TANGENT	
TEMP	TEMPORARY	
TC	TOP OF CURB	
TOS	TOP OF SLOPE	
TYP	TYPICAL	
UP	UTILITY POLE	
VAR	VARIES	
VERT	VERTICAL	
VC	VERTICAL CURVE	
WG	WATER GATE	
WIP	WROUGHT IRON PIPE	
WM	WATER METER/WATER MAIN	
X-SECT	CROSS SECTION	

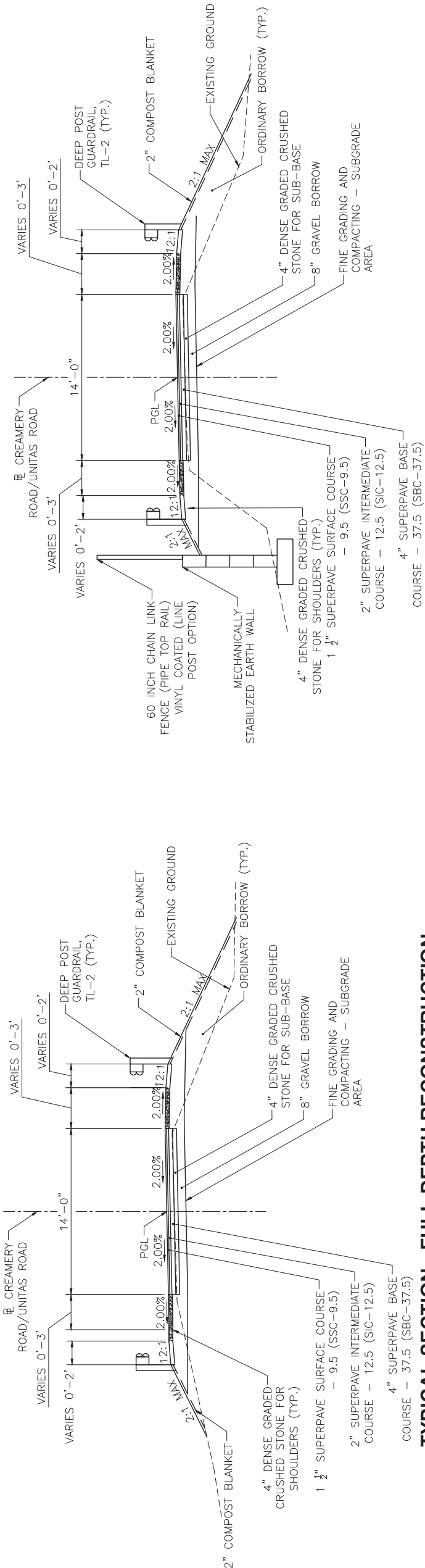
TRAFFIC SIGNAL ABBREVIATIONS

CAB	CABINET
CCVE	CLOSED CIRCUIT VIDEO EQUIPMENT
DW	STEADY UPRAISED HAND
FDW	FLASHING UPRAISED HAND
FR	FLASHING CIRCULAR RED
FRL	FLASHING RED LEFT ARROW
FRR	FLASHING RED RIGHT ARROW
FY	FLASHING CIRCULAR YELLOW
FYL	FLASHING YELLOW LEFT ARROW
FYR	FLASHING YELLOW RIGHT ARROW
G	STEADY CIRCULAR GREEN
GL	STEADY GREEN LEFT ARROW
GR	STEADY GREEN RIGHT ARROW
GSL	STEADY GREEN SLASH LEFT ARROW
GSR	STEADY GREEN SLASH RIGHT ARROW
GV	STEADY GREEN VERTICAL ARROW
OL	OVERLAP
PED	PEDESTRIAN
PPTZ	PAN, TILT, ZOOM
R	STEADY CIRCULAR RED
RL	STEADY RED LEFT ARROW
RR	STEADY RED RIGHT ARROW
TR SIG	TRAFFIC SIGNAL
TSC	TRAFFIC SIGNAL CONDUIT
W	STEADY WALKING PERSON
Y	STEADY CIRCULAR YELLOW
YL	STEADY YELLOW LEFT ARROW

HARDWICK/NEW BRAINTREE
CREAMERY ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	3	35
PROJECT FILE NO. 608851			

TYPICAL SECTION

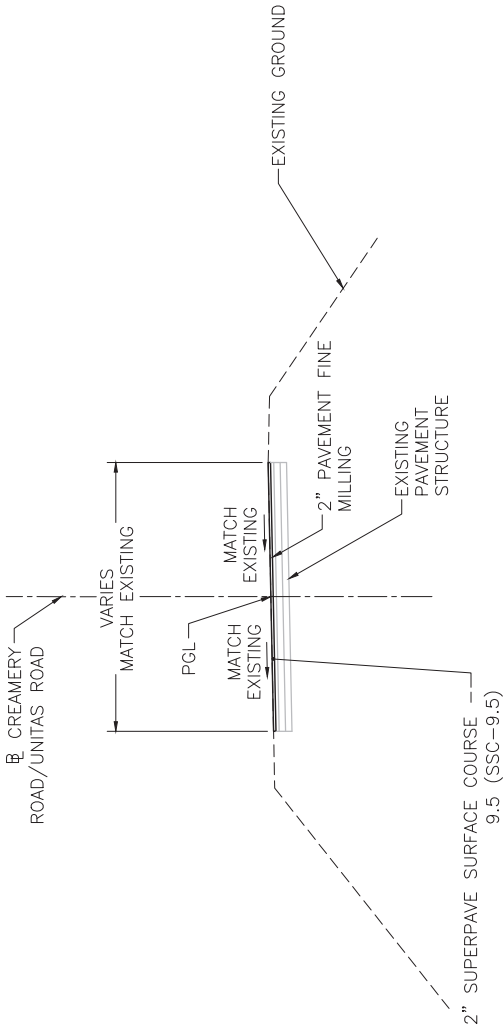


TYPICAL SECTION - FULL DEPTH RECONSTRUCTION
CREAMERY ROAD/UNITAS ROAD

SCALE: 1" = 10'
STA. 0+85 TO STA. 2+59
STA. 3+93 TO STA. 4+75

TYPICAL SECTION - FULL DEPTH RECONSTRUCTION
CREAMERY ROAD/UNITAS ROAD

SCALE: 1" = 10'
STA. 4+75 TO STA. 5+60



TYPICAL SECTION - PAVEMENT FINE MILLING
CREAMERY ROAD/UNITAS ROAD

SCALE: 1" = 10'
STA. 0+30 TO STA. 0+83
STA. 5+60 TO STA. 5+85

PAVEMENT NOTES

PROPOSED FULL DEPTH PAVEMENT

SURFACE:
2" SUPERPAVE SURFACE COURSE 9.5 (SSC - 9.5) OVER
2" SUPERPAVE INTERMEDIATE COURSE 12.5 (SIC - 12.5) OVER
4" SUPERPAVE BASE COURSE 37.5 (SBC - 37.5)

SUBBASE:
4" DENSE GRADED CRUSHED STONE FOR SUB-BASE OVER
8" GRAVEL BORROW

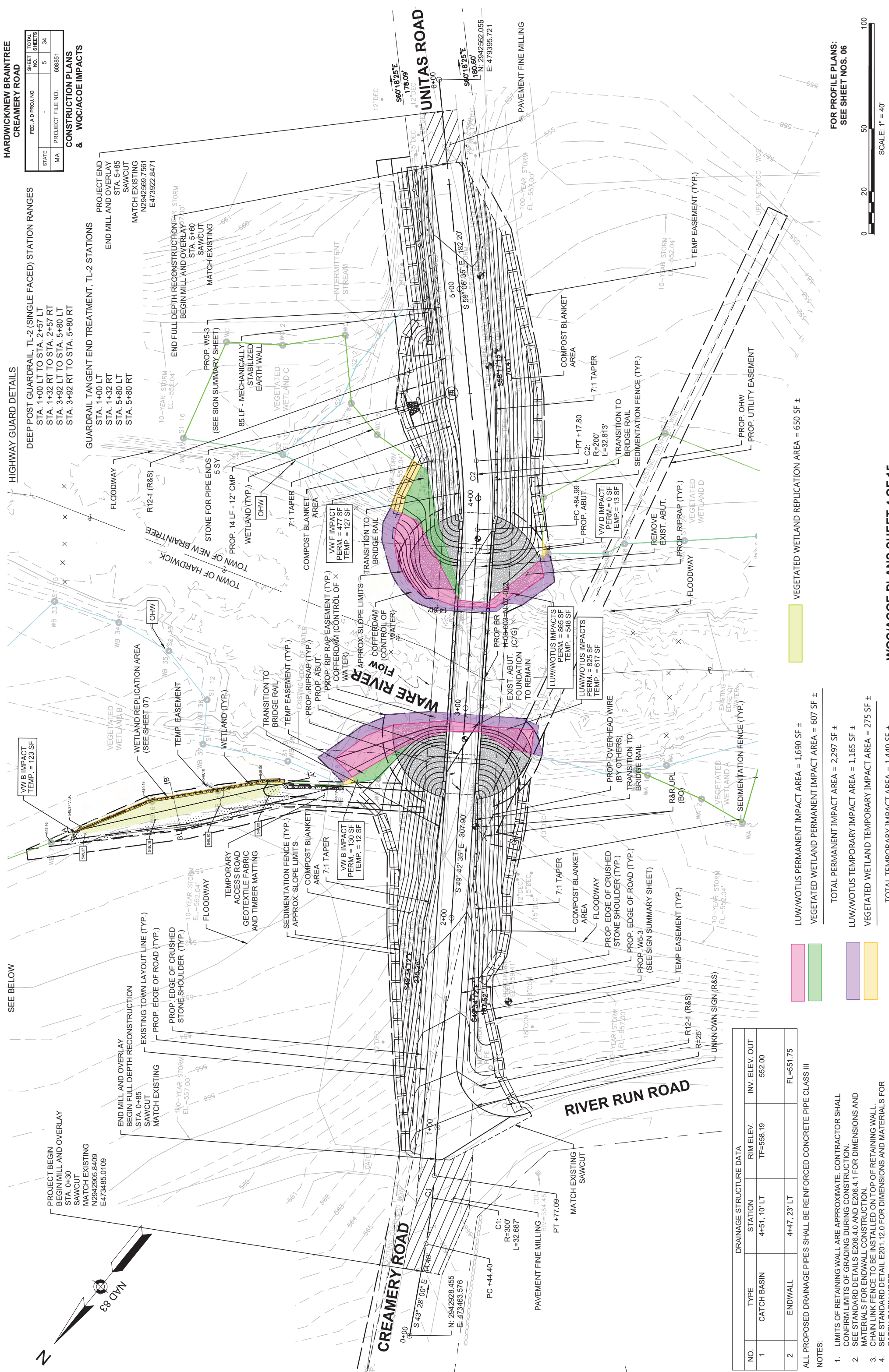
ASPHALT EMULSION FOR TACK COAT APPLIED AT A RATE OF 0.06 TO 0.08 GAL/SY OVER
BASE AND INTERMEDIATE COURSES.

PROPOSED PAVEMENT FINE MILLING

2" DEPTH

SURFACE:
2" SUPERPAVE SURFACE COURSE 9.5 (SSC - 9.5)

ASPHALT EMULSION FOR TACK COAT APPLIED AT A RATE OF 0.07 TO 0.09 GAL/SY OVER
MILLED SURFACE.



**HARDWICK/NEW BRAINTREE
CREAMERY ROAD**

FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
-	5	34
STATE	PROJECT FILE NO.	608851
MA	N2942568.7561	

**CONSTRUCTION PLANS
& WQC/ACOE IMPACTS**

DEEP POST GUARDRAIL, TL-2 (SINGLE FACED) STATION RANGES
STA. 1+00 LT TO STA. 2+57 LT
STA. 1+32 RT TO STA. 2+57 RT
STA. 3+92 LT TO STA. 5+80 LT
STA. 3+92 RT TO STA. 5+80 RT

GUARDRAIL TANGENT END TREATMENT, TL-2 STATIONS
STA. 1+00 LT
STA. 1+32 RT
STA. 5+80 LT
STA. 5+80 RT

PROJECT BEGIN
BEGIN MILL AND OVERLAY
STA. 0+30
SAWCUT
MATCH EXISTING
N2942905.8409
E473485.0109

PROJECT END
END MILL AND OVERLAY
STA. 5+85
SAWCUT
MATCH EXISTING
N2942568.7561
E473922.8471

VEGETATED WETLAND B/
VEGETATED WETLAND C
VEGETATED WETLAND D
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VEGETATED WETLAND F
VEGETATED WETLAND G
VEGETATED WETLAND H
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NO.	TYPE	STATION	RIM ELEV.	INV. ELEV.	OUT
1	CATCH BASIN	4+51, 10' LT	TF=558.19	552.00	
2	ENDWALL	4+47, 23' LT		FL=551.75	

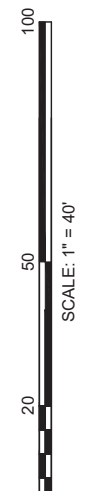
- ALL PROPOSED DRAINAGE PIPES SHALL BE REINFORCED CONCRETE PIPE CLASS III
- NOTES:
- LIMITS OF RETAINING WALL ARE APPROXIMATE. CONTRACTOR SHALL CONFIRM LIMITS OF GRADING DURING CONSTRUCTION.
 - SEE STANDARD DETAILS E208.4.0 AND E206.4.1 FOR DIMENSIONS AND MATERIALS FOR ENDWALL CONSTRUCTION.
 - CHAIN LINK FENCE TO BE INSTALLED ON TOP OF RETAINING WALL.
 - SEE STANDARD DETAIL E201.12.0 FOR DIMENSIONS AND MATERIALS FOR CATCH BASIN HOOD.
 - PROPOSED CATCH BASIN AT STA. 4+51, 10' LT SHALL BE DEEP SUMP.

VEGETATED WETLAND REPLICATION AREA = 650 SF ±

LUW/WOTUS PERMANENT IMPACT AREA = 1,690 SF ±
VEGETATED WETLAND PERMANENT IMPACT AREA = 607 SF ±

TOTAL PERMANENT IMPACT AREA = 2,297 SF ±
LUW/WOTUS TEMPORARY IMPACT AREA = 1,165 SF ±
VEGETATED WETLAND TEMPORARY IMPACT AREA = 275 SF ±
TOTAL TEMPORARY IMPACT AREA = 1,440 SF ±

FOR PROFILE PLANS:
SEE SHEET NOS. 06

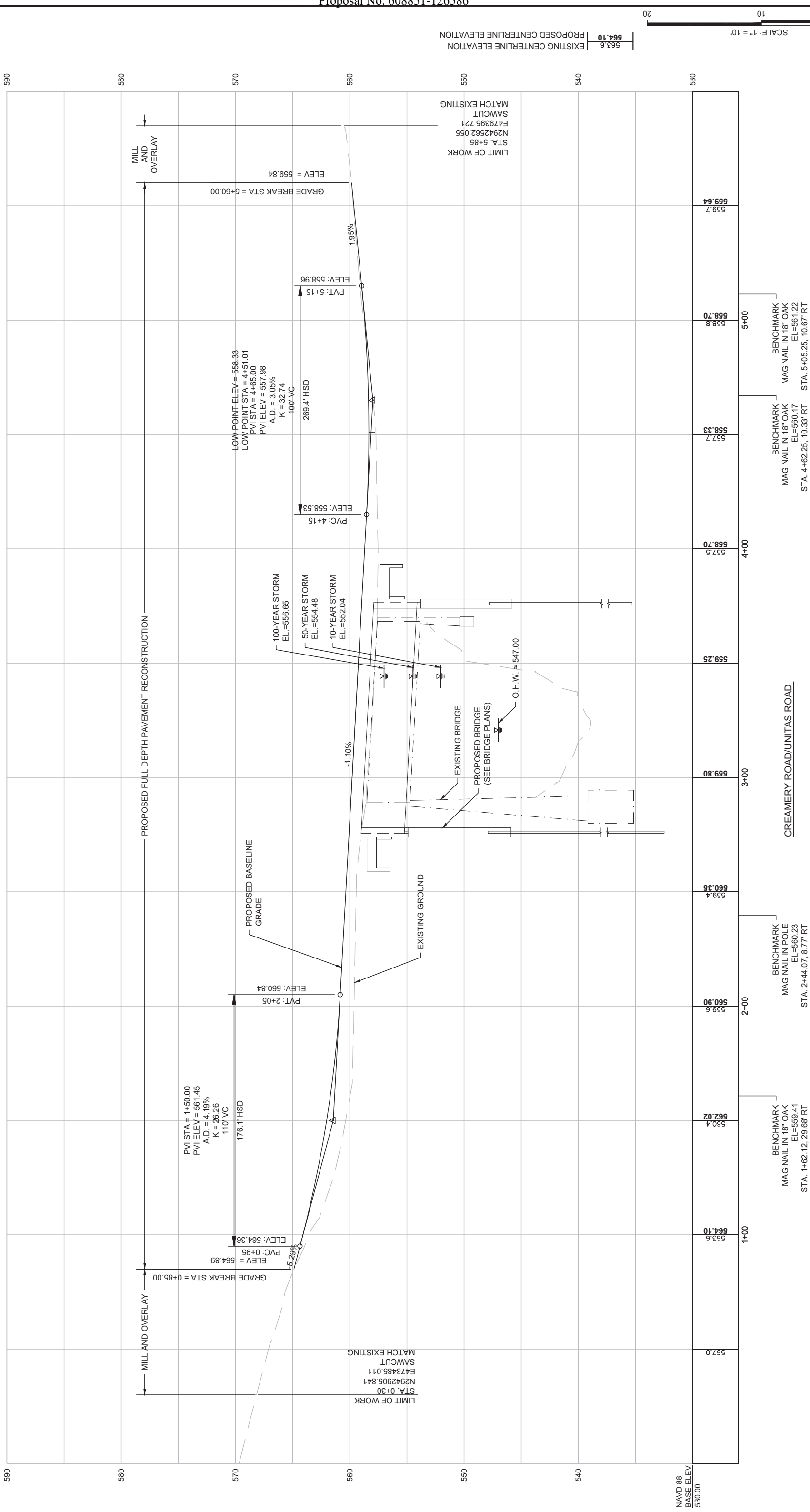


NOTE: AVERAGE BANK WIDTH UNDER BRIDGE STRUCTURE IS APPROXIMATELY 65'

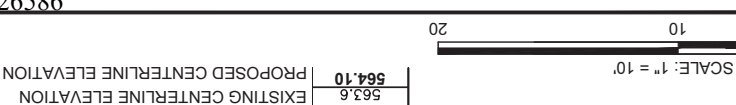
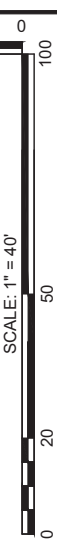
HARDWICK/NEW BRAINTREE
CREAMERY ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	5	35
PROJECT FILE NO.		608851	

PROFILE



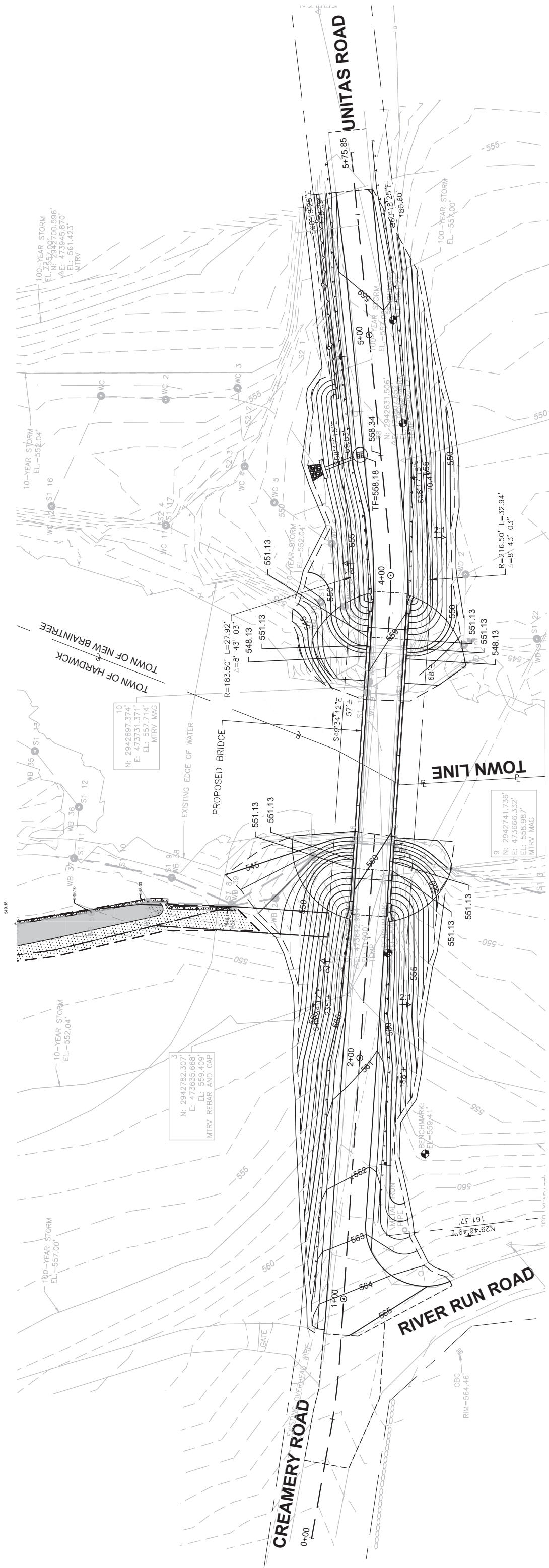
FOR CONSTRUCTION PLANS:
SEE SHEET NO. 5



CREAMERY ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	6	35
PROJECT FILE NO.			608851

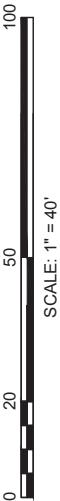
GRADING PLAN



Curve Table: Alignments							
Curve #	Radius	Tangent	Delta	Length	PC	PT	PI
C1	300.00'	16.360	6°14'34.09"	32.667	N:2942896.228 E:473494.123	N:2942873.775 E:473517.856	N:2942884.354 E:473505.377
C2	200.00'	16.443	9°24'00.76"	32.813	N:2942674.669 E:473752.714	N:2942655.593 E:473779.368	N:2942664.035 E:473765.257

1. LIMITS OF RETAINING WALL ARE APPROXIMATE. CONTRACTOR SHALL CONFIRM LIMITS OF GRADING DURING CONSTRUCTION.

WQC/ACOE PLANS SHEET 6 OF 15

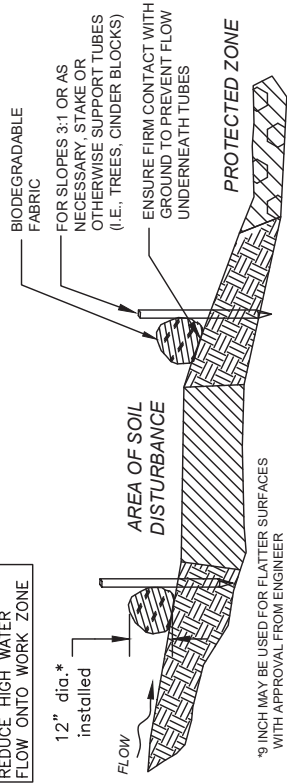


STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	8	35

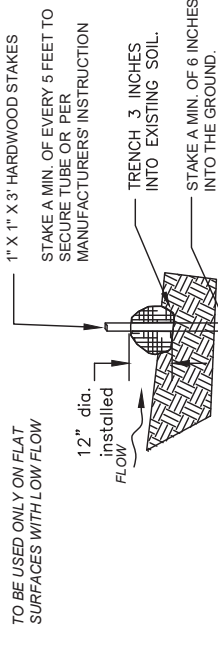
PROJECT FILE NO. 608851	
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LANDSCAPE AND WETLAND
REPLICATION DETAILS

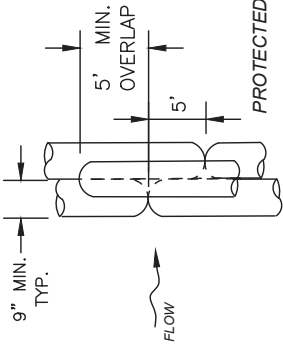
CAPTURE SEDIMENT AND PREVENT FLOW OFF SITE. PLACE AS CLOSE TO **AREA OF DISTURBANCE** AS POSSIBLE



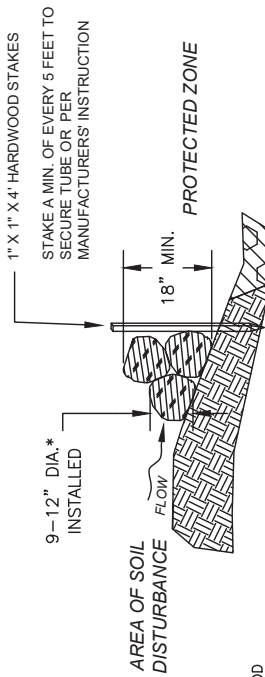
12 INCH STRAW WATTLE



SECTION



PLAN VIEW



SECTION

COMPOST FILTER TUBE BERM (SLOPES 2:1 OR STEEPER)

NOT TO SCALE

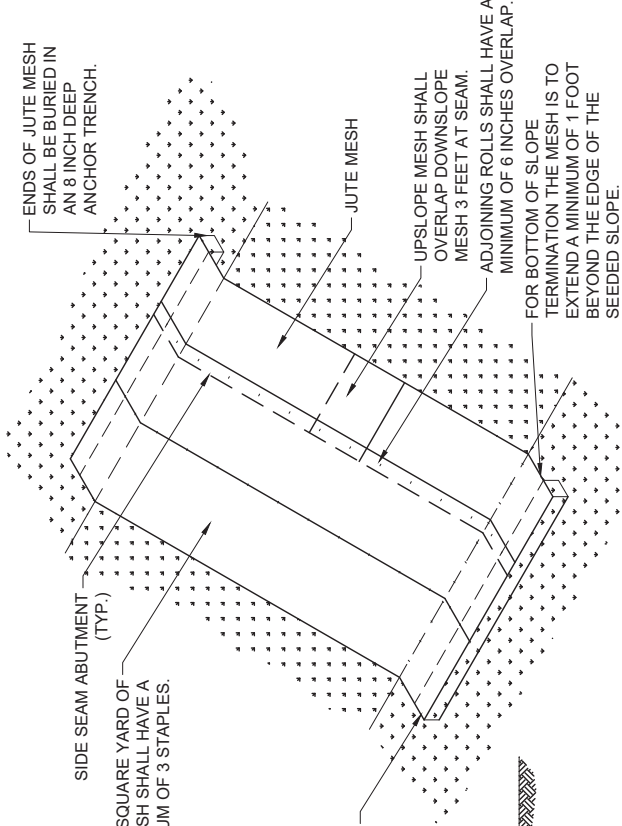
COMPOST FILTER TUBE & SILT FENCE

NOT TO SCALE

SEDIMENT CONTROL BARRIERS - COMPOST FILTER TUBE & STRAW WATTLES

NOT TO SCALE

2



JUTE MESH FABRIC ON SLOPE

NOTES:

1. SEE MANUFACTURER'S STAPLE PATTERN GUIDE FOR DETAILS.
2. INSTALL JUTE MESH ON SLOPES GREATER THAN 3 FEET HORIZONTAL TO 1 FOOT VERTICAL AND WHERE ADDED STABILIZATION FOR EROSION CONTROL IS NEEDED.
3. JUTE MESH SHALL BE INSTALLED WITH CONTINUOUS CONTACT WITH THE SOIL.
4. AREAS WITH JUTE MESH SHALL BE SEEDED PRIOR TO THE INSTALLATION OF THE JUTE MESH.
5. STAPLES SHALL BE DRIVEN IN UNTIL THEIR TOPS ARE FLUSH WITH THE SOIL.
6. STAPLES SHALL BE 11 GAUGE STEEL 6 OR 9 INCHES IN LENGTH. IN AREAS THAT WILL BE MOWN FREQUENTLY EIGHT INCH WOOD STAKES SHALL BE USED TO ANCHOR MESH.
7. JUTE MESH SHALL BE BIODEGRADABLE.

ANCHORING TRENCH DETAILS

NOTE:

1. RESEED ANCHORING TRENCHES.

STAPLING DETAILS

STAPLE 12" O.C. ALONG THE BOTTOM OF THE MESH AT THE END OF THE SLOPE

STAPLE 12" O.C. ALONG THE MESH AT SLOPE CHANGE

ENDS OF JUTE MESH SHALL BE BURIED IN AN 8 INCH DEEP ANCHOR TRENCH.

2 ROWS OF STAPLES, 4" APART, STAGGERED, 6" O.C., STAPLES TO BE PLACED CLOSE TO EDGE OF THE MAT

THE END SEAMS OF THE MESH FABRIC SHALL OVERLAP 3 FEET. PLACE STAPLES, ONE ON EACH CORNER OF MESH FABRIC, 12" O.C. ALONG THE MESH FABRIC END THROUGH BOTH MESH FABRICS. THE UPSLOPE MESH LAPS OVER THE DOWNSLOPE MESH.

STAPLES ARE THROUGH BOTH MESH FABRICS. THE SIDE SEAMS SHALL OVERLAP 6".

SOIL FILLED FROM SOIL PILE

TRENCH APPROX. 10" WIDE x 8" DEEP

SOIL PILE FROM TRENCH

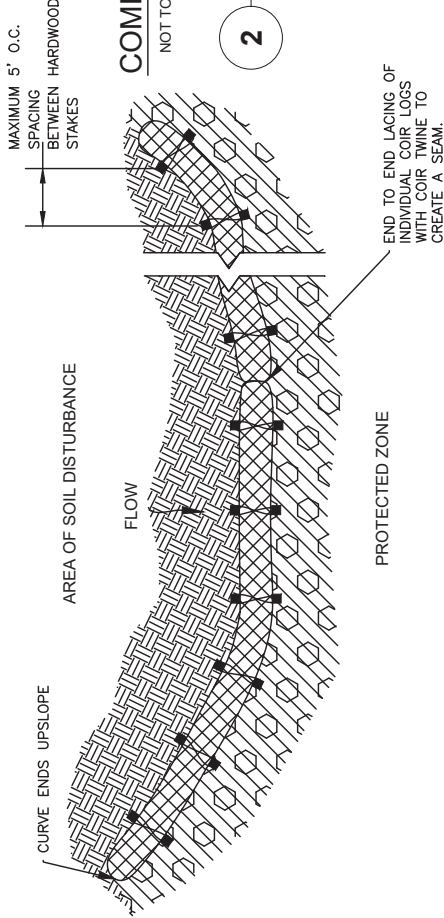
1 ROW OF STAPLES, 12" O.C.

2 ROWS OF STAPLES, STAGGERED, 6" O.C., EA. DIR.

SLOPE TO PROTECT

1 JUTE MESH

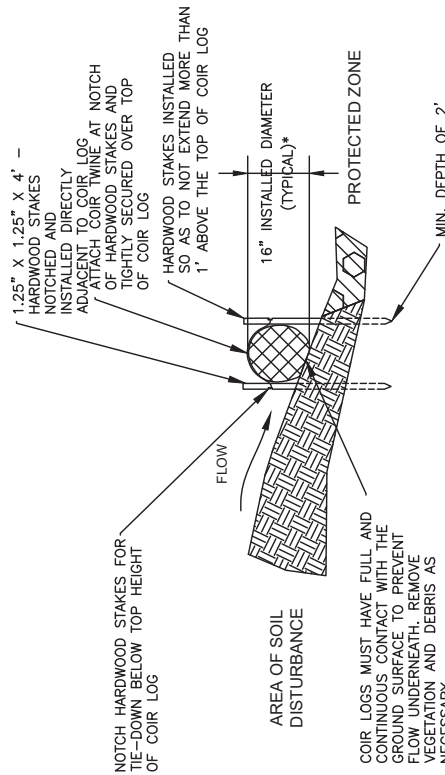
NOT TO SCALE



PLAN VIEW

SEDIMENT BARRIER — COIR LOG

NOT TO SCALE



*IF, UPON APPROVAL OF THE ENGINEER, COIR WATTLE IS USED IN PLACE OF COIR LOGS FOR REPAIRS DURING CONSTRUCTION, DIAMETER OF COIR WATTLE MAY BE 12 INCHES.

SECTION

3 COIR FIBER ROLL

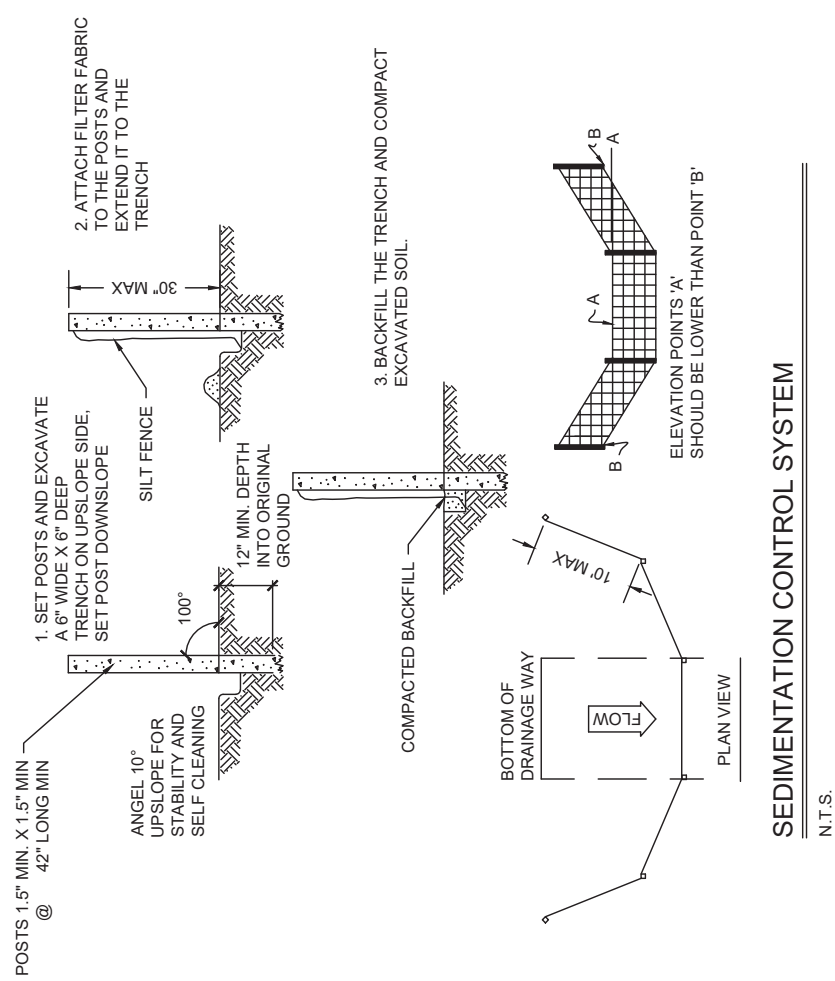
NOT TO SCALE

HARDWICK/NEW BRAINTREE
CREAMERY ROAD

STATE	FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	13	35

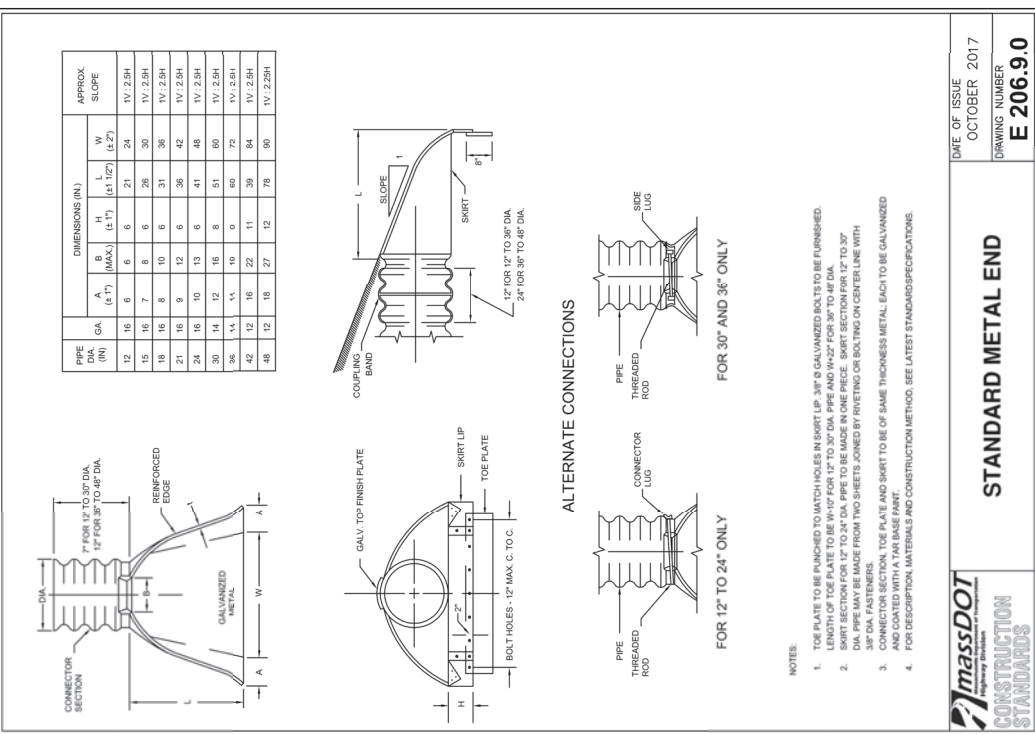
PROJECT FILE NO. 608851

CONSTRUCTION DETAILS

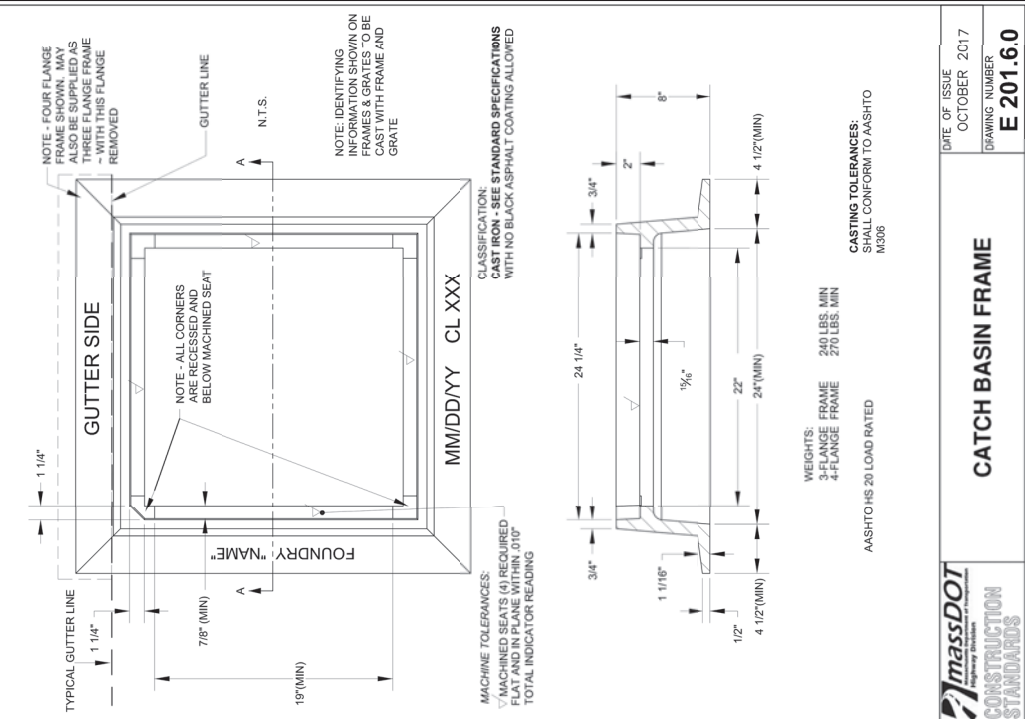


SEDIMENTATION CONTROL SYSTEM

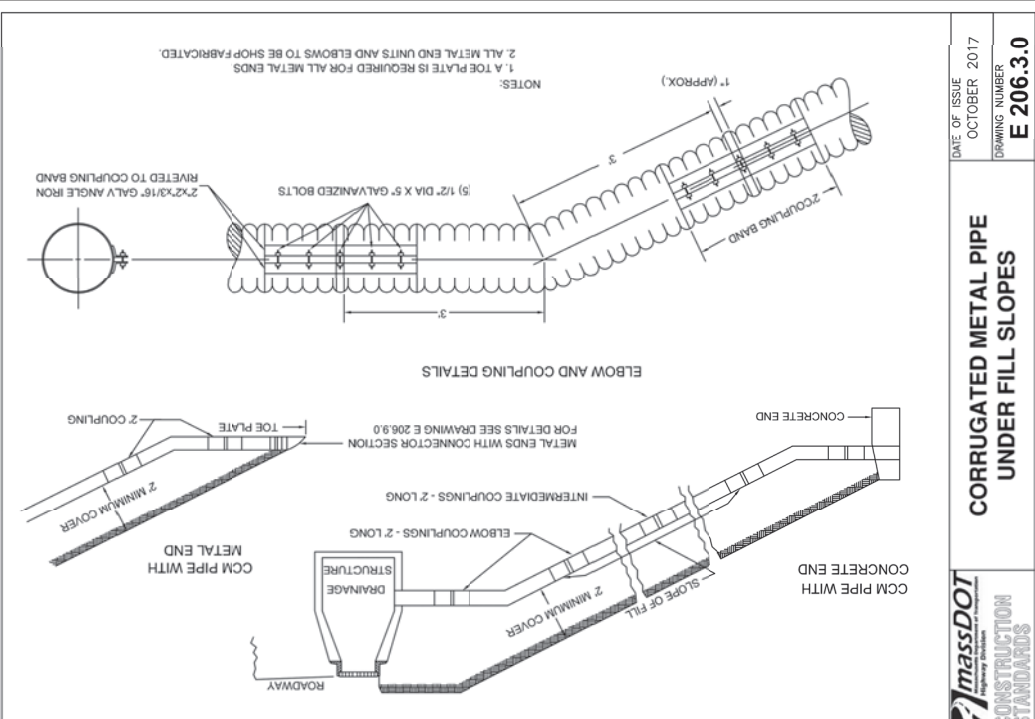
N.T.S.



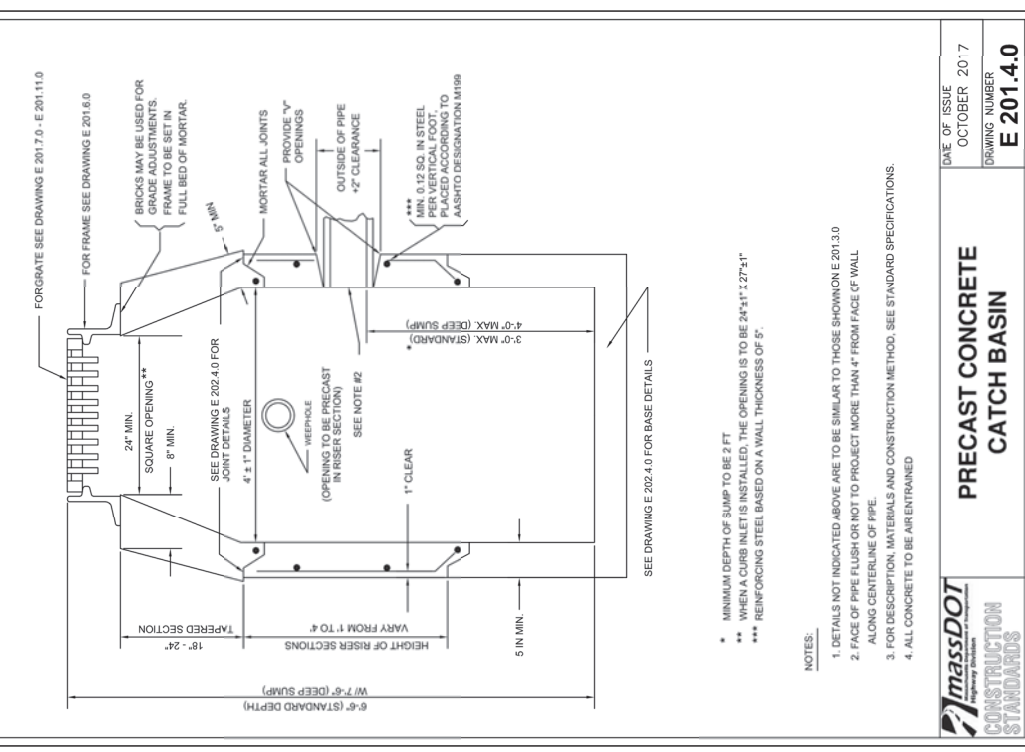
DATE OF ISSUE OCTOBER 2017	DRAWING NUMBER E 206.9.0
STANDARD METAL END	



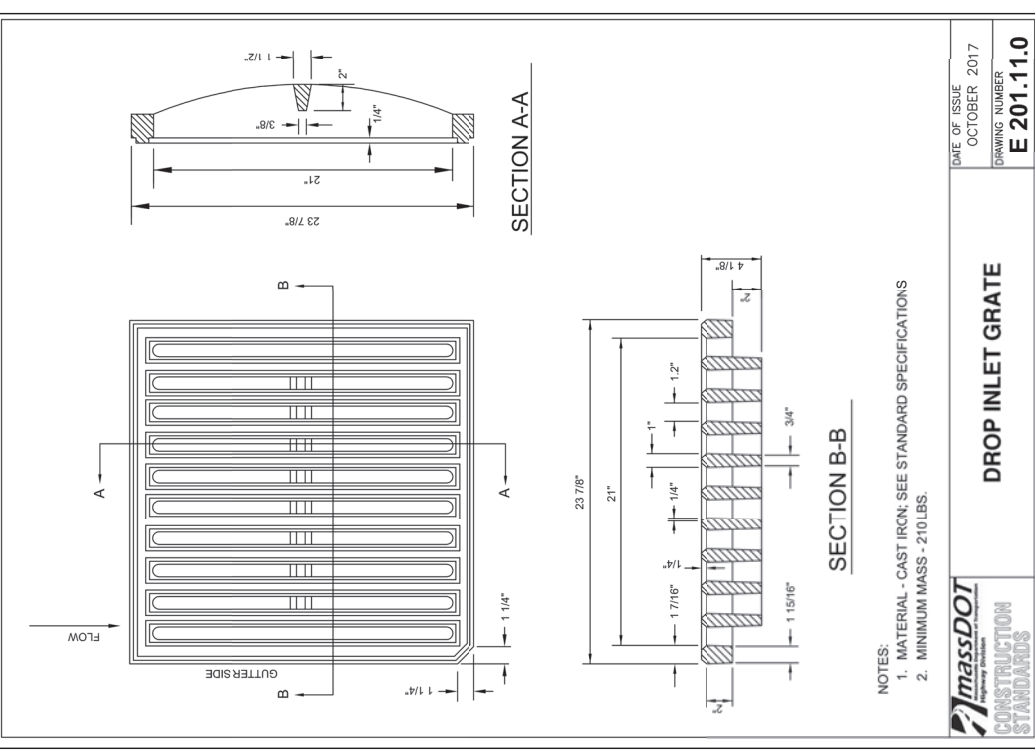
DATE OF ISSUE OCTOBER 2017	DRAWING NUMBER E 201.6.0
CATCH BASIN FRAME	



DATE OF ISSUE OCTOBER 2017	DRAWING NUMBER E 206.3.0
CORRUGATED METAL PIPE UNDER FILL SLOPES	



DATE OF ISSUE OCTOBER 2017	DRAWING NUMBER E 201.4.0
PRECAST CONCRETE CATCH BASIN	



DATE OF ISSUE OCTOBER 2017	DRAWING NUMBER E 201.11.0
DROP INLET GRATE	

GENERAL NOTES:

DESIGN:

IN ACCORDANCE WITH THE 2020 AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS LRFD BRIDGE DESIGN SPECIFICATIONS, FOR HL-93 LOADING.

MASSDOT BENCH MARK:

- MAG NAIL IN 18" OAK: ELEV = 559.41
N = 2942796.18
E = 473563.59
- MAG NAIL IN POLE: ELEV = 560.23
N = 2942759.12
E = 473639.59
- MAG NAIL IN 18" OAK: ELEV = 560.17
N = 2942623.86
E = 473812.19
- MAG NAIL IN 18" OAK: ELEV = 561.22
N = 2942601.57
E = 473848.96

ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988.

DATE:

TO BE PLACED ON THE INSIDE FACE OF THE NORTHEASTERN AND SOUTHWESTERN HIGHWAY GUARDRAIL TRANSITIONS. A SHEET SHOWING SIZE AND CHARACTER OF NUMERALS WILL BE FURNISHED. THE DATE USED SHALL BE THE LATEST YEAR OF CONTRACT COMPLETION AS OF THE DATE THE FIRST HIGHWAY GUARDRAIL TRANSITION IS CONSTRUCTED. BOTH HIGHWAY GUARDRAIL TRANSITIONS SHALL FEATURE THE SAME DATE.

MASSDOT SURVEY NOTES:

ELECTRONIC SURVEY PERFORMED BY BL COMPANIES WAS USED IN THE PREPARATION OF THESE CONSTRUCTION PLANS.

SCALES:

SCALES NOTED ON THE PLANS ARE NOT APPLICABLE TO REDUCED SIZE PRINTS. DIVIDE SCALES BY 2 FOR HALF SIZE PRINTS (A3).

FOUNDATIONS:

FOUNDATIONS MAY BE ALTERED, IF NECESSARY, TO SUIT CONDITIONS ENCOUNTERED DURING CONSTRUCTION, WITH THE APPROVAL OF THE ENGINEER. THE CONTRACTOR SHALL BE PREPARED TO PRE-DRILL THROUGH POTENTIAL OBSTRUCTIONS, AS DEFINED IN ITEMS 944.2 AND 944.3 IN THE SPECIAL PROVISIONS. IT IS UP TO THE MEANS AND METHODS OF THE CONTRACTOR TO REMOVE OBSTRUCTIONS AND KEEP THE HOLE FROM COLLAPSING. CASING MAY BE NEEDED TO KEEP THE PRE-DRILL HOLE FROM COLLAPSING. ADDITIONALLY, THE CONTRACTOR SHALL PROVIDE CASING AT THE DISCRETION OF THE RESIDENT ENGINEER.

UNSUITABLE MATERIAL:

ALL UNSUITABLE MATERIAL SHALL BE REMOVED WITHIN THE LIMITS OF THE FOUNDATIONS OF THE STRUCTURE, AS DIRECTED BY THE ENGINEER.

ANCHOR BOLTS:

ALL ANCHOR BOLTS SHALL BE SET BY TEMPLATE BEFORE THE CONCRETE IS PLACED.

CONCRETE:

4000 PSI, 1½ IN., 565 CEMENT CONCRETE SHALL BE PROVIDED FOR THE ABUTMENT STEMS, WINGWALL STEMS AND APPROACH SLABS.

4000 PSI, ¾ IN., 610 CEMENT CONCRETE SHALL BE PROVIDED FOR THE PEDESTALS.

4000 PSI, ¾ IN., 585 HP CEMENT CONCRETE SHALL BE PROVIDED FOR THE DECK AND CAST IN PLACE DIAPHRAGMS.

5000 PSI, ¾ IN., 685 HP CEMENT CONCRETE SHALL BE PROVIDED FOR THE PRECAST HIGHWAY GUARDRAIL TRANSITIONS.

5000 PSI, ¾ IN., 710 HP CEMENT CONCRETE SHALL BE PROVIDED FOR THE CT-TL2 BARRIER.

REINFORCEMENT:

REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M 31 GRADE 60. UNLESS OTHERWISE NOTED ON THE CONSTRUCTION DRAWINGS, ALL BARS SHALL BE LAPPED AS FOLLOWS:

MODIFICATION CONDITION

1. NONE

#4 BARS16" #5 BARS19" #6 BARS23"

2. 12" OF CONCRETE BELOW BAR
- 20"
- 25"
- 30"
3. EPOXY COATED BARS, COVER < 3d,
OR CLEAR SPACING < 6d,
- 23"
- 29"
- 34"
4. COATED BARS, ALL OTHER CASES
- 18"
- 23"
- 27"
5. CONDITION 2 AND 3
- 26"
- 32"
- 39"
6. CONDITION 2 AND 4
- 24"
- 30"
- 36"

NOTE: BARS ARE TO BE EPOXY COATED

ALL OTHER BARS SHALL BE LAPPED AS SHOWN ON THE CONSTRUCTION DRAWINGS.

MEMBRANE WATERPROOFING:

ALL MEMBRANE WATERPROOFING USED ON BRIDGE DECKS SHALL BE MEMBRANE WATERPROOFING FOR BRIDGE DECKS – SPRAY APPLIED.

EXISTING BRIDGE PLANS:

PLANS FOR EXISTING BRIDGE (H-08-003), DATED AUGUST 1961 MAY BE SEEN AT THE OFFICE OF PLANS AND RECORDS, MASSACHUSETTS DEPARTMENT OF TRANSPORTATION, 10 PARK PLAZA, BOSTON, MASSACHUSETTS. DIMENSIONS AND DETAILS OF THE EXISTING STRUCTURE ARE NOT GUARANTEED AND SHALL BE VERIFIED BY THE CONTRACTOR.

BRIDGE DEMOLITION:

THE DEMOLITION OF THE BRIDGE IS PAID UNDER PAY ITEM 115.1. SEE SPECIAL PROVISION.

THE DISPOSAL OF THE WOOD RAILINGS IS PAID FOR UNDER "DISPOSAL OF TREATED WOOD PRODUCTS.

ESTIMATED BRIDGE QUANTITIES		
ITEMS	UNITS	QUANTITY
DEMOLITION OF BRIDGE NO. H-08-003=N-07-002 (18J)	LS	1
BRIDGE EXCAVATION	CY	340
CLASS B ROCK EXCAVATION	CY	70
GRAVEL BORROW FOR BRIDGE FOUNDATION	CY	150
CONTROLLED DENSITY FILL - NON-EXCAVATABLE	CY	5
CRUSHED STONE	TON	170
CRUSHED STONE FOR BRIDGE FOUNDATIONS	TON	20
DISPOSAL OF TREATED WOOD PRODUCTS	TON	3
SUPERPAVE BRIDGE SURFACE COURSE - 9.5 (SSC-B - 9.5)	TON	60
SUPERPAVE BRIDGE PROTECTIVE COURSE - 9.5 (SSC-B - 9.5)	TON	20
GEOTEXTILE FABRIC FOR PERMANENT EROSION CONTROL	SY	530
STEEL PILE HP 12 X 84	FT	360
PRE-DRILLING FOR PILES	FT	210
DRILLING FOR PILE OBSTRUCTIONS	FT	23
DYNAMIC LOAD TEST BY CONTRACTOR	EA	2
PILE SHOES	EA	8
DUMPED RIPRAP	TON	490
STREAMBED/BANK RESTORATION	TON	390
CONTROL OF WATER - STRUCTURE NO. H-08-003=N-07-002 C7G	LS	1
BRIDGE STRUCTURE, BRIDGE NO. H-08-003=N-07-002 C7G	LS	1

HARDWICK-NEW BRAINTREE
CREAMERY ROAD

STATE	FED AID PROJ NO.	SHEET NO.	TOTAL SHEETS
MA	#	15	35
PROJECT FILE NO.		608851	

GENERAL NOTES

TRAFFIC DATA		
DESIGN YEAR	ROADWAY OVER	ROADWAY UNDER
DESIGN YEAR	2025	
AVERAGE DAILY TRAFFIC – PRESENT	100	
AVERAGE DAILY TRAFFIC – DESIGN YEAR	107	
DESIGN HOURLY VOLUME	11	
DIRECTIONAL DISTRIBUTION	50%	
TRUCK PERCENTAGE – AVERAGE DAY	6%	
TRUCK PERCENTAGE – PEAK HOUR	6%	
DESIGN SPEED	25 MPH	
DIRECTIONAL DESIGN HOURLY VOLUME	6	

SEISMIC DESIGN CRITERIA

DESIGN RETURN PERIOD:	1,000 YRS
DESIGN SPECTRA	
As	0.097
SDs	0.213
SD1	0.093
SITE CLASS	D
SEISMIC DESIGN CATEGORY (SDC)	A

HYDRAULIC DESIGN DATA

DRAINAGE AREA (SQ. MILES)	148
DESIGN FLOOD DISCHARGE (C.F.S.)	3,690
DESIGN FLOOD FREQUENCY (YEARS)	10
DESIGN FLOOD VELOCITY (F.P.S.)	5.8
DESIGN FLOOD ELEVATION (FEET, NAVD)	552.04

BASE (100-YEAR) FLOOD DATA

BASE FLOOD DISCHARGE (C.F.S.)	7,820
BASE FLOOD ELEVATION (FEET, NAVD)	556.65

DESIGN AND CHECK SCOUR DATA

DESIGN SCOUR FLOOD EVENT	25
RETURN FREQUENCY (YEARS)	
DESIGN FLOOD ABUTMENT SCOUR DEPTH (FEET)	1.38
DESIGN FLOOD PIER SCOUR DEPTH (FEET)	N/A
CHECK SCOUR FLOOD EVENT	50
RETURN FREQUENCY (YEARS)	
CHECK FLOOD ABUTMENT SCOUR DEPTH (FEET)	1.13
CHECK FLOOD PIER SCOUR DEPTH (FEET)	N/A

FLOOD OF RECORD

DISCHARGE (C.F.S.)	~18,300
FREQUENCY (IF KNOWN, YEARS)	>500
MAXIMUM ELEVATION (FEET, NAVD)	N/A
DATE (MM/YYYY)	09/1938
HISTORY OF ICE FLOES	N/A
EVIDENCE OF SCOUR	
AND EROSION	6 FEET

TEMPORARY WATER CONTROL
DESIGN DATA

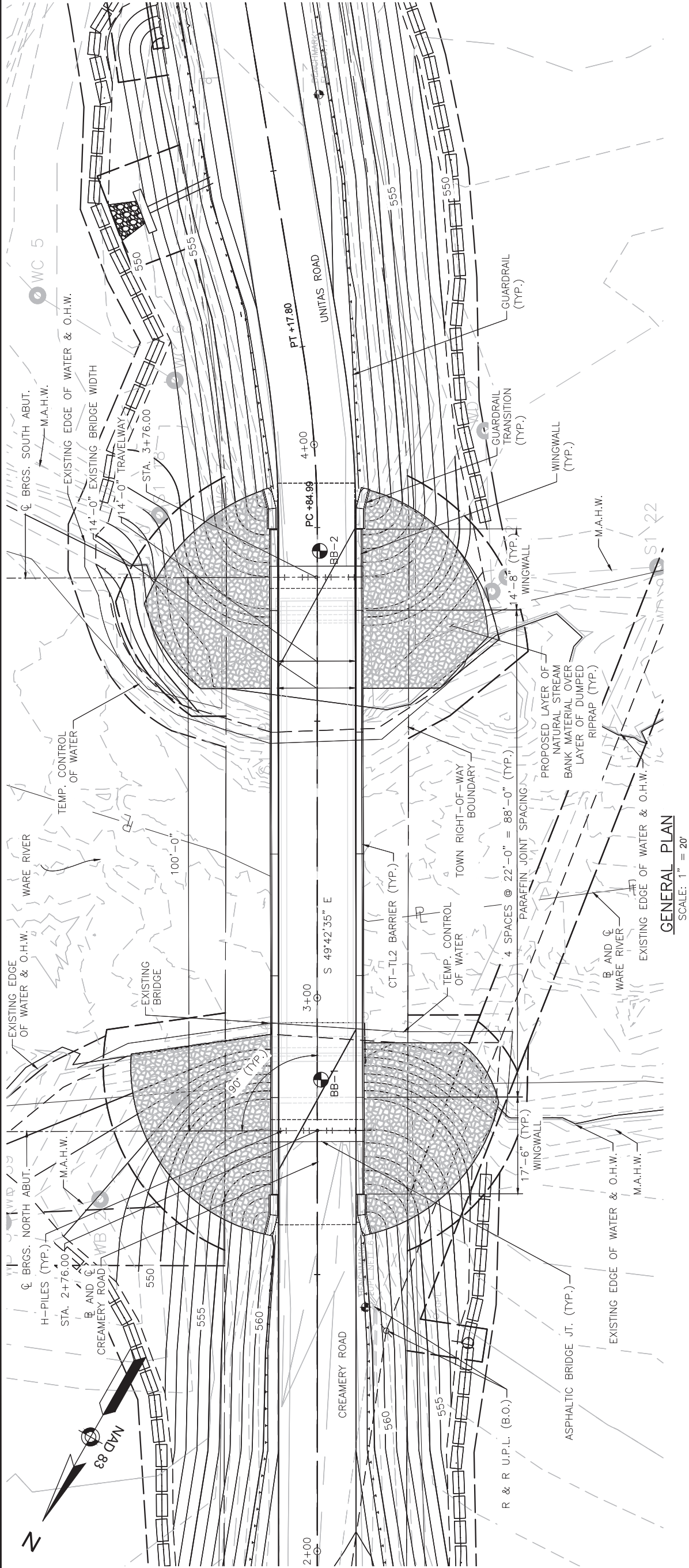
DESIGN FLOOD DISCHARGE (C.F.S.)	1,780
DESIGN FLOOD FREQUENCY (YEARS)	2
DESIGN FLOOD VELOCITY (F.P.S.)	3.9
DESIGN FLOOD ELEVATION (FEET, NAVD)	549.04

MAY 22, 2023	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER	
USE ONLY PRINTS OF LATEST DATE	

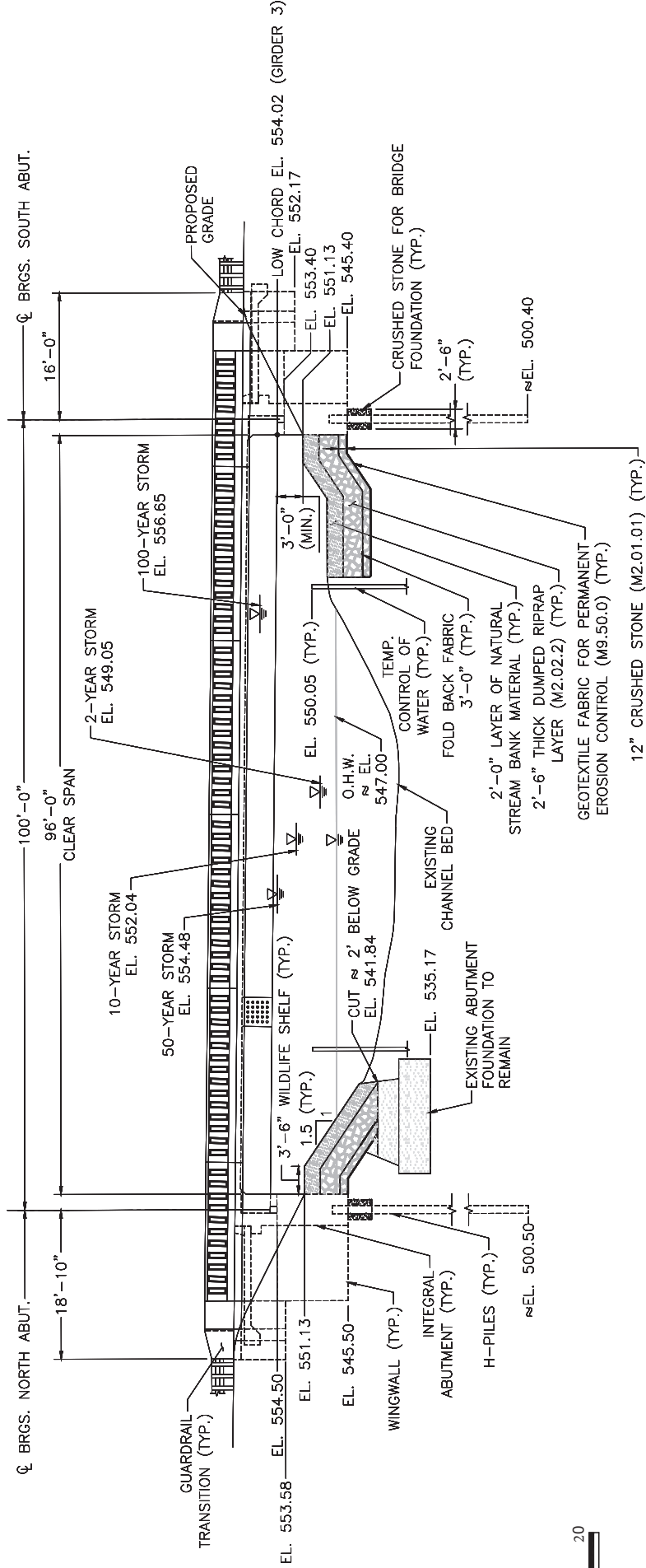
HARDWICK-NEW BRAINTREE
CREAMERY ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#	17	35
PROJECT FILE NO. 608851			

GENERAL PLAN & ELEVATION



GENERAL PLAN
SCALE: 1" = 20'

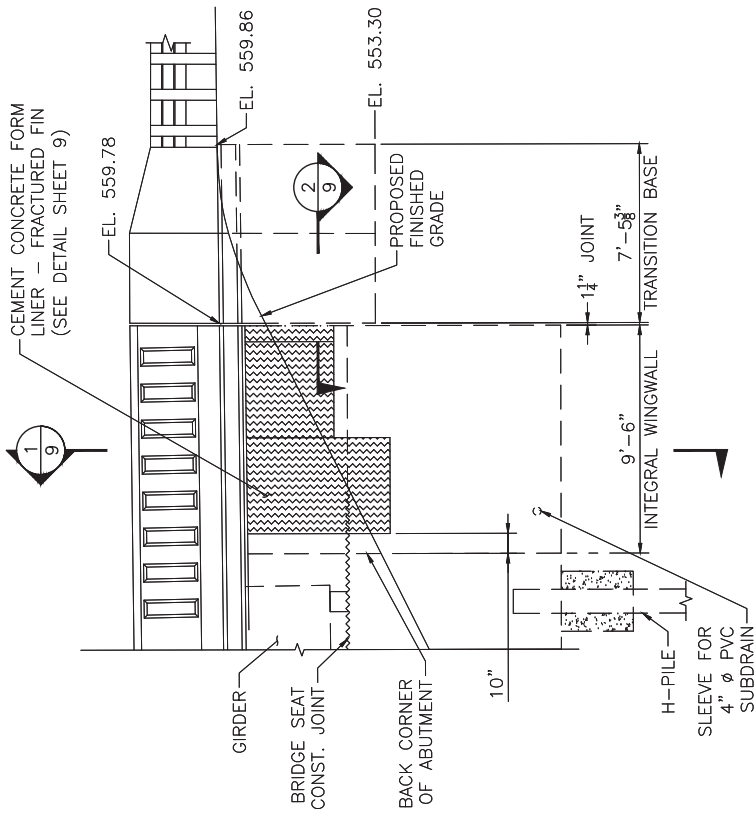
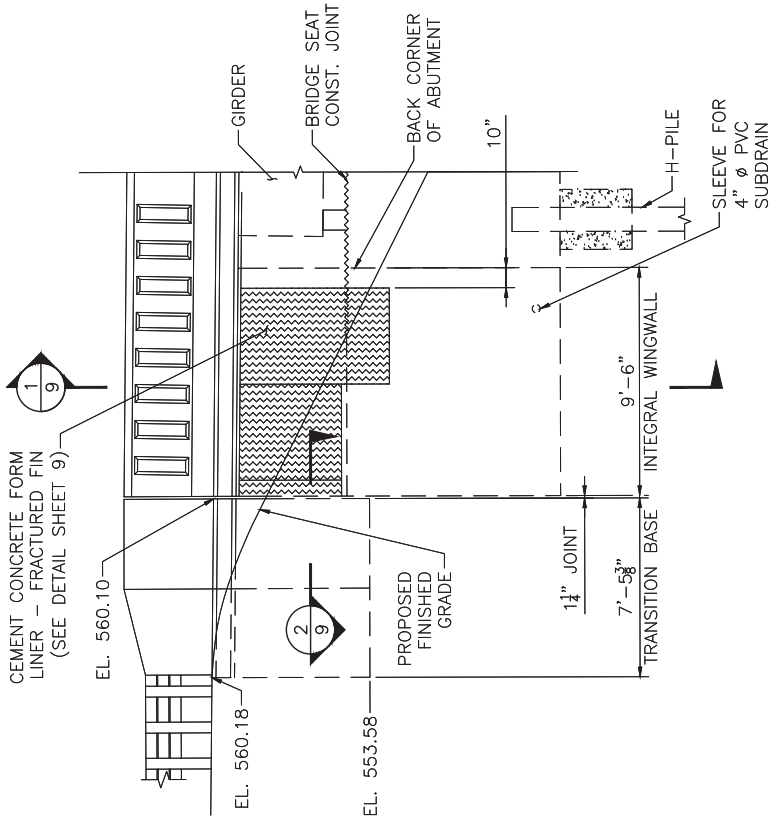
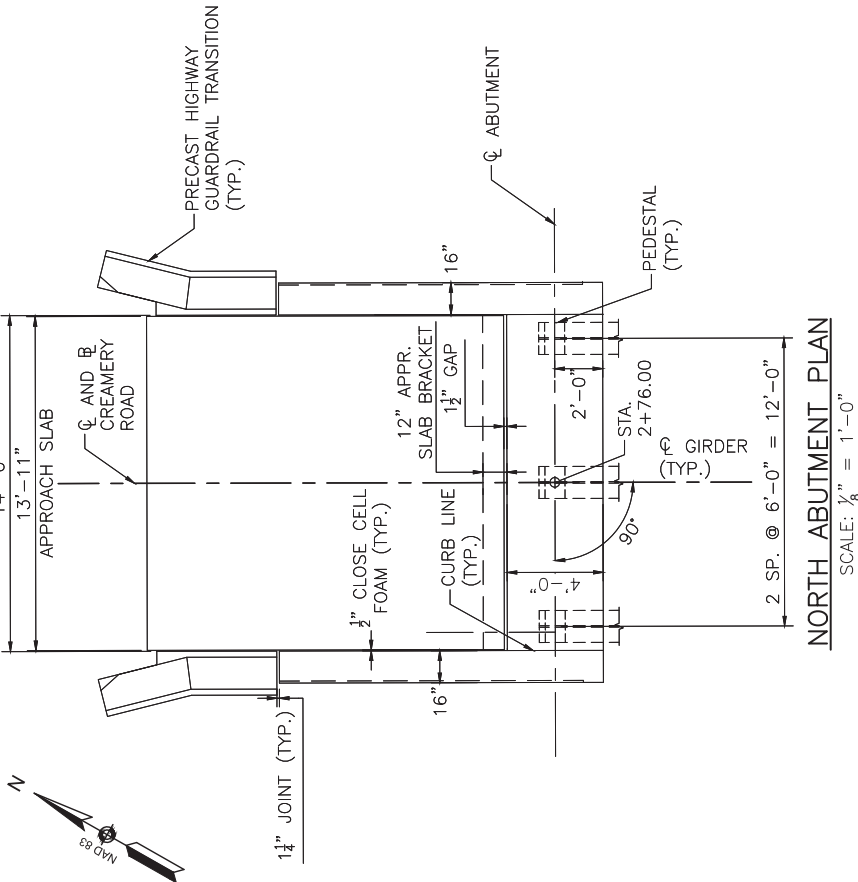


SCALE IN FEET

WQC/ACOE PLANS SHEET 12 OF 15

WEST ELEVATION
SCALE: 1" = 20'

MAY 22, 2023	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT AUTHORIZED SIGNATORY:	
STATE BRIDGE ENGINEER	
USE ONLY PRINTS OF LATEST DATE	



TOP OF PEDESTAL ELEVATIONS		
G-1	G-2	G-3
555.31	555.19	555.07

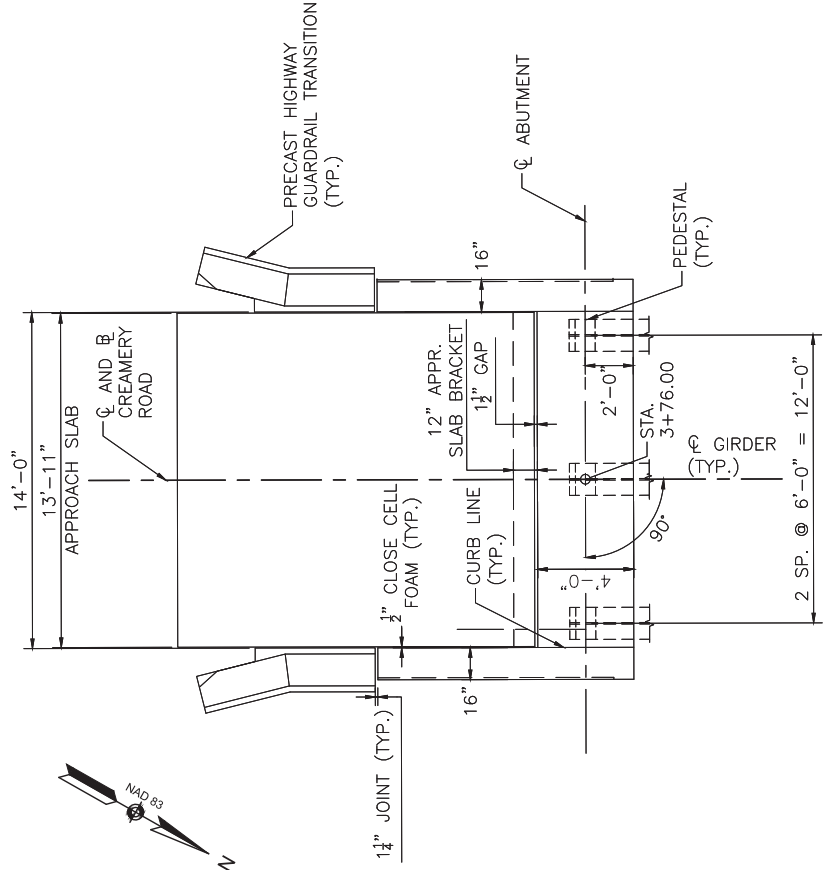
NOTES:

- ALL ELEVATIONS ARE SHOWN AT ABUTMENT CENTERLINE.
- DETAILS ABOVE DECK LEVEL AND INDEPENDENT WINGWALLS OMITTED FOR CLARITY.
- ELEVATIONS DO NOT INCLUDE ERECTION PAD THICKNESS.

HARDWICK-NEW BRAINTREE
CREAMERY ROAD

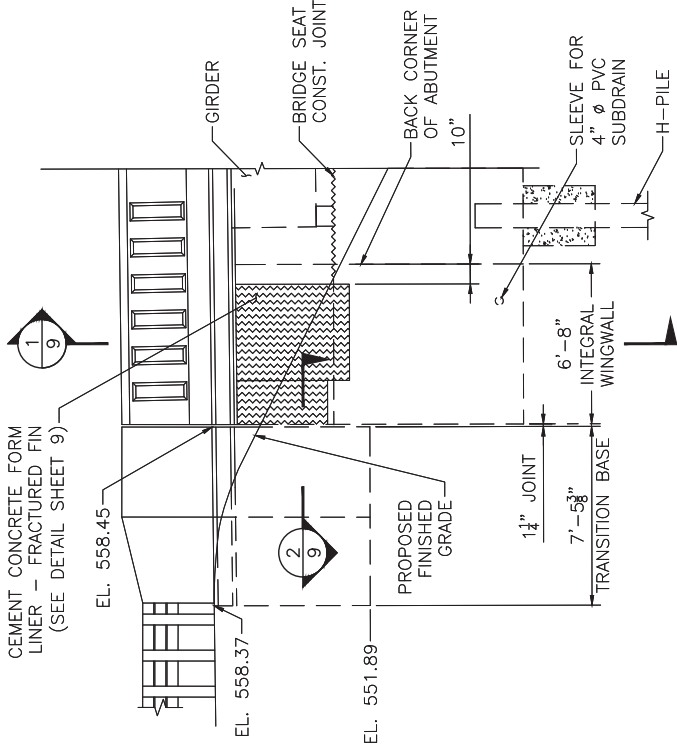
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#	20	35
PROJECT FILE NO.		608851	

SOUTH ABUTMENT



SOUTH ABUTMENT PLAN

SCALE: 1/8" = 1'-0"

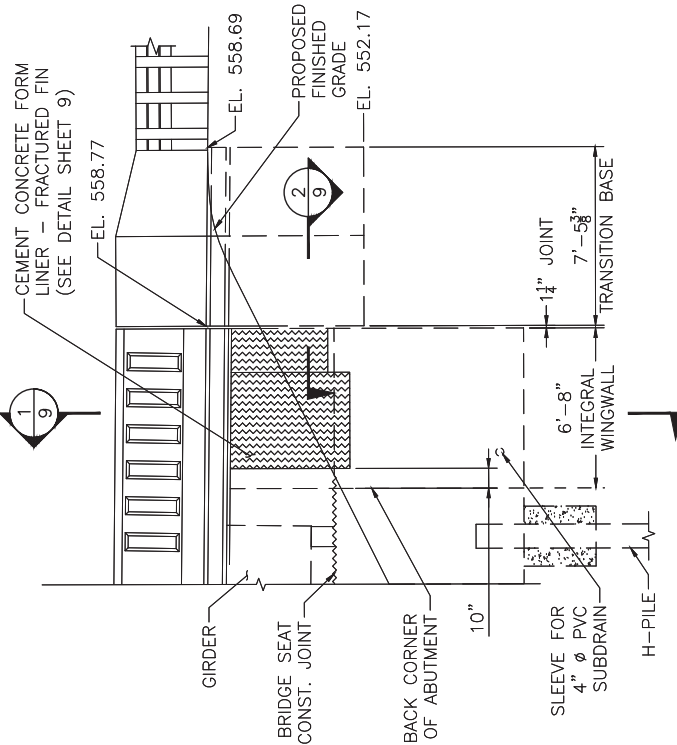


SOUTHEAST WINGWALL ELEVATION

SCALE: 1/8" = 1'-0"



SCALE IN FEET



SOUTHWEST WINGWALL ELEVATION

SCALE: 1/8" = 1'-0"

NOTES:

- ALL ELEVATIONS ARE SHOWN AT ABUTMENT CENTERLINE.
- DETAILS ABOVE DECK LEVEL AND INDEPENDENT WINGWALLS OMITTED FOR CLARITY.
- ELEVATIONS DO NOT INCLUDE ERECTION PAD THICKNESS.

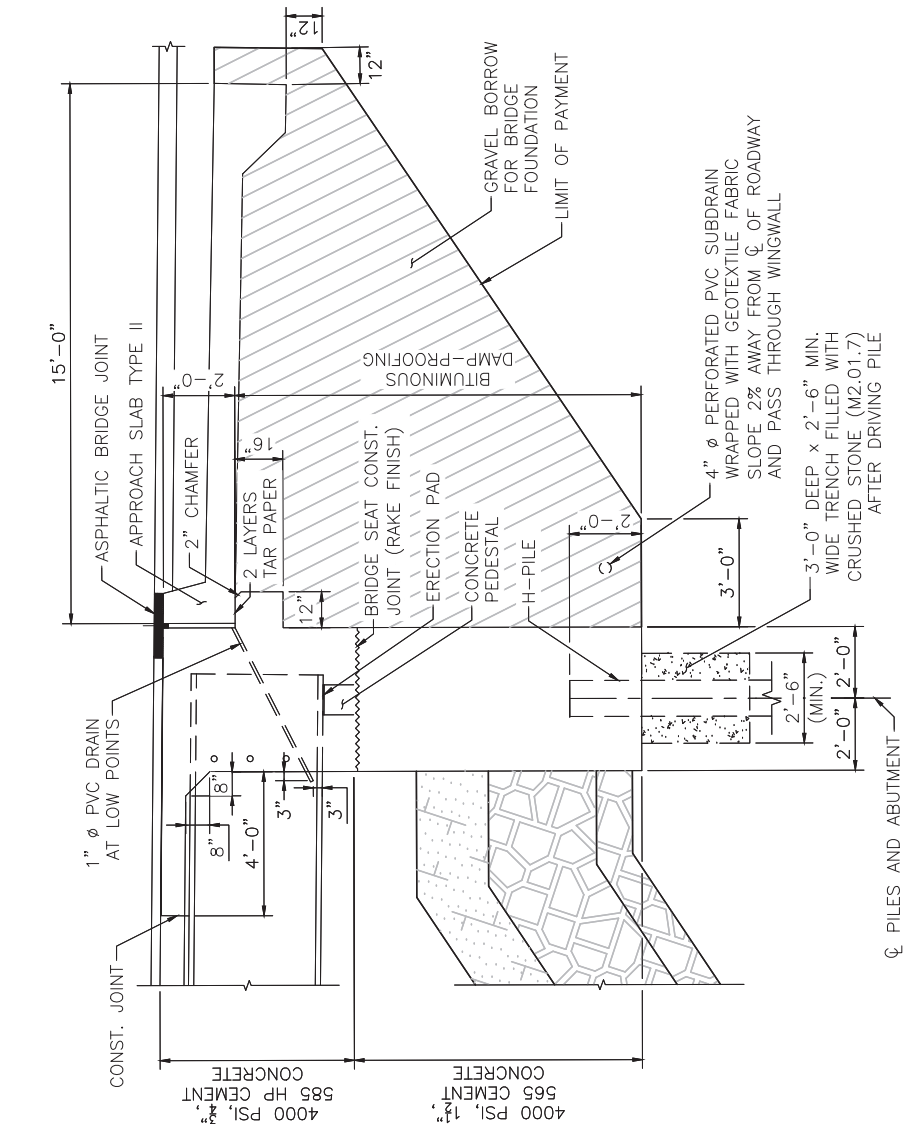
SOUTH ABUTMENT ELEVATION

SCALE: 1/8" = 1'-0"

MAY 22, 2023	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT	
AUTHORIZED SIGNATORY:	STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE	

STATE	FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#	21	35
PROJECT FILE NO. 608851			

ABUTMENT SECTIONS

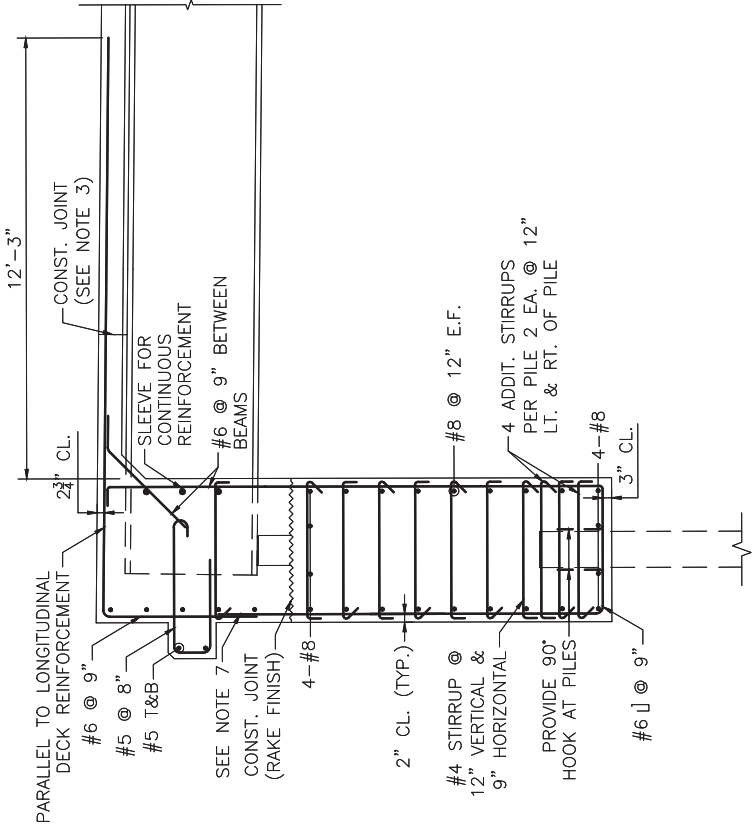


SOUTH ABUTMENT SECTION

SCALE: 3/8" = 1'-0"

NOTES:

1. ALL REINFORCEMENT SHALL BE EPOXY COATED.
2. DECK SLAB REINFORCEMENT NOT SHOWN FOR CLARITY. CONTINUE DECK SLAB REINFORCEMENT TO BACK OF ABUTMENT.
3. THE CONTRACTOR SHALL FOLLOW THE DECK PLACEMENT SEQUENCE AS SHOWN ON THESE CONSTRUCTION DRAWINGS REFERENCED ON SHEET 16.
4. ALL CONCRETE SHALL CONTAIN SUPERPLASTICIZER TO ENSURE ADEQUATE CONSOLIDATION.
5. BOTH ABUTMENTS SHALL BE BACKFILLED SIMULTANEOUSLY. NO MORE THAN TWO (2) FEET OF DIFFERENTIAL BACKFILL HEIGHT SHALL BE PERMITTED. BACKFILLING SHALL NOT BEGIN UNTIL THE ABUTMENT AND DECK CONSTRUCTION IS COMPLETE.
6. THE CONTRACTOR MAY USE MECHANICAL REINFORCING BAR SPLICERS IN LIEU OF TENSION LAP SPLICES TO FACILITATE CONSTRUCTION. HOWEVER, NO ADDITIONAL COMPENSATION WILL BE PROVIDED FOR THE USE OF MECHANICAL REINFORCING BAR SPLICERS.
7. THE TOP OF THE APPROACH SLAB SHALL MATCH THE TOP OF THE ABUTMENT DIAPHRAGM.



NORTH ABUTMENT SECTION

SCALE: 3/8" = 1'-0"

NOTES:

1. ALL REINFORCEMENT SHALL BE EPOXY COATED.
2. DECK SLAB REINFORCEMENT NOT SHOWN FOR CLARITY. CONTINUE DECK SLAB REINFORCEMENT TO BACK OF ABUTMENT.
3. THE CONTRACTOR SHALL FOLLOW THE DECK PLACEMENT SEQUENCE AS SHOWN ON THESE CONSTRUCTION DRAWINGS REFERENCED ON SHEET 16.
4. ALL CONCRETE SHALL CONTAIN SUPERPLASTICIZER TO ENSURE ADEQUATE CONSOLIDATION.
5. BOTH ABUTMENTS SHALL BE BACKFILLED SIMULTANEOUSLY. NO MORE THAN TWO (2) FEET OF DIFFERENTIAL BACKFILL HEIGHT SHALL BE PERMITTED. BACKFILLING SHALL NOT BEGIN UNTIL THE ABUTMENT AND DECK CONSTRUCTION IS COMPLETE.
6. THE CONTRACTOR MAY USE MECHANICAL REINFORCING BAR SPLICERS IN LIEU OF TENSION LAP SPLICES TO FACILITATE CONSTRUCTION. HOWEVER, NO ADDITIONAL COMPENSATION WILL BE PROVIDED FOR THE USE OF MECHANICAL REINFORCING BAR SPLICERS.
7. THE TOP OF THE APPROACH SLAB SHALL MATCH THE TOP OF THE ABUTMENT DIAPHRAGM.

SOUTH ABUTMENT REINFORCEMENT

SCALE: 3/8" = 1'-0"

NORTH ABUTMENT REINFORCEMENT

SCALE: 3/8" = 1'-0"



SCALE: 1" = 5'-4"

MAY 22, 2023	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT	
AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER	
USE ONLY PRINTS OF LATEST DATE	

Work-Start Notification Form

File Number: NAE-2024-00143

State: Massachusetts

County: Worcester

Permittee: MassDOT - Highway Division, Courtney Walker

Date Verification Issued: 3/11/2024

Project Manager: Daniel Vasconcelos

At least two weeks prior to commencing the activity authorized by this permit, sign this certification and return it to the following address:

US ARMY CORPS OF ENGINEERS

New England District

Attn: Daniel Vasconcelos

696 Virginia Road

Concord, MA 01742

or

daniel.b.vasconcelos@usace.army.mil

978-318-8653

Please note that your permitted activity is subject to a compliance inspection by a U. S. Army Corps of Engineers (USACE) representative. Failure to comply with any terms or conditions of this authorization may result in the USACE suspending, modifying or revoking the authorization and/or issuing a Class I administrative penalty, or initiating other appropriate legal action.

The people (e.g. contractor) listed below will do the work, and they understand the permit's conditions and limitations.

Contractor Name/Contractor Firm: _____

Business Address: _____

Contractor Phone and Email: _____

Proposed Construction Dates: Start: _____ **Finish:** _____

Signature of Permittee

Date

Compliance Certification Form

File Number: NAE-2024-00143

State: Massachusetts

County: Worcester

Permittee: MassDOT - Highway Division, Courtney Walker

Date Verification Issued: 3/11/2024

Project Manager: Daniel Vasconcelos

Within one month of completion of the activity authorized by this permit and any mitigation required by the permit (you must submit this form after mitigation is complete, but not the mitigation monitoring, which requires separate submittals), sign this certification and return it to the following address:

US ARMY CORPS OF ENGINEERS

New England District

Attn: Daniel Vasconcelos

696 Virginia Road

Concord, MA 01742

or

daniel.b.vasconcelos@usace.army.mil

Please note that your permitted activity is subject to a compliance inspection by a U. S. Army Corps of Engineers (USACE) representative. Failure to comply with any terms or conditions of this authorization may result in the USACE suspending, modifying, or revoking the authorization and/or issuing a Class I administrative penalty, or initiating other appropriate legal action.

I hereby certify that the work, and mitigation (if applicable), authorized by the above referenced permit has been completed in accordance with the terms and conditions of the said permit including any general or specific conditions.

Date Authorized Work Started: _____ **Completed:** _____

Describe any deviations from permit (attach drawing(s) depicting the deviations):

***Note: The description of any deviations on this form does not constitute approval by the USACE.**

Signature of Permittee

Date



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

100 Cambridge Street Suite 900 Boston, MA 02114 • 617-292-5500

Maura T. Healey
Governor

Kimberley Driscoll
Lieutenant Governor

Rebecca L. Tepper
Secretary

Bonnie Heiple
Commissioner

March 1, 2024

Massachusetts Department of Transportation
Highway Division
10 Park Plaza, Suite 6340
Boston, MA 02116
ATTN: Courtney Walker

RE: Section 401 Water Quality Certification
BRP WW 11, Minor Fill Project
Creamery Road over Ware River (Bridge No. H-08-003=N-07-002)
Hardwick and New Braintree, MA

401 WQC Filing Number: 24-WW11-0004-APP
USACE Application No. NAE-2024-00143

Dear Ms. Walker:

The Massachusetts Department of Environmental Protection (MassDEP) has reviewed your application for a Water Quality Certification (WQC), as referenced above; this application was deemed complete on January 31, 2024. In accordance with the provisions of MGL Ch. 21, §§26-53 and Section 401 of the Federal Clean Water Act as amended (33 U.S.C. §1251 et seq.), it has been determined there is reasonable assurance the proposed project will be conducted in a manner which will not violate applicable water quality standards (314 CMR 4.00) and other applicable requirements of state law.

The project proposes to replace the bridge superstructure of Bridge No. H-08-003=N-07-002 carrying Creamery Road over the Ware River in the Towns of Hardwick and New Braintree. The bridge is located approximately 950 feet southeast of the State Route 32 and Creamery Road intersection in Hardwick. Creamery Road continues into New Braintree where it becomes Unitas Road. The existing structure, which was built in 1939 and was reconstructed in 1961, is functionally obsolete and structurally deficient.

Creamery Road/Unitas Road is classified by MassDOT as a Rural Local Roadway and, like Bridge No. H-08-003=N-07-002, is owned and maintained by the Towns of Hardwick and New Braintree. Creamery Road/Unitas Road is a one-lane, two-way road that is approximately 14-feet wide with no shoulders present on either side. The existing bridge is a single span steel stringer structure with an overall length of 79 feet, 4 inches, an out-to-out deck width of approximately 13 feet, and a curb-to-curb width of 11

feet. There is no existing drainage infrastructure within the project area, and stormwater sheet flows off the roadway and through vegetation along the side of the road before discharging to the Ware River.

The project proposes to replace the superstructure of the bridge, remove the existing southern abutment, cut down the northern abutment below Ordinary High Water (OHW) and construct the new abutment behind it. There will be rip rap placed in front of the new northern abutment and on top of the existing foundation that will remain in place. The proposed structure will have an out-to-out deck width of 16 feet, 10 inches and a curb-to-curb width of 14 feet. The proposed superstructure will have an open span of 96 feet and will remain a one-lane structure with a clearance (freeboard) of 2.59 feet.

Portions of the project will take place within the Federal Emergency Management Agency (FEMA) mapped floodplain and is classified as Zone A.

The proposed superstructure replacement and associated work will require temporary and permanent impacts associated with the dewatering, excavation and fill within the river as shown in Table 1. A total of 56 cubic yards (cy) of dredging in Ware River is required for regrading activities and work within the streambed, which includes placing a two-and-a-half-foot layer of rip rap topped by a two-foot layer of natural streambed material.

Table 1. BVW and LUW Impacts

Wetland/LUW	Permanent Impact (sf)	Temporary Impact (sf)
Bordering Vegetated Wetland	607	275
Ware River (LUW)	1,690	1,165

To mitigate for the 607 square feet of permanently impacted bordering vegetated wetlands, the project proposes a wetland replication area to be constructed just northeast of the bridge work. The wetland replication area will contain an area of approximately 650 square feet. The wetland replication area will be excavated to a depth between 12 and 18 inches below the final design elevation and will reuse suitable soils to match the elevation of the replication area to the abutting wetland to maintain a hydrologic connection.

Bridge demolition and reconstruction will require the road to be fully closed during construction due to its one-lane, two-way configuration. Construction is anticipated to occur in dry conditions; however, dewatering may be required due to weather conditions. Construction is anticipated to be completed in one construction season.

As the project is considered redevelopment in accordance with the stormwater provisions of 314 CMR 9.06(a)7., stormwater standards will be met to the maximum extent practicable (MEP). The project site currently has no drainage infrastructure and will maintain the same drainage patterns as the predeveloped conditions. There will be an increase in impervious area of 630 square feet. A deep sump hooded catch basin is proposed which will connect to a 14-foot corrugated metal pipe that will

discharge to a rip rap apron and then through approximately 50 feet of vegetation upgradient of the Ware River.

The existing single-span bridge will be replaced in kind with another single-span superstructure. The original stream channel cross-section will be altered to support the bridge work but natural substrate will be placed over the altered streambed that will consist of streambed materials stockpiled for re-use or similar materials from nearby reaches of the river. Though span length will be increased from 77 feet to 95 feet, it does not quite meet the 1.2 times bankfull width standard. However, the proposed project will significantly improve the opening and passage for wildlife under the proposed conditions and will provide a wildlife shelf on both sides of the river.

The Project occurs within Natural Heritage and Endangered Species Program (NHESP) Priority Habitats and Estimated Habitats of Rare Wildlife for the wood turtle (*Glyptemys insculpta*) and freshwater creeper mussel (*Strophitus undulatus*). In a letter dated November 16, 2023, NHESP concluded that the Project will not result in a prohibited Take of state-listed rare species, subject to the attached conditions from the Massachusetts Division of Fisheries and Wildlife. These include a turtle protection plan and a mussel sweep/translocation plan. Therefore, as conditioned, the Project complies with 314 CMR 9.06(2).

Based on a review of information provided by the applicant, MassDEP finds that this project complies with the standards described under 314 CMR 9.06 and 9.07. Public notice was provided in the Barre Gazette and in the Ware River News on January 4, 2024, and in the MEPA Monitor on January 10, 2024. No comment letters were received during the public comment period.

Therefore, based on information currently in the record, MassDEP grants a WQC for this project subject to the following conditions to maintain water quality, to minimize impact on waters and wetlands, and to ensure compliance with appropriate state law. The Department further certifies in accordance with 314 CMR 9.00 that there is reasonable assurance the project or activity will be conducted in a manner which will not violate applicable water quality standards (314 CMR 4.00) and other applicable requirements of state law. Finally, the Department has determined that upon satisfying the conditions and mitigation requirements of this approval, the project provides a level of water quality necessary to protect existing uses and accordingly finds that the project to be implemented satisfies the Surface Water Quality Standards at 314 CMR 4.00.

Pursuant to 314 CMR 9.09(1)(d); 314 CMR 9.06(6)(a); 310 CMR 9.06(2); 314 CMR 9.07; 314 CMR 9.07(1); 314 CMR 9.09(7)(5)(c); 314 CMR 9.11; and 314 CMR 9.09(1)(e), the following Special Conditions are necessary to ensure that construction practices and stormwater controls are implemented in such a manner as to prevent degradation to wetlands and waters; ensure that practicable steps have been taken which will avoid and minimize impacts to wetlands and waters; minimize turbidity and sediment caused by construction activities; ensure that water quality is not degraded, and that biology of the waters are not negatively impacted by potential discharges; and/or maintain a record of the dredged material for reference and to ensure accountability in its transportation.

Those Special Conditions that require direct submittals to MassDEP for either review, or review and approval, are denoted by the following notation (Submittal) at the end of the condition and are summarized in Attachment A. In addition, those conditions with the (Submittal) designation shall be included in the Special Provisions and, as applicable, reviewed at the Pre-Construction Meeting.

1. All work shall be performed in accordance with the following documents and plans:
 - Application for Water Quality Certification. Prepared by Green International Affiliates, Inc. on behalf of MassDOT, dated December 26, 2023, with cover letter and attachments. 401 WQC Filing Number: 24-WW11-0004-APP.
 - Plans entitled: “Creamery Road Bridge Replacement Over Ware River (Bridge No. H-08-003=N-07-002)”, Sheets 1-3, 5-8, 13-15, 17, 19-21. Prepared by BL Companies. Dated December 26, 2023.
 - Letter from the Massachusetts Natural Heritage and Endangered Species Program dated November 16, 2023, with attached **List of Conditions**. 608851 – Hardwick – New Braintree – Bridge Replacement, H-08-003=N-07-002, Creamery Road over Ware River. NHESP File No. 23-8704
 - MassDEP Technical Review. 401 Water Quality Certification, Minor Fill Project Certification. Dated January 17, 2024.
 - Responses to MassDEP Technical Review. Prepared by Green International Affiliates, Inc. on behalf of MassDOT. 401 Water Quality Certification, Minor Fill Project Certification. Dated January 31, 2024.

Pre-Construction

2. A qualified **Wetland Scientist** (WS) with a minimum of five years of relevant professional experience with wetland replacement projects shall be employed to oversee all BVW replacement activities, including but not limited to grading, seeding, vegetation plantings, and wildlife habitat features. The name, contact information, and qualifications of the WS shall be provided to MassDEP for approval with a copy to the Hardwick and New Braintree Conservation Commissions prior to the Pre-Construction Meeting. **(Submittal)**
3. As specified in the permit application and Item 983.5 of the Streambed/Bank Restoration project specifications, a qualified **Fluvial Geomorphologist** (FGM) with a minimum of five years of relevant professional experience in stream replacement and restoration projects shall be employed to oversee all LUW replacement and restoration activities. The name, contact information, and qualifications of the FGM shall be provided to MassDEP for approval with a copy to the Hardwick and New Braintree Conservation Commissions prior to the Pre-Construction Meeting. **(Submittal)**
4. Prior to the Pre-Construction Meeting, the applicant shall provide MassDEP with the name and contact information of the Resident Engineer (RE) responsible for ensuring that all work complies with the conditions of this WQC. **(Submittal)**
5. A minimum of 21 days prior to the start of work, MassDOT shall contact MassDEP to schedule an onsite Pre-Construction Meeting to review the approved plans and terms and conditions of this WQC. The RE, the construction contractor, the WS, the FGM, a representative from the MassDOT Environmental Section and/or the District Environmental Engineer shall attend the Pre-Construction Meeting.

6. MassDEP shall be copied on applicable submittals to the U.S. Army Corps of Engineers (Corps). These include but are not limited to: Self-Verification Notification Form (SVNF); Pre-Construction Notification (PCN); Work-Start Notification Form; Mitigation Work-Start Notification Form; and Compliance Certification Form. The Work-Start Notification Form shall be submitted at least 14 days before the anticipated start of work and the Compliance Certification Form shall be submitted within 30 days following the completion of the authorized work. **(Submittal)**
7. A CP/PP shall be developed and implemented as required by 314 CMR 9.06(6)(a)8. A minimum of 14 days prior to the start of work, MassDOT shall submit the CP/PP for review and approval. If the EPA CGP applies, the SWPPP may serve as the CP/PP, providing it includes the measures required to be in the CP/PP per these Special Conditions, in addition to the measures specifically required by the CGP. Any subsequent changes to the Final CP/PP (defined herein as including the construction period SWPPP) must be approved by MassDEP. **(Submittal)**
8. Training regarding erosion and sedimentation controls is required. The RE, CP/PP Inspector, and any other relevant personnel responsible for erosion and sedimentation controls shall complete the EPA Construction General Permit Inspector Training, or other training that meets the CGP requirements, as well as complete a comprehensive review of the Final CP/PP. Verification of proof of completion training of the shall be submitted to MassDEP prior to the start of work. **(Submittal)**
9. The CP/PP shall identify, but shall not be limited to, staging and laydown areas in relation to BVWs and LUW, proposed dewatering locations, proposed stockpile locations and their proximity to catch basins or other drainage conveyances that discharge to wetland resource areas, and the location of construction-period erosion and sedimentation controls.
10. A minimum of 21 days prior to the start of work, MassDOT shall submit a Water Management Plan for review and approval. The Plan shall include proposed methods to manage construction-period water including but not limited to dewatering methods and locations, specifications for any water bypass systems, and dredge and debris material dewatering prior to shipment off site, as applicable. The plan shall meet requirements of the CP/PP and be specific to the Project. Dewatering and water bypasses shall be conducted under the supervision of the RE and comply with the applicable conditions identified herein. **(Submittal)**
11. Prior to the start of work, approved erosion and sedimentation control measures shall be installed per the approved CP/PP and as applicable, the manufacturer specifications. Erosion and sedimentation control measures may consist of, but are not limited to, silt fence, staked straw bales, silt/turbidity curtains, compost filter tubes, etc.
12. Prior to the Pre-Construction Meeting, the boundaries of BVWs and LUW shall be re-flagged where they are within 50 feet of the limits of work. In the event BVWs and LUW boundaries overlap, the outermost boundary (i.e., closest to the proposed work) shall be flagged. All boundary markers, once in place, shall remain in place throughout construction until all disturbed surfaces have been permanently stabilized. Boundary markers shall be fully evaluated annually and refreshed where needed. Implementation of and compliance with this

requirement shall be documented by the WS. All construction personnel shall be made aware of these markers.

13. A Flood Contingency Plan shall be submitted to MassDEP for review and approval that addresses areas that fall within the 1% annual chance of flooding zone within project limits. The Plan shall address the potential need for temporary relocation of construction and auxiliary equipment during flood events to designated upland locations above the Base Flood Elevation. The Plan shall be approved by MassDEP prior to any work within the 1% annual chance of flooding zone, including mobilization or storage of equipment and materials. **(Submittal)**
14. The applicant shall develop an Invasive Plant Management Strategy (IMPS) to be submitted to MassDEP for review and approval prior to the Pre-Construction Meeting. The IMPS shall be implemented as approved. **(Submittal)**
15. If needed, use of herbicides to control invasive species shall be implemented in accordance with the approved IPMS and with the following requirements:
 - a. Herbicides can only be applied by a Licensed Applicator;
 - b. Applicant must provide MassDEP Material Safety Data Sheets (MSDS) of the product being used and must also keep MSDS sheets on site;
 - c. Product registration in MA with Massachusetts Pesticide Product Registration Number must be confirmed with Massachusetts Department of Agricultural Resources Pesticide Division;
 - d. EPA Registration Number for the product must be identified;
 - e. Product label restricted use provisions must be followed; and
 - f. Applicant must contact MassDEP Division of Watershed Planning to determine if a BRP WM 04 herbicide permit is required.
16. A minimum of 21 days prior to the start of work, a Demolition Plan shall be submitted for review and approval describing how the existing bridge will be demolished and what measures will be taken to assure that demolition material is properly contained and does not enter the Ware River. **(Submittal)**

Construction Period

17. No more than **607 sf** of permanent and **275 sf** of temporary impacts to BVWs shall occur. No more than **1,690 sf** of permanent and **1,165 sf** of temporary impacts to LUW shall occur. No more than **56 cy** of dredging in LUW shall occur. All work shall avoid unapproved impacts to BVW and LUW.
18. CP/PP inspections shall occur at least once every seven calendar days and within 24 hours of a storm event that produces 0.5 inches or more of rain within a 24-hour period, or at a more stringent frequency if the CP/PP requires.

19. Copies of CP/PP Inspection and Maintenance Log Forms shall be submitted to MassDEP within 14 days upon request.
20. Inspection and maintenance of erosion and sediment controls in active work areas shall be the responsibility of both the Contractor and RE. The RE shall be ultimately responsible for inspection and maintenance of site controls. The RE and/or contractor shall immediately notify MassDEP, and the Hardwick and New Braintree Conservation Commission if any unauthorized discharges to BVWs or LUW occur.
21. Disturbed areas shall be stabilized immediately after activities have permanently ceased or will be temporarily inactive for 14 or more calendar days. The installation of stabilization measures shall be implemented as soon as practicable, but no later than 14 calendar days after stabilization has been initiated.
22. A floating silt fence shall be kept on site and ready to deploy when construction work is likely to discharge sediment into the waterway. The floating silt fence shall not be allowed to block more than 50 percent of the channel width. The floating silt fence shall be installed to contain any sediment discharges from work areas and shall be cleaned as recommended by the floating silt fence manufacturer. The floating silt fence shall be removed from the waterway when construction work allows and removed from the site when no longer needed.
23. Work within LUW shall be conducted in low or no-flow conditions to the extent practicable. Notice shall be provided to MassDEP and the Hardwick and New Braintree Conservation Commission within 24 hours prior to the commencement of dewatering. Dewatering methods and location(s) shall be approved by the RE prior to use, and shall be documented in the CP/PP. There shall be no discharge of untreated dewatered stormwater or groundwater to BVWs or LUW. Any discharges shall be visibly free of sediment.
24. Additional erosion and sedimentation control materials shall be stored on-site at all times for emergency and routine replacement. Materials shall be kept covered, dry, and accessible at all times. The RE shall be responsible for anticipating the need for and installation of additional erosion and sedimentation controls and shall have the authority to require additional erosion control measures to protect wetland resource areas beyond what is shown on the plans if field conditions or professional judgment dictate that additional protection is necessary.
25. The RE shall monitor the National Weather Service forecast for updates, and upon issuance of a flood watch for the 1% annual chance of flooding zone, shall implement the flood contingency plan referenced in Condition 13.
26. Any storm drains with potential to receive discharge from stockpiled materials or construction operations shall be managed to inhibit the inflow of sediment while not increasing the likelihood of roadway flooding during periods of precipitation. Stockpiles shall be located no less than 50 feet from BVWs, LUW, catch basins, or other drainage conveyances that discharge to BVWs or LUW. The CP/PP shall specify measures to implement this. Filter fabric stretched under storm drain inlet grates are not acceptable for this purpose.

27. The contractor shall have designated washout areas for concrete equipment that will be comprised of impermeable material and sized to contain project concrete wastes and wash water. Concrete wash out areas shall be located no less than 50 feet from BVWs, LUW, and catch basins or other drainage conveyances that discharge directly or indirectly to BVWs or LUW.
28. Refueling, washing, and cleaning of vehicles and other construction equipment shall not take place within 50 feet of BVWs or LUW and any wash water shall be contained such that it does not drain toward BVWs or LUW. MassDEP shall explicitly approve in writing any deviation to this condition for oversized stationary vehicles.
29. The contractor shall have spill containment kits on site. In the event of a release of fuels and/or oils, the local fire department and MassDEP shall be notified.
30. Sheet piles shall be fully removed from wetland resource areas upon stabilization of the area as required. No portion of sheet piles shall remain unless approved by MassDEP in writing prior to installation. A request to leave sheet piles shall include, but not be limited to, demonstration that full removal of the sheet piles is not feasible or practicable, and an alternatives analysis demonstrating alternative methods to isolate the work area(s) are not feasible or practicable. At no time shall sheet piles be allowed to remain in LUW of a waterway that provides aquatic organism passage.
31. A temporary shielding system shall be in place beneath the bridge structure prior to removal and concrete excavation to prevent debris from falling into the water below. In the event that any debris accidentally enters the Ware River, it shall be immediately retrieved. Notice shall be provided to MassDEP if debris enters the river and that it has been removed with photo-documentation (if practicable) submitted by email.

Wetland Mitigation

32. The WS shall oversee all BVW replication, including final grading and seeding. A bordering vegetated wetlands replication area with a minimum area of 650 square feet shall be constructed. The WS shall confirm that constructed BVW replication areas have adequate soils and hydrology to promote wetland plant species prior to seeding and shall recommend measures to amend soils and promote wetland hydrology as needed.
33. Planting and seeding shall not take place between November 15th and April 15th, except as allowed by MassDEP in writing. Plantings and seed mixes shall consist of native and non-invasive species. Species may be substituted at the recommendation of the WS, and review and approval by MassDEP.
34. At least 75% of the surface area of the BVW replication areas shall be vegetated with indigenous wetland plant species within two growing seasons, or the period required by the Section 404 permit, whichever is longer. Additionally, evidence of hydrology, including hydric soil formation shall be submitted at the same time. Annual monitoring reports shall be submitted by the WS no later than January 15th each year. Monitoring reports shall include an assessment based on

the approved success criteria, representative photos, and recommended corrective actions as needed. **(Submittal)**

35. MassDEP reserves the right to determine the success or failure of the BVW replication areas, and reserves the right to require additional plantings, regrading, or other measures deemed necessary to promote success, and MassDOT shall comply with such requirements.

Stream Mitigation

36. The FGM shall oversee all LUW replication in accordance with the plans and specifications approved herein. Placement of streambed materials shall take place in no- or low-flow conditions. The Water Management Plan required in Condition 10 shall include measures to create no-flow conditions for this work such as a pump bypass system or other dewatering method, if needed. Placement of streambed materials during greater than low-flow conditions shall require a placement plan, with a narrative describing turbidity control measures, submitted to MassDEP for review and approval.
37. Streambed materials must be approved by the Resident Engineer and FGM prior to use.
38. A report shall be submitted by the FGM following completion of the LUW restoration, which shall include representative photos and a summary of the restoration activities and results. **(Submittal)**
39. Water shall be slowly introduced back into the restored and dewatered LUW work areas as to not cause erosion and sedimentation. This work shall be overseen by the FGM.

Post-Construction

40. All temporary erosion controls shall be removed at the conclusion of work once the surrounding area has achieved final stabilization.

General Conditions

41. Any proposed alterations, minor plan changes, or amendment requests, as well as any required submittals shall be sent by email for review and approval to heidi.davis@mass.gov and ryan.morrison@mass.gov. **(Submittal)**
42. This WQC remains in effect for the same duration as the Section 404 permit that requires it.
43. No Special Condition set forth herein shall be construed or operate to prohibit MassDEP from taking enforcement against the MassDOT or its contractors for any failure to comply with the terms and requirements of this WQC.
44. No activity authorized by this WQC may begin prior to expiration of the 21-day appeal period, or until a final decision is issued by MassDEP in the event of an appeal.

Failure to comply with this Certification is grounds for enforcement, including civil and criminal penalties, under MGL Ch. 21 §42, MGL Ch. 21A §16, or other possible actions/penalties as authorized by the General Laws of the Commonwealth.

This Certification does not relieve the applicant of the obligation to comply with other appropriate state or federal statutes or regulations.

NOTICE OF APPEAL RIGHTS

a.) Appeal Rights and Time Limits

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

Case Administrator
Department of Environmental Protection
100 Cambridge Street, 9th Floor
Boston, MA 02114

A copy of the request shall at the same time be sent by certified mail or hand delivery to the Department of Environmental Protection at:

Department of Environmental Protection
Commissioner's Office
100 Cambridge Street, Suite 900
Boston, MA 02114

b.) Contents of Hearing Request

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):

3. the 401 Certification Transmittal Number;
4. the complete name of the applicant and address of the project;

5. 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;
6. 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;
7. a clear and concise statement that an adjudicatory hearing is being requested;
8. 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 Certification; and
9. 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.

c.) Filing Fee and Address

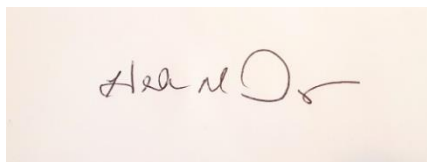
The hearing request along with a DEP Fee Transmittal Form and a valid check or money order payable to the Commonwealth of Massachusetts in the amount of one hundred dollars (\$100) must be mailed to:

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 permit, please contact myself or Ryan Hale at Heidi.davis@mass.gov and ryan.morrison@mass.gov

Very truly yours,

A handwritten signature in dark ink, appearing to read "Heidi Davis", is written on a light-colored rectangular background.

Heidi M. Davis
Highway Unit Supervisor

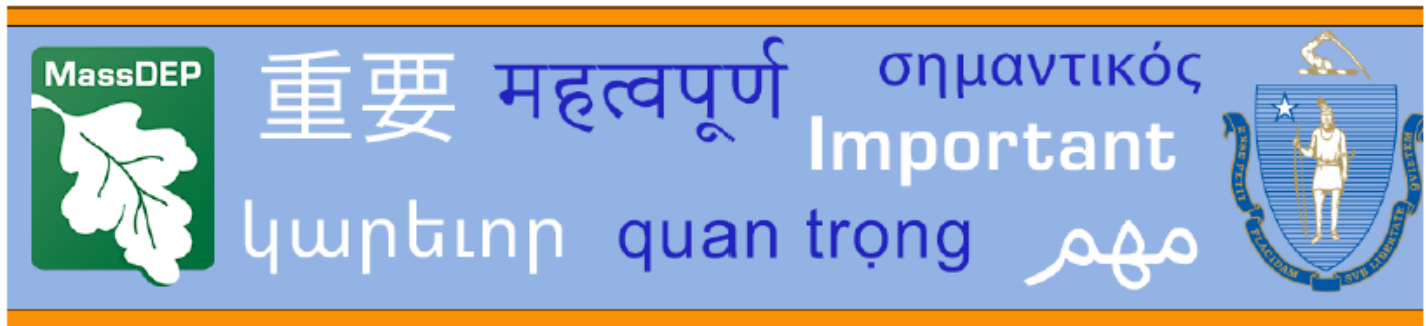
Ecc: DEP – CERO – Judith Schmitz
 DEP – WERO – Michael McHugh
 USACE – Dan Vasconcelos
 MassDOT – Melissa Lenker
 MassDOT – Kylie Abouzeid
 MassDOT – William Brown
 Arthur Rossi - abrossi@verizon.net
 MassDOT D2 Environmental Engineer – Billie Li - Billie.M.Li@dot.state.ma.us
 Green International Affiliates, Inc. – Danielle Spicer – dspicer@greenintl.com
 Hardwick Conservation Commission – William Zinni – conservation@townofhardwick.com
 New Braintree Conservation Commission – Jim Brown – concom@newbraintree.org

ATTACHMENT A
Bridge Replacement – Creamery Road Over Ware River
Hardwick and New Braintree, MA

PRE-CONSTRUCTION SUBMITTAL CHECKLIST

THIS CHECKLIST MUST BE COMPLETED PRIOR TO THE START OF WORK; NOTE THAT SOME CONDITIONS REQUIRE THAT INFORMATION BE SUBMITTED A SPECIFIC NUMBER OF DAYS PRIOR TO THE START OF WORK OR THE PRE-CONSTRUCTION MEETING.

Condition	Required Submittal	Due Date	Date Submitted	Date Approved
PRE-CONSTRUCTION SUBMITTAL REQUIREMENTS				
2, 3 and 4	Name, contact information, and qualifications of the RE, WS and FGM including specific experience and years to meet requirement	Prior to Pre-Construction Meeting		
6	Corps Work-Start Notification Form	14 days prior to work start		
7	CP/PP	14 days prior to work start		
8	Verification of training regarding erosion and sedimentation controls	Prior to work start		
10	Water Management Plan	21 days prior to work start		
13	Flood Contingency Plan	Prior to any work within 1% annual chance of flooding zone		
14	Invasive Plant Management Strategy	Prior to work start		
16	Demolition Plan	21 days prior to work start		
ACTIVE/POST-CONSTRUCTION SUBMITTAL REQUIREMENTS				
34	Annual Reporting	Annually, no later than January 15 th unless approved by DEP		
38	LUW Restoration Report	Post-Construction of LUW		
41	Proposed alterations, minor plan changes or amendments	N/A		



Communication for Non-English-Speaking Parties

This document is important and should be translated immediately.

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

Español Spanish

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

Português Portuguese

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

繁體中文 Chinese Traditional

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

简体中文 Chinese Simplified

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

Ayisyen Kreyòl Haitian Creole

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

Việt Vietnamese

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

ប្រទេសកម្ពុជា Khmer/Cambodian

ឯកសារនេះមានសារៈសំខាន់
ហើយគួរត្រូវបានបកប្រែភ្លាមៗ។
ប្រសិនបើអ្នកត្រូវការអោយឯកសារនេះបកប្រែ
សូមទាក់ទងនាយកផ្នែកយុត្តិធម៌បរិស្ថានរបស់
MassDEPតាមរយៈលេខទូរស័ព្ទដែលបានរាយដូចខាងក្រោម។

Kriolu Kabuverdianu Cape Verdean

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

Contact Deneen Simpson 857-406-0738

**Massachusetts Department of Environmental Protection
100 Cambridge Street 9th Floor Boston, MA 02114**

TTY# MassRelay Service 1-800-439-2370 • <https://www.mass.gov/environmental-justice>
(Version revised 8.2.2023) 310 CMR 1.03(5)(a)

Русский Russian

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

العربية Arabic

هذه الوثيقة مهمة وتجب ترجمتها على الفور.

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

한국어 Korean

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

հայերէն Armenian

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

فارسی Farsi Persian

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

Français French

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

Deutsch German

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

Ελληνική Greek

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

Italiano Italian

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

Język Polski Polish

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

हिन्दी Hindi

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

Contact Deneen Simpson 857-406-0738

Massachusetts Department of Environmental Protection
100 Cambridge Street 9th Floor Boston, MA 02114

TTY# MassRelay Service 1-800-439-2370 • <https://www.mass.gov/environmental-justice>
(Version revised 8.2.2023) 310 CMR 1.03(5)(a)

DOCUMENT A00833

**MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

401 – 404

**Administrative Completeness and
Technical Deficiency Review**

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Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

100 Cambridge Street Suite 900 Boston, MA 02114 • 617-292-5500

Maura T. Healey
Governor

Kimberley Driscoll
Lieutenant Governor

Rebecca L. Tepper
Secretary

Bonnie Heiple
Commissioner

January 17, 2024

Massachusetts Department of Transportation Highway Division
Ten Park Plaza, Suite 4160
Boston, MA 02116
ATTN: Courtney Walker

RE: 401 WATER QUALITY CERTIFICATION
Administrative Completeness and Technical Deficiency Review
401 WQC Application No: 24-WW11-0004

AT: Bridge Replacement, Bridge No. H-08-003=N-07-002, Creamery Road Over Ware River
Hardwick and New Braintree

Dear Ms. Walker:

MassDEP has completed its Administrative Review and Technical Deficiency Review of the application for the above-referenced application and notes that the application still requires a proof of public notice to be administratively complete.

MassDEP has completed its Technical Review of the application for the above-referenced application and is requesting that you submit the following additional information:

1. There is one inlet proposed at the low point of the road to collect stormwater. Please provide a cross-section of the outfall and stone.
2. Sheet 5/34 on the plans call for "Prop. Edge of crushed stone shoulder", please evaluate placement of a vegetated filter strip in this area that is contoured to convey stormwater.
3. The Alternatives Analysis provided does not discuss alternatives to resource area impacts but focuses on materials and constructability. In accordance with 314 CMR 9.06(1), "*No discharge of dredge or fill materials shall be permitted if there is a practicable alternative to proposed discharge that would have less adverse impact on the aquatic ecosystem...*". Please provide a discussion that demonstrates alternatives to resource area impacts were evaluated.

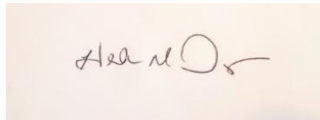
This information is available in alternate format. Please contact Melixza Esenyie at 617-626-1282.

TTY# MassRelay Service 1-800-439-2370
MassDEP Website: www.mass.gov/dep

Upon receipt of all requested supplemental information, MassDEP has 30 calendar days in which to issue or deny a certification.

Should you have any questions relative to this letter, please email myself at Heidi.davis@mass.gov or ryan.morrison@mass.gov.

Sincerely,

A handwritten signature in dark ink, appearing to read "Heidi M. Davis", is centered on a light-colored rectangular background.

Heidi M. Davis
Highway Unit Supervisor

Ecc: DEP - CERO – Judith Schmitz
 DEP – WERO – Michael McHugh
 USACE - Dan Vasconcelos
 MassDOT – Melissa Lenker
 MassDOT – Kylie Abouzeid
 MassDOT – William Brown
 Green International Affiliates, Inc. – Danielle Spicer – dspicer@greenintl.com
 Hardwick Conservation Commission – William Zinni - conservation@townofhardwick.com
 New Braintree Conservation Commission – Jim Brown - concom@newbraintree.org

DOCUMENT A00834

**MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

401 – 404

**Administrative Completeness and
Technical Deficiency Review**

Response Letter

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GREEN INTERNATIONAL AFFILIATES, INC.

100 AMES POND DRIVE, SUITE 200 TEWKSBURY, MA 01876

T: (978) 923-0400 | F: (978) 399-0033 | WWW.GREENINTL.COM

MEMORANDUM

January 31, 2024

To: Heidi Davis, MassDEP (heidi.davis@state.ma.us)
Tyler Lewis, MassDEP (Tyler.Lewis@mass.gov)

Cc: Dan Vasconcelos, USACOE New England (daniel.b.vasconcelos@usace.army.mil)
Courtney Walker, MassDOT (courtney.l.walker@dot.state.ma.us)
Melissa Lenker, MassDOT (melissa.lenker@state.ma.us)
William Brown, MassDOT
Kylie Abouzeid, MassDOT
Judith Schmitz, DEP - CERO
Michael McHugh, DEP – WERO
Hardwick Conservation Commission – William Zinni (conservation@townofhardwick.com)
New Braintree Conservation Commission – Jim Brown (concom@newbraintree.org)

From: Oxana Fartushnaya, Green International Affiliates, Inc.

Date: January 31, 2024

Project Name: Bridge Replacement, Bridge No. H-08-003=N-07-002, Creamery Road Over Ware River, Harwick & New Braintree, MA

Project Number: Green No. 21061.0344

Subject: **Response to MassDEP Administrative Completeness and Technical Deficiency Review letter for 401 WQC Application No: 24-WW11-0004**

This memorandum provides the responses to DEP Administrative Completeness and Technical Deficiency Letter for 401 WQC Application No: 24-WW11-0004.

A proof of public notices published in the Ware River News and the Barre Gazette on 1/4/2024 was uploaded on ePortal on 1/18/2024 as well as emailed to DEP by MassDOT Environmental on 1/18/2024.

Responses to each technical review comment are noted below in **Bold**.

1. There is one inlet proposed at the low point of the road to collect stormwater. Please provide a cross-section of the outfall and stone.

Please see the cross sections attached to these responses.

2. Sheet 5/34 on the plans call for “Prop. Edge of crushed stone shoulder”, please evaluate placement of a vegetated filter strip in this area that is contoured to convey stormwater.

The crushed stone shoulder is proposed in order to widen the approaches so there is enough room for cars to pass each other. The proposed travelway width of the bridge and approaches is 14’-0” wide, which is not wide enough to fit two cars travelling (one in each direction). Beyond this, the design intends to provide a wide enough travelway in case the cars are driving by each other in each direction, so the added 3’ on each side will give the ample space (20’-0” wide). The crushed stone shoulder will provide a more durable surface for the cars to travel over, as a vegetated shoulder will experience greater wear and tear over time from cars driving over it.

Response to MassDEP Administrative Completeness and Technical Deficiency Review letter for 401 WQC
Application No: 24-WW11-0004
January 31, 2024

3. The Alternatives Analysis provided does not discuss alternatives to resource area impacts but focuses on materials and constructability. In accordance with 314 CMR 9.06(1), "No discharge of dredge or fill materials shall be permitted if there is a practicable alternative to proposed discharge that would have less adverse impact on the aquatic ecosystem...". Please provide a discussion that demonstrates alternatives to resource area impacts were evaluated.

Multiple alternatives were evaluated by the Designer at the earlier stages of the project. The "No-Build" Alternative is not evaluated for this project due to the necessity to replace the structurally deficient bridge. The alternatives discussed in the WQC both resulted in the same impacts to the adjacent resource areas. However, both alternatives were developed after applying all considerations for minimizing the impacts to nearby Vegetated Wetlands (VWs) and Land Under Water (LUW) to the maximum extent feasible. At earlier design stages the other alternatives which would result to more impacts to VWs and LUW of the Ware River were dismissed from further considerations.

The span length was determined based on several components aimed at benefiting wildlife in the area. The selected design alternative significantly improves the opening for the wildlife under the proposed conditions. The proposed increased span length of the bridge provides room for the inclusion of the wildlife shelf to allow crossing for rare species that inhabit the project area. The lengthened span also allows to build behind the existing abutments, which reduces excavation since it will not need to be placed as deeply. The use of an integral abutment with piles allows less excavation than any other alternative with a spread footing as this would have a larger area of the surrounding VWs impacted. Adding a slope adjacent to the guardrails in the approaches is required, unless a retaining wall was built, which would require more excavation extending into adjacent VWs.

While excavation near the channel is necessary for building the proposed bridge and extending the bankfull width, the overall efforts described above were made to minimize all the impacts to the maximum extent feasible, however, they can not be further avoided in order to reach the project purpose for this water-dependent bridge replacement project.

Enclosed with this letter response are the following documents:

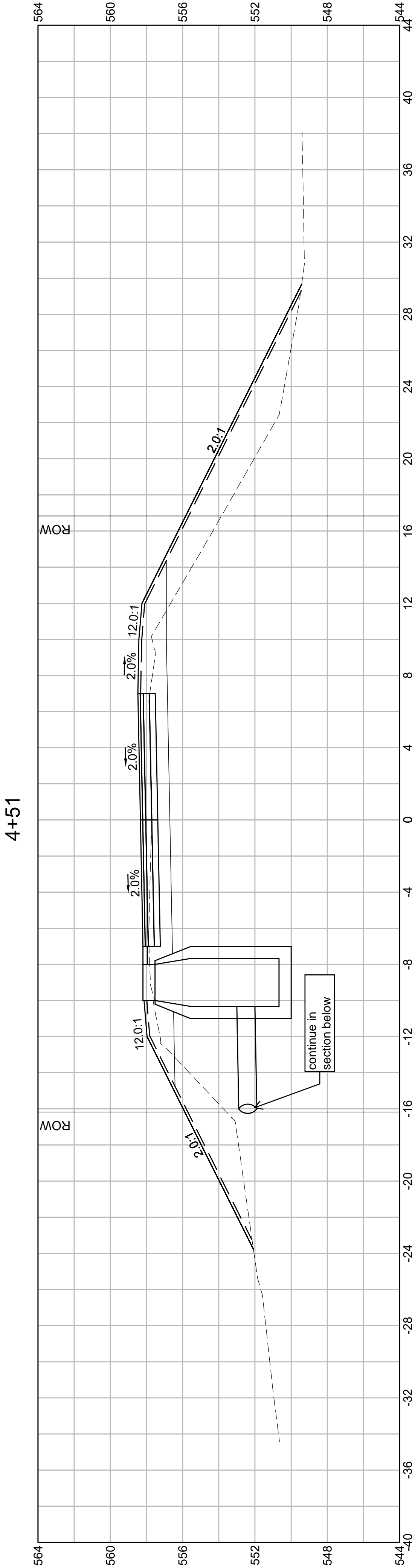
- Cross-section views of outfall at approx. Sta. 4+51 – Sta. 4+46

\\Egnytedrive\Greenintl\Shared\Engineering\Projects\2018\18045\18045.01 Hardwick-New Braintree
608851\Documents\Environmental\WQC\DEP Admin Complete Tech Def Letter\Responses To Admin Complete And Tech Def - 608851 Hardwick-
New Braintree.Docx

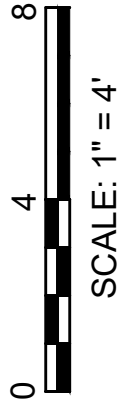
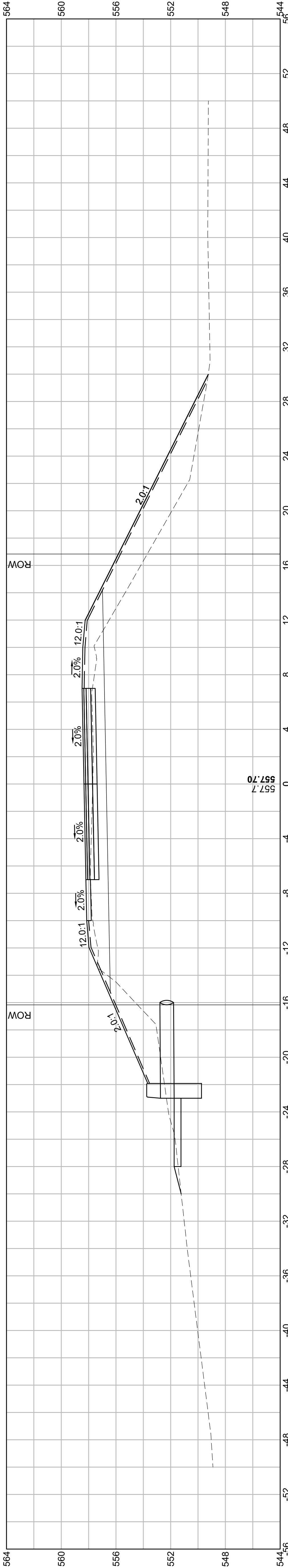
HARDWICK/NEW BRAINTREE
CREAMERY ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-		
PROJECT FILE NO. 608851			

CROSS SECTIONS



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DOCUMENT A00841

MASSACHUSETTS
Department of Environmental Protection
Water Quality Certificate

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Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

100 Cambridge Street Suite 900 Boston, MA 02114 • 617-292-5500

Maura T. Healey
Governor

Kimberley Driscoll
Lieutenant Governor

Rebecca L. Tepper
Secretary

Bonnie Heiple
Commissioner

March 1, 2024

Massachusetts Department of Transportation
Highway Division
10 Park Plaza, Suite 6340
Boston, MA 02116
ATTN: Courtney Walker

RE: Section 401 Water Quality Certification
BRP WW 11, Minor Fill Project
Creamery Road over Ware River (Bridge No. H-08-003=N-07-002)
Hardwick and New Braintree, MA

401 WQC Filing Number: 24-WW11-0004-APP
USACE Application No. NAE-2024-00143

Dear Ms. Walker:

The Massachusetts Department of Environmental Protection (MassDEP) has reviewed your application for a Water Quality Certification (WQC), as referenced above; this application was deemed complete on January 31, 2024. In accordance with the provisions of MGL Ch. 21, §§26-53 and Section 401 of the Federal Clean Water Act as amended (33 U.S.C. §1251 et seq.), it has been determined there is reasonable assurance the proposed project will be conducted in a manner which will not violate applicable water quality standards (314 CMR 4.00) and other applicable requirements of state law.

The project proposes to replace the bridge superstructure of Bridge No. H-08-003=N-07-002 carrying Creamery Road over the Ware River in the Towns of Hardwick and New Braintree. The bridge is located approximately 950 feet southeast of the State Route 32 and Creamery Road intersection in Hardwick. Creamery Road continues into New Braintree where it becomes Unitas Road. The existing structure, which was built in 1939 and was reconstructed in 1961, is functionally obsolete and structurally deficient.

Creamery Road/Unitas Road is classified by MassDOT as a Rural Local Roadway and, like Bridge No. H-08-003=N-07-002, is owned and maintained by the Towns of Hardwick and New Braintree. Creamery Road/Unitas Road is a one-lane, two-way road that is approximately 14-feet wide with no shoulders present on either side. The existing bridge is a single span steel stringer structure with an overall length of 79 feet, 4 inches, an out-to-out deck width of approximately 13 feet, and a curb-to-curb width of 11

feet. There is no existing drainage infrastructure within the project area, and stormwater sheet flows off the roadway and through vegetation along the side of the road before discharging to the Ware River.

The project proposes to replace the superstructure of the bridge, remove the existing southern abutment, cut down the northern abutment below Ordinary High Water (OHW) and construct the new abutment behind it. There will be rip rap placed in front of the new northern abutment and on top of the existing foundation that will remain in place. The proposed structure will have an out-to-out deck width of 16 feet, 10 inches and a curb-to-curb width of 14 feet. The proposed superstructure will have an open span of 96 feet and will remain a one-lane structure with a clearance (freeboard) of 2.59 feet.

Portions of the project will take place within the Federal Emergency Management Agency (FEMA) mapped floodplain and is classified as Zone A.

The proposed superstructure replacement and associated work will require temporary and permanent impacts associated with the dewatering, excavation and fill within the river as shown in Table 1. A total of 56 cubic yards (cy) of dredging in Ware River is required for regrading activities and work within the streambed, which includes placing a two-and-a-half-foot layer of rip rap topped by a two-foot layer of natural streambed material.

Table 1. BVW and LUW Impacts

Wetland/LUW	Permanent Impact (sf)	Temporary Impact (sf)
Bordering Vegetated Wetland	607	275
Ware River (LUW)	1,690	1,165

To mitigate for the 607 square feet of permanently impacted bordering vegetated wetlands, the project proposes a wetland replication area to be constructed just northeast of the bridge work. The wetland replication area will contain an area of approximately 650 square feet. The wetland replication area will be excavated to a depth between 12 and 18 inches below the final design elevation and will reuse suitable soils to match the elevation of the replication area to the abutting wetland to maintain a hydrologic connection.

Bridge demolition and reconstruction will require the road to be fully closed during construction due to its one-lane, two-way configuration. Construction is anticipated to occur in dry conditions; however, dewatering may be required due to weather conditions. Construction is anticipated to be completed in one construction season.

As the project is considered redevelopment in accordance with the stormwater provisions of 314 CMR 9.06(a)7., stormwater standards will be met to the maximum extent practicable (MEP). The project site currently has no drainage infrastructure and will maintain the same drainage patterns as the predeveloped conditions. There will be an increase in impervious area of 630 square feet. A deep sump hooded catch basin is proposed which will connect to a 14-foot corrugated metal pipe that will

discharge to a rip rap apron and then through approximately 50 feet of vegetation upgradient of the Ware River.

The existing single-span bridge will be replaced in kind with another single-span superstructure. The original stream channel cross-section will be altered to support the bridge work but natural substrate will be placed over the altered streambed that will consist of streambed materials stockpiled for re-use or similar materials from nearby reaches of the river. Though span length will be increased from 77 feet to 95 feet, it does not quite meet the 1.2 times bankfull width standard. However, the proposed project will significantly improve the opening and passage for wildlife under the proposed conditions and will provide a wildlife shelf on both sides of the river.

The Project occurs within Natural Heritage and Endangered Species Program (NHESP) Priority Habitats and Estimated Habitats of Rare Wildlife for the wood turtle (*Glyptemys insculpta*) and freshwater creeper mussel (*Strophitus undulatus*). In a letter dated November 16, 2023, NHESP concluded that the Project will not result in a prohibited Take of state-listed rare species, subject to the attached conditions from the Massachusetts Division of Fisheries and Wildlife. These include a turtle protection plan and a mussel sweep/translocation plan. Therefore, as conditioned, the Project complies with 314 CMR 9.06(2).

Based on a review of information provided by the applicant, MassDEP finds that this project complies with the standards described under 314 CMR 9.06 and 9.07. Public notice was provided in the Barre Gazette and in the Ware River News on January 4, 2024, and in the MEPA Monitor on January 10, 2024. No comment letters were received during the public comment period.

Therefore, based on information currently in the record, MassDEP grants a WQC for this project subject to the following conditions to maintain water quality, to minimize impact on waters and wetlands, and to ensure compliance with appropriate state law. The Department further certifies in accordance with 314 CMR 9.00 that there is reasonable assurance the project or activity will be conducted in a manner which will not violate applicable water quality standards (314 CMR 4.00) and other applicable requirements of state law. Finally, the Department has determined that upon satisfying the conditions and mitigation requirements of this approval, the project provides a level of water quality necessary to protect existing uses and accordingly finds that the project to be implemented satisfies the Surface Water Quality Standards at 314 CMR 4.00.

Pursuant to 314 CMR 9.09(1)(d); 314 CMR 9.06(6)(a); 310 CMR 9.06(2); 314 CMR 9.07; 314 CMR 9.07(1); 314 CMR 9.09(7)(5)(c); 314 CMR 9.11; and 314 CMR 9.09(1)(e), the following Special Conditions are necessary to ensure that construction practices and stormwater controls are implemented in such a manner as to prevent degradation to wetlands and waters; ensure that practicable steps have been taken which will avoid and minimize impacts to wetlands and waters; minimize turbidity and sediment caused by construction activities; ensure that water quality is not degraded, and that biology of the waters are not negatively impacted by potential discharges; and/or maintain a record of the dredged material for reference and to ensure accountability in its transportation.

Those Special Conditions that require direct submittals to MassDEP for either review, or review and approval, are denoted by the following notation (Submittal) at the end of the condition and are summarized in Attachment A. In addition, those conditions with the (Submittal) designation shall be included in the Special Provisions and, as applicable, reviewed at the Pre-Construction Meeting.

1. All work shall be performed in accordance with the following documents and plans:
 - Application for Water Quality Certification. Prepared by Green International Affiliates, Inc. on behalf of MassDOT, dated December 26, 2023, with cover letter and attachments. 401 WQC Filing Number: 24-WW11-0004-APP.
 - Plans entitled: “Creamery Road Bridge Replacement Over Ware River (Bridge No. H-08-003=N-07-002)”, Sheets 1-3, 5-8, 13-15, 17, 19-21. Prepared by BL Companies. Dated December 26, 2023.
 - Letter from the Massachusetts Natural Heritage and Endangered Species Program dated November 16, 2023, with attached **List of Conditions**. 608851 – Hardwick – New Braintree – Bridge Replacement, H-08-003=N-07-002, Creamery Road over Ware River. NHESP File No. 23-8704
 - MassDEP Technical Review. 401 Water Quality Certification, Minor Fill Project Certification. Dated January 17, 2024.
 - Responses to MassDEP Technical Review. Prepared by Green International Affiliates, Inc. on behalf of MassDOT. 401 Water Quality Certification, Minor Fill Project Certification. Dated January 31, 2024.

Pre-Construction

2. A qualified **Wetland Scientist** (WS) with a minimum of five years of relevant professional experience with wetland replacement projects shall be employed to oversee all BVW replacement activities, including but not limited to grading, seeding, vegetation plantings, and wildlife habitat features. The name, contact information, and qualifications of the WS shall be provided to MassDEP for approval with a copy to the Hardwick and New Braintree Conservation Commissions prior to the Pre-Construction Meeting. **(Submittal)**
3. As specified in the permit application and Item 983.5 of the Streambed/Bank Restoration project specifications, a qualified **Fluvial Geomorphologist** (FGM) with a minimum of five years of relevant professional experience in stream replacement and restoration projects shall be employed to oversee all LUW replacement and restoration activities. The name, contact information, and qualifications of the FGM shall be provided to MassDEP for approval with a copy to the Hardwick and New Braintree Conservation Commissions prior to the Pre-Construction Meeting. **(Submittal)**
4. Prior to the Pre-Construction Meeting, the applicant shall provide MassDEP with the name and contact information of the Resident Engineer (RE) responsible for ensuring that all work complies with the conditions of this WQC. **(Submittal)**
5. A minimum of 21 days prior to the start of work, MassDOT shall contact MassDEP to schedule an onsite Pre-Construction Meeting to review the approved plans and terms and conditions of this WQC. The RE, the construction contractor, the WS, the FGM, a representative from the MassDOT Environmental Section and/or the District Environmental Engineer shall attend the Pre-Construction Meeting.

6. MassDEP shall be copied on applicable submittals to the U.S. Army Corps of Engineers (Corps). These include but are not limited to: Self-Verification Notification Form (SVNF); Pre-Construction Notification (PCN); Work-Start Notification Form; Mitigation Work-Start Notification Form; and Compliance Certification Form. The Work-Start Notification Form shall be submitted at least 14 days before the anticipated start of work and the Compliance Certification Form shall be submitted within 30 days following the completion of the authorized work. **(Submittal)**
7. A CP/PP shall be developed and implemented as required by 314 CMR 9.06(6)(a)8. A minimum of 14 days prior to the start of work, MassDOT shall submit the CP/PP for review and approval. If the EPA CGP applies, the SWPPP may serve as the CP/PP, providing it includes the measures required to be in the CP/PP per these Special Conditions, in addition to the measures specifically required by the CGP. Any subsequent changes to the Final CP/PP (defined herein as including the construction period SWPPP) must be approved by MassDEP. **(Submittal)**
8. Training regarding erosion and sedimentation controls is required. The RE, CP/PP Inspector, and any other relevant personnel responsible for erosion and sedimentation controls shall complete the EPA Construction General Permit Inspector Training, or other training that meets the CGP requirements, as well as complete a comprehensive review of the Final CP/PP. Verification of proof of completion training of the shall be submitted to MassDEP prior to the start of work. **(Submittal)**
9. The CP/PP shall identify, but shall not be limited to, staging and laydown areas in relation to BVWs and LUW, proposed dewatering locations, proposed stockpile locations and their proximity to catch basins or other drainage conveyances that discharge to wetland resource areas, and the location of construction-period erosion and sedimentation controls.
10. A minimum of 21 days prior to the start of work, MassDOT shall submit a Water Management Plan for review and approval. The Plan shall include proposed methods to manage construction-period water including but not limited to dewatering methods and locations, specifications for any water bypass systems, and dredge and debris material dewatering prior to shipment off site, as applicable. The plan shall meet requirements of the CP/PP and be specific to the Project. Dewatering and water bypasses shall be conducted under the supervision of the RE and comply with the applicable conditions identified herein. **(Submittal)**
11. Prior to the start of work, approved erosion and sedimentation control measures shall be installed per the approved CP/PP and as applicable, the manufacturer specifications. Erosion and sedimentation control measures may consist of, but are not limited to, silt fence, staked straw bales, silt/turbidity curtains, compost filter tubes, etc.
12. Prior to the Pre-Construction Meeting, the boundaries of BVWs and LUW shall be re-flagged where they are within 50 feet of the limits of work. In the event BVWs and LUW boundaries overlap, the outermost boundary (i.e., closest to the proposed work) shall be flagged. All boundary markers, once in place, shall remain in place throughout construction until all disturbed surfaces have been permanently stabilized. Boundary markers shall be fully evaluated annually and refreshed where needed. Implementation of and compliance with this

requirement shall be documented by the WS. All construction personnel shall be made aware of these markers.

13. A Flood Contingency Plan shall be submitted to MassDEP for review and approval that addresses areas that fall within the 1% annual chance of flooding zone within project limits. The Plan shall address the potential need for temporary relocation of construction and auxiliary equipment during flood events to designated upland locations above the Base Flood Elevation. The Plan shall be approved by MassDEP prior to any work within the 1% annual chance of flooding zone, including mobilization or storage of equipment and materials. **(Submittal)**
14. The applicant shall develop an Invasive Plant Management Strategy (IMPS) to be submitted to MassDEP for review and approval prior to the Pre-Construction Meeting. The IMPS shall be implemented as approved. **(Submittal)**
15. If needed, use of herbicides to control invasive species shall be implemented in accordance with the approved IPMS and with the following requirements:
 - a. Herbicides can only be applied by a Licensed Applicator;
 - b. Applicant must provide MassDEP Material Safety Data Sheets (MSDS) of the product being used and must also keep MSDS sheets on site;
 - c. Product registration in MA with Massachusetts Pesticide Product Registration Number must be confirmed with Massachusetts Department of Agricultural Resources Pesticide Division;
 - d. EPA Registration Number for the product must be identified;
 - e. Product label restricted use provisions must be followed; and
 - f. Applicant must contact MassDEP Division of Watershed Planning to determine if a BRP WM 04 herbicide permit is required.
16. A minimum of 21 days prior to the start of work, a Demolition Plan shall be submitted for review and approval describing how the existing bridge will be demolished and what measures will be taken to assure that demolition material is properly contained and does not enter the Ware River. **(Submittal)**

Construction Period

17. No more than **607 sf** of permanent and **275 sf** of temporary impacts to BVWs shall occur. No more than **1,690 sf** of permanent and **1,165 sf** of temporary impacts to LUW shall occur. No more than **56 cy** of dredging in LUW shall occur. All work shall avoid unapproved impacts to BVW and LUW.
18. CP/PP inspections shall occur at least once every seven calendar days and within 24 hours of a storm event that produces 0.5 inches or more of rain within a 24-hour period, or at a more stringent frequency if the CP/PP requires.

19. Copies of CP/PP Inspection and Maintenance Log Forms shall be submitted to MassDEP within 14 days upon request.
20. Inspection and maintenance of erosion and sediment controls in active work areas shall be the responsibility of both the Contractor and RE. The RE shall be ultimately responsible for inspection and maintenance of site controls. The RE and/or contractor shall immediately notify MassDEP, and the Hardwick and New Braintree Conservation Commission if any unauthorized discharges to BVWs or LUW occur.
21. Disturbed areas shall be stabilized immediately after activities have permanently ceased or will be temporarily inactive for 14 or more calendar days. The installation of stabilization measures shall be implemented as soon as practicable, but no later than 14 calendar days after stabilization has been initiated.
22. A floating silt fence shall be kept on site and ready to deploy when construction work is likely to discharge sediment into the waterway. The floating silt fence shall not be allowed to block more than 50 percent of the channel width. The floating silt fence shall be installed to contain any sediment discharges from work areas and shall be cleaned as recommended by the floating silt fence manufacturer. The floating silt fence shall be removed from the waterway when construction work allows and removed from the site when no longer needed.
23. Work within LUW shall be conducted in low or no-flow conditions to the extent practicable. Notice shall be provided to MassDEP and the Hardwick and New Braintree Conservation Commission within 24 hours prior to the commencement of dewatering. Dewatering methods and location(s) shall be approved by the RE prior to use, and shall be documented in the CP/PP. There shall be no discharge of untreated dewatered stormwater or groundwater to BVWs or LUW. Any discharges shall be visibly free of sediment.
24. Additional erosion and sedimentation control materials shall be stored on-site at all times for emergency and routine replacement. Materials shall be kept covered, dry, and accessible at all times. The RE shall be responsible for anticipating the need for and installation of additional erosion and sedimentation controls and shall have the authority to require additional erosion control measures to protect wetland resource areas beyond what is shown on the plans if field conditions or professional judgment dictate that additional protection is necessary.
25. The RE shall monitor the National Weather Service forecast for updates, and upon issuance of a flood watch for the 1% annual chance of flooding zone, shall implement the flood contingency plan referenced in Condition 13.
26. Any storm drains with potential to receive discharge from stockpiled materials or construction operations shall be managed to inhibit the inflow of sediment while not increasing the likelihood of roadway flooding during periods of precipitation. Stockpiles shall be located no less than 50 feet from BVWs, LUW, catch basins, or other drainage conveyances that discharge to BVWs or LUW. The CP/PP shall specify measures to implement this. Filter fabric stretched under storm drain inlet grates are not acceptable for this purpose.

27. The contractor shall have designated washout areas for concrete equipment that will be comprised of impermeable material and sized to contain project concrete wastes and wash water. Concrete wash out areas shall be located no less than 50 feet from BVWs, LUW, and catch basins or other drainage conveyances that discharge directly or indirectly to BVWs or LUW.
28. Refueling, washing, and cleaning of vehicles and other construction equipment shall not take place within 50 feet of BVWs or LUW and any wash water shall be contained such that it does not drain toward BVWs or LUW. MassDEP shall explicitly approve in writing any deviation to this condition for oversized stationary vehicles.
29. The contractor shall have spill containment kits on site. In the event of a release of fuels and/or oils, the local fire department and MassDEP shall be notified.
30. Sheet piles shall be fully removed from wetland resource areas upon stabilization of the area as required. No portion of sheet piles shall remain unless approved by MassDEP in writing prior to installation. A request to leave sheet piles shall include, but not be limited to, demonstration that full removal of the sheet piles is not feasible or practicable, and an alternatives analysis demonstrating alternative methods to isolate the work area(s) are not feasible or practicable. At no time shall sheet piles be allowed to remain in LUW of a waterway that provides aquatic organism passage.
31. A temporary shielding system shall be in place beneath the bridge structure prior to removal and concrete excavation to prevent debris from falling into the water below. In the event that any debris accidentally enters the Ware River, it shall be immediately retrieved. Notice shall be provided to MassDEP if debris enters the river and that it has been removed with photo-documentation (if practicable) submitted by email.

Wetland Mitigation

32. The WS shall oversee all BVW replication, including final grading and seeding. A bordering vegetated wetlands replication area with a minimum area of 650 square feet shall be constructed. The WS shall confirm that constructed BVW replication areas have adequate soils and hydrology to promote wetland plant species prior to seeding and shall recommend measures to amend soils and promote wetland hydrology as needed.
33. Planting and seeding shall not take place between November 15th and April 15th, except as allowed by MassDEP in writing. Plantings and seed mixes shall consist of native and non-invasive species. Species may be substituted at the recommendation of the WS, and review and approval by MassDEP.
34. At least 75% of the surface area of the BVW replication areas shall be vegetated with indigenous wetland plant species within two growing seasons, or the period required by the Section 404 permit, whichever is longer. Additionally, evidence of hydrology, including hydric soil formation shall be submitted at the same time. Annual monitoring reports shall be submitted by the WS no later than January 15th each year. Monitoring reports shall include an assessment based on

the approved success criteria, representative photos, and recommended corrective actions as needed. **(Submittal)**

35. MassDEP reserves the right to determine the success or failure of the BVW replication areas, and reserves the right to require additional plantings, regrading, or other measures deemed necessary to promote success, and MassDOT shall comply with such requirements.

Stream Mitigation

36. The FGM shall oversee all LUW replication in accordance with the plans and specifications approved herein. Placement of streambed materials shall take place in no- or low-flow conditions. The Water Management Plan required in Condition 10 shall include measures to create no-flow conditions for this work such as a pump bypass system or other dewatering method, if needed. Placement of streambed materials during greater than low-flow conditions shall require a placement plan, with a narrative describing turbidity control measures, submitted to MassDEP for review and approval.
37. Streambed materials must be approved by the Resident Engineer and FGM prior to use.
38. A report shall be submitted by the FGM following completion of the LUW restoration, which shall include representative photos and a summary of the restoration activities and results. **(Submittal)**
39. Water shall be slowly introduced back into the restored and dewatered LUW work areas as to not cause erosion and sedimentation. This work shall be overseen by the FGM.

Post-Construction

40. All temporary erosion controls shall be removed at the conclusion of work once the surrounding area has achieved final stabilization.

General Conditions

41. Any proposed alterations, minor plan changes, or amendment requests, as well as any required submittals shall be sent by email for review and approval to heidi.davis@mass.gov and ryan.morrison@mass.gov. **(Submittal)**
42. This WQC remains in effect for the same duration as the Section 404 permit that requires it.
43. No Special Condition set forth herein shall be construed or operate to prohibit MassDEP from taking enforcement against the MassDOT or its contractors for any failure to comply with the terms and requirements of this WQC.
44. No activity authorized by this WQC may begin prior to expiration of the 21-day appeal period, or until a final decision is issued by MassDEP in the event of an appeal.

Failure to comply with this Certification is grounds for enforcement, including civil and criminal penalties, under MGL Ch. 21 §42, MGL Ch. 21A §16, or other possible actions/penalties as authorized by the General Laws of the Commonwealth.

This Certification does not relieve the applicant of the obligation to comply with other appropriate state or federal statutes or regulations.

NOTICE OF APPEAL RIGHTS

a.) Appeal Rights and Time Limits

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

Case Administrator
Department of Environmental Protection
100 Cambridge Street, 9th Floor
Boston, MA 02114

A copy of the request shall at the same time be sent by certified mail or hand delivery to the Department of Environmental Protection at:

Department of Environmental Protection
Commissioner's Office
100 Cambridge Street, Suite 900
Boston, MA 02114

b.) Contents of Hearing Request

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):

3. the 401 Certification Transmittal Number;
4. the complete name of the applicant and address of the project;

5. 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;
6. 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;
7. a clear and concise statement that an adjudicatory hearing is being requested;
8. 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 Certification; and
9. 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.

c.) Filing Fee and Address

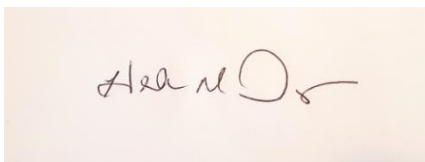
The hearing request along with a DEP Fee Transmittal Form and a valid check or money order payable to the Commonwealth of Massachusetts in the amount of one hundred dollars (\$100) must be mailed to:

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 permit, please contact myself or Ryan Hale at Heidi.davis@mass.gov and ryan.morrison@mass.gov

Very truly yours,

A handwritten signature in dark ink, appearing to read "Heidi Davis", is written on a light-colored rectangular background.

Heidi M. Davis
Highway Unit Supervisor

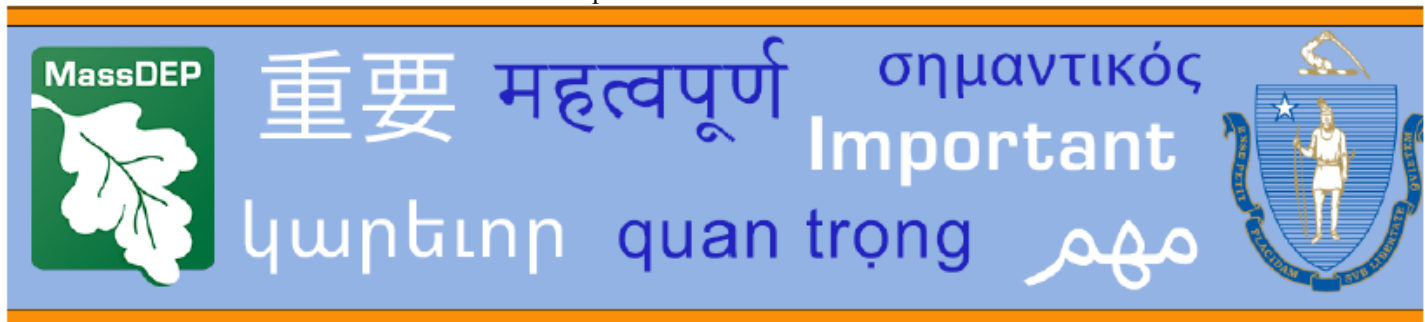
Ecc: DEP – CERO – Judith Schmitz
 DEP – WERO – Michael McHugh
 USACE – Dan Vasconcelos
 MassDOT – Melissa Lenker
 MassDOT – Kylie Abouzeid
 MassDOT – William Brown
 Arthur Rossi - abrossi@verizon.net
 MassDOT D2 Environmental Engineer – Billie Li - Billie.M.Li@dot.state.ma.us
 Green International Affiliates, Inc. – Danielle Spicer – dspicer@greenintl.com
 Hardwick Conservation Commission – William Zinni – conservation@townofhardwick.com
 New Braintree Conservation Commission – Jim Brown – concom@newbraintree.org

ATTACHMENT A
Bridge Replacement – Creamery Road Over Ware River
Hardwick and New Braintree, MA

PRE-CONSTRUCTION SUBMITTAL CHECKLIST

THIS CHECKLIST MUST BE COMPLETED PRIOR TO THE START OF WORK; NOTE THAT SOME CONDITIONS REQUIRE THAT INFORMATION BE SUBMITTED A SPECIFIC NUMBER OF DAYS PRIOR TO THE START OF WORK OR THE PRE-CONSTRUCTION MEETING.

Condition	Required Submittal	Due Date	Date Submitted	Date Approved
PRE-CONSTRUCTION SUBMITTAL REQUIREMENTS				
2, 3 and 4	Name, contact information, and qualifications of the RE, WS and FGM including specific experience and years to meet requirement	Prior to Pre-Construction Meeting		
6	Corps Work-Start Notification Form	14 days prior to work start		
7	CP/PP	14 days prior to work start		
8	Verification of training regarding erosion and sedimentation controls	Prior to work start		
10	Water Management Plan	21 days prior to work start		
13	Flood Contingency Plan	Prior to any work within 1% annual chance of flooding zone		
14	Invasive Plant Management Strategy	Prior to work start		
16	Demolition Plan	21 days prior to work start		
ACTIVE/POST-CONSTRUCTION SUBMITTAL REQUIREMENTS				
34	Annual Reporting	Annually, no later than January 15 th unless approved by DEP		
38	LUW Restoration Report	Post-Construction of LUW		
41	Proposed alterations, minor plan changes or amendments	N/A		



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

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Việt Vietnamese

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

ប្រទេសកម្ពុជា Khmer/Cambodian

ឯកសារនេះមានសារៈសំខាន់
ហើយគួរត្រូវបានបកប្រែភ្លាមៗ។
ប្រសិនបើអ្នកត្រូវការអោយឯកសារនេះបកប្រែ
សូមទាក់ទងនាយកផ្នែកយុត្តិធម៌បរិស្ថានរបស់
MassDEPតាមរយៈលេខទូរស័ព្ទដែលបានរាយដូចខាងក្រោម។

Kriolu Kabuverdianu Cape Verdean

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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

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العربية Arabic

هذه الوثيقة مهمة وتجب ترجمتها على الفور.

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한국어 Korean

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

հայերէն Armenian

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فارسی Farsi Persian

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Français French

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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

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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
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DOCUMENT A00842

Northern Long-Eared Bat Acoustic Survey Report

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August 29, 2023

Ref: 14394.10

Mr. Dave Paulson
Wildlife and Endangered Species Program Supervisor
Massachusetts Department of Transportation – Highway Division
Ten Park Plaza, Room 7360
Boston, MA 02116-3973

Project	Northern Long-eared Bat (NLEB) Presence/Absence Acoustic Survey and Bridge Assessment
MassDOT Project #	608851
MassDOT Project Title	Bridge Replacement, H-08-003=N-07-002, Creamery Road over Ware River
Town	Hardwick and New Braintree, Massachusetts
Surveyor Name/Firm	Kimberley Justham, Dorothy Lawrence, Savannah McInvale, Chelsea Glinka/VHB
Detector Operation Dates	July 24-27, 2023
Acoustic Survey Results	NLEB NOT DETECTED
Acoustic Survey Results	MYLE NOT DETECTED
Acoustic Survey Results	MYLU DETECTED
Acoustic Survey Results	PESU NOT DETECTED
Bridge Assessment Date	August 3, 2023
Bridge Assessment Results	Signs of Bats Not Detected at Bridge No. H-08-003=N-07-002

Dear Mr. Paulson:

This report contains the results of the Massachusetts Department of Transportation (MassDOT) northern long-eared bat (*Myotis septentrionalis*, hereafter MYSE) summer presence/absence survey performed at the proposed Bridge (H-08-003=N-07-002) Replacement Project (Project) on Creamery Road over the Ware River (MassDOT #608851) in Hardwick and New Braintree, Massachusetts. Acoustic detectors deployed by VHB did not detect the presence of NLEB. Two (2) bat passes were initially classified as federally endangered NLEB by analysis software, however both calls were determined to be the state-endangered little brown bat (*Myotis lucifugus*; MYLU) during qualitative assessment. Seven (7) bat passes were initially classified as the state-endangered MYLU, six of those calls were confirmed with qualitative analysis, and with the two aforementioned passes, eight (8) calls were confirmed as MYLU. There were no calls classified as the state endangered eastern small-footed bat (*Myotis leibei*) or the state endangered tri-colored bat (*Perimyotis subflavus*) and subsequent qualitative analysis of all high frequency calls did not detect either of these species.

This report also contains the results of the MassDOT bridge assessment performed for the MassDOT Project # 608851, Bridge Replacement, H-08-003=N-07-002, Creamery Road over Ware River, in Hardwick and New Braintree, Massachusetts. No bats (dead or alive), staining, bat sounds, or distinct odors were observed for this bridge. This bridge does not appear to provide a cave-like environment. For the reasons stated above, it is determined that this bridge is not used by bats.

Sincerely,

VHB

Chelsea O. Glinka
Project Manager/Senior Environmental Scientist
cglinka@vhb.com

Attachments: NLEB Survey Report for Hardwick-New Braintree, 608851
Site Photographs

US FISH AND WILDLIFE SERVICE PHASE 2 BAT ACOUSTIC SURVEY REPORT
AND VISUAL BRIDGE ASSESSMENT
MASSDOT PROJECT # 608851

Bridge Replacement, H-08-003=N-07-002, Creamery Road over Ware River

Hardwick and New Braintree, Massachusetts

PREPARED FOR



Massachusetts Department of Transportation
10 Park Plaza, Room 4260
Boston, Massachusetts 02116
857.368.4636

PREPARED BY



101 Walnut Street
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Watertown, Massachusetts 02471
617.924.1770

August 2023

Table of Contents

1	Introduction.....	1
1.1	Project Overview.....	1
1.2	Existing Conditions.....	2
2	Methods.....	3
2.1	Habitat Assessment and Site Selection.....	3
2.2	Detector and Microphone Deployment and Placement.....	3
2.3	Weather Criteria.....	4
2.4	Call Analysis.....	4
2.5	Visual Bridge Assessment.....	5
3	Results.....	6
3.1	Acoustic Survey Results.....	6
3.2	Bridge Assessment Findings.....	6
4	References.....	7

Appendices

Appendix A	Site Figure
Appendix B	Field Data Forms and Site Photos
Appendix C	Data Tables
Appendix D	Resumes of Qualified Individuals
Appendix E	Bridge Inspection Form and Photos
Appendix F	Representative Spectrograms
Appendix G	Event Logs

1

Introduction

This report summarizes the results of the Phase 2 Presence/Probable Absence Acoustic Monitoring Surveys (acoustic surveys) and Visual Bridge Assessment targeting the northern long-eared bat (*Myotis septentrionalis* or MYSE) performed by VHB on behalf of the Massachusetts Department of Transportation (MassDOT) for the proposed replacement of Bridge H-08-003=N-07-002 on Creamery Road over the Ware River in Hardwick and New Braintree, MA (MassDOT Project # 608851, **Figure 1 in Appendix A**). The MYSE is state-endangered in Massachusetts and has recently been reclassified from federally threatened to federally endangered under the Endangered Species Act (ESA; 16 U.S.C. § 1531 et seq.). The final rule to reclassify MYSE as federally endangered was published in the Federal Register on November 30, 2022, and took effect March 31, 2023 (Federal Register, Vol. 87 No. 229). This survey was performed as a due diligence effort because the Project is within the range of MYSE and contains potentially suitable bat habitat. The survey was conducted in accordance with the MYSE Phase 2 Study Plan for the Project which was approved by USFWS in June 2023.

The acoustic surveys targeted the following Massachusetts state-endangered species in addition to MYSE: tricolored bat (*Perimyotis subflavus*; PESU), little brown bat (*Myotis lucifugus*, MYLU), and eastern small-footed bat (*Myotis leibii*, MYLE). Two of these species are under consideration for federal protections as well: on September 14, 2022, the USFWS published their proposal to list the PESU as endangered under the ESA (Federal Register, Vol. 87, No. 177) and they are conducting a discretionary review on the status of MYLU (USFWS, 2021) expected to be completed in 2023. In 2013 the USFWS issued a 12-Month Finding on a petition to list the MYLE as endangered or threatened under the ESA and determined that listing MYLE was not warranted (Federal Register, Vol. 78, No. 191).

1.1 Project Overview

The Project includes the replacement of the Creamery Road bridge over the Ware River (Bridge H-08-003=N-07-002) and 200-feet of roadway improvements along both sides of the bridge on Creamery Road (the Project Area). The bridge will increase the total curb-to-curb width of the roadway to 14-feet and an architecturally styled concrete bridge railing system will be located along both sides of the bridge. Steel highway guard railing will be installed on both sides of both approaches and the roadway will be raised approximately two feet to provide hydraulic clearances. The total length of the Project is approximately

0.1 kilometer (km). However, the Project limits were extended to reach a Project length of one km in anticipation that additional MassDOT-planned work will occur in the adjacent suitable summer habitat in the near future. This approach is consistent with the MassDOT NLEB Survey Protocol for Small Projects and Bridges.

1.2 Existing Conditions

Bridge H-08-003=N-07-002 is a steel I-beam structure that carries Creamery Road over the Ware River in Hardwick and New Braintree, Massachusetts. The land use surrounding Bridge H-08-003=N-07-002 is mixed agricultural use and undeveloped woodland. Mixed deciduous upland forests border the river to the southwest and the northeast of the Project Area and a shrub swamp is present to the north. Maintained cropland/agricultural fields border the river to the northwest and the southeast. Suitable summer bat habitat exists southwest and northeast of the bridge.

2

Methods

VHB biologists with bat acoustic survey and bridge assessment experience conducted the acoustic survey and visual bridge assessment in accordance with the Phase 2 Study Plan approved by the USFWS in June 2023. The Study Plan was developed in accordance with the *USFWS 2023 Range-wide Indiana Bat and Northern Long-Eared Bat Survey Guidelines (Guidelines)*.

2.1 Habitat Assessment and Site Selection

Per the USFWS *Guidelines*, sites were selected through a desktop analysis (i.e., aerial photo interpretation) during the development of the Study Plan by VHB biologists to ensure sufficient coverage of the linear Project. The survey was planned for two detector locations over two calendar nights. Each detector location was micro-sited in the field to ensure that suitable site conditions were present, and that optimal microphone placement was achieved.

The detector at Site 1 was deployed on the western shoulder of Creamery Road adjacent to the Massachusetts Central Rail Trail, northwest of Bridge H-08-003=N-07-002 and oriented southeast, parallel to the tree line and with the flow of traffic. The dominant vegetation at Site 1 included white meadowsweet (*Spiraea alba*), glossy buckthorn (*Rhamnus frangula*), poison ivy (*Toxicodendron radicans*) and autumn-olive (*Elaeagnus umbellata*). The adjacent forest canopy included grey birch (*Betula populifolia*), northern red oak (*Quercus rubra*) and eastern white pine (*Pinus strobus*).

The detector at Site 2 was on the north side of Creamery Road Bridge, at the east end of the bridge. It was oriented northeast and parallel with the tree line. Dominant vegetation at Site 2 consisted of slippery elm (*Ulmus rubra*), white meadowsweet, Morrow's honeysuckle (*Lonicera morrowii*), river grape (*Vitis riparia*), poison ivy, elderberry (*Sambucus nigra*), black cherry (*Prunus serotina*) and northern red oak.

2.2 Detector and Microphone Deployment and Placement

Two Pettersson D500x ultrasonic full spectrum detectors (detector) with Pettersson external, directional microphones were deployed within the Project Area (**Figure 1**) for three consecutive calendar nights from July 24-27, 2023. Photographs of the survey sites and field data forms are included in **Appendix B**. A concise summary of the survey effort for this project is detailed in **Tables 1** and **2** provided in **Appendix C**. A total of six detector nights

were recorded during the survey effort and analysis of the recordings is presented in **Table 3** of **Appendix C**.

Detector locations were micro-sited in the field to meet the USFWS survey protocols for detector and microphone placement, as described in the approved Study Plan. This includes raising the microphone to a height of at least three meters above the ground level vegetation and orienting the microphone toward potential flight corridors such as forest canopy openings, near water sources, parallel to woodland edges, or other suitable survey locations as described within the *Guidelines* and when available within the Project Area. VHB biologists selected survey locations with minimal vegetative clutter in the cone of detection of all survey locations, however, due to the nature of the Project Area it was not possible to site the detectors to achieve a cone of detection that was absent of vegetation within 100 feet¹ in front of the microphones. Site descriptions are included on the field data forms provided in **Appendix B**. Detector equipment function was verified prior to deployment and at retrieval with a clap and/or finger rub test at the microphone, along with verification of the detector settings and review of the event logs. Refer to **Table 1** provided in **Appendix C** for additional equipment details. Specific information for each detector by site is listed in **Table 2**, also provided in **Appendix C**.

2.3 Weather Criteria

The survey included three calendar nights and two of them (the nights of July 24 and July 26, 2023) met the following survey weather criteria per the USFWS *Guidelines*: temperatures did not fall below 50°F during the first five hours of the survey period; no precipitation (rain and/or fog) that exceeded 30 minutes continuously or continued intermittently during the first five hours of the survey period; and no sustained wind speeds greater than nine miles per hour for 30 minutes continuously during the first five hours of the survey period. Hourly weather conditions were monitored from the nearest active Weather Underground Stations: KMAWARE24- Mountain side. The second calendar night of recording (July 25, 2023) included light rain for the first 1.5 hours of recording and therefore the detectors were kept in place for a third calendar night to ensure weather criteria was met for the four-detector night minimum. Refer to **Table 1** provided in **Appendix C** for an abbreviated weather summary for each detector night.

2.4 Call Analysis

VHB biologists trained in conducting acoustic analyses (principally Chelsea Glinka and Kim Justham resumes provided in **Appendix D**) were responsible for automated call analysis and the qualitative review of call files. Sound files were processed through SonoBat Data Wizard Version 4.4.5 to attribute metadata to each file and then calls were scrubbed with the SonoBat Data Wizard Batch File Scrubber to remove sound files that registered below 20 kilohertz (kHz). Full spectrum files were auto classified with Kaleidoscope Pro Version 5.4.7. Total call counts by species are included in **Table 3** provided in **Appendix C**. The MLE

¹ The acoustic sampling protocol in the USFWS Range-Wide Indiana Bat [and Northern Long-eared Bat] Survey Guidelines recommends that survey sites are sited in areas with minimal vegetation within 100 feet of highly directional microphones.

("maximum likelihood estimator" or p values) assigned by Kaleidoscope Pro are reported in **Table 3** and species that have been manually vetted are also denoted in **Table 3**.

Qualitative analysis (manual vetting) was conducted for all calls that were auto-identified as high frequency (i.e., *Myotis* sp., PESU, and eastern red bat (*Lasiurus borealis* or LABO) regardless of MLE value) and any unknown calls which have a characteristic frequency (Fc) of 35 kilohertz (kHz) or greater since these calls are considered high frequency and have the potential to include *Myotis*, PESU, or LABO calls.. The suite of species evaluated in the manual vetting process includes the federally and state endangered MYSE and the state endangered MYLU, MYLE, and PESU. Select calls that were auto classified as low frequency species were also manually reviewed to confirm presence. Qualitative analysis was performed by VHB (principally by Chelsea Glinka) on a total of 43 calls that met the qualitative review criteria, as detailed in **Table 5** provided in **Appendix C**. Calls were submitted to Janet Tyburec of Bat Survey Solutions (BSS) to provide a second opinion as a means of quality control (refer to **Appendix D** for resume).

Decisions on manual identification of calls are made based on a variety of call characteristics, including characteristic slope (Fs), Fc, the length of the sequence, frequency modulation, the type of call (search phase, attack phase, feeding buzz, etc.), the presence of harmonics, among other factors. References consulted during the qualitative analysis process are based on in-person workshops on manual vetting, Echolocation Call Characteristics of Eastern U.S. Bats, and the USGS Guide to Processing Bat Acoustic Data for the North American Bat Program. BSS was consulted for final review of the calls that met the criteria for manual vetting for this Project. These sources are included in the References section below.

2.5 Visual Bridge Assessment

A visual bridge assessment was conducted on August 3, 2023, during daytime hours, following Bridge/Structure Bat Assessment Guidance by the Federal Transportation Agency/State Department of Transportation, last updated in 2020. Bridge H-08-003=N-07-002 was examined from the top of the bridge deck using a GoPro camera mounted to a telescoping pole. VHB biologists also gained limited views of the underside of the bridge deck on the southeast side of the bridge from the eastern bank of the Ware River using binoculars and flashlights. The west bank of the Ware River was not accessible. The Bridge Inspection Form and Photo Log are provided in **Attachment E** of this report. The findings of the bridge assessment are summarized below.

3

Results

3.1 Acoustic Survey Results

Acoustic Surveys resulted in a probable absence determination for MYSE and PESU. Automated and qualitative analysis of calls resulted in the detection of the following species: big brown bat (*Eptesicus fuscus* or EPFU), silver-haired bat (*Lasionycteris noctivagans* or LANO), LABO, hoary bat (*Lasiurus cinereus* or LACI), and little brown bat (*Myotis lucifugus*, MYLU)², which is endangered under the Massachusetts Endangered Species Act. Two (2) bat passes were initially classified as federally endangered MYSE by analysis software, however both calls were determined to be MYLU during qualitative analysis. The results of the data analysis efforts are detailed in **Tables 3** through **5** provided in **Appendix C**. Spectrograms of select calls are provided in **Appendix F**. The event logs for each detector night are provided in **Appendix G**.

The completed USFWS Northeast 2023 Reporting Form for Acoustic Surveys will be submitted to USFWS as an electronic Excel spreadsheet following this report submission.

3.2 Bridge Assessment Findings

VHB biologists accessed the deck of Bridge H-08-002=N-07-002 from the shoulders of the bridge and the eastern bank of the Ware River. Although the acoustic survey detected bats within the vicinity of the bridge, there was no evidence of bat roosting observed during the visual assessment (see photos in **Appendix E**).

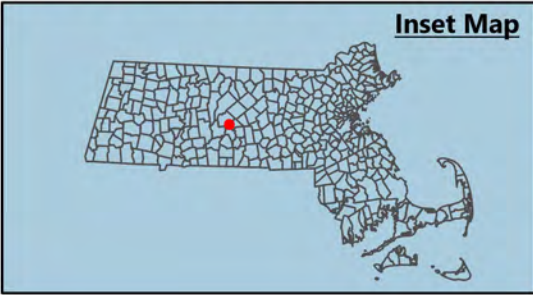
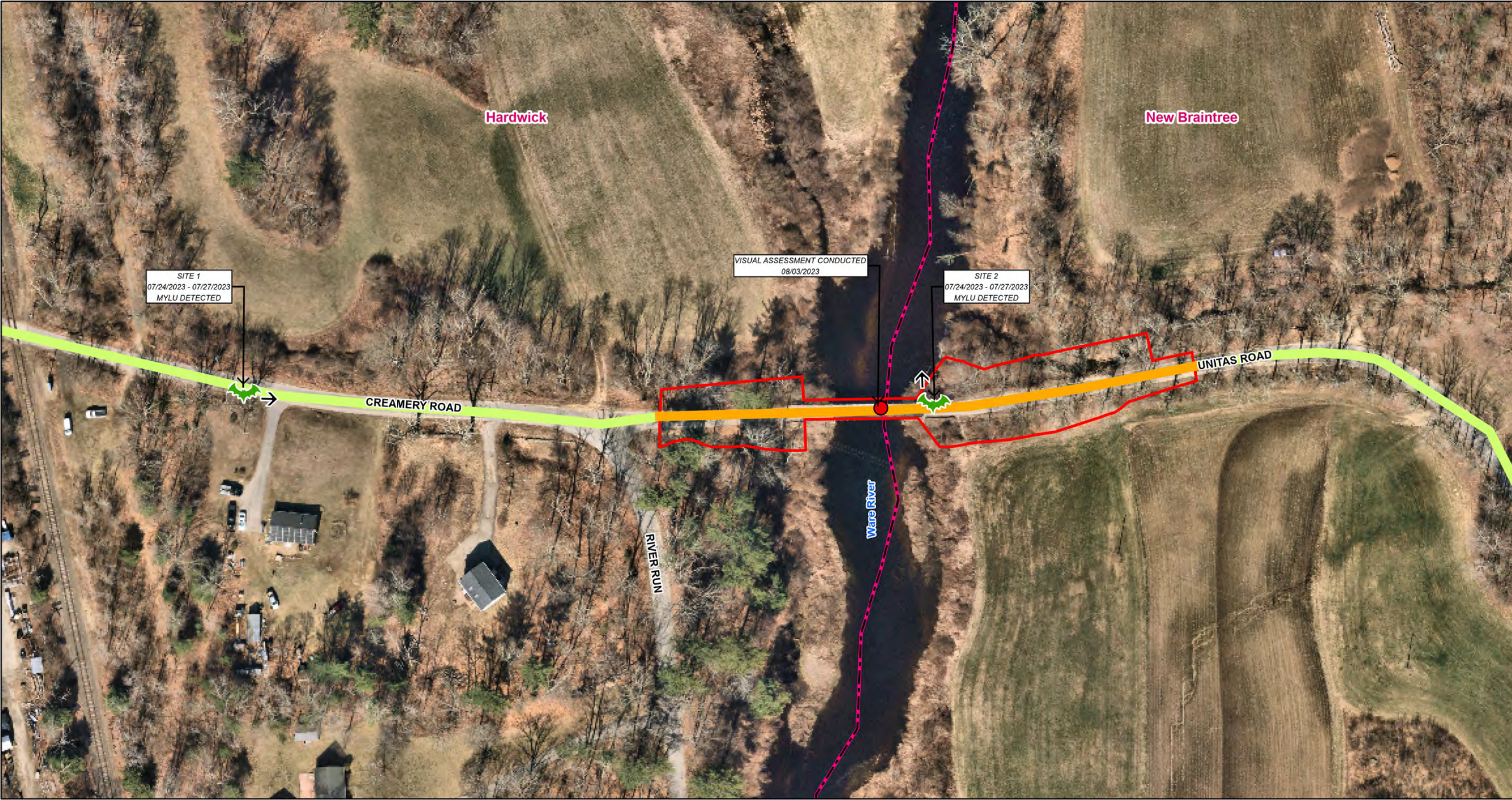
² The final species composition reported here only includes those species that were confirmed by manual vetting or had software generated MLE values of 0.05 or less for low-frequency species. For the full suite of species identified by the software and the respective MLE values, refer to **Table 3** in **Appendix C**.

4

References

- Corben, Christopher. Bat Sense. July 2020. Examples of calls from Bats of the Midwest and Eastern U.S. Manual ID Workshop.
- Federal Register, Vol. 87, No. 177, September 14, 2022. 50 CFR Part 17. Docket No. FWS–R5–ES–2021–0163; FF09E21000 FXES1111090FEDR 223] RIN 1018–BG15 Endangered and Threatened Wildlife and Plants; Endangered Species Status for Tricolored Bat. Available at: FR-2022-09-14.pdf (govinfo.gov)
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- Szewczak, J.M., A. Corcoran, J.P. Kennedy, T.J. Weller, P.C. Ormsbee. Echolocation Calls of Eastern U.S. Bats. Humboldt State University Bat Lab, USFS Redwood Science Lab, USFS Pacific Northwest Research Station.
- Tyburec, Janet. Bat Survey Solutions. December 15-17, 2021. Acoustic Survey Methods – Custom In-Person Training Course for VHB.
- U.S. Fish and Wildlife Service. April 2021. North Atlantic-Appalachian Region Endangered Species Act Update. Item 15: Three Bat Species: Tri-colored bat, Little Brown Bat, Northern Long-eared Bat – SSA to Inform Status Reviews. Available at: https://www.fws.gov/northeast/virginiafield/pdf/endspecies/R5_endangered_species_updates/ESA_Updat_37.pdf
- U.S. Fish and Wildlife Service. March 2023. Range Wide Indiana Bat and Northern Long Eared Bat Survey Guidelines.
- U.S. Fish and Wildlife Service. 2020. Instructions for Electronic Submittal of Bat Survey Data for U.S. Fish and Wildlife Service 2020.

Appendix A: Site Figure



- Legend**
-  Project Location
 -  Extended Project Survey Area
 -  Visual Bridge Assessment
 -  Town Boundary
 -  Bat Acoustic Survey Location - State Listed Species Detected
 -  Microphone Orientation

Note:
Project Length: ~1 KM
MassDOT Project: 608851
Detector nights surveyed: 4

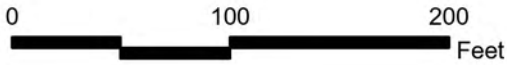



Figure 1 - Aerial Map

Northern Long-eared Bat Acoustic Survey
608851: Bridge Replacement, H-08-003=N-07-002,
Creamery Road over Ware River
Hardwick & New Braintree, MA

August 2023

Appendix B: Field Data Forms and Site Photos

Bat Acoustic Monitoring Data Form & Photo Log

Project:	608851: Bridge Replacement, H-08-003=N-07-002, Creamery Road over Ware River				Site#:	1		Site Name:	MA Central Rail Trail				
Municipality:	Hardwick		County:	Worcester		State:	MA		Survey Contact: kjustham@vhb.com				
Latitude:	42.32218376		Longitude:	-72.17637792			Datum:	WGS84					
Surveyed By:	K. Justham, D. Lawrence						Setup: 07/24/2023 13:24			Retrieval: 07/27/2023 14:46			
Land Use:	Residential, Transport / Utilities, Shrub and Brush, Mixed Deciduous and Evergreen				Mic Test	Setup	Yes	Battery Capacity (v)	Setup	5.1	CF Card Capacity (GB)	Setup	44.74
						Retrieval	Yes		Retrieval	4.6		Retrieval	44.21
BD #	Trigger Sensitivity	Mic		Mic Orientation	HT ¹	Clutter	Gain	Trigger	Interval	Recording Start Time	Recording End Time		
52505	Medium	External / High Frequency / Directional Horned		SE	4.88	EDGE	45	160	0	19:37	06:04		
Site Description / Additional Notes													
Detector set up on west side of Creamery Road oriented SE along tree line; microphone approximately 15-20 feet from the treeline. Vegetation present: glossy buckthorn, eastern white pine, northern red oak, hickory, grey birch, poison ivy, white meadowsweet, pin cherry, autumn-olive. Snag within 20ft, multiple in the area.													

Site sketch

¹ Height of microphone above ground level (in meters)

MassDOT Project # 608851

Bridge Replacement, H-08-003=N-07-002, Creamery Rd over Ware River

Hardwick and New Braintree, MA

massDOT
Massachusetts Department of Transportation



Bat Acoustic Monitoring Data Form & Photo Log

Photo 1: Site 1 - MA Central Rail Trail – Cone of Detection

Date Taken:

July 27, 2023

Photo Orientation:

SE

Description:

Detector is positioned facing the Creamery Road Bridge.



Photo 2: Site 1 - MA Central Rail Trail

Date Taken:

July 24, 2023

Photo Orientation:

SW

Description:

View from east shoulder of Creamery Road showing detector set up with tree line behind the detector.



MassDOT Project # 608851

Bridge Replacement, H-08-003=N-07-002, Creamery Rd over Ware River

Hardwick and New Braintree, MA

massDOT
Massachusetts Department of Transportation



Bat Acoustic Monitoring Data Form & Photo Log

Photo 3: Site 1 - MA Central Rail Trail

Date Taken:

July 24, 2023

Photo Orientation:

NW

Description:

View from Creamery Road showing detector set up on western shoulder, looking towards railroad crossing.



Photo 4: Site 1 - MA Central Rail Trail

Date Taken:

July 24, 2023

Photo Orientation:

SE

Description:

View from west shoulder of Creamery Road showing the detector set up parallel to the tree line.



MassDOT Project # 608851

Bridge Replacement, H-08-003=N-07-002, Creamery Rd over Ware River

Hardwick and New Braintree, MA

massDOT
Massachusetts Department of Transportation



Bat Acoustic Monitoring Data Form & Photo Log

Photo 5: Site 1 - MA Central Rail Trail

Date Taken:

July 24, 2023

Photo Orientation:

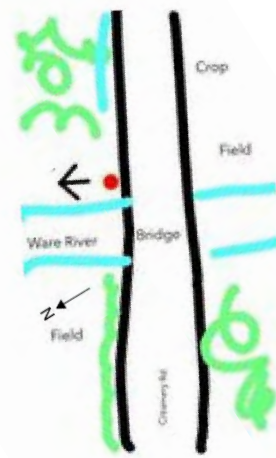
N

Description:

View of from
Creamery Road
showing the detector
set up along western
shoulder of
Creamery Road and
edge of tree line.



Bat Acoustic Monitoring Data Form & Photo Log

Project:	608851: Bridge Replacement, H-08-003=N-07-002, Creamery Road over Ware River				Site#:	2		Site Name:	Creamery Road Bridge				
Municipality:	Hardwick		County:	Worcester		State:	MA		Survey Contact: kjustham@vhb.com				
Latitude:	42.32089242		Longitude:	-72.1745092			Datum:	WGS84					
Surveyed By:	K. Justham, D. Lawrence					Setup: 07/24/2023 14:08			Retrieval: 07/27/2023 15:04				
Land Use:	Transport / Utilities, Cropland / Pasture, Mixed Deciduous and Evergreen, Streams / Canals				Mic Test	Setup	Yes	Battery Capacity (v)	Setup	5.1	CF Card Capacity (GB)	Setup	59.63
					Retrieval	Yes		Retrieval	4.5		Retrieval	55.55	
BD #	Trigger Sensitivity	Mic	Mic Orientation	HT ¹	Clutter	Gain	Trigger	Interval	Recording Start Time	Recording End Time			
52522	Medium	External / High Frequency / Directional Horned	NE	4.88	LOW	45	160	0	19:37	06:04			
Site Description / Additional Notes					 <p>Site sketch</p>								
<p>Detector set up on north side of Creamery Road bridge, at east end. Microphone oriented north along river and edge of tree line. Vegetation present: slippery elm, white meadowsweet, morrow's honeysuckle, river grape, poison ivy, black cherry, northern red oak, elderberry. Detector 10-15 feet from the tree line.</p>													

¹ Height of microphone above ground level (in meters)

MassDOT Project # 608851

Bridge Replacement, H-08-003=N-07-002, Creamery Rd over Ware River

Hardwick and New Braintree, MA

Bat Acoustic Monitoring Data Form & Photo Log

Photo 1: Site 2 - Creamery Road Bridge – Cone of Detection

Date Taken:

July 27, 2023

Photo Orientation:

NE

Description:

Detector is positioned on the northern shoulder of Creamery Road along the edge of the Ware River and tree line.



Photo 2: Site 2 - Creamery Road Bridge

Date Taken:

July 24, 2023

Photo Orientation:

NW

Description:

View from the northern shoulder of Creamery Road showing the detector set up, Ware River and the adjacent tree line.



MassDOT Project # 608851

Bridge Replacement, H-08-003=N-07-002, Creamery Rd over Ware River

Hardwick and New Braintree, MA

Bat Acoustic Monitoring Data Form & Photo Log

Photo 3: Site 2 - Creamery Road Bridge

Date Taken:

July 24, 2023

Photo Orientation:

SE

Description:

View from the Creamery Road Bridge showing the detector set up along the northern edge of Creamery Road.



Photo 4: Site 2 - Creamery Road Bridge

Date Taken:

July 24, 2023

Photo Orientation:

NE

Description:

View from Creamery Road Bridge showing the Ware River and adjacent tree line.



Appendix C: Data Tables

Table 1: Project and Equipment Overview

Project Name	Bridge Replacement, H-08-003=N-07-002, Creamery Road over Ware River
MassDOT Project #	608851
Project Location	Hardwick, Worcester County, Massachusetts
Weather Summary	<p>7/24/2023-7/25/2023: High Temp: 75.70°F, Low Temp: 64.90°F, Avg Temp: 68.80°F, Avg Wind Speed: 0.37 mph, Precipitation: No</p> <p>7/25/2023-7/26/2023: High Temp: 65.80°F, Low Temp: 62.40°F, Avg Temp: 63.71°F, Avg Wind Speed: 0.00 mph, Precipitation: .02 inch*</p> <p>7/26/2023-7/27/2023: High Temp: 70.00°F, Low Temp: 64.40°F, Avg Temp: 67.65°F, Avg Wind Speed: 0.14 mph, Precipitation: .01 inch**</p> <p>Weather Underground Station: Mountain side (KMAWARE24)</p> <p>*Rain occurred within first 1.5 hours of recording and therefore survey weather criteria were not met for this calendar night</p> <p>**Rain occurred within first 10 minutes of recording and therefore survey weather criteria were met for this calendar night</p>
Principal Equipment	Pettersson D500x; D500x external, high frequency, full spectrum microphone with a directional horn and PVC tube
VHB Personnel	Chelsea Glinka, Kimberley Justham, Dorothy Lawrence, Savannah McInvale; Refer to resumes in Appendix D
BSS Personnel	Janet Tyburec (provided second opinion on qualitative analysis of calls); Refer to resume in Appendix D .
Standard Pettersson D500x Settings	<p>Sampling Frequency = 500</p> <p>PreTrig = Off</p> <p>Recording Length = 5 seconds</p> <p>HP-Filter = Yes</p> <p>Auto-Record = Yes</p> <p>Input Gain = 45</p> <p>Trigger Level = 160</p> <p>Interval = 0</p> <p>Trigger Sensitivity: Medium</p>
Standard Microphone Setup	<p>Height above ground = 4.88 meters</p> <p>Vertical orientation = 0 degrees; horizontal plane (assuming 0 degrees is parallel with the ground).</p> <p>Clap sound test performed at deployment and retrieval to determine proper functioning, along with review of event log.</p>
Acoustic Analysis Software	<p>Program: Kaleidoscope Pro 5.4.7 for automated analysis; SonoBat, V 4.4.5 for qualitative analysis</p> <p>Filters or Parameters: Files were scrubbed and attributed using SonoBat Data Wizard V 4.4.5, set to medium: accepts all but poor-quality calls; accepts some noise with tonal content, include signals from 20 kHz and above.</p> <p>Program Settings</p> <p>Signal detection parameters (default parameters)</p> <p>Minimum and Maximum Frequency Range: 8-120 kHz</p> <p>Minimum and Maximum Length of Detected Pulses: 2-500 ms</p> <p>Maximum inter-syllable gap: 500 ms</p> <p>Min. # of pulses for species ID = 2</p> <p>Other relevant settings affecting ID = Kaleidoscope Pro set to Massachusetts species setting</p> <p>Suite of species included in program analysis: EPFU, LANO, LABO, LACI, MYLE, MYLU, MYSE, PESU</p> <p>Classifier Sensitivity: -1 More Sensitive (Liberal)</p>

Table 2: Detector Details

Site	Detector #	Detector Night Start Dates	Latitude ¹	Longitude ¹	Start Time	End Time	Microphone Orientation	Clutter	Distance to Nearest Vegetation or Obstruction	Habitat Type ²
1	52505	7/24/2023	42.32218376	-72.17637792	19:37	06:04	SE	Edge	15-20 feet	Detector set up on west shoulder of Creamery Road oriented SE along tree line.
		7/25/2023								
		7/26/2023								
2	52522	7/24/2023	42.32089242	-72.1745092	19:37	06:04	NE	Edge	10-15 feet	Detector set up on north side of Creamery Road bridge, at east end of bridge. Microphone oriented NE towards the Ware River.
		7/25/2023								
		7/26/2023								

1 Sub-meter accuracy.

2 Refer to the Field Data Forms in Appendix B for more detailed site information.

Table 3: Recorded Bat Calls

Site # & Detector Night		Species Identification ¹											Total # of Significant ³ Calls	Total # of Calls
		EPFU	LABO	LACI	LANO	EPFU/LANO	MYLE	MYLU	MYSE	PESU	MYsp	UNKN		
Site 1 7/24/2023 – 7/25/2023	Number of Calls	16*	0	10*	3	1*	0	0	0	0	0	0	27	30
	MLE (p) ²	0.0	-	0.0	1	-	-	-	-	-	-	-		
Site 1 7/25/2023 – 7/26/2023	Number of Calls	10*	0	4	0	0	0	0	0	0	0	0	10	14
	MLE (p) ²	0.0	-	0.06	-	-	-	-	-	-	-	-		
Site 1 7/26/2023 – 7/27/2023	Number of Calls	29*	0	9*	3	1*	0	2*	0	0	0	0	41	44
	MLE (p) ²	0.0	-	0.01	1	-	-	0.16	-	-	-	-		
Site 2 7/24/2023 – 7/25/2023	Number of Calls	119*	4*	19	16*	0	0	2*	0	0	0	1*	161	162
	MLE (p) ²	0.0	0.0	0.02	1	-	-	0.13	-	-	-	-		
Site 2 7/25/2023 – 7/26/2023	Number of Calls	259*	6*	41*	120	3*	0	1*	0	0	0	0	310	430
	MLE (p) ²	0.0	0.0	0.01	0.0	-	-	1	-	-	-	-		
Site 2 7/26/2023 – 7/27/2023	Number of Calls	147*	6*	47*	39	0	0	3*	0	0	0	0	203	242
	MLE (p) ²	0.0	0.0	0.0	1	-	-	0.40	-	-	-	-		
TOTAL CALLS FOR ALL SITES													-	922
TOTAL SIGNIFICANT CALLS FOR ALL SITES³													752	-

1 Refer to species key in Table 4

2 MLE (p) values ≤0.05 are considered to be significant and suggest presence.

3 Significant calls (italicized) include those with an MLE value ≤0.05 and those calls which have been manually vetted; this does not include any calls classified as UNKN or MYsp.

* All or a portion of the calls were qualitatively reviewed to confirm species presence.

** Note that if an MLE value is missing it's because it was classified via manual vetting and does not include a software generated MLE value

Table 4: Bat Species Key¹

Species Abbreviation	Scientific Name	Common Name
EPFU	<i>Eptesicus fuscus</i>	Big Brown Bat
LABO	<i>Lasiurus borealis</i>	Eastern Red Bat
LACI	<i>Lasiurus cinereus</i>	Hoary Bat
LANO	<i>Lasionycteris noctivagans</i>	Silver-haired Bat
MYLE	<i>Myotis leibii</i>	Eastern Small-footed Bat
MYLU	<i>Myotis lucifugus</i>	Little Brown Bat
MYSE	<i>Myotis septentrionalis</i>	Northern Long-eared Bat
PESU	<i>Perimyotis subflavus</i>	Tri-colored Bat
MYsp	<i>Myotis sp.</i>	Unknown Myotis
LAsp	<i>Lasiurus sp.</i>	Unknown Lasiurine
UNKN	<i>Unknown</i>	Assigned to calls that are too fragmented or poor quality to be classified to species
EPFU/LANO	<i>Eptesicus fuscus/ Lasionycteris noctivagans</i> Guild	Big Brown Bat/Silver-haired Bat Guild

1 The Massachusetts Natural Heritage Program indicates that the Indiana bat (*Myotis sodalis*) (<https://www.mass.gov/doc/indiana-bat/download>) is extirpated in Massachusetts. Therefore, this species is not included in the analysis.

Table 5: Qualitative Analysis Summary

Site	Detector Night Start Date	Auto-ID by KPro 5.4.7	QA-QC ID by VHB/BSS	Comments
Site 1	7/24/2023	LANO	EPFU/LANO	Ambiguous between EPFU and LANO; much diffuse echo and noise in file obscuring call details.
Site 1	7/24/2023	EPFU	EPFU	Long sequence with both diffuse echo and reflective echo, but enough clear call characteristics to confidently identify; with a faint LoF interloper (possible EPFU/LANO).
Site 1	7/24/2023	EPFU	EPFU + EPFU	Two bats in file, likely two EPFU with directive(s).
Site 1	7/24/2023	LACI	LACI	Much diffuse echo, but enough call characters for confident identification.
Site 1	7/25/2023	EPFU	EPFU	Good long search-phase sequence consistent with archetypical EPFU metrics and characteristics.
Site 1	7/26/2023	EPFU	EPFU	Excellent archetypical search-phase sequence for EPTFUS.
Site 1	7/26/2023	LACI	LACI	Archetypical search-phase sequence for LACI, albeit with much diffuse echo.
Site 1	7/26/2023	LANO	EPFU/LANO	Ambiguous between EPFU and LANO; much diffuse and reflective echo (and noise) in file obscuring call details.
Site 1	7/26/2023	MYSE	MYLU	Pulses are mostly out-of-range, but low F_c^1 , long duration and laid-back slopes are consistent with MYLU (not steep enough or broad bandwidth enough for MYSE)
Site 1	7/26/2023	MYLU	MYLU	Oversaturated signal (making amplitude metrics spurious), but clearly a good search-phase of a MYLU.
Site 2	7/24/2023	EPFU	EPFU	Archetypical for an EPFU slight approach-phase trending into a more typical search phase
Site 2	7/24/2023	LACI	UNKN	3 out of range call pulses and 3-4 more buried in diffuse echo with too few call characters to disambiguate between EPTFUS, LASNOC and LASCIN
Site 2	7/24/2023	LANO	LANO	Archetypical for LANO with consistent F_c and bi-linear call shape throughout sequence.
Site 2	7/24/2023	LABO	LABO	Archetypical for LASBO open-air search phase sequence with reverse-J shaped to canoe-shaped call pulses with variable F_c across sequence.

Site	Detector Night Start Date	Auto-ID by KPro 5.4.7	QA-QC ID by VHB/BSS	Comments
Site 2	7/24/2023	MYLU	MYLU+UNMY	Archetypical for MYLU open-air search-phase sequence with faint 40kMYO interloper at beginning.
Site 2	7/24/2023	MYLU	LABO	Archetypical for LABO open-air search phase sequence with variable bandwidth, duration, and Fc across this short sequence.
Site 2	7/24/2023	MYLU	MYLU	Archetypical for MYLU open-air search-phase sequence, though short, with good duration, bandwidth, and slopes typical for this species.
Site 2	7/25/2023	LANO	EPFU/LANO	Ambiguous metrics for EPFU and/or LANO; power is well centered as in LANO, body of calls maintain downward slope as in EPFU.
Site 2	7/25/2023	EPFU	EPFU	Archetypical for EPTFUS search-phase sequence with slight approach near end of recording.
Site 2	7/25/2023	LANO	EPFU/LANO	Ambiguous metrics for EPFU and/or LANO; full bandwidth of fundamental missing due to being out of range plus includes diffuse echo making metrics difficult to quantify.
Site 2	7/25/2023	LACI	LACI	Archetypical for LACI search-phase sequence with low Fc and bandwidth at onsite, transitioning to approach-phase call types by end of recording.
Site 2	7/25/2023	MYSE	MYLU + EPFU/LANO	Two bats in file, HiF ² species archetypical for MYLU with Fhi ³ <90kHz, long durations (4-5ms) and low slopes and a LoF ⁴ species with call characteristics ambiguous between EPFU and LANO.
Site 2	7/25/2023	LABO	LABO	Archetypical for LABO open-air search phase sequence with reverse-J shaped call pules with variable Fc across sequence.
Site 2	7/25/2023	LABO	LABO + LABO	Two bats in file, likely two LABO, one dominant "foreground" bat archetypical for LABO with directives and one faint, background interloper likely for LABO.
Site 2	7/25/2023	LABO	LABO	Archetypical for LABO open-air search phase sequence with reverse-J shaped call pules with variable Fc across sequence, albeit a short sequence.
Site 2	7/25/2023	LABO	LABO	Archetypical for LABO open-air search phase sequence with reverse-J shaped call pules with slightly variable Fc across sequence.

Site	Detector Night Start Date	Auto-ID by KPro 5.4.7	QA-QC ID by VHB/BSS	Comments
Site 2	7/25/2023	LABO	LABO	Likely for LABO, albeit a short, out-of-range sequence with long-duration, curvilinear pulse types consistent with open air search-phase type calls.
Site 2	7/26/2023	No ID	EPFU	Likely EPFU call shape and metrics more typical for EPFU than LACI, more linear and less reverse-J shaped or canoe-shaped as would be typical for LACI.
Site 2	7/26/2023	EPFU	EPFU	Archetypical for EPFU search-phase sequence becoming slightly out-of-range by end of recording.
Site 2	7/26/2023	LANO	EPFU	Archetypical for EPFU search-phase sequence though with much diffuse echo and slightly out-of-range by end of recording.
Site 2	7/26/2023	LACI	LACI	Archetypical for LACI search-phase sequence with low Fc and variable bandwidth from pulse to pulse across sequence.
Site 2	7/26/2023	LABO	LABO	Archetypical for LABO open-air search phase sequence with reverse-J shaped call pulses with variable Fc across sequence.
Site 2	7/26/2023	MYLU	MYLU	Likely MYLU, though quite out of range, prominent tails are distinguishable and low bandwidth, long duration, low slope is consistent with this species.
Site 2	7/26/2023	MYLU	MYLU	Archetypical for MYLU with initial approach-phase sequence settling into a typical open-air search phase
Site 2	7/26/2023	MYLU	MYLU	Archetypical for MYLU, though over-saturated, duration >6ms and low slope and HiF < 90kHz provides confident metrics for ID.
Site 2	7/26/2023	LABO	LABO	Archetypical for LABO open-air search phase sequence with reverse-J shaped call pulses with slightly variable Fc across sequence.
Site 2	7/26/2023	LABO	LABO	Archetypical for LABO open-air search phase sequence with long-duration, canoe-shaped call pulses with variable Fc across sequence, albeit a short sequence.
Site 2	7/26/2023	EPFU	EPFU	Archetypical for EPFU search-phase sequence though with much diffuse echo and slightly out-of-range, nevertheless cannot easily be confused with other LoF species.

Site	Detector Night Start Date	Auto-ID by KPro 5.4.7	QA-QC ID by VHB/BSS	Comments
Site 2	7/26/2023	LABO	LABO	Archetypical for LABO open-air search phase sequence with long-duration, canoe-shaped call pulses with variable Fc across sequence, albeit a short sequence.
Site 2	7/26/2023	LABO	LABO	Archetypical for LABO open-air search phase sequence with long-duration, canoe-shaped call pulses with variable Fc across sequence.

¹Fc = characteristic frequency; the frequency of a call pulse at its flattest point, where the slope is closest to horizontal; this is usually at the terminal end of a bat call pulse, except in cases where lower intensity, toes are present; many bats put the most power, or intensity (i.e., volume) at or near the characteristic frequency.

²HiF = high frequency.

³Fhi = Highest frequency

⁴LoF = low frequency.

Appendix D: Resumes of Qualified Individuals

Chelsea Glinka

Senior Environmental Scientist



Chelsea Glinka is a Senior Environmental Scientist in VHB's Providence, Rhode Island office. Her experience includes assessing permitting needs and developing environmental permit applications for small and large-scale projects within the private and public sectors. She supports project by leading rare, threatened, and endangered species surveys and facilitating Section 7 consultations under the Endangered Species Act through U.S. Fish and Wildlife Service and NOAA Fisheries.

13 years of professional experience

Education

MS, Natural Resources,
University of Connecticut, 2013

BS, Environmental Sciences,
University of Rhode Island, 2010

Ct, Bat Acoustic Qualitative
Analysis Training (Tittley
Scientific), 2020

Ct, Acoustic Survey Methods
(Bat Survey Solutions) 2021

Presentations

Co-Panelist; Meghan Lout
(VTrans), Timothy Dexter
(MassDOT), David Paulson
(MassDOT); "Transportation
Panel Discussion about Bat
Surveys" Northeast Bat Working
Group Conference; Burlington,
VT; Jan. 2023

MassDOT Environmental Services Master Services Agreement

Chelsea Glinka is the Project Manager for bat survey efforts conducted on behalf of the Massachusetts Department of Transportation (MassDOT). Since 2015, Chelsea has conducted passive acoustic surveys targeting the northern long-eared bat (*Myotis septentrionalis*; MYSE) for MassDOT. Her responsibilities include assessing survey effort in accordance with the most recently issued survey guidelines by the U.S. Fish and Wildlife Service (USFWS), developing Phase II Acoustic Study Plan for review and approval by USFWS, conducting acoustic surveys and visual bridge assessments and training VHB staff in survey techniques and equipment operation, acoustic analysis using auto-classification software and manual vetting of high frequency calls, report review and finalization and completion of the USFWS Northeastern US Bat Reporting Spreadsheet for Acoustic Surveys. Chelsea also prepares files for submission to the North American Bat Monitoring Project (NABat) on behalf of MassDOT. Chelsea recently worked with MassDOT to provide a Project Review Package under the Section 7 consultation process for a project location where NLEB presence was detected via acoustic surveys. The package included the description of the action area, potential impacts to MYSE, and proposed conservation measures to mitigate and minimize Project impacts to MYSE. The USFWS issued their concurrence for a determination of "may affect, not likely to adversely affect".

RIDOT Master Price Agreement Visual Bridge Assessments for Bat Presence

Chelsea managed the visual bridge assessment effort of 34 bridges throughout Rhode Island for evidence of bat roosting. The inspections were performed during the active bat season in 2022. VHB confirmed probable absence of roosting bats at most bridge locations slated for the 2023 construction season and detected potential presence of roosting bats based on guano and staining. Chelsea coordinated with RIDOT environmental staff, project management, and RIDOT Construction Supervisors for the design and implementation of traffic control set ups for bridge inspections occurring on Interstate 95 and other high-traffic volume roadways; performed work site hazard assessments and safety tailboard meetings; prepared inspection reports using the USFWS reporting form and consulted with USFWS Endangered Species Biologists at the New England Field Office.

CTDOT Environmental Services Task Orders

Chelsea conducted an acoustic bat survey along the proposed linear route of the I-95 Interchange 74 Improvements at Route 161 and Replacement of Bridge No. 250 in East



Lyme Connecticut in 2022. The survey effort included the development of a Phase II Acoustic Study Plan with proposed survey locations for submission to USFWS, conducting the acoustic survey at five survey locations within the Project limits to target a range of potentially suitable summer habitat, training VHB staff in survey techniques, acoustic analysis, and report development.

NH DOT, Exit 4A Interstate 93 Interchange & Keene-Swanzey Floodplain Compensatory Storage

Chelsea led the acoustic bat survey effort for two NHDOT projects targeting the NLEB in 2021 and 2022. Survey tasks included development and review of the Phase II Acoustic Study Plan, conducting the survey in accordance with USFWS survey guidelines, acoustic analysis, and report development. Chelsea trained VHB team members in survey techniques and worked closely with the client to ensure that all reporting requirements were met for these surveys.

Confidential Solar Project, VT

Chelsea assisted in the natural resource assessment in support of a 20 MW solar development in central Vermont by leading the acoustic bat survey effort to detect the probable absence or presence of Indiana bat (*Myotis sodalis*) and MYSE. Chelsea assisted in the development of the Phase II Acoustic Study Plan and coordinated with Vermont Fish and Wildlife Department for plan approval. Chelsea conducted the acoustic survey and trained VHB staff in survey techniques and performed acoustic analysis and determined the presence of six species. The findings of this work will be incorporated into project reporting, permitting, and design to ensure compliance with state and federal regulations.

NJDMAVA, NABat Acoustic Survey Reporting, RI

Chelsea is the Project Manager of an acoustic data management project with the New Jersey Department of Military and Veterans Affairs (NJDMAVA). Chelsea is leading efforts to analyze acoustic bat data collected during surveys at various NJDMAVA facilities from 2009 through 2021 and standardize the metadata and call files for upload to the North American Bat Monitoring Program (NABat). The Project has compiled and formatted the metadata to NABat standards for survey efforts dating back to 2009 and analyzed files via auto-classification software approved by USFWS. VHB has also collaborated with NABat to develop a methodology to manually vet a subset of data from each survey due to the large volume of data. VHB is working with a subconsultant to complete the manual vetting and verify the presence or probable absence of bat species recorded during the survey efforts. VHB has also consolidated NABat protocols and tailored them to the specificities of the NJDMAVA datasets to develop a standard operating procedure that can be used for future data analysis and upload efforts. This project will consolidate several years of bat survey data and make it more readily usable as a reference source by the New Jersey Army National Guard when new activities must consider potential impacts on state and federally-listed bat species.



Kimberley M. Justham

Ecologist



Kimberley is an Ecologist in the Environmental Permitting and Natural Sciences Group in VHB's Worcester, Massachusetts, office. Her background includes environmental compliance monitoring, wetland delineation and restoration oversight, federally and state-listed rare species surveys and monitoring (bats, turtles, birds, plants), invasive species management, and habitat restoration.

16 years of professional experience

Education

MS, Environmental Science,
University of Rhode Island, 2016

BS, Conservation Biology,
University of Rhode Island, 2005

MassDOT Acoustic Bat Surveys and Visual Bridge Surveys, Massachusetts

Kim has led the VHB field team conducting northern long-eared bat acoustic surveys and visual bridge assessments over multiple locations in a variety of habitat types for the Massachusetts Department of Transportation (MassDOT). Her responsibilities have included assisting with the development of Phase II Acoustic Study Plans for review and approval by USFWS, conducting habitat assessments, acoustic surveys and visual bridge assessments, training VHB staff in these survey techniques and equipment operation, acoustic analysis using auto-classification software, compiling and reviewing year-end reporting, and completion of the USFWS Northeastern US Bat Reporting Spreadsheet for Acoustic Surveys. Kim also prepares files for submission to the North American Bat Monitoring Project (NABat) on behalf of MassDOT.

Interstate 93 Exit 4A Interchange Project Bat Acoustic Monitoring – Londonderry and Derry, NH (2021)

As a consultant for the NHDOT, Kim assisted with the field work for the Phase 2 Presence/Probable Absence Acoustic Monitoring Surveys targeting the northern long-eared bat (*Myotis septentrionalis* or NLEB) and other NH state-listed bat species in accordance with the procedures and standards outlined in the United States Fish and Wildlife Service (USFWS) *Range-Wide Indiana Bat Survey Guidelines* (dated March 2020) and USFWS-approved Study Plan for the project.

New Jersey Department of Military and Veterans Affairs, North American Bat Monitoring Program Acoustic Survey Results Reporting, NJ

VHB provided acoustic call and metadata processing and file upload services to NJDMAVA. Kim assisted in creating a process to extract, organize, process, and post over ten years' of bat monitoring data to the North American Bat Monitoring Program data clearinghouse site. Her responsibilities have included extraction of data from acoustic survey and mistnet survey reports, compilation of metadata for bulk upload processing in NABat, and processing bat call files for AutoID using SonoBat and Kaleidoscope Pro. Kim has compiled the metadata documents into the NABat bulk metadata template and uploaded the processed metadata and ZC (call) files to the NABat website.



CTDOT Environmental Services Task Orders

VHB conducted an acoustic bat survey along the proposed linear route of the the I-95 Interchange 74 Improvements at Route 161 and Replacement of Bridge No. 250 in East Lyme Connecticut in 2022. The survey effort included the development of a Phase II Acoustic Study Plan with proposed survey locations for submission to USFWS, conducting the acoustic survey at five survey locations within the Project limits to target a range of potentially suitable summer habitat, training VHB staff in survey techniques, acoustic analysis, and report development. Kim assisted in the preparation of the final report submitted to USFWS.

MA Division of Fisheries and Wildlife, Westborough, MA

Prior to joining VHB, Kim was a Conservation Biologist for the Natural Heritage and Endangered Species Program. She wrote habitat management plans and secured wetland permits for rare plant species habitat restoration projects and monitored several federally listed plant species annually. Kim designed sampling protocols and conducted and supervised vegetation sampling, data entry and data clean-up for a sandplain grassland restoration monitoring project and led a large-scale, multi-year habitat restoration project on a remote, 75-acre island in Buzzards Bay. Restoration activities included a prescribed burn of the entire island, herbicide applications to control for invasive and woody plants, and site prep and seeding with locally sourced warm season grasses. She interpreted aerial photographs, topographic maps, and site plans to accurately map rare species observations. Kim used ArcGIS Desktop to delineate regulated and non-regulated habitat areas for state and federally listed bats, mammals, and vernal pool invertebrates. She worked with the database team to input, manage, and distribute rare species data. She conducted control of invasive and aggressive vegetation through application of herbicides and mechanical removal. Kim monitored and mapped Natural Communities over 4 years; managed habitat for terns and censused and banded terns over 8 years; conducted avian monitoring, including nightjar, marsh bird, and shorebird surveys over 5 years; and conducted salamander surveys and trapping, mussel surveys, and vernal pool surveys over 4 years. She also conducted active searches by foot, nesting surveys, trapping surveys and radio-telemetry surveys of MESA-listed turtle species, including the federally listed bog turtle over 5 years.

RI Department of Environmental Management, Providence, RI

Prior to joining VHB, Kim was an Environmental Scientist on the Wetlands Enforcement team where she performed DEM Wetland Permit and RIPDES compliance inspections, identified wetland violations, supervised the installation and maintenance of ESC measures, and supervised wetland restorations. ACOE methodology included identification of wetland plant communities, hydric soils, and other hydrologic indicators. Kim interpreted aerial photographs, topographic maps, and site plans to help determine the extent of wetlands violations and areas to be restored. She coordinated with Rhode Island state and town officials, farmers, landowners, contractors, and consultants to resolve wetland violations. She supervised restorations and served as the point of contact for landowners throughout the inspection and restoration process.



Dorothy Lawrence

Project Manager/Environmental Scientist



Education

MS, Conservation and
Sustainability
University of Massachusetts
Amherst, 2019

GCert, Regional Planning,
University of Massachusetts
Amherst, 2019

BS, Earth Science, Bridgewater
State University, 2014

Registrations/Certifications

LEED Green Associate, 10/2023

Dorothy is a Project Manager and Environmental Scientist at VHB specializing in natural resources and wetlands permitting. Prior to joining VHB she served as the Wetland Program Intern at the Massachusetts Department of Environmental Protection's Central Region Office. She currently manages VHB's Eversource Maintenance Program in Central and Eastern Massachusetts, has provided environmental consultation services on over 60 Eversource projects, and is located in the VHB Worcester Office. Additionally, she provides support to Senior Wetland Scientists and Project Managers for various local, state, and federal permitting efforts. Her services include project management, wetland delineations, bat acoustic and bridge surveys, construction oversight, environmental compliance training, permit assessments, permit application preparation, and submission.

3 years of professional experience

MassDOT Acoustic Bat Surveys and Visual Bridge Surveys, Massachusetts

Dorothy has assisted in conducting northern long-eared bat acoustic surveys and visual bridge assessments over multiple locations in a variety of habitat types for the Massachusetts Department of Transportation (MassDOT). She has assisted on the following tasks; on the ground location assessment for instrument deployment, acoustic equipment survey setup, visual bridge assessments, site visual assessment and recording, and compiling of year-end reporting.

Eversource, Line 533-508 Structure Replacement Project, Lexington, MA

Dorothy currently provides environmental consulting services to support Eversource's Lines 533-508 structure replacement project (ROW 8-3) in the town of Lexington, Massachusetts. Project support has included project management and coordination which consisted of the development of project plans; coordination with cultural resource subconsultants; maintenance notifications and coordination with local Conservation Commissions, the Army Corps of Engineers, and MassDEP, as well as the development and submittal of a 401 Water Quality Certification; filing of an electronic Notice of Intent (eNOI) for coverage and compliance with the Environmental Protection Agency National Pollutant Discharge Elimination System (NPDES) General Permit for construction activities (CGP) and preparation of the Stormwater Pollution Prevention Plan (SWPPP); and environmental and SWPPP compliance trainings with contractors and construction oversight.

Eversource, Line 320-508 Structure Replacement Projects, Lexington, and Waltham, MA

Dorothy is currently managing Eversource's Line 320-508 structure replacement project (ROW 8-3) in the towns of Lexington and Waltham, Massachusetts. Portions of the project site were located within Outstanding Resource Waters within 400 feet of a Class A surface water resulting in the need for daily monitoring during active construction. She coordinated development of project plans, wetland permits, and



notifications for the local Conservation Commissions, the Army Corps of Engineers, and MassDEP, including a 401 Water Quality Certification. Dorothy also oversaw project compliance with the NPDES CGP and other applicable permit conditions.

Shrewsbury Street Roadway and Intersection Improvement Project, Holden, MA

Dorothy is currently providing environmental consulting services to support for the Town of Holden and Massachusetts Department of Transportation (MassDOT) Shrewsbury Street Roadway and Intersection Improvement Project in Holden, Massachusetts. Project support includes wetland delineation; development of project plans; coordination and meetings with the Holden Conservation Commission, MassDOT, MassDEP, Army Corps of Engineers, and DCR; development and submittal of: Wetlands Protection Act Notice of Intent, 401 Water Quality Certification; Watershed Protection Act notification; attendance and presentations at public hearings.

National Grid – Parallel Lines Initiative Project, MA

Dorothy is currently providing environmental consulting services to support National Grid Parallel Lines Initiative Project in the towns of West Boylston, Abington, Hanover, Billerica, Millbury, Bridgewater, Stoughton, Rockland, Groveland and Tewksbury, Massachusetts. Project support includes project management, permit review for each span location, maintenance notifications and coordination with local Conservation Commissions, MassDEP, and the Army Corps of Engineers; development and submittal of a Request for Watershed Determination of Applicability for the Massachusetts Watershed Protection Act to the Department of Conservation and Recreation (DCR); environmental compliance training for contractors, and general construction oversight

Eversource, Walpole to Holbrook Reliability Project

Dorothy is currently providing environmental consulting and project management services to support Eversource's Walpole to Holbrook Reliability Project, in the towns of Avon, Canton, Holbrook, Randolph, Sharon, Stoughton, and Walpole, Massachusetts. Project support included SWPPP site inspections, compliance monitoring and reporting, construction oversight, and preparation of requests for Certificates of Compliance for local Conservation Commissions. Future support will include Certificate of Compliance finalization as well as wetland mitigation oversight and monitoring.

Eversource, Line 240-601 and 433-507 Structure Replacement Projects, Framingham, and Sherborn, MA

Dorothy supported permitting and construction of Eversource's Lines 240-601 and 433-507 structure replacement projects (ROW 3A) in the towns of Framingham and Sherborn, Massachusetts. This project required maintenance notifications and coordination with local Conservation Commissions, MassDEP, and the Army Corps of Engineers; and compliance with the NPDES CGP, including preparation of a SWPPP and eNOI, contractor trainings, and construction oversight.

Eversource, Line 338 Structure Replacement Project, Burlington and Woburn, MA

Dorothy provided environmental consulting services to support Eversource's Line 338 Structure Replacement Projects in the towns of Burlington and Woburn, Massachusetts. The project required the identification of endangered plant species and coordination with contractors and monitoring construction to avoid key areas. Project



support also included the development of project plans; maintenance notifications and coordination with local Conservation Commissions, MassDEP, and the Army Corps of Engineers; environmental compliance trainings with contractors and construction oversight.

Eversource, Right of Way (ROW) 8-3 Vegetation Management Project Woburn, Burlington, and Lexington, MA

Dorothy provided environmental consulting services to support Eversource's ROW 8-3 Vegetation Management Project in the towns of Woburn, Burlington, and Lexington, Massachusetts. Project support included maintenance notifications and coordination with local Conservation Commissions and the Army Corps of Engineers; development and submittal of a 401 Water Quality Certification to MassDEP; environmental compliance trainings with contractors and construction oversight.

NSTAR, Gas Distribution Improvement Project, Dedham and Attleboro, MA

Dorothy provided environmental consulting services to support NSTAR's Gas line improvement Projects in the town of Dedham and Attleboro, Massachusetts. Project support included coordination and notification with local Conservation Commissions and MassDEP; Request for Determination of Applicability package preparation and submittal for the Massachusetts Wetland Protection Act; on-site meetings with contractors and conservation commission representatives; environmental compliance training preparation and presentation with contractors.

Savannah McInvale

Environmental Scientist

Savannah is an Environmental Scientist in VHB's Providence, Rhode Island office. Her experience includes environmental compliance monitoring, wetland delineation and restoration oversight, vernal pool surveys, federally and state-listed rare species surveys and monitoring (bats, turtles, birds, plants) and habitat restoration.

Education

MS, Conservation Biology
Antioch University, 2020

BS, Animal Science, University of
Vermont, 2011

Ct, Acoustic Survey Methods
(Bat Survey Solutions) 2021

9 years of professional experience

MassDOT Acoustic Bat Surveys and Visual Bridge Surveys, Massachusetts

Savannah is a part of the VHB field team conducting northern long-eared bat acoustic surveys and visual bridge assessments over multiple locations in a variety of habitat types for the Massachusetts Department of Transportation (MassDOT). Her responsibilities have included acoustic surveys and visual bridge assessments, acoustic analysis using auto-classification software, and compiling and reviewing year-end reporting.

CTDOT Route 7/15 Interchange Improvement Project, Norwalk, Connecticut

Savannah assisted and led the field work for the Acoustic Monitoring Surveys targeting the northern long-eared bat (*Myotis septentrionalis* or NLEB) and other CT state-listed bat species in accordance with the procedures and standards outlined in the United States Fish and Wildlife Service (USFWS) *Range-Wide Indiana Bat Survey Guidelines* (dated March 2020) and USFWS-approved Study Plan for the project.

Gravel Pit Solar Project: American Kestrel Monitoring and Implementation of the Migratory Bird Treaty Act, East Windsor, CT

Savannah leads the American Kestrel (*Falco sparverius*) nest monitoring program in support of a 120 MW solar development on several parcels in East Windsor, CT. Savannah helped develop a weekly monitoring plan that is implemented during the active American Kestrel nesting season. Throughout the season, Savannah provides expertise and insight on the movements and activities of state and federally listed avian species within the Project Area. At the culmination of the nesting season, Savannah compiles an annual report on the success and failures of listed species at the Project Site.

CT Solar Projects: Breeding Bird and Vernal Pool Surveys

Savannah assists with the planning and implantation of Breeding Bird and Vernal Pool surveys at multiple solar project sites in Connecticut. During the early spring, Savannah assists in identifying potential vernal pools and utilizing the definition and guidelines for vernal pool surveys provided by Klemens and Calhoun 2022¹, to confirm vernal

¹ Calhoun, A. J. K. and M. W. Klemens. 2002. Best development practices: Conserving pool-breeding amphibians in residential and commercial developments in the northeastern United States. MCA Technical Paper No. 5, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, New York.



pool resource areas. Between late April and early June, Savannah leads breeding bird surveys at potential solar project parcels to identify the presence or absence of state and federally listed avian species. At the culmination of the vernal pool breeding and avian migration periods, Savannah assists in compilation of reports on the findings.

Conservation Field Inspector: Town of North Andover, Massachusetts

Prior to joining VHB, Savannah was a Conservation Field Inspector for the Town of North Andover, Massachusetts. She conducted environmental reviews for building projects near wetlands, including wetland delineations, site surveys, vegetation surveys, and endangered species habitat assessments. Savannah enforced regulations imposed by the MA Wetlands Protection Act and the Town of North Andover Conservation by-laws and assisted in running Conservation Commission meetings. She used GIS and mapping resources to help establish management restoration projects related to the North Region gas pipe explosions in 2018.

Conservation Biologist II: Department of Conservation and Recreation

Prior to joining VHB, Savannah was a Conservation Biologist II for the Department of Conservation and Recreation in Massachusetts. Savannah's responsibilities included coordinating schedules and creating training materials for the crew of three Conservation Biologists. She also created and implemented educational activities for schools, the general public and for state department staff. Her primary duties included monitoring endangered shorebird species of Massachusetts, including Piping Plovers (*Charadrius melodus*) and Least Tern (*Sternula antillarum*). She conducted and reviewed biological data on the population trends and impacts of various environmental factors and compiled end of the season reports, including Habitat Conservation Plan, and submitted them to Massachusetts Wildlife Coastal Waterbird Division.

JANET DEBELAK TYBUREC

PROFESSIONAL PROFILE

Experienced author, educator, photographer, presenter, and wildlife biologist specializing in environmental and nature studies, especially addressing bat conservation and research. Works in various settings: lecture halls, classrooms, and outdoor field locations. Professional development, coordination, and management of multi-day trainings, workshops, and field surveys. Since 1992 has organized, conducted, and instructed at over 175 workshop venues, personally training over 2,500 students on research skills, including bat capture, handling, identification, and echolocation call recording and analysis. Has been the primary investigator on projects for studying and managing bat populations and conducting field research across North America.

RELEVANT EXPERIENCE

Author; Educator; Photographer; Wildlife Biologist (September 2012 to present)

Bat Survey Solutions, LLC owned by Janet Tyburec Consulting, Tucson AZ

Duties: Provide training and instruction on bat research, inventory, and monitoring, including physical capture techniques, radio-tracking, and acoustic surveys for private, federal and state agencies, including the USDA Forest Service, USDI Bureau of Land Management, National Park Service, Fish and Wildlife Service, and the Department of Defense and Army Corps of Engineers. Perform professional bat surveys for agency directors, staff, wildlife biologists, resource managers, seasonal employees, and volunteers.

Contract Instructor (September 2002 to September 2012)

Bat Conservation International (BCI), Austin TX

Job Duties: Design and teach summer field workshops for BCI and its partner agencies and organizations about bat research and conservation, advanced capture techniques, acoustic monitoring, *Myotis sodalis* survey techniques, and inventory and management techniques; using field study techniques including mist netting, harp trapping, acoustic monitoring equipment and software; radio-tracking, banding, light-tagging, species identification, habitat assessment and management, status determination, and data management tools.

Director of Education Programs (June 1996-September 2002); Assistant Dir. (September 1989-June 1996)

Bat Conservation International (BCI), Austin TX

Administrative Duties: Prepare annual departmental budget for three program activities; contribute to semi-annual departmental reports and provide organizational and donor annual reports.

Job Duties: Organize, schedule, promote, and instruct at BCI's educational workshops. Develop and edit educational materials, posters, books, audio/visual programs.

EDUCATION

Trinity University, San Antonio TX. May 1989

B.A., Biology and English: Undergraduate Science Studies: Botany, Plant Physiology, Vertebrate Zoology, Ecology, Oceanography, Genetics, General Biology, Chemistry, Physics, Statistics
Undergraduate English Studies: Elizabethan Playwrights, Complete Works of Shakespeare, American Novelists, Complete Works of Faulkner, Language Arts, Magazine Writing

University of Colorado, Boulder CO. August 1988

Course work in Comparative Ecology of Alpine and Desert Ecosystems

Pima Community College, Tucson AZ. August 1984 - May 1985

Course work in Creative Writing

JANET DEBELAK TYBUREC

SELECT PUBLICATIONS

- Tyburec, J.D. 1998. Memoirs from bat camp. *BATS* 16(3): 8-9.
- Tyburec, J.D. 1998. (Ed.) *Discover Bats!* Bat Conservation International, Austin. 228 pages.
- Tyburec, J.D. 1999. Vacation bat watching in the tropics. *BATS* 17(4): 10-13.
- Tyburec, J.D. 2003. "A Gallery of Workshop Wildlife" (photo essay) *BATS* 21(3): 10.
- Tyburec, J.D., C. Weise, A. McIntire, and S. Richardson. 2011. Bat Conservation: Priorities and Initiatives in the Sonoran Desert Region. *Sonorensis* 31 (1): 20-25.
- Tyburec, J.D. 2014. "Bats." In: *Cave Creek Canyon: Revealing the Heart of Arizona's Chiricabua Mountains*. ECO Wear & Publishing, Rodeo NM 274 pages.
- Tyburec, J.D. 2015 (2nd Ed.). "Bats." In: *A Natural History of the Sonoran Desert*. S.J. Phillips and P.W. Comus (Eds.) University of California Press, Berkeley. Pages 401-410.
- Robbins, L.W., J.D. Tyburec, J.C. Timpona, and V. Brack, Jr. 2021. *Bats of Oklahoma*, Center for Bat Research, Outreach, and Conservation, Indiana State University, Terre Haute. 100 pages.

SELECT PRESENTATIONS

- Tyburec, J.D. 2012. *Acoustic Monitoring: A Silver-bullet or a Sticky-wicket?* Presentation at the Northeast Bat Working Group Meeting, Carlisle PA, January 2012.
- Tyburec, J.D. 2012. *Harp trap effectiveness for the Capture of Myotis leibii, small-footed myotis*. Presentation at the Northeast Bat Working Group Meeting, Carlisle PA, January 2012.
- Tyburec, J.D. and J.D. Cheng. 2013. *Using Auto-classifiers for Acoustic Surveys: Do Results Reflect Reality?* Presentation at the Northeast Bat Working Group Meeting, Albany NY, January 2013.
- Tyburec, J.D. and J.D. Cheng. 2013. *Auto-classifiers for Acoustic Surveys: A Bat in the Hand is Worth how Many Detectors in the Bush?* Presentation at the Southeast Bat Diversity Network Meeting, Pikeville TN. February 2013.
- Cheng, J.D. and J.D. Tyburec. 2014. Comparing bat detector deployments at different heights, in different orientations, and using different microphone types. Presentation (poster) at the Southeast Bat Diversity Network Meeting, Nacogdoches TX. February 2014.
- Tyburec, J.D., J.D. Cheng and J.M. Szewczak. 2014. Comparing four acoustic analysis software packages and the accuracies of their auto-classification results for determining bat occupancy in a habitat. Presentation at the Southeast Bat Diversity Network Meeting, Nacogdoches TX. February 2014.
- Tyburec, J.D., and J.D. Cheng. 2019. Improving Bat Survey Efficiency and Probable Presence Results by Combining Physical Capture and Acoustic Recording Methods. Oral presentation at the American Fisheries Society and The Wildlife Society's 2019 Joint Conference in Reno NV. October 2019.
- Tyburec, J.D., and J.D. Cheng. 2021. Stationary Point (Passive) Acoustic Surveys for Bats: Using Auto-classification Software Results to Infer Relative Bat Activity - The Problem of Multiple Bat Passes in a Recording. Oral presentation at the Northeast Bat Working Group 2021 Virtual Meeting, 10-11 March.

SELECT BAT-SURVEY & ACOUSTIC-MONITORING PROJECTS

- 2009 - Acoustic Identification Summary for 2005-2008 Bat Surveys conducted by the **USDA-Forest Service, Region 1** (Idaho/Montana), involving reviewing, vetting and reporting results for over 6,500 full-spectrum echolocation recordings.
- 2009 - Acoustic Identification Summary for a 2009 Bat Survey conducted by **Sanders Environmental**, involving reviewing, vetting and reporting results for over 33,000 full-spectrum echolocation call recordings from the Northeastern U.S. to identify federally listed T&E species and state-sensitive species.

JANET DEBELAK TYBUREC

- 2010 - Acoustic Identification Summary for a 2010 Bat Survey conducted by **Sanders Environmental**, involving reviewing, vetting and reporting results for over 380,000 full-spectrum echolocation call recordings from the Northeastern U.S.
- 2011 - Acoustic Analysis provided for a 2011 Bat Survey conducted by **Sanders Environmental**, involving reviewing, vetting and reporting results from over 60,000 full-spectrum echolocation call recordings from the Northeastern U.S. using SonoBat software.
- 2012 - Capture and Acoustic Field Survey for the **US Army Corps of Engineers** (Illinois/Missouri), involving site selection for capture and concurrent acoustic surveys designed to assess management needs for T&E bats, data collection, and reviewing, vetting and reporting results from over 120 bats captured and 12,000 full-spectrum echolocation call recordings collected, with 100% manual vetting of the acoustic files.
- 2014 - Acoustic Field survey for **URS Corporation** to assess *Myotis leibii* habitat along a proposed Pennsylvania Power and Light, right-of-way development in the Pocono Mountains (Wilkes-Barre PA), deploying over 190 bat-detectors, collecting and analyzing over 90,000 recordings from nearly 6,000 hours of full-spectrum monitoring, with 100% of the acoustic files manually vetted.
- 2016 - Acoustic Analysis of nearly 600 full-spectrum echolocation call recordings from 17 passive monitoring deployments and 2 mobile transects for the **Environmental Research Group, LLC** of Bainbridge GA. The analysis included auto-classification outputs from SonoBat4 (NE) and KaliedoscopePRO with manual vetting of both results to document 6 eastern U.S. bat species according to current USF&WS Indiana Bat Summer Survey Guidelines.
- 2016 - Manual Vetting to provide a second opinion on nearly 1,000 full-spectrum echolocation call recordings, representing nearly 1,200 distinct bat passes, from select locations monitoring from the years of 2011 thru 2016 for the **U.S. Fish and Wildlife Service, Sheldon-Hart Mountain National Wildlife Refuge Complex**, in Lakeview OR. Analysis included auto-classification outputs from SonoBat4 (NW) with manual vetting to confirm the presence of 13 bat species, including 5 northwestern *Myotis* species.
- 2016 - Capture and Acoustic Survey, Morphological Identification, Manual Acoustic Vetting, and Acoustic Survey Report Comparing and Summarizing a 2-week Survey Effort in each of 3 locations: in Southeastern Arizona, Northern California and Western Kentucky, which together comprised over 1,000 capture records, 20,000 acoustic recordings, and documented 12 - 20 bat species per location. (100% of the acoustic files were manually vetted with results presented in Tyburec et al. Poster Presentation at the 2016 North American Symposium on Bat Research in San Antonio TX.)
- 2017 - Capture and Acoustic Field Survey for the **Sky Island Alliance** and Appleton-Whitell Audubon Research Ranch to survey bat occurrence at managed wetlands designed for mitigation to aid recovery of the Chiricahua Leopard Frog (Santa Cruz County, Arizona); site selection for capture and acoustic inventories of a 4-site; 7-night period with over 12 capture survey hours and 272 acoustic survey hours, where 12 individual bats of three species were captured and nearly 4,000 individual bat passes were recorded and almost 2,800 were confidently identified to 14 different species.
- 2017 - Manual Vetting of nearly 400 full-spectrum echolocation call recordings, representing almost 500 individual bat passes, from select monitoring locations during the years of 2014 thru 2016 for the **Canadian Wildlife Service, Northern Conservation Division, Whitehorse YT**. Analysis included auto-classification outputs from SonoBat4 (WY) with manual vetting to confirm the presence of four (4) bat species including 3 common northwestern *Myotis* species.
- 2018 - Passive Acoustic Survey, Manual Vetting, and Acoustic Survey Report for a 17-night passive acoustic survey conducted at a southern Arizona grassland community near Elgin, summarizing 5 detector locations, totaling over 19,000 recordings (60GB), from 614 acoustic survey hours, and 66 detector-survey nights, that yielded almost 29,000 bat-passes (that were 100% manually vetted) and confirmed the presence of 19 southwestern bat species: *Antrozous pallidus*, *Choeronycteris mexicana*, *Eptesicus fuscus*, *Lasiurus noctivagans*, *Lasiurus blossevillei*, *Lasiurus cinereus*, *Lasiurus xanthinus*, *Leptonycteris yerbabuenae*, *Myotis auriculus*, *Myotis californicus*, *Myotis ciliolabrum*, *Myotis occultus*, *Myotis thysanodes*, *Myotis velifer*, *Myotis volans*, *Myotis yumanensis*, *Nyctinomops* spp. *Pipistrellus hesperus*, and *Tadarida brasiliensis*.

JANET DEBELAK TYBUREC

- 2018 - Manual Vetting to provide a second opinion of over 100 full-spectrum echolocation call recordings, representing 130 distinct bat passes, from select monitoring stations deployed in 2017 by the **Maryland Department of Natural Resources**. Analysis included auto-classification outputs from SonoBat4 (NE, NNE, and PA-VA-NY) with manual vetting to confirm the presence of nearly 50 confidently identified passes from 5 bat species, including *Myotis lucifugus*.
- 2016-2018 - Passive and Mobile Acoustic Surveys, Manual Vetting, and Acoustic Survey Report summarizing 3 years of acoustic survey work conducted near Punta Gorda FL in association with the Bat Survey Solutions, LLC, Acoustic Survey Methods trainings, summarizing efforts at 35 detector locations, totaling 12,000 recordings (45GB) that were 100% manually vetted, and confirmed the presence of 8 southeastern bat species: *Eptesicus fuscus*, *Eumops floridanus*, *Lasiurus borealis/seminolus*, *Lasiurus intermedius*, *Nycticeius humeralis*, *Pipistrellus subflavus*, and *Tadarida brasiliensis*.
- 2019 - Bat Survey Efforts (including physical captures with single-high mist nets, triple-high mist nets, twin-bank harp traps, and triple-bank harp traps; and full-spectrum active and passive acoustic recording using full-spectrum Wildlife Acoustics SongMeter detectors, Pettersson M500 microphones, and SonoBat LIVE recorders) for **Merlin Tuttle's Bat Conservation** "Experience Texas Bats" Natural History Tour in Big Bend National Park, TX during April 2019. Presented a bat survey summary presentation at the end of the week analyzing over 4,000 acoustic records and over 200 capture records, documenting 18 of the 24 suspected species found in the park, with breakdown of species only captured physically, only acoustically, and both via capture and acoustic methods, with 100% of the acoustic collection manually vetted to species or species-guild.
- 2019 - Manual Vetting to provide a second opinion/species identification confirmation of 1,200 zero-cross recordings collected during an **Office of Surface Mining** acoustic survey in Pennsylvania. Analysis and manual vetting performed with KaleidoscopePRO software, using USF&WS Indiana Bat Summer Survey Guidelines.
- 2019 - Manual Vetting to provide a second opinion/species identification confirmation of 50 suspected *Myotis* species recordings collected in Pennsylvania by **Bat Conservation and Management**. Analysis performed with Kaleidoscope PRO software and manual vetting performed with SonoBat software.
- 2019 - Manual Vetting to provide species occupancy report on 350 zero-cross recordings collected from 10 survey locations in Alaska for the **Alaska Center for Conservation Science**. Analysis and manual vetting performed using KaleidoscopePRO software.
- 2020 - Manual Vetting to provide a second opinion and species identification confirmation of 100 recordings suspected to be of *Myotis* species bats collected by the **Maryland Department of Conservation**.
- 2020 - Manual Vetting to provide species occupancy report on 7,000 full-spectrum files collected by **Sanders Environmental** to identify T&E species (*M. septentrionalis* and *M. sodalis*) in Pennsylvania using current USF&WS Indiana Bat Summer Survey Guidelines. Analysis and vetting performed using MLE results from KaleidoscopePRO software and full-spectrum qualitative analysis using the SonoBat viewer.
- 2020 - Manual Vetting to provide a second opinion/species identification confirmation on 4,000 full-spectrum recordings collected in Pennsylvania by **Sanders Environmental** to provide species occupancy report from fall swarming habitats near mine features, using current USF&WS Indiana Bat Summer Survey Guidelines.
- 2021 - Manual Vetting to provide second opinions and species identification confirmation on 300 full-spectrum recordings for **Bat Conservation and Management** from a proposed development in Pennsylvania to determine *Myotis sodalis* and/or *M. septentrionalis* presence at the site, using current USF&WS Indiana Bat Summer Survey Guidelines.
- 2021 - Acoustic survey report to identify true-positive, false-positive, and false-negative auto-classifier decisions to provide a site-level species occupancy report at a four-site, three-night survey in southern Arizona performed by **Copperhead Consulting**. Analysis and manual vetting of over 8,000 zero-cross recordings using KaleidoscopePRO software.

JANET DEBELAK TYBUREC

BAT SURVEY TRAINING CLASSES DEVELOPED & TAUGHT

From 1992-2012 Janet Debelak Tyburec worked for Bat Conservation International (Austin TX) to develop their “Bat Conservation and Management” workshops, “Educator” workshops and “Decision Makers” workshops which were conducted at venues in Arizona, California, Kentucky, Montana, Pennsylvania, Texas, Virginia and Toronto, Ontario CANADA, working with founder Merlin D. Tuttle and Director of Education, Patricia A. Morton to manage and direct all training efforts. In 2001 BCI began offering “Acoustic Monitoring for Bats” workshops at the “flagship” venues in the Chiricahua Mountains of Arizona (May/June), Lava Beds National Monument in California (July), Mammoth Cave National Park in Kentucky (July/August), and at Canoe Creek State Park in Central Pennsylvania (August/September). Beginning in 2008 Janet became a private contractor and federal agency contractor, and worked with Bat Conservation and Management (BCM, Carlisle PA) to offer “Bat Study and Survey Techniques” workshops at venues in Arizona, California, Indiana, Kentucky, Maryland, New Jersey, New York, Pennsylvania, Tennessee, Texas and West Virginia. In 2012 she formed her own company to take over all bat-survey training after BCM and BCI dropped educational outreach from their respective missions. Below is a select list of notable training courses.

- 2008 “Forest Bat Conservation and Inventory Techniques” workshop for the United States Forest Service, Coronado National Forest in Tucson AZ, 18-19 September.
- 2009 “Acoustic Monitoring as a Non-contact Bat Survey Method” workshop for Cleveland MetroParks in Akron OH, 25 August.
- 2009 “Bat Survey Techniques for Caves, Mines, Buildings, and Bridges” workshop for the United States Forest Service, Doublehead Ranger District, in Dillon MT, 14-17 September.
- 2009 “Forest Bat Conservation and Inventory Techniques” workshop for the United States Forest Service, Coronado National Forest and local partner agencies, in Tucson AZ, 12-13 November.
- 2010 “Introduction to Bat Conservation, Survey Methods, and Management” workshop for the United States Forest Service, Guadalupe National Forest, Carlsbad Ranger District, in Carlsbad NM, 6-8 July.
- 2010 “Forest Bat Conservation: Water, Mines, and Man-made Structures” workshop for the United States Forest Service, Lincoln National Forest, Smokey Bear Ranger District in Ruidoso NM, 15-17 July.
- 2010 “AnaBat Acoustic Survey Training” workshop for the Department of Defense, Nellis Air Force Base in Las Vegas NV, 22-24 October.
- 2011 “Bat Inventory and Monitoring” workshop for the United States Forest Service, Guadalupe National Forest and the Bureau of Land Management, in Carlsbad NM, 10-13 August.
- 2011 “White-nose Syndrome in Bats, History, Prevention, and Prognosis” class for the Department of Defense, in Sierra Vista AZ, 30 August-1 September.
- 2012 “Bat Capture and Acoustic Survey Techniques” class for the United States Forest Service, North Central Research Station, in Portal AZ, 19-21 May.
- 2012 “Bat Inventory and Monitoring” workshop for the Utah Bat Conservation Cooperative, joint agency: Bureau of Land Management, National Park Service and United States Forest Service in Escalante UT, 30 July-2 August.
- 2012 “AnaBat Acoustic Inventory Methods” workshop for the United States Fish and Wildlife Service, in McBee SC, 23-24 April.
- 2013 “SonoBat Acoustic Analysis Techniques” class for Pima County Parks Department, Tucson AZ, 22 April.
- 2013 “Acoustic Survey Field Techniques for Bat Studies” workshop for the United States Fish and Wildlife Service, in State College PA, 20-21 October
- 2014 “Pettersson Detector and SonoBat Software Acoustic Survey Techniques” workshop for Sanders Environmental Clients and Sub-contractors, in Somerset PA, 7-9 April.
- 2014 “Bat Detectors and Acoustic Survey Protocols” workshop for the United States Fish and Wildlife Service, in Dixon IA, 3-5 June.
- 2015 “Acoustic Data Management” training workshops in Alton, IL (7-9 March); Hollidaysburg PA (28-29 April); Harrisburg, PA (12-14 October); and Fairfield ME (14-16 June).

JANET DEBELAK TYBUREC










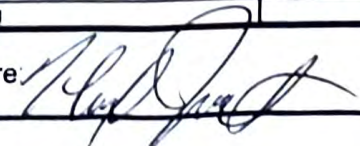
- 2015 “Combined Field Survey Techniques” training workshops in Portal AZ (20-26 May); Tullake CA (10-17 July); and Mammoth Cave, KY (19-25 September).
- 2015 “Field Survey Techniques” training for National Park Service, Mammoth Cave, KY, 14-17 September.
- 2016 “Acoustic Data Management” training workshops in Duluth MN (7-9 March), Wells ME (7-9 April), and Harrisburg PA (17-19 October).
- 2016 “Acoustic Survey Methods” training workshop in Punta Gorda FL, 1-5 February.
- 2016 “Combined Field Survey Techniques for Bats” training workshops in Portal AZ (22-29 May), Tullake CA (10-17 July), and Mammoth Cave KY (28 August - 4 September).
- 2016 “Field Survey Techniques for Bats” training workshop for California Department of Fish and Game, Tullake CA, 18-22 July.
- 2017 “Acoustic Survey Methods” training course in Punta Gorda FL (23-27 January) and Tucson AZ (3-7 April)
- 2017 “Combined Field Survey Techniques” training workshops in Portal AZ (13-20 May), Tullake CA (14-21 July), and Mammoth Cave KY (22-30 August).
- 2017 “Field Survey Techniques” training workshop for National Park Service staff in Tullake CA, 24-28 July.
- 2017 “Acoustic Data Management” training class in Harrisburg PA, 11-13 October.
- 2018 “Acoustic Survey Methods” training course in Punta Gorda FL, 21-26 January.
- 2018 “Combined Field Survey Techniques for Bats” training workshop in Portal AZ (8-15 May), Tullake CA (29 July - 5 August), and Mammoth Cave KY (4-12 September).
- 2018 “Combined Field Survey Techniques for Bats” training workshop for National Park Service staff at Santa Monica Mountains National Recreation Area, Los Angeles County CA, 18-20 September.
- 2018 “Acoustic Data Management” training class in Harrisburg PA, 16-18 October.
- 2019 “Acoustic Survey Methods” training course in Punta Gorda FL, 8-13 January.
- 2019 “Acoustic Survey Methods” training course for the Seminole Tribe in Big Cypress FL, 11-13 March.
- 2019 Bat Survey for Merlin Tuttle’s Bat Conservation “Discover Texas Bats,” Big Bend TX, 27 March - 4 April.
- 2019 “Acoustic Survey Methods” training course in Tucson AZ, 8-13 April.
- 2019 “Acoustic Data Management” training class in Tulsa OK, 26-28 April.
- 2019 “Cave Conservation and Management for Bats” field training workshop in San Marcos TX, 7-9 May
- 2019 “Combined Field Survey Techniques for Bats” field training workshop in Portal AZ, 20-27 May.
- 2019 “Acoustic Data Management using KaleidoscopePRO Software” custom training class for Environmental Science Associates consultants in Tampa FL, 24-25 July.
- 2019 “Bat Survey Techniques for Agency Biologists” training workshop in Great Basin (Baker) NV, 15-19 July.
- 2019 “Combined Field Survey Techniques for Bats” training workshop in Great Basin (Baker) NV, 21-28 July.
- 2019 “Combined Field Survey Techniques for Bats” training workshop in Mammoth Cave KY, 4-12 September.
- 2019 “Acoustic Data Management” training class in Harrisburg PA, 22-24 October.
- 2020 “Acoustic Survey Methods” training course in Punta Gorda FL, 10-16 January.
- 2020 “Acoustic Survey Methods for Conducting North American Bat Conservation Program Surveys” for the Southwest Bat HUB, on-line training workshop, 14-18 September.
- 2020 “Acoustic Survey Methods for Conducting Florida Bonneted Bat Surveys using KaleidoscopePRO” for KCA Environmental Consultants (Tampa FL), on-line training workshop (24-26 August) and follow-up mock-survey consultation (29 September - 1 October).
- 2021 “Acoustic Survey Methods/NABat Survey Methods” field training course in Tucson AZ, 21-25 June.
- 2021 “Acoustic Survey Methods/NABat Survey Methods” field training course in Elgin AZ, 5-9 July.

SKILLS

Writing (non-fiction, fiction, and creative), Photography (outdoor and nature; digital and film), Design/Layout (computer assisted), Drawing, drafting, painting, Cycling (recreational road biking; racing), Sea Kayaking, Running Exercise/Health/Nutrition/Fitness, Hiking, Nature Study and Travel

Appendix E: Bridge Inspection Form and Photos

Bridge/Structure Bat Assessment Form

Date & Time of Assessment 8/3/2023 8:30 AM		DOT Project Number 608831		Route/Facility Carried Cremery Rd/ Unites Rd		County Worcester	
Federal Structure ID		Structure Coordinates (latitude and longitude) 42.320982 -72.174649		Structure Height (approximate) ~8'		Structure Length ~100'	
Structure Type (check one)				Structure Material (check all that apply)			
Bridge Construction Style				Deck Material		Beam Material	
<input type="radio"/> Cast-in-place  <input type="radio"/> Flat Slab/Box  <input type="radio"/> Truss  <input type="radio"/> Parallel Box Beam 				<input type="radio"/> Pre-stressed Girder  <input checked="" type="radio"/> Steel I-beam  <input type="radio"/> Covered  <input type="radio"/> Other		<input checked="" type="checkbox"/> Metal <input checked="" type="checkbox"/> Concrete <input checked="" type="checkbox"/> Timber <input type="checkbox"/> Open grid <input type="checkbox"/> Other	
Culvert Type				Culvert Material		End/Back Wall Material	
<input type="radio"/> Box <input type="radio"/> Pipe/Round <input type="radio"/> Other				<input type="checkbox"/> Metal <input type="checkbox"/> Concrete <input type="checkbox"/> Plastic <input type="checkbox"/> Stone/Masonry <input type="checkbox"/> Other		<input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Timber <input checked="" type="checkbox"/> Stone/Masonry <input type="checkbox"/> Other	
Other Structure				Creosote Evidence		Notes:	
Crossings Traversed (check all that apply)				Surrounding Habitat (check all that apply)			
<input type="checkbox"/> Bare ground <input checked="" type="checkbox"/> Rip-rap <input checked="" type="checkbox"/> Flowing water <input type="checkbox"/> Standing water <input type="checkbox"/> Seasonal water				<input type="checkbox"/> Open vegetation <input type="checkbox"/> Closed vegetation <input type="checkbox"/> Railroad <input type="checkbox"/> Road/trail - Type <input type="checkbox"/> Other:			
Areas Assessed (check all that apply)				Surrounding Habitat (check all that apply)			
Check all areas that apply. If an area is not present in the structure, check the "not present" box.				<input checked="" type="checkbox"/> Agricultural <input type="checkbox"/> Commercial <input type="checkbox"/> Residential-urban <input type="checkbox"/> Residential-rural <input checked="" type="checkbox"/> Woodland/forested			
Document all bat indicators observed during the assessment. Include the species present, if known, and provide photo documentation as indicated.				<input type="checkbox"/> Grassland <input type="checkbox"/> Ranching <input checked="" type="checkbox"/> Riparian/wetland <input type="checkbox"/> Mixed use <input type="checkbox"/> Other			
Area (check if assessed)		Assessment Notes		Evidence of Bats (include photos if present)		Species	
<input type="checkbox"/> All crevices and cracks: <input checked="" type="checkbox"/> Bridges/culverts: rough surfaces or imperfections in concrete <input type="checkbox"/> Other structures: soffits, rafters, attic areas		<input type="checkbox"/> Not present <p>partial: SE end full, rest outside only w/GoPro</p>		<input type="checkbox"/> Visual - live # dead # <input type="checkbox"/> Guano <input type="checkbox"/> Staining		<input type="checkbox"/> Audible <input type="checkbox"/> Odor <input type="checkbox"/> Photos <p>No Bat Evidence</p>	
<input checked="" type="checkbox"/> Concrete surfaces (open roosting on concrete)		<input type="checkbox"/> Not present		<input type="checkbox"/> Visual - live # dead # <input type="checkbox"/> Guano <input type="checkbox"/> Staining		<input type="checkbox"/> Audible <input type="checkbox"/> Odor <input type="checkbox"/> Photos <p>No Bat Evidence</p>	
<input checked="" type="checkbox"/> Spaces between concrete end walls and the bridge deck		<input type="checkbox"/> Not present <p>SE end only</p>		<input type="checkbox"/> Visual - live # dead # <input type="checkbox"/> Guano <input type="checkbox"/> Staining		<input type="checkbox"/> Audible <input type="checkbox"/> Odor <input type="checkbox"/> Photos <p>No Bat Evidence</p>	
<input type="checkbox"/> Crack between concrete railings on top of the bridge deck <div style="display: flex; align-items: center;"> <div style="margin-right: 5px;">Gap</div>  </div> <div style="display: flex; align-items: center;"> <div style="margin-right: 5px;">Railing</div>  </div>		<input checked="" type="checkbox"/> Not present		<input type="checkbox"/> Visual - live # dead # <input type="checkbox"/> Guano <input type="checkbox"/> Staining		<input type="checkbox"/> Audible <input type="checkbox"/> Odor <input type="checkbox"/> Photos <p>No Bat Evidence</p>	
<input checked="" type="checkbox"/> Vertical surfaces on concrete I-beams		<input type="checkbox"/> Not present		<input type="checkbox"/> Visual - live # dead # <input type="checkbox"/> Guano <input type="checkbox"/> Staining		<input type="checkbox"/> Audible <input type="checkbox"/> Odor <input type="checkbox"/> Photos <p>No Bat Evidence</p>	
<input checked="" type="checkbox"/> Spaces between walls, ceiling joists		<input type="checkbox"/> Not present		<input type="checkbox"/> Visual - live # dead # <input type="checkbox"/> Guano <input type="checkbox"/> Staining		<input type="checkbox"/> Audible <input type="checkbox"/> Odor <input type="checkbox"/> Photos <p>No Bat Evidence</p>	
<input type="checkbox"/> Weep holes, scupper drains, and inlets/pipes		<input checked="" type="checkbox"/> Not present		<input type="checkbox"/> Visual - live # dead # <input type="checkbox"/> Guano <input type="checkbox"/> Staining		<input type="checkbox"/> Audible <input type="checkbox"/> Odor <input type="checkbox"/> Photos 	
<input checked="" type="checkbox"/> All guiderails		<input type="checkbox"/> Not present <p>wooden rails</p>		<input type="checkbox"/> Visual - live # dead # <input type="checkbox"/> Guano <input type="checkbox"/> Staining		<input type="checkbox"/> Audible <input type="checkbox"/> Odor <input type="checkbox"/> Photos <p>No Bat Evidence</p>	
<input type="checkbox"/> All expansion joints		<input checked="" type="checkbox"/> Not present		<input type="checkbox"/> Visual - live # dead # <input type="checkbox"/> Guano <input type="checkbox"/> Staining		<input type="checkbox"/> Audible <input type="checkbox"/> Odor <input type="checkbox"/> Photos 	
Name: Kim Latham				Signature: 			

VISUAL BRIDGE ASSESSMENT PROJECT 608851 – CREAMERY ROAD OVER WARE RIVER

Bridge Assessment Photos



Photo 1: A southeasterly view of the deck and railings of bridge H-08-003=N-07-002, carrying Creamery Road over the Ware River.

VISUAL BRIDGE ASSESSMENT PROJECT 608851 – CREAMERY ROAD OVER WARE RIVER



Photo 2: A southerly view of the steel beams and concrete abutments supporting bridge H-08-003=N-07-002.

VISUAL BRIDGE ASSESSMENT PROJECT 608851 – CREAMERY ROAD OVER WARE RIVER



Photo 3: A northwesterly view of the underside of bridge H-08-003=N-07-002 from the southeastern abutment.

VISUAL BRIDGE ASSESSMENT PROJECT 608851 – CREAMERY ROAD OVER WARE RIVER



Photo 4: A northwesterly view of the east girder of bridge H-08-003=N-07-002 from the southeastern abutment.

VISUAL BRIDGE ASSESSMENT PROJECT 608851 – CREAMERY ROAD OVER WARE RIVER



Photo 5: A northwesterly view of the west girder of bridge H-08-003=N-07-002 from the southeastern abutment.

VISUAL BRIDGE ASSESSMENT PROJECT 608851 – CREAMERY ROAD OVER WARE RIVER



Photo 5: A southeasterly view of the underside of bridge H-08-003=N-07-002 over the Ware River showing the stone and concrete abutment.

VISUAL BRIDGE ASSESSMENT PROJECT 608851 – CREAMERY ROAD OVER WARE RIVER



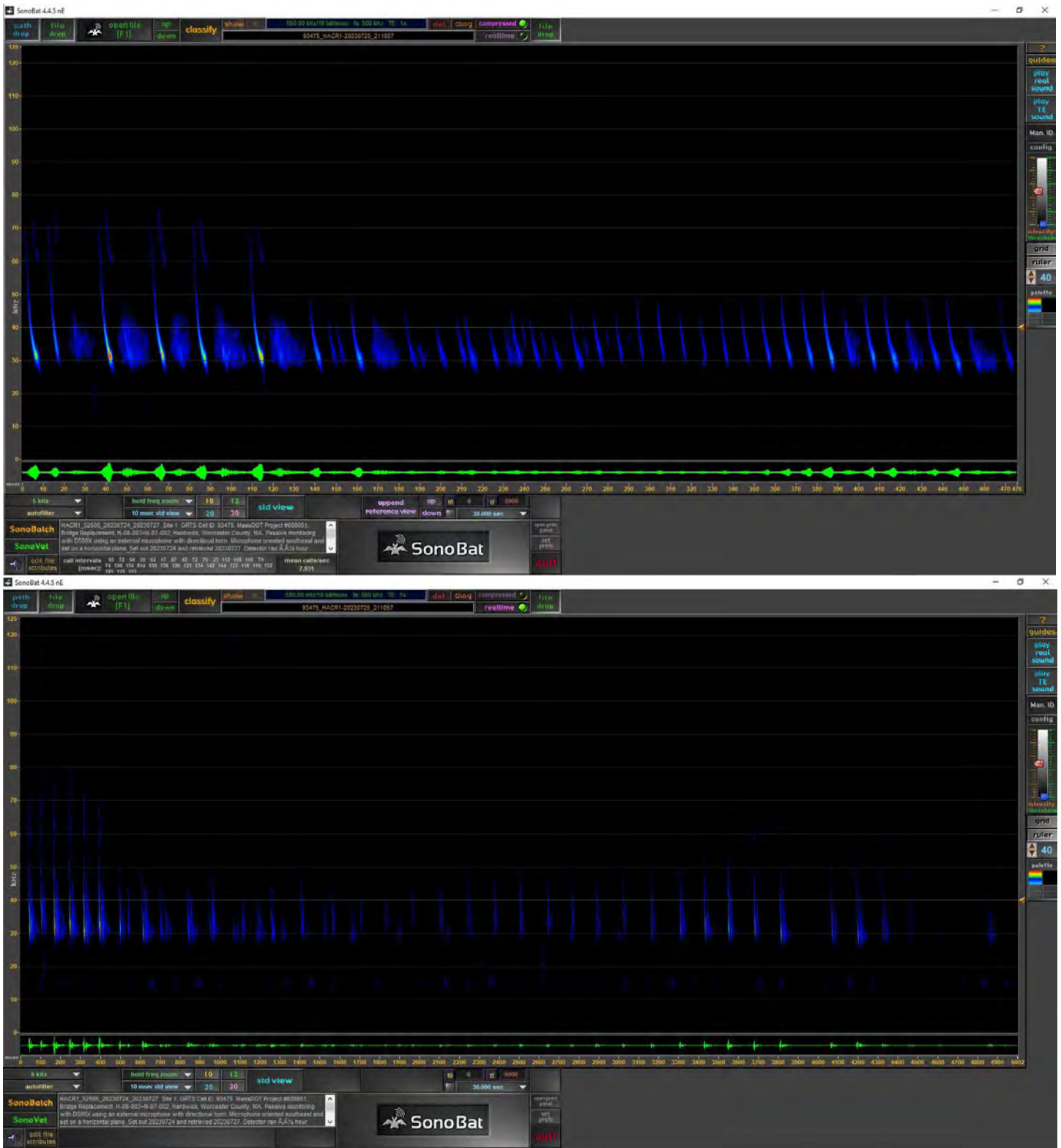
Photo 6: A southerly view of the southeastern abutment of bridge H-08-003=N-07-002.

VISUAL BRIDGE ASSESSMENT PROJECT 608851 – CREAMERY ROAD OVER WARE RIVER

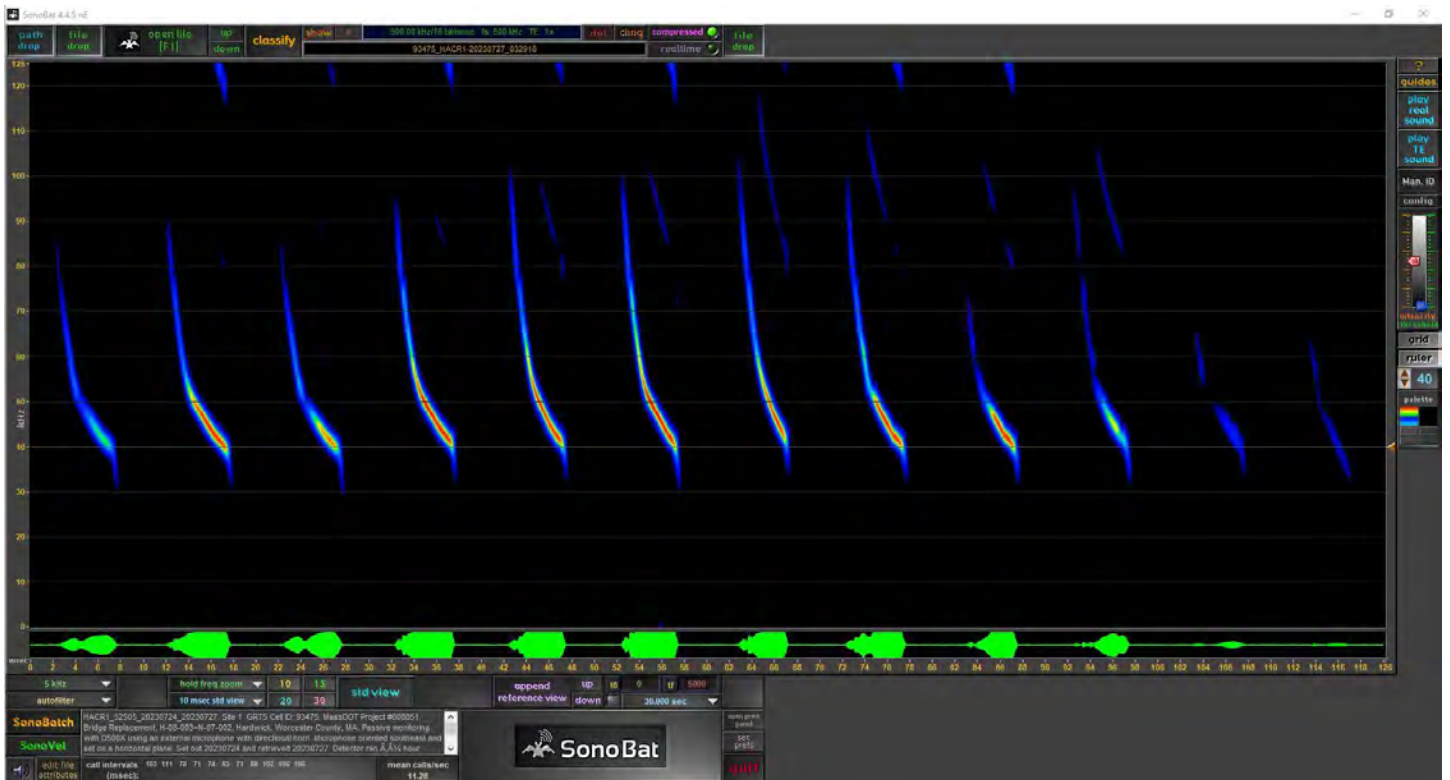
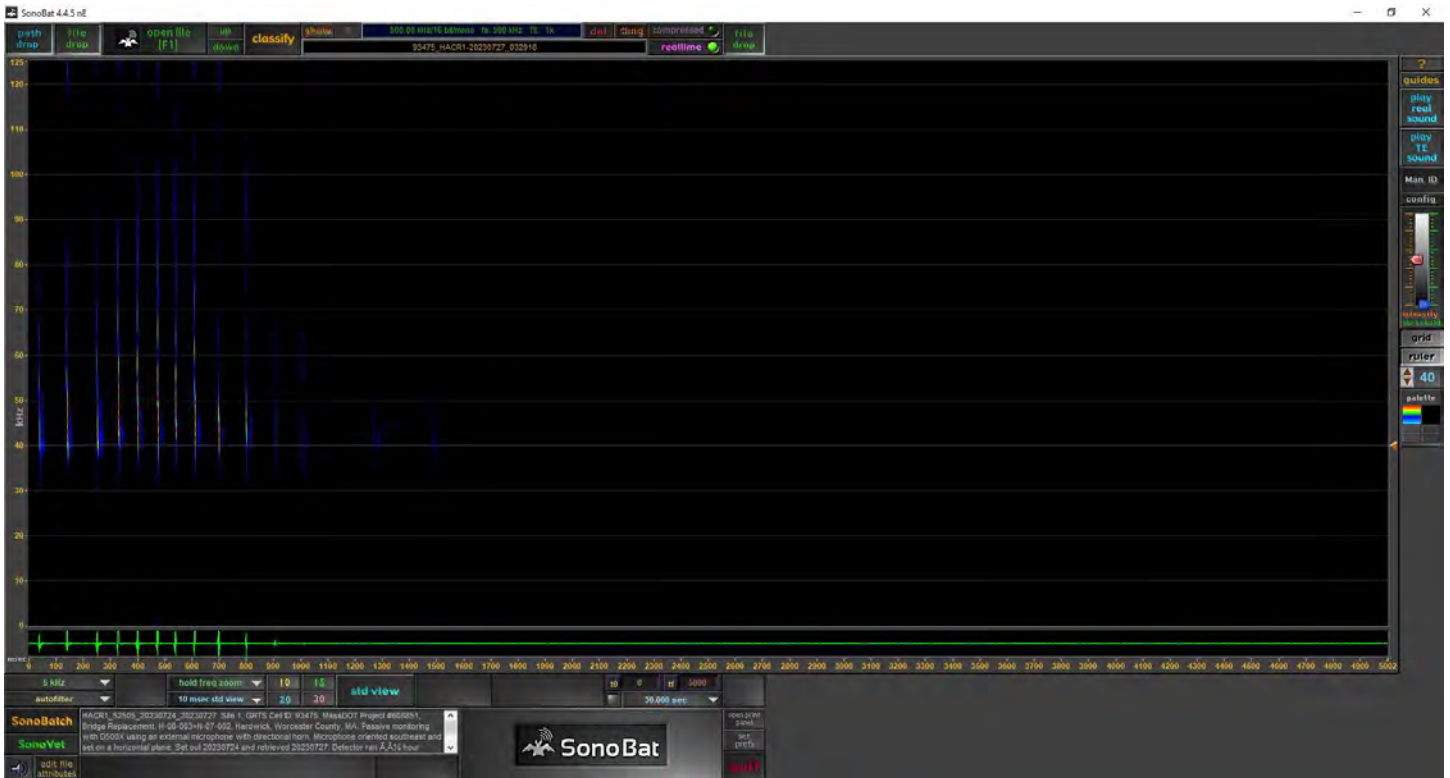


Photo 7: A northerly view of the southeastern abutment of bridge H-08-003=N-07-002.

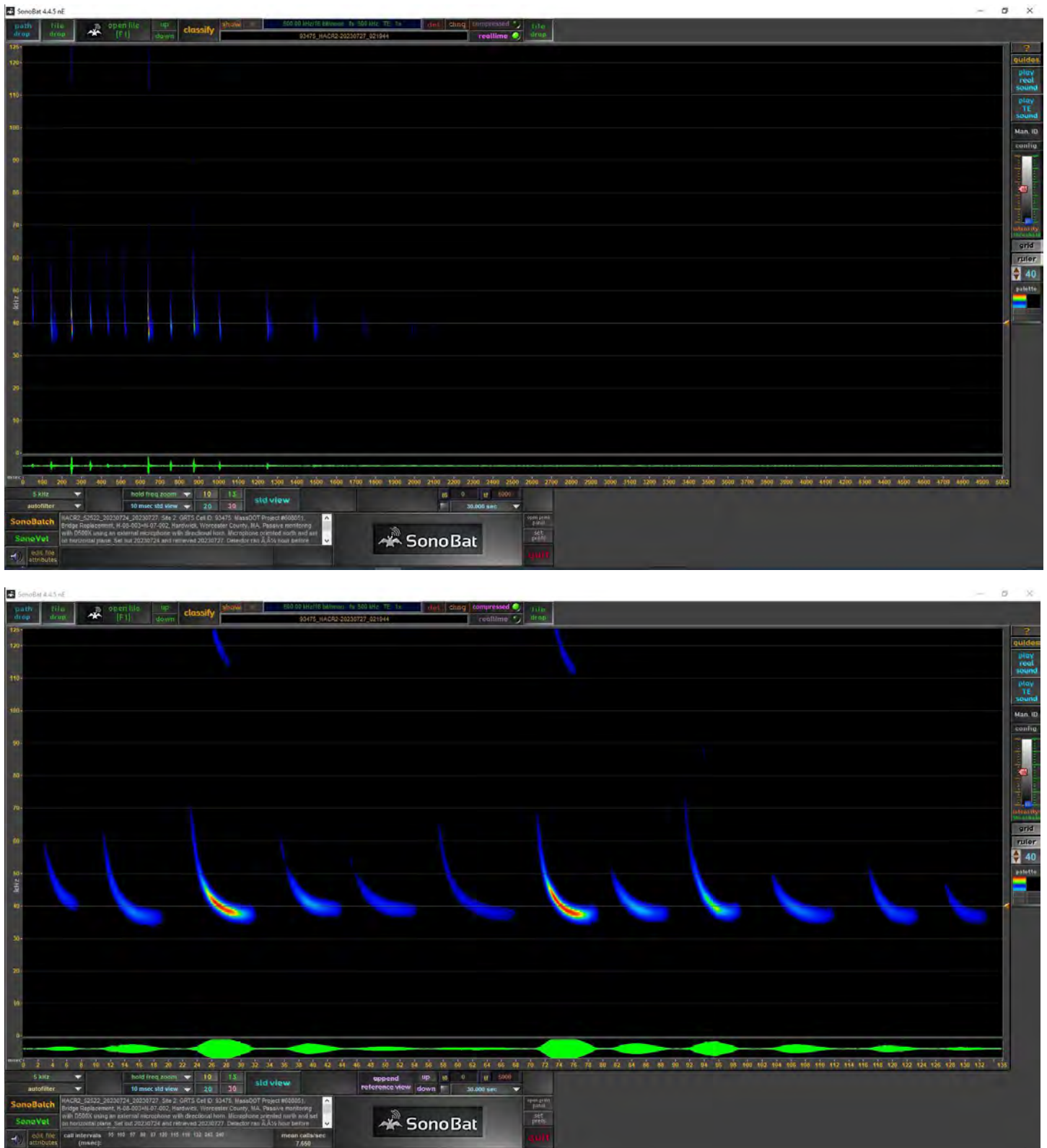
Appendix F: Representative Spectrograms



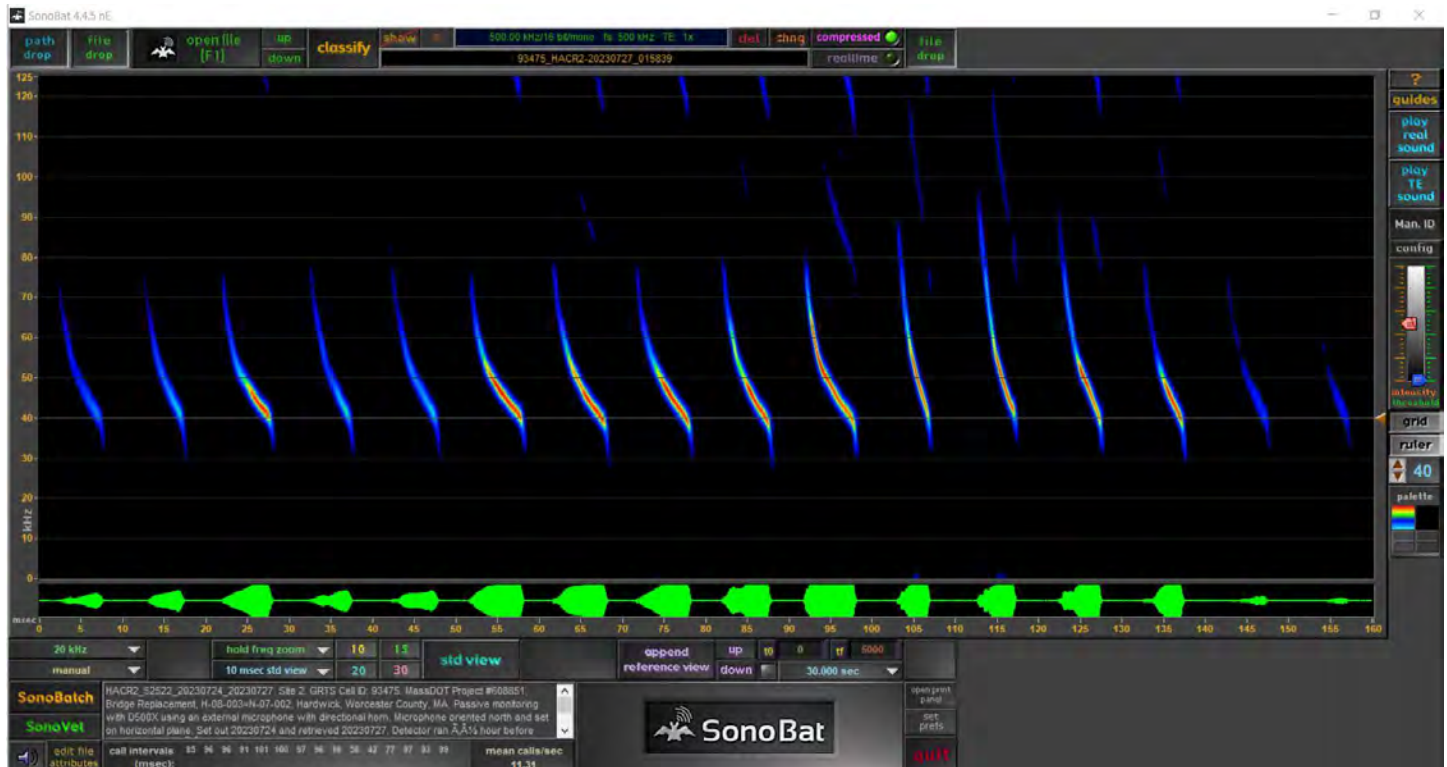
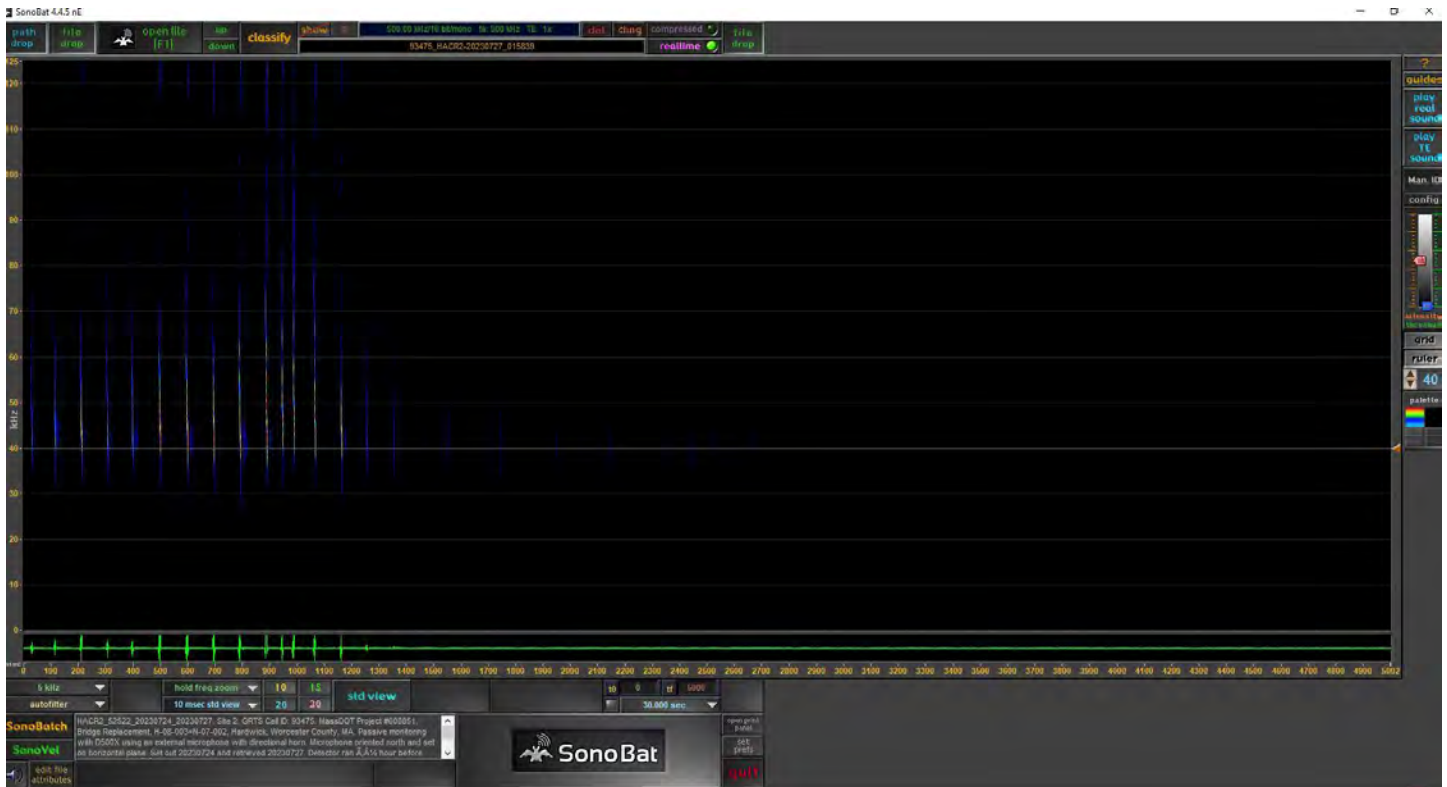
Spectrogram 1: A confirmed big brown bat (*Eptesicus fuscus*; EPFU) recorded at Site 1 on the night of July 25, 2023, as shown in full-spectrum format via Sonobat 4.4.5 in true-time format (top) and compressed format (bottom). This call shows a long search-phase sequence consistent with archetypical EPFU metrics and characteristics.



Spectrogram 2: A confirmed little brown bat (*Myotis lucifugus*; MYLU) recorded at Site 3 on the night of July 26, 2023, as shown in full-spectrum format via Sonobat 4.4.5 in true-time format (top) and compressed format (bottom). The signal is oversaturated, but it provide a good search phase that is archetypical of MYLU.



Spectrogram 3: A confirmed eastern red bat (*Lasiurus borealis*; LABO) recorded at Site 2 on the night of July 26, 2023, as shown in full-spectrum format via SonoBat 4.4.5 in true-time format (top) and compressed format (bottom). This call is archetypical for LABO open-air search phase sequence with reverse-J shaped call pulses with slightly variable Fc across sequence.



Spectrogram 4: A confirmed little brown bat (*Myotis lucifugus*; MYLU) recorded at Site 2 on the night of July 26, 2023, as shown in full-spectrum format via Sonobat 4.4.5 in true-time format (top) and compressed format (bottom). This call is archetypical for MYLU, though over-saturated, duration >6ms and low slope and HiF < 90kHz provides confident metrics for ID.

Appendix G: Event Logs

Detector 52505_20230724_20230727_Event Log
MODEL NO: TS32GCF133
FW REV: 20171204
SERIAL: 9G17975020351AE00002
LABEL: D500X
2023-07-24 13:20:38 \$\$SYSTEM START, FW VERSION: D500X V2.4.5 201211, 12:06:56, S/N: 52505, TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:18/05:35, DST=DIS, BATTERY: 5.1V, FILE: -, TOTAL FREE: 44.73G
2023-07-24 13:23:00 \$\$TIMER SLEEP ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:18/05:35, DST=DIS, BATTERY: 5.0V, FILE: -, TOTAL FREE: 44.73G
2023-07-24 14:00:00 \$\$HOUR LOG ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:18/05:35, DST=DIS, BATTERY: 5.1V, FILE: -, TOTAL FREE: 44.73G
2023-07-24 15:00:00 \$\$HOUR LOG ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:18/05:35, DST=DIS, BATTERY: 5.1V, FILE: -, TOTAL FREE: 44.73G
2023-07-24 16:00:00 \$\$HOUR LOG ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:18/05:35, DST=DIS, BATTERY: 5.1V, FILE: -, TOTAL FREE: 44.73G
2023-07-24 17:00:00 \$\$HOUR LOG ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:18/05:35, DST=DIS, BATTERY: 5.1V, FILE: -, TOTAL FREE: 44.73G
2023-07-24 18:00:00 \$\$HOUR LOG ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:18/05:35, DST=DIS, BATTERY: 5.1V, FILE: -, TOTAL FREE: 44.73G
2023-07-24 19:00:00 \$\$HOUR LOG ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:18/05:35, DST=DIS, BATTERY: 5.1V, FILE: -, TOTAL FREE: 44.73G
2023-07-24 19:37:02 \$\$TIMER WAKEUP ----- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:18/05:35, DST=DIS, BATTERY: 5.0V, FILE: -, TOTAL FREE: 44.73G
2023-07-24 20:00:02 \$\$HOUR LOG ----- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:18/05:35, DST=DIS, BATTERY: 5.0V, FILE: -, TOTAL FREE: 44.73G
2023-07-24 21:00:04 \$\$HOUR LOG ----- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:18/05:35, DST=DIS, BATTERY: 4.8V, FILE: M000003.WAV, TOTAL FREE: 44.72G
2023-07-24 22:00:01 \$\$HOUR LOG ----- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:18/05:35, DST=DIS, BATTERY: 4.8V, FILE: M000015.WAV, TOTAL FREE: 44.66G
2023-07-24 23:00:05 \$\$HOUR LOG ----- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:18/05:35, DST=DIS, BATTERY: 4.8V, FILE: M000020.WAV, TOTAL FREE: 44.64G
2023-07-25 00:00:03 \$\$HOUR LOG ----- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:18/05:35, DST=DIS, BATTERY: 4.8V, FILE: M000022.WAV, TOTAL FREE: 44.63G
2023-07-25 01:00:00 \$\$HOUR LOG ----- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:18/05:35, DST=DIS, BATTERY: 4.8V, FILE: M000022.WAV, TOTAL FREE: 44.63G
2023-07-25 02:00:03 \$\$HOUR LOG ----- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:18/05:35, DST=DIS, BATTERY: 4.7V, FILE: M000022.WAV, TOTAL FREE: 44.63G
2023-07-25 03:00:00 \$\$HOUR LOG ----- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:18/05:35, DST=DIS, BATTERY: 4.7V, FILE: M000023.WAV, TOTAL FREE: 44.62G
2023-07-25 04:00:03 \$\$HOUR LOG ----- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:18/05:35, DST=DIS, BATTERY: 4.7V, FILE: M000025.WAV, TOTAL FREE: 44.61G
2023-07-25 05:00:00 \$\$HOUR LOG ----- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:18/05:35, DST=DIS, BATTERY: 4.7V, FILE: M000029.WAV, TOTAL FREE: 44.60G
2023-07-25 06:00:00 \$\$HOUR LOG ----- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:18/05:35, DST=DIS, BATTERY: 4.7V, FILE: M000035.WAV, TOTAL FREE: 44.57G
2023-07-25 06:04:30 \$\$TIMER SLEEP ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:18/05:35, DST=DIS, BATTERY: 4.7V, FILE: M000035.WAV, TOTAL FREE: 44.57G

[illegible]

[illegible]

2023-07-27 06:00:00 \$\$HOUR LOG ----- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:16/05:36, DST=DIS, BATTERY: 4.5V, FILE: M000110.WAV, TOTAL FREE: 44.21G
2023-07-27 06:04:30 \$\$TIMER SLEEP ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:16/05:36, DST=DIS, BATTERY: 4.5V, FILE: M000110.WAV, TOTAL FREE: 44.21G
2023-07-27 07:00:00 \$\$HOUR LOG ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:16/05:36, DST=DIS, BATTERY: 4.5V, FILE: M000110.WAV, TOTAL FREE: 44.21G
2023-07-27 08:00:00 \$\$HOUR LOG ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:16/05:36, DST=DIS, BATTERY: 4.6V, FILE: M000110.WAV, TOTAL FREE: 44.21G
2023-07-27 09:00:00 \$\$HOUR LOG ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:16/05:36, DST=DIS, BATTERY: 4.6V, FILE: M000110.WAV, TOTAL FREE: 44.21G
2023-07-27 10:00:00 \$\$HOUR LOG ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:16/05:36, DST=DIS, BATTERY: 4.6V, FILE: M000110.WAV, TOTAL FREE: 44.21G
2023-07-27 11:00:00 \$\$HOUR LOG ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:16/05:36, DST=DIS, BATTERY: 4.6V, FILE: M000110.WAV, TOTAL FREE: 44.21G
2023-07-27 12:00:00 \$\$HOUR LOG ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:16/05:36, DST=DIS, BATTERY: 4.6V, FILE: M000110.WAV, TOTAL FREE: 44.21G
2023-07-27 13:00:00 \$\$HOUR LOG ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:16/05:36, DST=DIS, BATTERY: 4.6V, FILE: M000110.WAV, TOTAL FREE: 44.21G
2023-07-27 14:00:00 \$\$HOUR LOG ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:16/05:36, DST=DIS, BATTERY: 4.7V, FILE: M000110.WAV, TOTAL FREE: 44.21G
2023-07-27 14:44:36 \$\$KEYBOARD WAKEUP --- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:16/05:36, DST=DIS, BATTERY: 4.7V, FILE: M000110.WAV, TOTAL FREE: 44.21G
2023-07-27 14:47:30 \$\$KEYBOARD SLEEP ---- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 20:16/05:36, DST=DIS, BATTERY: 4.6V, FILE: M000110.WAV, TOTAL FREE: 44.21G

Detector 52522_20230724_20230727_Event Log
MODEL NO: TS32GCF133
FW REV: 20171204
SERIAL: 9G17976020351AC60077
LABEL: D500X
2023-07-24 14:09:13 \$\$SYSTEM START, FW VERSION: D500X V2.4.5 201211, 12:06:56, S/N: 52522, TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 5.1V, FILE: -, TOTAL FREE: 59.63G
2023-07-24 14:19:30 \$\$TIMER SLEEP ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 5.0V, FILE: -, TOTAL FREE: 59.63G
2023-07-24 15:00:00 \$\$HOUR LOG ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 5.0V, FILE: -, TOTAL FREE: 59.63G
2023-07-24 16:00:00 \$\$HOUR LOG ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 5.0V, FILE: -, TOTAL FREE: 59.63G
2023-07-24 17:00:00 \$\$HOUR LOG ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 5.0V, FILE: -, TOTAL FREE: 59.63G
2023-07-24 18:00:00 \$\$HOUR LOG ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 5.0V, FILE: -, TOTAL FREE: 59.63G
2023-07-24 19:00:00 \$\$HOUR LOG ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 5.0V, FILE: -, TOTAL FREE: 59.63G
2023-07-24 19:37:02 \$\$TIMER WAKEUP ----- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 5.0V, FILE: -, TOTAL FREE: 59.63G
2023-07-24 20:00:02 \$\$HOUR LOG ----- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 4.9V, FILE: M000005.WAV, TOTAL FREE: 59.60G
2023-07-24 21:00:04 \$\$HOUR LOG ----- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 4.8V, FILE: M000019.WAV, TOTAL FREE: 59.54G
2023-07-24 22:00:13 \$\$HOUR LOG ----- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 4.8V, FILE: M000048.WAV, TOTAL FREE: 59.40G
2023-07-24 23:00:01 \$\$HOUR LOG ----- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 4.8V, FILE: M000071.WAV, TOTAL FREE: 59.29G
2023-07-25 00:00:01 \$\$HOUR LOG ----- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 4.7V, FILE: M000089.WAV, TOTAL FREE: 59.20G
2023-07-25 01:00:02 \$\$HOUR LOG ----- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 4.7V, FILE: M000101.WAV, TOTAL FREE: 59.15G
2023-07-25 02:00:00 \$\$HOUR LOG ----- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 4.7V, FILE: M000106.WAV, TOTAL FREE: 59.12G
2023-07-25 03:00:01 \$\$HOUR LOG ----- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 4.7V, FILE: M000113.WAV, TOTAL FREE: 59.09G
2023-07-25 04:00:03 \$\$HOUR LOG ----- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 4.7V, FILE: M000121.WAV, TOTAL FREE: 59.05G
2023-07-25 05:00:04 \$\$HOUR LOG ----- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 4.7V, FILE: M000160.WAV, TOTAL FREE: 58.87G
2023-07-25 06:00:02 \$\$HOUR LOG ----- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 4.7V, FILE: M000170.WAV, TOTAL FREE: 58.82G
2023-07-25 06:04:30 \$\$TIMER SLEEP ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 4.7V, FILE: M000170.WAV, TOTAL FREE: 58.82G
2023-07-25 07:00:00 \$\$HOUR LOG ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 4.7V, FILE: M000170.WAV, TOTAL FREE: 58.82G

[illegible]

[illegible]

2023-07-27 06:04:30 \$\$TIMER SLEEP ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 4.4V, FILE: M000856.WAV, TOTAL FREE: 55.55G
2023-07-27 07:00:00 \$\$HOUR LOG ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 4.4V, FILE: M000856.WAV, TOTAL FREE: 55.55G
2023-07-27 08:00:00 \$\$HOUR LOG ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 4.4V, FILE: M000856.WAV, TOTAL FREE: 55.55G
2023-07-27 09:00:00 \$\$HOUR LOG ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 4.4V, FILE: M000856.WAV, TOTAL FREE: 55.55G
2023-07-27 10:00:00 \$\$HOUR LOG ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 4.5V, FILE: M000856.WAV, TOTAL FREE: 55.55G
2023-07-27 11:00:00 \$\$HOUR LOG ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 4.5V, FILE: M000856.WAV, TOTAL FREE: 55.55G
2023-07-27 12:00:00 \$\$HOUR LOG ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 4.5V, FILE: M000856.WAV, TOTAL FREE: 55.55G
2023-07-27 13:00:00 \$\$HOUR LOG ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 4.5V, FILE: M000856.WAV, TOTAL FREE: 55.55G
2023-07-27 14:00:00 \$\$HOUR LOG ----- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 4.5V, FILE: M000856.WAV, TOTAL FREE: 55.55G
2023-07-27 14:55:30 \$\$KEYBOARD WAKEUP --- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 4.6V, FILE: M000856.WAV, TOTAL FREE: 55.55G
2023-07-27 14:59:11 \$\$KEYBOARD SLEEP ---- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:-- , SET/RISE 14:10/02:03, DST=DIS, BATTERY: 4.5V, FILE: M000856.WAV, TOTAL FREE: 55.55G

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DOCUMENT A00844

U.S. FISH AND WILDLIFE SERVICE

NLAA CONCURRENCE VERIFICATION LETTER

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104



In Reply Refer To:

October 19, 2023

Project code: 2024-0005976

Project Name: 608851-HARDWICK- NEW BRAINTREE- BRIDGE REPLACEMENT,
CREAMERY ROAD OVER WARE RIVER

Subject: Concurrence verification letter for the '608851-HARDWICK- NEW BRAINTREE- BRIDGE REPLACEMENT, CREAMERY ROAD OVER WARE RIVER' project under the amended February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion (dated March 23, 2023) for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat (NLEB).

To whom it may concern:

The U.S. Fish and Wildlife Service (Service) has received your request dated October 19, 2023 to verify that the **608851-HARDWICK- NEW BRAINTREE- BRIDGE REPLACEMENT, CREAMERY ROAD OVER WARE RIVER** (Proposed Action) may rely on the concurrence provided in the amended February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion (dated March 23, 2023) for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat (PBO) to satisfy requirements under Section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 *et seq.*).

Based on the information you provided (Project Description shown below), you have determined that the Proposed Action is within the scope and adheres to the criteria of the PBO, including the adoption of applicable avoidance and minimization measures. **At least one of the qualification interview questions indicated an activity or portion of your project is consistent with a not likely to adversely affect determination therefore, the overall determination for your project is, may affect, and is not likely to adversely affect (NLAA) the endangered Indiana bat (*Myotis sodalis*) and/or the endangered northern long-eared bat (*Myotis septentrionalis*).** Consultation with the Service pursuant to section 7(a)(2) of ESA (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) is required.

The Service has 14 calendar days to notify the lead Federal action agency or designated non-federal representative if we determine that the Proposed Action does not meet the criteria for a NLAA determination under the PBO. If we do not notify the lead Federal action agency or designated non-federal representative within that timeframe, you may proceed with the Proposed

Action under the terms of the NLAA concurrence provided in the PBO. This verification period allows Service Field Offices to apply local knowledge to implementation of the PBO, as we may identify a small subset of actions having impacts that were unanticipated. In such instances, Service Field Offices may request additional information that is necessary to verify inclusion of the proposed action under the PBO.

For Proposed Actions that include bridge/culvert or structure removal, replacement, and/or maintenance activities: If your initial bridge/culvert or structure assessment documented signs of bat use or occupancy, or an assessment failed to detect Indiana bats and/or NLEBs, yet are later detected prior to, or during construction, please submit the Post Assessment Discovery of Bats at Bridge/Culvert or Structure Form (User Guide Appendix E) to this Service Office within 2 working days of any potential take. In these instances, potential incidental take of Indiana bats and/or NLEBs is covered under the Incidental Take Statement in the 2018 FHWA, FRA, FTA PBO (provided that the take is reported to the Service).

If the Proposed Action is modified, or new information reveals that it may affect the Indiana bat and/or northern long-eared bat in a manner or to an extent not considered in the PBO, further review to conclude the requirements of ESA Section 7(a)(2) may be required.

For Proposed Actions that include bridge/culvert or structure removal, replacement, and/or maintenance activities:

If your initial bridge/culvert or structure assessments failed to detect Indiana bats and/or NLEB use or occupancy, yet bats are later detected prior to, or during construction, please submit the Post Assessment Discovery of Bats at Bridge/Culvert or Structure Form (User Guide Appendix E) to this Service Office within 2 working days of the incident. In these instances, potential incidental take of Indiana bats and/or NLEBs may be exempted provided that the take is reported to the Service.

If the Proposed Action may affect any other federally-listed or proposed species, and/or any designated critical habitat, additional consultation between the lead Federal action agency and this Service Office is required. If the proposed action has the potential to take bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act may also be required. In either of these circumstances, please contact this Service Office.

The following species may occur in your project area and **are not** covered by this determination:

- Monarch Butterfly *Danaus plexippus* Candidate

PROJECT DESCRIPTION

The following project name and description was collected in IPaC as part of the endangered species review process.

NAME

608851-HARDWICK- NEW BRAINTREE- BRIDGE REPLACEMENT, CREAMERY ROAD OVER WARE RIVER

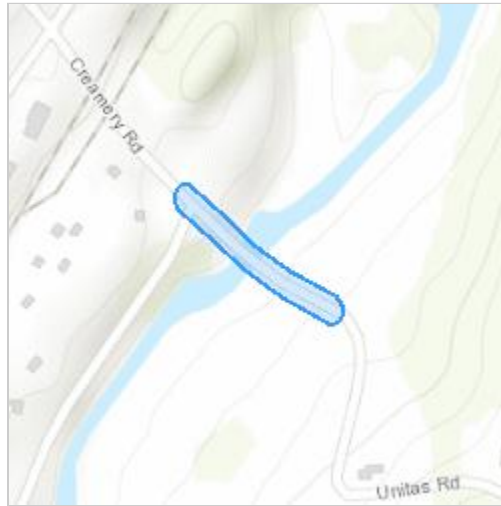
DESCRIPTION

608851 - HARDWICK- NEW BRAINTREE- BRIDGE REPLACEMENT,
H-08-003=N-07-002, CREAMERY ROAD OVER WARE RIVER

This proposed bridge project consists of a 100' long single span bridge. The bridge will increase the total curb-to-curb width to 14' and an architecturally styled concrete bridge railing system will be located along both sides of the bridge with a steel highway guard railing located on both sides of both approaches. The roadway will be raised approximately 2' to provide for hydraulic clearances which will require approximately 200' of roadway improvements along both sides of the bridge. No pedestrian or bicycle accommodation improvements will be provided.

Monarch Butterfly: Candidate Species only, no conservation measures at this time.

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@42.320916800000006,-72.17466386141098,14z>



DETERMINATION KEY RESULT

Based on your answers provided, this project(s) may affect, but is not likely to adversely affect the endangered Indiana bat and/or the endangered northern long-eared bat, therefore, consultation with the U.S. Fish and Wildlife Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended 16 U.S.C. 1531 *et seq.*) is required. However, also based on your answers provided, this project may rely on the concurrence provided in the amended February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion (dated March 23, 2023) for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat.

QUALIFICATION INTERVIEW

1. Is the project within the range of the Indiana bat^[1]?

[1] See [Indiana bat species profile](#)

Automatically answered

No

2. Is the project within the range of the northern long-eared bat^[1]?

[1] See [northern long-eared bat species profile](#)

Automatically answered

Yes

3. Which Federal Agency is the lead for the action?

A) *Federal Highway Administration (FHWA)*

4. Are *all* project activities limited to non-construction^[1] activities only? (examples of non-construction activities include: bridge/abandoned structure assessments, surveys, planning and technical studies, property inspections, and property sales)

[1] Construction refers to activities involving ground disturbance, percussive noise, and/or lighting.

No

5. Does the project include *any* activities that are **greater than** 300 feet from existing road/rail surfaces^[1]?

[1] Road surface is defined as the actively used [e.g. motorized vehicles] driving surface and shoulders [may be pavement, gravel, etc.] and rail surface is defined as the edge of the actively used rail ballast.

No

6. Does the project include *any* activities **within** 0.5 miles of a known Indiana bat and/or NLEB hibernaculum^[1]?

[1] For the purpose of this consultation, a hibernaculum is a site, most often a cave or mine, where bats hibernate during the winter (see suitable habitat), but could also include bridges and structures if bats are found to be hibernating there during the winter.

No

7. Is the project located **within** a karst area?

No

8. Is there *any* suitable^[1] summer habitat for Indiana Bat or NLEB **within** the project action area^[2]? (includes any trees suitable for maternity, roosting, foraging, or travelling habitat)

[1] See the Service's [summer survey guidance](#) for our current definitions of suitable habitat.

[2] The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR Section 402.02). Further clarification is provided by the [User's Guide for the Range-wide Programmatic Consultation for Indiana Bat and Northern Long-eared Bat](#).

Yes

9. Will the project remove *any* suitable summer habitat^[1] and/or remove/trim any existing trees **within** suitable summer habitat?

[1] See the Service's [summer survey guidance](#) for our current definitions of suitable habitat.

Yes

10. Will the project clear more than 20 acres of suitable habitat per 5-mile section of road/rail?

No

11. Have presence/probable absence (P/A) summer surveys^{[1][2]} been conducted^{[3][4]} **within** the suitable habitat located within your project action area?

[1] See the Service's [summer survey guidance](#) for our current definitions of suitable habitat.

[2] Presence/probable absence summer surveys conducted within the fall swarming/spring emergence home range of a documented Indiana bat hibernaculum (contact local Service Field Office for appropriate distance from hibernacula) that result in a negative finding requires additional consultation with the local Service Field Office to determine if clearing of forested habitat is appropriate and/or if seasonal clearing restrictions are needed to avoid and minimize potential adverse effects on fall swarming and spring emerging Indiana bats.

[3] For projects within the range of either the Indiana bat or NLEB in which suitable habitat is present, and no bat surveys have been conducted, the transportation agency will assume presence of the appropriate species. This assumption of presence should be based upon the presence of suitable habitat and the capability of bats to occupy it because of their mobility.

[4] Negative presence/probable absence survey results obtained using the [summer survey guidance](#) are valid for a minimum of two years from the completion of the survey unless new information (e.g., other nearby surveys) suggest otherwise.

Yes

SUBMITTED DOCUMENTS

- *Acoustic_Bridge Report_608851_Final_Binder_reduced.pdf* <https://ipac.ecosphere.fws.gov/project/KIUZUQPBKZHHDNKUT6PFRVCIXQ/projectDocuments/133414559>

12. Did the presence/probable absence (P/A) summer surveys detect Indiana bats and/or NLEB^[1]?

[1] P/A summer surveys conducted within the fall swarming/spring emergence home range of a documented Indiana bat hibernaculum (contact local Service Field Office for appropriate home range) that result in a negative finding requires additional consultation with the local Service Field Office to determine if clearing of forested habitat is appropriate and/or if seasonal clearing restrictions are needed to avoid and minimize potential adverse effects on fall swarming and spring emerging Indiana bats.

No

13. Were the P/A summer surveys conducted **within** the fall swarming/spring emergence range of a documented Indiana bat hibernaculum^[1]?

[1] Contact the local Service Field Office for appropriate distance from hibernacula.

No

14. Does the project include activities **within documented NLEB habitat**^{[1][2]}?

[1] Documented roosting or foraging habitat – for the purposes of this consultation, we are considering documented habitat as that where Indiana bats and/or NLEB have actually been captured and tracked using (1) radio telemetry to roosts; (2) radio telemetry biangulation/triangulation to estimate foraging areas; or (3) foraging areas with repeated use documented using acoustics. Documented roosting habitat is also considered as suitable summer habitat within 0.25 miles of documented roosts.)

[2] For the purposes of this key, we are considering documented corridors as that where Indiana bats and/or NLEB have actually been captured and tracked to using (1) radio telemetry; or (2) treed corridors located directly between documented roosting and foraging habitat.

No

15. Will the removal or trimming of habitat or trees occur **within** suitable but **undocumented NLEB** roosting/foraging habitat or travel corridors?

Yes

16. What time of year will the removal or trimming of habitat or trees **within** suitable but **undocumented NLEB** roosting/foraging habitat or travel corridors occur?

C) During both the active and inactive seasons

17. Will *any* tree trimming or removal occur **within** 100 feet of existing road/rail surfaces?

Yes

18. Will *any* tree trimming or removal occur **between** 100-300 feet of existing road/rail surfaces?

No

19. Are *all* trees that are being removed clearly demarcated?

Yes

20. Will the removal of habitat or the removal/trimming of trees involve the use of **temporary** lighting?

Yes

21. Will the removal of habitat or the removal/trimming of trees include installing new or replacing existing **permanent** lighting?

No

22. Does the project include wetland or stream protection activities associated with compensatory wetland mitigation?

Yes

23. Does the project include slash pile burning?

No

24. Does the project include *any* bridge removal, replacement, and/or maintenance activities (e.g., any bridge repair, retrofit, maintenance, and/or rehabilitation work)?

Yes

25. Is there *any* suitable habitat^[1] for Indiana bat or NLEB **within** 1,000 feet of the bridge? (includes any trees suitable for maternity, roosting, foraging, or travelling habitat)

[1] See the Service's current [summer survey guidance](#) for our current definitions of suitable habitat.

Yes

26. Has a bridge assessment^[1] been conducted **within** the last 24 months^[2] to determine if the bridge is being used by bats?

[1] See [User Guide Appendix D](#) for bridge/structure assessment guidance

[2] Assessments must be completed no more than 2 years prior to conducting any work below the deck surface on all bridges that meet the physical characteristics described in the Programmatic Consultation, regardless of whether assessments have been conducted in the past. Due to the transitory nature of bat use, a negative result in one year does not guarantee that bats will not use that bridge/structure in subsequent years.

Yes

SUBMITTED DOCUMENTS

- *Acoustic_Bridge Report_608851_Final_Binder_reduced.pdf* <https://ipac.ecosphere.fws.gov/project/KIUZUQPBKZHHDNKUT6PFRVCIXQ/projectDocuments/133414559>

27. Did the bridge assessment detect *any* signs of Indiana bats and/or NLEBs roosting in/under the bridge (bats, guano, etc.)^[1]?

[1] If bridge assessment detects signs of *any* species of bats, coordination with the local FWS office is needed to identify potential threatened or endangered bat species. Additional studies may be undertaken to try to identify which bat species may be utilizing the bridge prior to allowing *any* work to proceed.

Note: There is a small chance bridge assessments for bat occupancy do not detect bats. Should a small number of bats be observed roosting on a bridge just prior to or during construction, such that take is likely to occur or does occur in the form of harassment, injury or death, the PBO requires the action agency to report the take. Report all unanticipated take within 2 working days of the incident to the USFWS. Construction activities may continue without delay provided the take is reported to the USFWS and is limited to 5 bats per project.

No

28. Will the bridge removal, replacement, and/or maintenance activities include installing new or replacing existing **permanent** lighting?

No

29. Does the project include the removal, replacement, and/or maintenance of *any* structure other than a bridge? (e.g., rest areas, offices, sheds, outbuildings, barns, parking garages, etc.)

No

30. Will the project involve the use of *any* **temporary** lighting in addition to the lighting already indicated for habitat removal (including the removal or trimming of trees), or bridge/structure removal, replacement or maintenance activities?

Yes

31. Is there *any* suitable habitat **within** 1,000 feet of the location(s) where **temporary** lighting (other than the lighting already indicated for habitat removal (including the removal or trimming of trees) or bridge/structure removal, replacement or maintenance activities) will be used?

Yes

32. Will the project install new or replace existing **permanent** lighting?

No

33. Does the project include percussives or other activities (**not including tree removal/trimming or bridge/structure work**) that will increase noise levels above existing traffic/background levels?

Yes

34. Will the activities that use percussives (**not including tree removal/trimming or bridge/structure work**) and/or increase noise levels above existing traffic/background levels be conducted *during* the active season^[1]?

[1] Coordinate with the local Service Field Office for appropriate dates.

Yes

35. Will *any* activities that use percussives (**not including tree removal/trimming or bridge/structure work**) and/or increase noise levels above existing traffic/background levels be conducted *during* the inactive season^[1]?

[1] Coordinate with the local Service Field Office for appropriate dates.

Yes

36. Are *all* project activities that are **not associated with** habitat removal, tree removal/trimming, bridge and/or structure activities, temporary or permanent lighting, or use of percussives, limited to actions that DO NOT cause any additional stressors to the bat species?

Examples: lining roadways, unlighted signage, rail road crossing signals, signal lighting, and minor road repair such as asphalt fill of potholes, etc.

Yes

37. Will the project raise the road profile **above the tree canopy**?

No

38. Are the wetland or stream protection activities associated with compensatory wetland/stream mitigation portion of this project consistent with a Not Likely to Adversely Affect determination in this key?

Automatically answered

Yes, because your activities associated with compensatory wetland/stream mitigation activities do not clear suitable summer habitat and are not within 0.5 miles of Indiana bat or NLEB hibernaculum.

39. Are the project activities that use percussives (not including tree removal/trimming or bridge/structure work) consistent with a Not Likely to Adversely Affect determination in this key?

Automatically answered

Yes, because the activities are within 300 feet of the existing road/rail surface, greater than 0.5 miles from a hibernacula, and conducted during the active season within undocumented habitat.

40. Are the project activities that use percussives (not including tree removal/trimming or bridge/structure work) and/or increase noise levels above existing traffic/background levels consistent with a No Effect determination in this key?

Automatically answered

Yes, because the activities are within 300 feet of the existing road/rail surface, greater than 0.5 miles from a hibernacula, and conducted during the inactive season

41. Is the location of this project consistent with a Not Likely to Adversely Affect determination in this key?

Automatically answered

Yes, because no bats were detected during presence/probable absence surveys conducted during the summer survey season and outside of the fall swarming/spring emergence periods. Additionally, all activities were at least 0.5 miles from any hibernaculum.

42. Is the bridge removal, replacement, or maintenance activities portion of this project consistent with a No Effect determination in this key?

Automatically answered

Yes, because the bridge has been assessed using the criteria documented in the BA and no signs of bats were detected

43. **General AMM 1**

Will the project ensure *all* operators, employees, and contractors working in areas of known or presumed bat habitat are aware of *all* FHWA/FRA/FTA (Transportation Agencies) environmental commitments, including all applicable Avoidance and Minimization Measures?

Yes

PROJECT QUESTIONNAIRE

1. Have you made a No Effect determination for *all* other species indicated on the FWS IPaC generated species list?

N/A

2. Have you made a May Affect determination for *any* other species on the FWS IPaC generated species list?

N/A

3. How many acres^[1] of trees are proposed for removal between 0-100 feet of the existing road/rail surface?

[1] If described as number of trees, multiply by 0.09 to convert to acreage and enter that number.

1

4. Please describe the proposed bridge work:

This proposed bridge project consists of a 100' long single span bridge. The bridge will increase the total curb-to-curb width to 14' and an architecturally styled concrete bridge railing system will be located along both sides of the bridge with a steel highway guard railing located on both sides of both approaches. The roadway will be raised approximately 2' to provide for hydraulic clearances which will require approximately 200' of roadway improvements along both sides of the bridge. No pedestrian or bicycle accommodation improvements will be provided.

5. Please state the timing of all proposed bridge work:

March 2025 - October 2026

6. Please enter the date of the bridge assessment:

8/3/2023

AVOIDANCE AND MINIMIZATION MEASURES (AMMS)

This determination key result includes the commitment to implement the following Avoidance and Minimization Measures (AMMs):

GENERAL AMM 1

Ensure all operators, employees, and contractors working in areas of known or presumed bat habitat are aware of all FHWA/FRA/FTA (Transportation Agencies) environmental commitments, including all applicable AMMs.

DETERMINATION KEY DESCRIPTION: FHWA, FRA, FTA PROGRAMMATIC CONSULTATION FOR TRANSPORTATION PROJECTS AFFECTING NLEB OR INDIANA BAT

This key was last updated in IPaC on October 10, 2023. Keys are subject to periodic revision.

This decision key is intended for projects/activities funded or authorized by the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), and/or Federal Transit Administration (FTA), which may require consultation with the U.S. Fish and Wildlife Service (Service) under Section 7 of the Endangered Species Act (ESA) for the endangered **Indiana bat** (*Myotis sodalis*) and the endangered **northern long-eared bat** (NLEB) (*Myotis septentrionalis*).

This decision key should only be used to verify project applicability with the Service's [amended February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion \(dated March 23, 2023\) for Transportation Projects](#). The programmatic biological opinion covers limited transportation activities that may affect either bat species, and addresses situations that are both likely and not likely to adversely affect either bat species. This decision key will assist in identifying the effect of a specific project/activity and applicability of the programmatic consultation. The programmatic biological opinion is not intended to cover all types of transportation actions. Activities outside the scope of the programmatic biological opinion, or that may affect ESA-listed species other than the Indiana bat or NLEB, or any designated critical habitat, may require additional ESA Section 7 consultation.

IPAC USER CONTACT INFORMATION

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LEAD AGENCY CONTACT INFORMATION

Lead Agency: Federal Highway Administration

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DOCUMENT A00845

FRESHWATER MUSSEL SURVEY

NORMANDEAU ASSOCIATES

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Freshwater Mussel Survey in the Ware River for the Creamery Road Bridge Crossing, Worcester County, Massachusetts



Prepared for:
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Submitted on:
October 2023

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Table of Contents

1.0	INTRODUCTION	1
2.0	SURVEY AREA DESCRIPTION.....	3
3.0	POTENTIAL IMPACTS DUE TO CONSTRUCTION ACTIVITIES.....	4
4.0	METHODS	6
5.0	RESULTS AND DISCUSSION.....	8
5.1	Habitat	8
5.2	Mussel Community	8
6.0	CONCLUSION/SUMMARY	9
7.0	REFERENCES.....	10

Appendices

Appendix A. Survey Plan and MA NHESP Approval

Appendix B. Scientific Collectors Permit

Appendix C. Field Data Sheets

Appendix D. Photopages

List of Figures

- Figure 1. Project Location Map, Bridge over the Ware River, Hardwick-New Braintree, Worcester County, MA
- Figure 2. Proposed Survey Area, Bridge over the Ware River, Hardwick-New Braintree, Worcester County, MA
- Figure 3. Substrate and Maximum Water Depth (ft) Bridge over the Ware River, Hardwick-New Braintree, Worcester County, MA
- Figure 4. Catch Per Unit Effort (CPUE) Bridge over the Ware River, Hardwick-New Braintree, Worcester County, MA
- Figure 5. Live Mussels Collected and Species Distribution by Cell Bridge over the Ware River, Hardwick-New Braintree, Worcester County, MA

List of Tables

- Table 1. Unionid records for the Ware River in Massachusetts, September 26-28, 2023.
- Table 2. Maximum Depth, Number of Live Mussels, and Substrate Composition in the Ware River, Hardwick/New Braintree, September 26-28, 2023.
- Table 3. Summary of Mussel Species Observed in the Ware River, Hardwick/New Braintree, September 26-28, 2023.
- Table 4. Summary of Live Mussels, Species, and Relative Abundance Observed in the Ware River, Hardwick/New Braintree, September 26-28, 2023.
- Table 5. Summary of Live Mussels, Species, and CPUE per cell for the Ware River, Hardwick/New Braintree, September 26-28, 2023.

1.0 INTRODUCTION

On behalf of Massachusetts Department of Transportation (MassDOT), Normandeau Associates, Inc. (Normandeau) completed a freshwater mussel (unionid) survey in the Ware River, located in Worcester County, MA. In response to requests from the Massachusetts Division of Fish and Wildlife, mussel survey services were required as part of the permitting process for the Creamery Road bridge replacement project in Worcester County, MA (Figure 1).

The Creamery Road bridge replacement project includes the demolition of existing structures and the construction of a new bridge over the Ware River. A freshwater mussel survey was completed from September 26 to 28, 2023, to document the presence and distribution of mussel species at this location. Objectives of the survey included:

- Determining the presence or probable absence of any special status mussel species within the designated survey area.
- Determining the location of any significant mussel aggregations and distribution of species within the designated survey area; and
- Documenting existing in-stream habitat conditions.

A review of protected aquatic resources was necessary as part of the Clean Water Act Section 401, Section 404, and Massachusetts Division of Fish and Wildlife (MA NHESP) Permit authorization process. No federal listed mussel species were identified according to the U.S. Fish and Wildlife Service (USFWS) IPAC review, but several state rare and threatened species are known to occur in the Ware River including brook floater (*Alasmidonta varicosa*), triangle floater (*Alasmidonta undulata*), and creeper (*Strophitus undulatus*) (Table 1).

Table 1. Unionid Records for the Ware River in Massachusetts, 2023.

Subfamily	Scientific Name	Common Name	Federal	MA
Alasmidonta	<i>Alasmidonta undulata</i>	Triangle Floater	-	-
	<i>Alasmidonta varicosa</i>	Brook Floater	-	E
Ambleminae	<i>Elliptio complanata</i>	Eastern Elliptio	-	-
Anodontinae	<i>Utterbackiana implicata</i>	Alewife Floater	-	-
	<i>Pyganodon cataracta</i>	Eastern Floater	-	-
	<i>Strophitus undulatus</i>	Creeper	-	SOC
Lampsilinae	<i>Lampsilis cariosa</i>	Yellow Lampmussel	-	E
	<i>Lampsilis radiata</i>	Eastern Lampmussel	-	-

E= Endangered; T=Threatened; PT=Proposed Threatened; SOC=Species of Concern

¹ NHESP Correspondence 2023, MA.gov

The mussel survey was conducted following a survey plan that was reviewed and approved by the MA NHESP, included in **Appendix A**. The survey was conducted under Massachusetts License to Collect or Possess: Scientific Permit (NHESP No. 950.23) issued to Normandeau's Joseph Snavelly. Copies of these permits and approvals are included in **Appendix B**.

Normandeau's Joe Snavelly prepared the survey plan and is the author of this report. Mr. Snavelly is a Massachusetts recognized qualified surveyor by NHESP and the USFWS. He was assisted in the field by Normandeau Biologists and Scientific Divers.

2.0 SURVEY AREA DESCRIPTION

Based on the proposed construction activities, the footprint of in-stream bridge construction work (the Area of Direct Impact or ADI) was expected to span approximately 20m of the main channel, approximately 507m². In addition to the ADI, the surveyed area included an AIE, including a 100m downstream buffer (3,029m²) and a 50m (1,777m²) upstream buffer. The total length of surveyed area was approximately 170 linear meters of stream, resulting in approximately 5,313m² (Figure 2). After assessing the site, it was determined that approximately 1,150m² of area was omitted from the survey due to high densities of emergent vegetation that was characteristic of wetland habitats or swift flows (Figure 3).

Ambient weather conditions observed during the survey included cloudy to sunny skies with air temperatures that ranged from 42° Fahrenheit (F) to 65° F. Water temperature ranged from 56° to 58° F throughout the duration of the survey. Visibility throughout the survey was ideal at approximately 1.5 m (5 ft). River flow, visibility, and survey conditions remained consistent over the course of the survey with faster water velocities observed in the center portions of the channel.

3.0 POTENTIAL IMPACTS DUE TO CONSTRUCTION ACTIVITIES

Mussels are sedentary organisms that are relatively immobile. They spend most of their lives living in the sediments of streams, rivers, ponds, and lakes. Mussels feed by filtering particulate matter (e.g., algae, zooplankton, suspended sediments) from the water column. The respiratory and feeding mechanisms of mussels can expose them to a variety of stressors including siltation. Mussels typically require clean, stable substrates comprised of heterogeneous mixtures of small cobble, gravel, clays, and sand in areas of steady and moderate water flow. Substrate stability and suitability can be a major limiting factor for mussel species richness and abundance (Allen and Vaughn, 2010). Clay and sand serve as consolidating components in heterogeneous substrate. However, deep, unconsolidated silt and organic material typically do not support lotic or riverine mussel species and can even smother individuals.

Freshwater mussels require a fish host to complete their life cycle. Many species of mussels have separate sexes for adult males and females. However, some species are hermaphroditic and may self-fertilize. Once fertilized, the female adults release tiny glochidia (parasitic larvae), depending upon biotic and abiotic cues. The parasitic larvae require a specific host (typically fish) to attach to and continue development. The larvae attach to gills and/or fins of the host fish where they become blood parasites for a period before transforming into juvenile mussels. The juveniles then release from the host fish and fall into the substrate where they develop into adults.

Construction activities can result in both direct and indirect effects on mussels. In-stream construction (e.g., cofferdams) can result in changes to river conditions that influence flow and substrate conditions, which can result in stress, harm, or mortality to mussels (Watters, 2000; Strayer et al., 2004). Direct and indirect effects to mussels may alter their reproduction, growth, and survival. Direct effects may include physical injury or mortality resulting from significant changes in flow that create scour or deposition, smothering or crushing (i.e., excessive sediments, placement of structures), dewatering, or excavation and removal of mussels. Indirect effects may cause interruptions in reproductive activity, loss of fish host availability, or dislodgement of mussels into unfavorable habitat conditions.

Permanent impacts to mussels may include disturbance of the riverbed (habitat) through construction and placement of intake structures, placement of erosion and sediment control measures, and access disturbances to the riverbed to place the structures. Temporary impacts to mussels may include increased siltation during construction, spudding of temporary work platforms, and altered habitat from changes in flow regime during construction.

The ADI described herein, and the required area depicted on the survey plan mapping (**Figure 2**) represent current workspace needs for the bridge replacement project. Likely impacts to the Ware River and extant mussel populations from the construction activities are associated with dewatering, flow diversion, scour and sedimentation.

4.0 METHODS

Normandeau's survey crew established the ADI and AIE limits using the survey mapping approved by MADFW. The mussel survey focused on the discovery of live mussels. However, dead (or empty) shells encountered on the river bottom were identified, including a bank search for middens (accumulations of dead shells discarded by feeding wildlife).

The Phase 1 survey efforts were designed following the *Survey protocol for assessment of endangered freshwater mussels in the Allegheny River* (Smith et al. 2001), and the *Massachusetts Endangered Species Survey Guidelines: Freshwater Mussels* (May 2013)

The Phase 1 survey was performed using cells approximately 100m² in area (10m x 10m) encompassing 170m of the Ware River (**Figure 2**). All cells were surveyed, apart from margins characterized as wetlands and select cells located in the downstream buffer due to fast flow conditions (**Figure 3**). The survey design included surveying a total of 39 cells with tactile and visual searches, utilizing both snorkeling equipment and SCUBA. Additional time was spent in the ADI where live mussels were observed.

Search efforts were increased in areas where suitable habitat (mix of sand, silt, clay, and gravel) and live mussels were observed. Total search efforts ranged between 6-40 minutes per cell for the search area based on the observed habitat and species composition. Due to excellent visibility during the survey, surveyors were easily able to scan outside of the designated cells for evidence of any live mussels. Less time was spent in cells that had unsuitable substrate or were dewatered.

Portions of the center channel were reviewed for mussel habitat as part of the survey efforts. However, the center channel consisted of a five to eight meter-wide section where water velocities were very high. Subsequently, the available habitat observed in these areas were dominated by boulder and large cobble and were not considered suitable mussel habitat. Survey efforts focused on areas adjacent to the center channel and river bank were suitable mussel habitat and mussels were observed. No excavations or detailed Phase 2 survey methods were conducted as part of this effort.

Live mussels were collected in mesh bags for each cell, carried to the shoreline, and processed. Care was taken to minimize the amount of time mussels were out of the water. Live animals were kept in a mesh collection bag in river water until they were processed and returned to the cells where they were observed. Locations of any state-listed species that were encountered were recorded and they were returned to the approximate location from which they were observed. No mussels were tagged or marked during this survey effort.

Data recorded from the survey included time searched in each cell; substrate composition (visual percentage based on Wentworth scale); water depth (nearest foot); mussel species; size (length, height, and width to the nearest millimeter - listed species only) and sex (where applicable); age external annuli count; and other notable features. Shell material was classified as fresh dead (FD; nacre lustrous), weathered (WD; shell intact but nacre chalky), or sub-fossil (SF; shell brittle and periostracum worn). Field data sheets are provided in **Appendix C**. Photographs of the survey area and freshwater mussel species collected are provided in **Appendix D**. Relocation of mussel species was not conducted as part of this survey effort.

Recorded data were used to determine the following:

- Relative abundance per square meter.
- Catch per unit effort (CPUE; number per hour calculated as No. live mussels/sample time x 60 minutes = No. / Hour).
- Relative substrate percentage per cell.
- Mussel size, and where applicable sex identification; and
- Observed mortality, if any.

Normandeau's Joe Snavelly directed the field efforts, conducted the species identifications, and recorded data such as water depth and substrate conditions observed by the survey team. Collections were conducted under the Normandeau Scientific Collector's Permit (NHESP No. 950.23) (Joe Snavelly, Normandeau).

5.0 RESULTS AND DISCUSSION

Overall, the area within the survey area was conducive to mussel colonization and substrate and river morphology were suitable for mussels.

A total of 607 mussels representing four live species, including one state listed special concern species, were observed within a 4,160m² survey area. The dominant species observed was the eastern elliptio (*Elliptio complanata*) at 87.1%, followed by the eastern pearl shell (*Margaritifera margaritifera*) at 12.4%, triangle floater (*Alasmidonta undulata*) at 0.3%, and creeper (*Strophitus undulatus*) at only 0.2% (Table 4). Live mussels were observed in 37 of the 39 cells surveyed. Cells where no mussels were detected were characterized by swift flows, or silt and submerged aquatic vegetation dominant. No middens were observed along the shoreline of the designated survey area and no additional species were observed via shell material.

5.1 HABITAT

Overall habitat in the Ware River survey area was comprised of course to fine sediments including boulder, cobble, gravel, sand, and silt (Table 2; Figure 3). All surveyed cells along the margins provided suitable substrate for mussels in this part of the Ware River, with the exception of transition zones from fully aquatic to emergent wetlands or in areas of higher flows. The highest densities of mussels were observed along the river margins within five to ten meters of the riverbank. (Figure 4).

5.2 MUSSEL COMMUNITY

Live mussels were detected in 37 of the 39 cells surveyed (Table 3; Figures 4 and 5). CPUE ranged from 0.0 to 242.6 mussels per hour, with the highest CPUE observed in Cell 17 of the downstream buffer (Table 5, Figure 4). The average CPUE for the entire survey area was 48.9 mussels per hour (Table 5). A total of 529 eastern elliptio, 75 eastern pearl shell (found in a back water eddy directly downstream of the bridge), two triangle floaters, and one creeper were observed during the survey.

Populations of eastern elliptio appeared healthy with representation of multiple year classes (juvenile and adults) observed during the survey.

6.0 CONCLUSION/SUMMARY

The habitat observed in the survey area supports mussel populations, with concentrations primarily along the nearshore habitat areas, dominated by the common eastern elliptio (Figure 4). The following provides a list of key summary findings from the 2023 survey effort:

1. A total of 607 live mussels were observed in 37 of 39 cells.
2. Four live species were observed throughout the survey (eastern elliptio, eastern pearl shell, triangle floater, and creeper)
3. Catch per unit effort (CPUE) was variable throughout the survey, ranging from 0.0 to 242.6 mussels per hour with the highest densities observed in Cell 17 of the downstream buffer.
4. Two triangle floaters were observed in DSB 7, DSB 17 and one creeper was observed in ADI 1. A total of 75 eastern pearlshell were collected from ADI 2, ADI 4, and DSB 22.
5. No mussels were relocated during this survey effort.

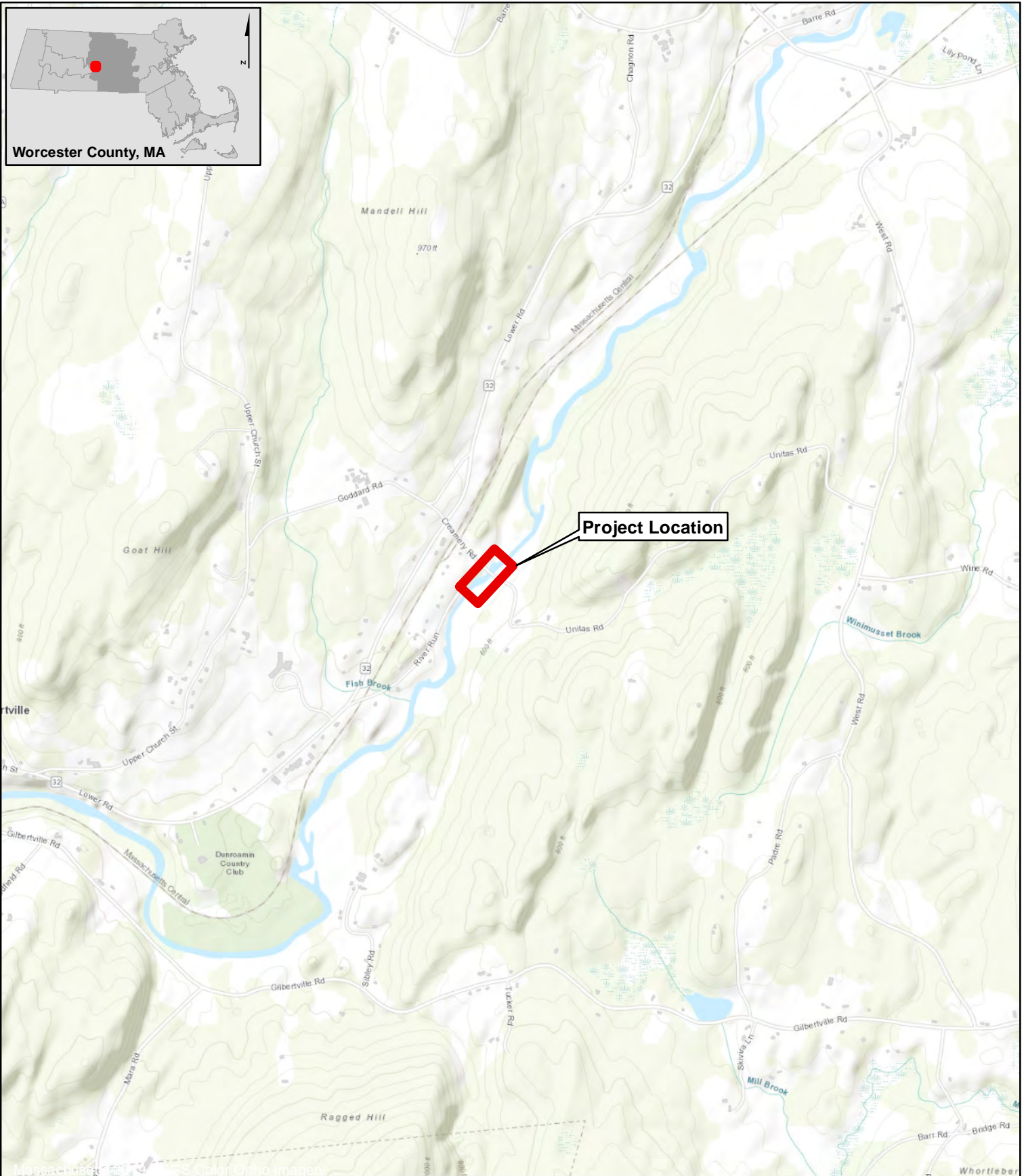
Habitat within the survey area was considered favorable for freshwater mussels. Dense aquatic vegetation growth, emergent wetland habitat, and swift velocities in the ADI were observed. These areas were not considered suitable habitat for freshwater mussels.

Best management practices should be incorporated as part of the bridge replacement process to minimize potential impacts to the surrounding mussel community to the extent practical. Methods to reduce excessive sediment and falling debris during the construction activities should also be employed to the extent practical. Overall, effects to the mussel community in the Ware River from the proposed Project activities are expected based on the observed distribution and species composition of the mussel community at this bridge location. Direct impacts to mussels are likely to occur based on their location in the ADI and buffer areas. Additional discussion regarding the effects and impacts state listed mussel species with MADFW and USFWS are warranted as part of the project design and construction planning coordination.


7.0 REFERENCES


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- <https://www.mass.gov/info-details/list-of-endangered-threatened-and-special-concern-species#mussels>. Accessed November 2023.

FIGURES



Path: C:\Projects\MassDOT_WareRiver_CreameryRd_2405\MXD\Fig1_CreameryRd_ProjectLocation.mxd

	0 0.25 0.5 1 Kilometers		0 0.125 0.25 0.5 Miles	
	Prepared for: jsnavely Prepared by: sshearn Project: 2405			

<p>Figure1. Project Location Map Bridge over the Ware River Hardwick- New Braintree Worcester County, MA</p>	
	Date: 10/17/2023



Massachusetts 2019 USGS Color Ortho Imagery



- Area of Direct Impact (ADI) - 507 sq m
- Downstream Buffer - 3,029 sq m
- Upstream Buffer - 1,777 sq m

0 10 20 40 Meters

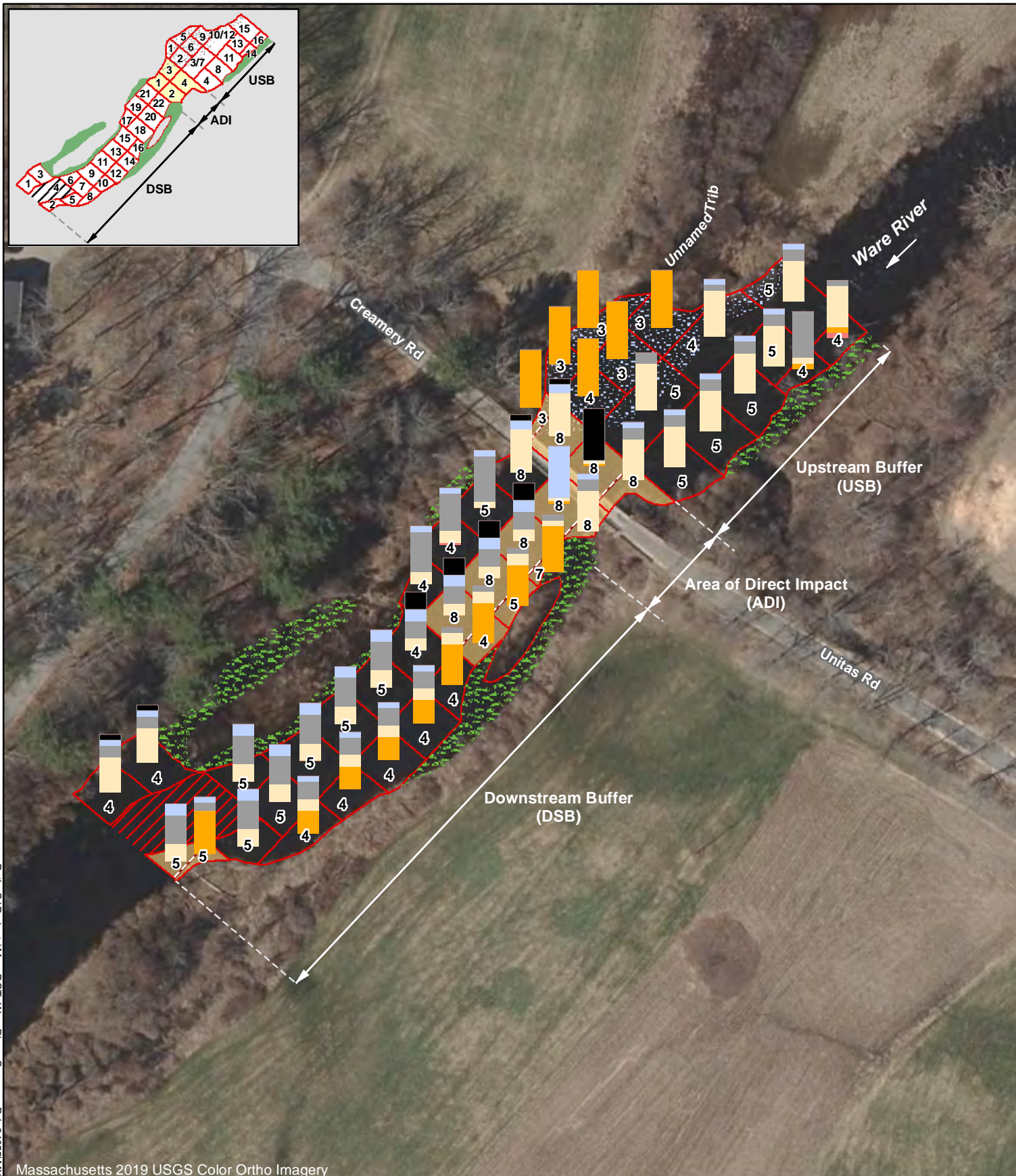
0 30 60 120 Feet

Figure 2.
Proposed Survey Area
Bridge over the Ware River
Hardwick- New Braintree
Worcester County, MA



Date:
10/18/2023

Path: C:\Projects\MassDOT_WareRiver_CreameryRd_24055MXDI\Fig2_CreameryRd_ProposedSurveyArea.mxd



Massachusetts 2019 USGS Color Ortho Imagery

- Survey Cell (multiple substrates)**
- Survey Cell**
- Not Surveyed - High Flow**
- Not Surveyed - Wetland and Dense Aquatic Vegetation**
- Large Emergent Aquatic Vegetation**

Substrate (with water depth in feet)

- Bedrock (BR)**
- Boulder (BO)**
- Cobble (CB)**
- Gravel (GR)**
- Sand (SD)**
- Silt (ST)**
- Clay (CL)**
- Other**

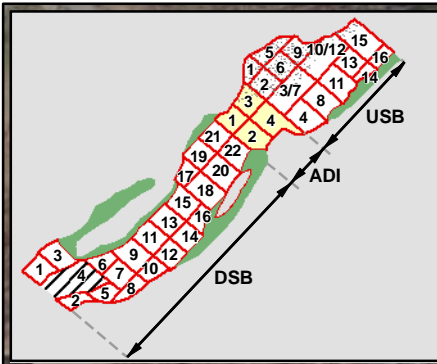
0 10 20 40 Meters

0 30 60 120 Feet

Figure 3.
Substrate and Maximum Water Depth (ft)
Bridge over the Ware River
Hardwick- New Braintree
Worcester County, MA

NORMANDEAU ASSOCIATES
ENVIRONMENTAL CONSULTANTS

Date:
10/18/2023



Massachusetts 2019 USGS Color Ortho Imagery



- Surveyed Cell
- Not Surveyed - High Flow
- Not Surveyed - Wetland and Dense Aquatic Vegetation
- Large Emergent Aquatic

0 10 20 40 Meters

**Catch Per Unit Effort (CPUE)
(No. Live/Hour)**

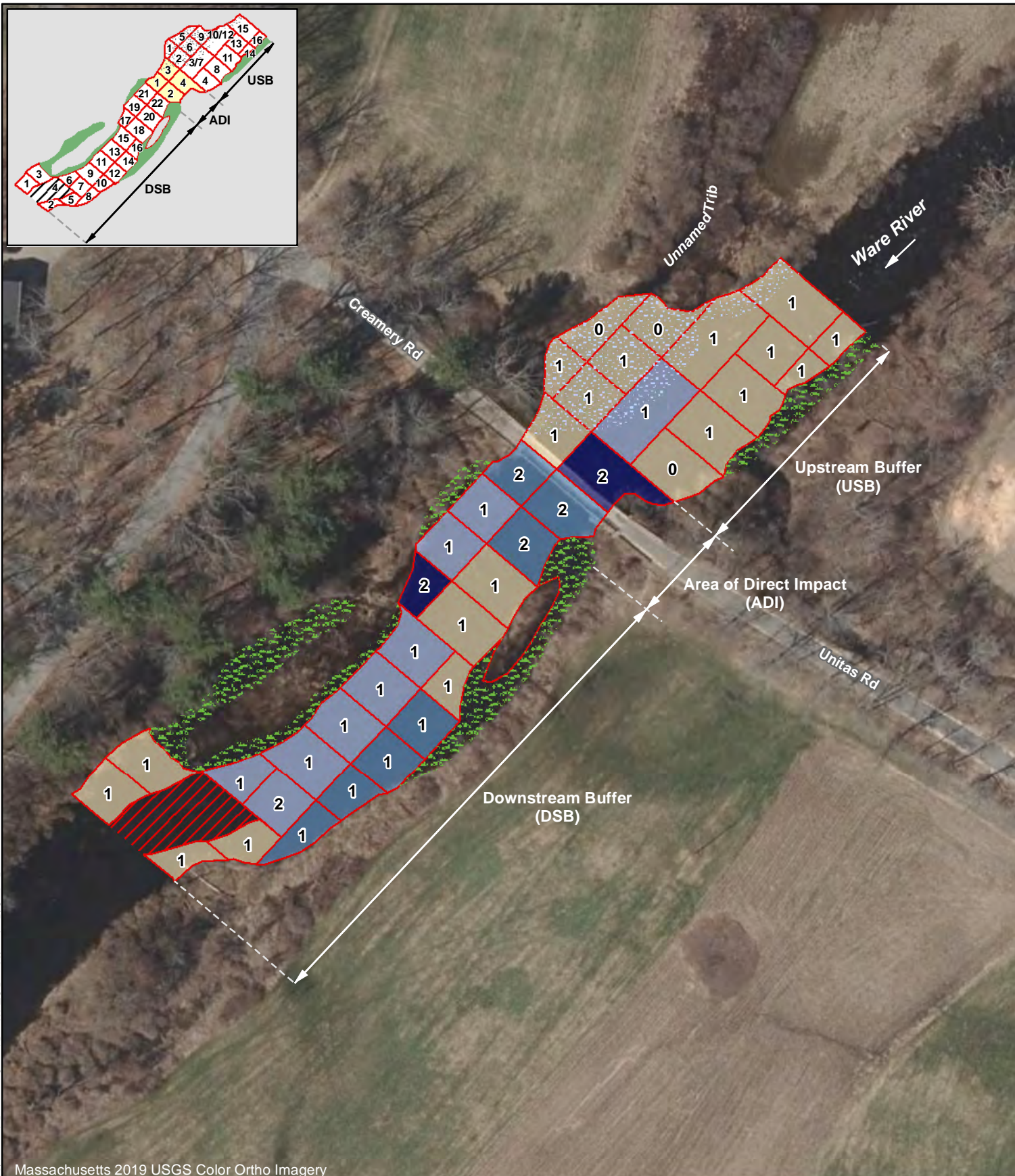
- 0.0
- 0.1 - 50.0
- 50.1 - 100.0
- 100.1 - 242.6

0 30 60 120 Feet

**Figure 4.
Catch Per Unit Effort (CPUE)
Bridge over the Ware River
Hardwick- New Braintree
Worcester County, MA**



Date: 10/18/2023



Massachusetts 2019 USGS Color Ortho Imagery



- Surveyed Cell
- Not Surveyed - High Flow
- Not Surveyed - Wetland and Dense Aquatic Vegetation
- Large Emergent Aquatic

Live Unionids (No. of Species)

- 0 - 10
- 11 - 21
- 22 - 33
- 34 - 93

0 10 20 40 Meters

0 30 60 120 Feet

Figure 5.
Live Mussels Collected
and Species Distribution by Cell
Bridge over the Ware River
Hardwick- New Braintree
Worcester County, MA



Date: 10/24/2023

TABLES

Table 2. Maximum Depth, Number of Live Mussels, and Substrate Composition in the Ware River, Hardwick/New Braintree, September 26-28, 2023

			Average Substrate Composition (%) ¹						
Survey Location	Maximum Depth (ft.)	Live Mussels	BR	BO	CB	GR	SD	ST	CL
ADI									
1	8	33	0	10	15	0	75	0	0
2	8	33	0	0	90	0	5	5	0
2 (BRIDGE ABUTMENT)	8	0	0	0	10	20	70	0	0
3 (SHORELINE)	3	0	0	0	0	0	0	100	0
3 (OFF SHORE)	8	7	0	10	15	0	75	0	0
4	8	64	0	90	0	0	5	5	0
4 (BRIDGE ABUTMENT)	8	0	0	0	10	20	70	0	0
ADI Subtotal	8	137	0	15.7	20	5.7	42.9	15.7	0
DSB									
1	4	8	0	10	10	20	60	0	0
2 (SHORELINE)	5	1	0	0	10	15	0	75	0
2 (OFF SHORE)	5	0	0	0	20	50	30	0	0
3	4	7	0	10	10	20	60	0	0
4 ²		NO SURVEY CONDUCTED DUE TO HIGH FLOW							
5	5	3	0	0	20	50	30	0	0
6	5	14	0	0	20	50	30	0	0
7	5	18	0	0	20	50	30	0	0
8	4	26	0	0	10	30	20	40	0
9	5	18	0	0	20	50	30	0	0
10	4	28	0	0	10	30	20	40	0
11	5	17	0	0	20	50	30	0	0
12	4	28	0	0	10	30	20	40	0
13	5	18	0	0	20	50	30	0	0
14	4	28	0	0	10	30	20	40	0
15	4	21	0	30	20	30	20	0	0
16	4	10	0	0	0	10	20	70	0
17	4	93	0	0	10	70	20	0	0
18 (SHORELINE)	4	10	0	0	0	10	20	70	0
18 (OFF SHORE)	8	0	0	30	20	30	20	0	0
19	4	19	0	0	10	65	20	0	5
20 (SHORELINE)	5	9	0	0	0	10	20	70	0
20 (OFF SHORE)	8	0	0	30	20	30	20	0	0
21	5	14	0	0	10	80	10	0	0
22 (SHORELINE)	7	27	0	0	0	10	10	80	0
22 (OFF SHORE)	8	0	0	30	20	30	20	0	0
DSB Subtotal	8	417	0	5.6	12.8	36	24.4	21	0.2
USB									
1	3	2	0	0	0	0	0	100	0
2	4	1	0	0	0	0	0	100	0
3/7 ³	5	17	0	0	0	20	80	0	0
4	5	0	0	0	10	20	70	0	0
5	3	0	0	0	0	0	0	100	0
6	3	1	0	0	0	0	0	100	0
8	5	8	0	0	10	20	70	0	0
9	3	0	0	0	0	0	0	100	0
10/12 ³	4	9	0	0	10	10	80	0	0
11	5	6	0	0	10	20	70	0	0
13	5	1	0	0	10	20	70	0	0
14	4	3	0	0	0	80	10	10	0
15	5	3	0	0	10	20	70	0	0
16	4	2	0	0	0	10	70	10	10
USB Subtotal	5	53	0	0	4.3	15.7	42.1	37.1	0.7
Grand Total	8	607	0	5.4	11.3	25.2	32.6	25.1	0.3

ADI= Area of Direct Impact, DSB= Downstream Buffer, USB= Upstream Buffer

¹ Wentworth scale (Wentworth 1922)

BR = bed rock, BO = boulder, CB = cobble, GR = gravel, SD = sand, ST = silt, CL = clay, Other = shell material, detritus etc.

² No survey conducted for this cell due to high flow

³ Cells that were combine for dive efficiency due to challenging flows

**Table 3. Summary of Mussel Species Observed
in the Ware River, Hardwick/New Braintree, September 26-28, 2023**

Survey Location/Species	Live	FD	WD	SF
ADI				
1				
<i>Elliptio complanata</i>	32	0	0	0
<i>Strophitus undulatus</i>	1	0	0	0
Subtotal	33	0	0	0
2				
<i>Elliptio complanata</i>	3	0	0	0
<i>Margaritifera margaritifera</i>	30	0	0	0
Subtotal	33	0	0	0
3				
<i>Elliptio complanata</i>	7	0	3	0
Subtotal	7	0	3	0
4				
<i>Elliptio complanata</i>	38	0	0	4
<i>Margaritifera margaritifera</i>	26	0	0	1
Subtotal	64	0	0	5
ADI Subtotal	137	0	3	5

DSB				
1				
<i>Elliptio complanata</i>	8	0	0	0
Subtotal	8	0	0	0
2 (SHORELINE)				
<i>Elliptio complanata</i>	1	0	0	0
Subtotal	1	0	0	0
3				
<i>Elliptio complanata</i>	7	0	0	0
Subtotal	7	0	0	0
4 ¹	NO SURVEY CONDUCTED DUE TO HIGH FLOW			
5				
<i>Elliptio complanata</i>	3	0	0	0
Subtotal	3	0	0	0
6				
<i>Elliptio complanata</i>	14	0	0	0
Subtotal	14	0	0	0

FD = Fresh Dead; WD = Weathered Dead; SF = Subfossil

ADI= Area of Direct Impact; DSB= Downstream Buffer; USB= Upstream Buffer

¹Cell Not Surveyed Due to High Flow

² Cells that were combine for dive efficiency due to challenging flows

**Table 3. Summary of Mussel Species Observed
in the Ware River, Hardwick/New Braintree, September 26-28, 2023**

Survey Location/Species	Live	FD	WD	SF
DSB				
7				
<i>Alasmidonta undulata</i>	1	0	0	0
<i>Elliptio complanata</i>	17	0	0	0
Subtotal	18	0	0	0
8				
<i>Elliptio complanata</i>	26	0	1	2
Subtotal	26	0	1	2
9				
<i>Elliptio complanata</i>	18	0	0	0
Subtotal	18	0	0	0
10				
<i>Elliptio complanata</i>	28	0	1	2
Subtotal	28	0	1	2
11				
<i>Elliptio complanata</i>	17	0	0	0
Subtotal	17	0	0	0
12				
<i>Elliptio complanata</i>				
Subtotal	28	0	1	2
13				
<i>Elliptio complanata</i>	18	0	0	0
Subtotal	18	0	0	0
14				
<i>Elliptio complanata</i>	28	0	1	2
Subtotal	28	0	1	2
15				
<i>Elliptio complanata</i>	21	0	3	0
Subtotal	21	0	3	0
16				
<i>Elliptio complanata</i>	10	0	0	0
Subtotal	10	0	0	0
17				
<i>Alasmidonta undulata</i>	1	0	0	0
<i>Elliptio complanata</i>	92	0	5	5
Subtotal	93	0	5	5

FD = Fresh Dead; WD = Weathered Dead; SF = Subfossil; ADI= Area of Direct Impact; DSB= Downstream Buffer; USB= l

ADI= Area of Direct Impact; DSB= Downstream Buffer; USB= Upstream Buffer

¹Cell Not Surveyed Due to High Flow

² Cells that were combine for dive efficiency due to challenging flows

**Table 3. Summary of Mussel Species Observed
in the Ware River, Hardwick/New Braintree, September 26-28, 2023**

Survey Location/Species	Live	FD	WD	SF
DSB				
18				
<i>Elliptio complanata</i>	10	0	0	2
Subtotal	10	0	0	2
19				
<i>Elliptio complanata</i>	19	0	0	1
Subtotal	19	0	0	1
20				
<i>Elliptio complanata</i>	9	0	0	4
Subtotal	9	0	0	4
21				
<i>Elliptio complanata</i>	14	0	0	0
Subtotal	14	0	0	0
22				
<i>Elliptio complanata</i>	9	0	0	4
<i>Margaritifera margaritifera</i>	18	0	0	0
Subtotal	27	0	0	4
DSB Subtotal	370	0	12	21
USB				
1				
<i>Elliptio complanata</i>	2	0	0	0
Subtotal	2	0	0	0
2				
<i>Elliptio complanata</i>	1	0	0	0
Subtotal	1	0	0	0
3/7 ²				
<i>Elliptio complanata</i>	17	0	3	0
Subtotal	17	0	3	0
4				
No Live Mussels or Shells	0	0	0	0
Subtotal	0	0	0	0
5				
No Live Mussels or Shells	0	0	0	0
Subtotal	0	0	0	0
6				
<i>Elliptio complanata</i>	1	0	0	0
Subtotal	1	0	0	0

FD = Fresh Dead; WD = Weathered Dead; SF = Subfossil; ADI= Area of Direct Impact; DSB= Downstream Buffer; USB= Upstream Buffer

ADI= Area of Direct Impact; DSB= Downstream Buffer; USB= Upstream Buffer

¹Cell Not Surveyed Due to High Flow

² Cells that were combine for dive efficiency due to challenging flows

**Table 3. Summary of Mussel Species Observed
in the Ware River, Hardwick/New Braintree, September 26-28, 2023**

Survey Location/Species	Live	FD	WD	SF
USB				
8				
<i>Elliptio complanata</i>	8	0	0	0
Subtotal	8	0	0	0
9				
No Live Mussels or Shells	0	0	0	0
Subtotal	0	0	0	0
10/12 ²				
<i>Elliptio complanata</i>	9	0	1	0
Subtotal	9	0	1	0
11				
<i>Elliptio complanata</i>	6	0	0	0
Subtotal	6	0	0	0
13				
<i>Margaritifera margaritifera</i>	1	0	0	0
Subtotal	1	0	0	0
14				
<i>Elliptio complanata</i>	3	0	0	1
Subtotal	3	0	0	1
15				
<i>Elliptio complanata</i>	3	0	0	0
Subtotal	3	0	0	0
16				
<i>Elliptio complanata</i>	2	0	0	0
Subtotal	2	0	0	0
USB Subtotal	45	0	4	1
Grand Total	552	0	19	27

FD = Fresh Dead; WD = Weathered Dead; SF = Subfossil

ADI= Area of Direct Impact; DSB= Downstream Buffer; USB= Upstream Buffer

¹Cell Not Surveyed Due to High Flow

² Cells that were combine for dive efficiency due to challenging flows

Table 4. Summary of Live Mussels, Species, and Relative Abundance Observed in the Ware River, Hardwick/New Braintree, September 26-28, 2023

Species	Total Live by Species	Rel. Ab. (%)
<i>Elliptio complanata</i>	529	87.1
<i>Margaritifera margaritifera</i>	75	12.4
<i>Alasmidonta undulata</i>	2	0.3
<i>Strophitus undulatus</i>	1	0.2
Species Richness Total	4	
Species Richness Live	4	
Total Live Relocated ²	None	
Total Live Mussels	607	
Survey Effort - hr(min)	12.4 (745)	
Total Search Area (m ²)	4,160.8	
Overall CPUE (no./hour) ¹	48.9	

¹ CPUE (Catch Per Unit Effort) = number live per work person hour (no. live / (Tot time/60 min)

² No mussels were relocated as part of this effort

Table 5. Summary of Live Mussels, Species, and CPUE per cell for the Ware River, Hardwick/New Braintree, September 26-28, 2023

Cell	Number Live Mussels	Survey Time (minutes)	¹ CPUE (no./hour) - Total	Search Area (m ²)
ADI				
1	33	22	90.0	92.3
2	33	34	58.2	128.8
3	64	40	96.0	101.5
4	7	34	12.4	156.2
ADI Subtotal	137	130	63.2	478.8
DSB				
4	8	7	68.6	99.0
2	1	13	4.6	58.4
3	7	6	70.0	110.7
4 ²		NO SURVEY CONDUCTED DUE TO HIGH FLOW		
5	3	30	6.0	70.2
6	14	8	105.0	71.6
7	18	9	120.0	100.1
8	26	18	86.7	75.3
9	18	9	120.0	127.9
10	28	18	93.3	75.3
11	17	9	113.3	120.0
12	28	18	93.3	99.4
13	18	9	120.0	115.4
14	28	18	93.3	100.1
15	21	9	140.0	120.1
16	10	17	35.3	67.2
17	93	23	242.6	66.5
18	10	25	24.0	147.5
19	19	23	49.6	99.6
20	9	25	21.6	133.7
21	14	22	38.2	100.1
22	27	25	64.8	112.1
DSB Subtotal	417	341	73.4	2,070.2
USB				
1	2	18	6.7	57.8
2	1	17	3.5	100.1
3/7 ³	17	17	60.0	200.3
4	0	25	0.0	134.8
5	0	17	0.0	86.7
6	1	17	3.5	100.1
8	8	25	19.2	139.9
9	0	17	0.0	97.6
10/12 ³	9	16	33.8	195.5
11	6	25	14.4	140.2
13	1	24	2.5	100.1
14	3	16	11.3	40.2
15	3	24	7.5	164.7
16	2	16	7.5	53.8
USB Subtotal	53	274	11.6	1,611.8
Grand Total	607	745	48.9	4,160.8

ADI= Area of Direct Impact, DSB= Downstream Buffer, USB= Upstream Buffer

¹ CPUE (Catch per Unit Effort) = number live per work person hour (no. live / (Tot time/60 min)² No survey conducted for this cell, due to high flow³ Cells that were combined for dive efficiency due to challenging flows

APPENDIX A

Study Plan and Survey Approval



September 6, 2023

Mr. David Paulson
Massachusetts Division of Fish and Wildlife
Natural Heritage and Endangered Species Program
North Drive, Route 135
Westborough, MA 01581

SENT VIA EMAIL: David Paulson

RE: Project Title: Creamery Road Bridge Replacement Project (N-07-002)
Ware River Mussel Survey
Hardwick – New Braintree,
Worcester County, Massachusetts
Normandeau Associates, Inc.

Dear Mr. Paulson:

Normandeau Associates Inc. (Normandeau) is submitting this proposed freshwater mussel survey plan (Plan) for the Creamery Road Bridge Replacement over the Ware River on behalf of the Massachusetts Department of Transportation (MassDOT). This Plan was developed in accordance with methodologies outlined in the Survey Protocol for Assessment of Endangered Freshwater Mussels in the Allegheny River, Pennsylvania (Smith et al, 2001) and the Massachusetts Endangered Species Survey Guidelines: Freshwater Mussels (May 2013). Normandeau's US Fish and Wildlife Service and Massachusetts qualified surveyor (Joe Snavelly; **Attachment 1**) will oversee and conduct the freshwater mussel (unionid) survey.

PROJECT BACKGROUND

MassDOT is proposing to replace the existing structure at the Creamery Road Bridge (Bridge No. N-07-002) and place shoreline stabilization measures along the Ware River with a drainage area of approximately 148 square miles at the project site near Hardwick-New Braintree, Worcester County, MA (**Attachment 2**). The project will result in permanent and temporary impacts within the Ware River waterway. As part of the bridge replacement project, access roads into the river will be required immediately downstream of the bridge. These areas along with the proposed shoreline stabilization areas have been included in the Area of Direct Impact (ADI).

Based on a teleconference with MassDOT on May 15, 2021, the ADI and area of indirect effect (AIE) must be surveyed for the target species prior to initiating construction to determine if adverse impacts to mussels are likely to occur as a result of the project activities. No federal listed mussel species were identified according to the USFWS IPAC review, but several state rare and threatened species are known to occur in the Ware River including brook floater (*Alasmodonta varicosa*), triangle floater (*Alasmodonta undulata*), and creeper (*Strophitus undulatus*) (**Attachment 3**).

METHODS

400 Old Reading Pike, Building A, Suite 101 Stowe, PA 19464 (610) 705-5733

Corporate Office: Normandeau Associates, Inc. 25 Nashua Road Bedford, NH 03110 (603) 472-5191
www.normandeau.com

The objective of this survey is to detect the presence or probable absence of any special status species within the current project footprint. The area of stream bottom that will be directly affected by the bridge replacement and shoreline stabilization project is the Area of Direct Impact (ADI). The upstream buffer (AIE) extends approximately 50 meters from the ADI and the downstream buffer (AIE) extends 100 meters from the ADI at the bridge. The total length of the mussel survey area is approximately 171 linear meters of stream and extends the entire wetted width of the river and with total area of approximately 5,313 square meters (**Attachment 3**). Normandeau recently submitted for a Scientific Collecting permit amendment for freshwater mussels at this location.

The survey will be accomplished by a crew of biologists experienced in detection, identification, handling, and movement of mussels. The survey will be conducted using snorkels and/or view buckets in shallow water and SCUBA in deeper water. Any freshwater mussels observed during the survey will be collected in mesh bags, brought to the shoreline or to the boat, and held in free-flowing stream water during processing.

Normandeau proposes to establish survey cells or lanes within the survey area. Normandeau divers will use visual and tactile search methods to detect live mussels, gently disturbing the surface of the substrate by hand to sweep away cobble, organic debris, and fine sediments in order to detect buried or partially buried mussels. More survey time will be spent in high quality habitat and less in poor quality habitat. The mussels found in the survey area will be placed back into stream bottom substrate, anterior end down in the cells where they were collected.

All mussels, regardless of species, will be identified and counted. No shell measurements (length, width, and height) will be made, except for S1/S2 state-listed species. Representative photographs of each mussel species and the project area will be taken. No excavations will be conducted as part of this survey. No mussels will be tagged or relocated at this time. Representative spent shells will be retained as vouchers and sent to Massachusetts Department of Fisheries and Wildlife National Heritage and Endangered Species Program (MADFW NHESP) for documentation and identification purposes, if necessary.

As part of the initial mussel survey, Normandeau field crews will also search for and identify a suitable relocation site for mussels, should one be necessary. Wandering timed searches will be conducted to identify a suitable relocation site of equal or better habitat. Data regarding the existing substrate and mussel species composition will be recorded and presented to NHESP for approval. The perimeter of the selected relocation recipient site will be physically marked in the stream using semi-permanent stakes placed into the bottom with flagging attached. In addition, the perimeter will be noted by recording coordinates using a GPS field instrument to facilitate redetection as necessary.

Normandeau will prepare a draft and, subsequent to receipt of draft review comments, final reports describing the results of the survey and relocation site selection surveys. This report will include a description of methodology, the survey conditions, substrate characteristics, and the data associated with the observed mussels. The following data will be collected for each cell or wandering timed search and summarized in the survey report:

- Photographs will be taken of the survey area and a minimum of one representative photo of each mussel species will be taken for verification purposes including key diagnostic features, if apparent;
- Representative site and habitat photographs;
- Time for each survey area (cells);
- Substrate composition of each sample/pass (visual percentage based on Wentworth scale);
- Water depth (meters);
- Mussel species, individual size (length to the nearest millimeter – listed species only), sex (where applicable), and age (external annuli count);
- Mussel abundance (CPUE) estimates, and density estimates;
- Mussel shells (classified as fresh dead, weathered dead, or relic shell);
- Fish species observed;
- GPS locations of the survey area boundary; and
- Other notable features (visibility, stream characteristics, water temperature, weather conditions etc.)

Normandeau will prepare and submit a final summary report including the number and species of mussels collected for submission to MADFW-NHESP. The report will follow technical reporting guidelines and will include an introduction, methods, results, and discussion with associated tables, figures, and appendices. Figures will present sample distribution, a species list of mussels that were relocated, and any high quality habitat areas at the project location. We understand that detection of state or federal listed species may require additional coordination depending on their location.

If there are any questions or concerns regarding this Plan, please contact me at (267) 644-3928 or

jsnavely@normandeau.com.

Sincerely,



Joseph Snavelly
Principal Scientist
Project Manager

Attachments:



- Attachment (1) Resume Joe Snavely
- Attachment (2) MassDOT Plans
- Attachment (3) Proposed Survey Plan Mapping

REFERENCES

Smith, D.R., R.F. Villella, and D.P. Lemarie. 2001. Survey protocol for assessment of endangered freshwater mussels in the Allegheny River. J. N. Am. Benthol. Soc. 20(1): 118-132.

Massachusetts Endangered Species Survey Guidelines: Freshwater Mussels (May 2013) by Massachusetts Division of Fisheries and Wildlife.



Attachment 1

Resume Joe Snavelly

JOSEPH C. SNAVELY

Principal Scientist

Mr. Snavely has nearly 25 years of multidisciplinary project experience focused on project management, agency coordination, strategic planning, dive operations management, site safety, wetland identification/ delineation and functional evaluation of wetland systems, evaluation of aquatic ecosystems, stream and river classification, assisting in the completion of Environmental Impact Statements (EIS), and the completion of Joint Permit Applications for oil and gas, transportation, infrastructure, commercial, legal testimony and residential development projects in Pennsylvania, Maryland, Maine, Massachusetts, New Hampshire, New York, New Jersey, Delaware, and Virginia. He has delineated several thousand wetland systems throughout his career including large transportation, land development, oil and gas, and utility projects.

Mr. Snavely is involved in the study and evaluation of aquatic ecosystems, specifically, lotic systems. Evaluations include assessment of the physiochemical, aquatic habitat, and the aquatic biota conditions. He has extensive experience in aquatic habitat surveys/evaluations and aquatic ecology using methods and protocol outlined in EPA's Rapid BioAssessment Protocol for Use in Wadeable Streams and Rivers for Benthic Macroinvertebrates and Fish (1999), multihabitat assessment protocols from the Maryland Biological Stream Surveys for fish and macroinvertebrates, Pennsylvania multihabitat and macroinvertebrate protocols, Virginia Save Our Streams, and North Carolina DENR Bioassessments for State 401 Water Quality Certification. Mr. Snavely has nearly 20 years of experience in surveying for freshwater mussels for species from the Atlantic Slope, Interior and Great Lakes Basins.

Mr. Snavely has also provided 8 years of assistance in Phase I and Phase II Bog Turtle Habitat Evaluations in Pennsylvania and Maryland. Mr. Snavely has conducted sensitive plant species surveys in Pennsylvania and Virginia including assistance with monitoring for the Federal Endangered Northeastern Bulrush (*Scirpus ancistrocheatus*). Mr. Snavely has five years of experience in performing forest stand delineations in accordance with the State of Maryland Reforestation Act (1991), Roadside Tree Law, and Reforestation Law within the State of Maryland. Mr. Snavely has completed and submitted forest conservation plans necessary for the acquisition of land development permits in Anne Arundel, and Frederick County, Maryland.

EDUCATION

B.S. Environmental Health & Biology,
Indiana University of PA,

PROFESSIONAL EXPERIENCE

2016-Present Normandeau Associates
2011-2016 URS Corp./AECOM
2000-2011 Skelly and Loy, Inc.

PROFESSIONAL CERTIFICATIONS

- Qualified Professional Forest Stand Delineator, 2007
- Pennsylvania & U.S. Fish and Wildlife Service Qualified Northeastern Bulrush (*Scirpus ancistrocheatus*) Surveyor, 2015
- U.S. Fish and Wildlife Service, PA, NJ, NY, & New England Qualified Dwarf Wedgemussel Surveyor
- U.S. Fish and Wildlife Service Qualified Surveyor Region 3 and Region 5 – Federal Permit Holder All Species
- State Qualified Freshwater Mussel Surveyor – CT, MA, MD, ME, MI, MN, NJ, NH, NY, OH PA, VA, VT, WV
- SCUBA certified – Divemaster – Drysuit, FFM, Nitrox, Rescue
- DAN Oxygen, CPR, and First Aid
- Shell Safelands Safety Training
- URS/AECOM Certified Project Manager
- AECOM Dive Board 2015-2016
- Normandeau Dive Board (2018-Present)

PROFESSIONAL AFFILIATIONS

- Mid-Atlantic Water Pollution Biologists (2000-Present)
- Association of PA Contractors (2019-Present)
- Freshwater Mollusk Conservation Society (2015-Present)
- PA Biological Society – Mollusk Technical Sub-group (2015-Present)
- Chesapeake Bay Freshwater Mussel Workgroup (2010-Present)
- Ohio River Valley Mussel Group (2016-Present)
- Entomological Society of Pennsylvania (2003-2009)
- MBSS Macroinvertebrate Training (2000-2004, 2008-2012)
- MBSS Fish Training (2002-2004, 2008-2011)
- Natural Stream Channel Design Summit (2001-2002)

REPRESENTATIVE PROJECT EXPERIENCE

Massachusetts Division of Fisheries and Wildlife Statewide Site Surveys (2022-Present). In coordination with the MADFW, Mr. Snively coordinated and led the project coordination and site surveys at 45 locations across multiple watersheds using the Brook Floater Rapid Assessment Protocol. Sites were evaluated for presence of mussels including state listed endangered and threatened species for future project planning and coordination. Project Manager, Massachusetts/USFWS Qualified Surveyor Region 5.

Ware River Bridge Replacement Project, Brook Floater Relocation Project, Massachusetts Department of Transportation (2021-Present). In coordination with the project consultant team, MassDOT, Mr. Snively prepared and submitted a conservation management plan (CMP), mussel relocation plan, developed salvage strategies, and conducted agency negotiations to collect and relocate state endangered Brook Floater (*A. varicosa*) from the area of direct impact prior to construction activities. This project required a series of Net Benefit surveys at additional locations on the Ware River as part of the CMP and permit conditions. Mussel relocation services will be completed in 2023. Task Manager, Massachusetts/USFWS Qualified Surveyor Region 5.

Freshwater Mussel Surveys and Relocation Services (Multiple Locations) NYSDOT Statewide (2022-Present). In coordination with the project consultant and NYSDOT team, Mr. Snively lead all survey plan development, collection permit acquisition, and mussel survey field work for multiple project locations as part of the project permitting and coordination. Survey sites included species from the interior, great lakes and Atlantic slope basins. Project drainages included Oswayo Creek, Black Creek, Ninemile Creek, Chenango River and the Allegheny River (Seneca Nation). Project Manager, New York State and USFWS Qualified Surveyor Region 5.

Freshwater Mussel Coordination Services Oswayo Creek (2022-Present). In coordination with the project consultant and the NYSDOT team for bridge replacement project, Mr. Snively prepared the scope of work and a mussel relocation plan the federal endangered rayed bean (*Villosa fabilis*) under his current federal recovery permit. Through project coordination it was determined that the project could be modified and successfully completed to avoid in-water impacts. No mussel relocations were required as a result of this coordination. Project Manager, New York State and USFWS Qualified Surveyor Region 5.

Freshwater Mussel Surveys and Relocation Services Black Creek (2022-Present). In coordination with the project consultant and the NYSDOT team, Mr. Snively led all scope of services and survey plan development, collection permit acquisition, and mussel survey field work as part of the project permitting and coordination. Relocation recipient sites were identified as part of the survey efforts. Relocation plans were developed as part of this project in the event that in-water disturbances were necessary. Project drainages included Oswayo Creek, Black Creek, Ninemile Creek, Chenango River and the Allegheny River (Seneca Nation). Project Manager, New York State and USFWS Qualified Surveyor Region 5.

Freshwater Mussel Surveys Ninemile Creek (2022-Present). In coordination with the project consultant and NYSDOT team, Mr. Snively led all survey plan development, collection permit acquisition, and mussel survey field work as part of the project permitting and coordination. Relocation recipient sites were identified as part of the survey efforts. Project Manager, New York State and USFWS Qualified Surveyor Region 5.

Freshwater Mussel Surveys Deer River Flow (2022-Present). In coordination with the project consultant and NYSDOT team, Mr. Snively led all survey plan development, collection permit acquisition, and mussel survey field work as part of the project permitting and coordination. A modified survey approach was successfully negotiated with NYSDEC for the culvert replacement project to create more efficient use of survey time. Relocation recipient sites were also identified as part of the survey efforts. Project Manager, New York State and USFWS Qualified Surveyor Region 5.

Freshwater Mussel Surveys and Relocation Services Route 17 over the Allegheny River (2022-Present). In coordination with the project consultant, the Seneca Nation and NYSDOT team for this multi-phase bridge replacement project, Mr. Snively reviewed the USFWS Biological Opinion for impact to the federal endangered rayed bean (*Villosa fabilis*) and lead all scope and relocation and long-term monitoring plan development and collection permit acquisition. Under his current federal recovery permit Mr. Snively will lead the mussel relocation field work using multiple dive teams with experience mussel divers to complete this project. This project involves PIT tagging of rayed bean for targeted mark-recapture and monitoring of population recovery at the bridge construction site. Project Manager, New York State and USFWS Qualified Surveyor Region 5.

Freshwater Mussel Survey and Relocation, Edgemere Drive Alt 3A, Long Pond, Rochester, NY (2021-2022). Freshwater mussel survey and relocation at the Edgemere Drive Alt 3A bridge crossing over the Long Pond Outlet Channel. Survey crews observed several species including the lilliput (*Toxolasma parvum*), a New York state-listed High Priority Species of Greatest Conservation Need, were observed. The presence of this species in this particular Lake Ontario drainage was previously unknown. After the original mussel survey crews returned in 2022 to relocate the mussels to an NYSDEC approved relocation area. Project Manager, USFWS Qualified Surveyor.

Freshwater Mussel Survey, Long Pond, Greece, NY (2020-2021). Freshwater mussel survey at multiple stormwater outfalls proposed for rehabilitation. Six individuals of the lilliput, a New York state-listed High Priority Species of Greatest Conservation Need, were observed. The presence of this species in this particular Lake Ontario drainage was previously unknown. Project Manager, USFWS Qualified Surveyor.

Freshwater Mussel Survey, New York State Department of Transportation, Sterling Valley Creek, Cayuga County, NY (2020). Freshwater mussel survey at the site of proposed construction of the McIntyre Road Bridge and associated removal of two existing culvert pipes. This work was conducted through Barton & Loguidice on behalf of the NYSDOT. Project Manager, USFWS Qualified Surveyor.

New York State Route 430 Bridge Replacement Project, NYSDOT Region 5, Dewittville Creek, Chautauqua County, PA (2019-2021). Mr. Snively served as the natural resource coordinator and qualified malacologist for mussel survey on the Dewittville Creek in Chautauqua County, New York. Activities included mussel survey and salvage plan negotiation, visual and tactile searches (Smith et. al 2000, 2001, and 2006 and West Virginia protocols), timed searches, assessment of available habitat, and species distribution. Presently, Normandeau is supporting additional PFBC coordination for the project. Project Manager, New York/USFWS Qualified Surveyor.

Lancaster-Guildhall US Route 2 Bridge Replacement Project, Dwarf Wedgemussel Section 7 Consultation (2016-Present). In coordination with the project consultant team, NHDOT, and FHWA, Mr. Snively prepared and submitted a mussel survey plan, developed salvage strategies, and conducted agency negotiations for the development of a Biological Opinion to collect and relocate federally endangered Dwarf Wedgemussel (*A. heterodon*) from the area of direct impact prior to construction activities. This project required a multi-phase salvage approach over multiple years based on the construction schedule and duration of project disturbances. One of the largest relocation efforts for the species, over 40,000 mussels have been relocated including over 900 Dwarf Wedgemussel. Task Manager, New Hampshire/USFWS Qualified Surveyor Region 5.

Freshwater Mussel Survey, City of Binghamton, NY, Chenango and Susquehanna Rivers, Binghamton, NY (2020). Freshwater mussel surveys in the Chenango and Susquehanna Rivers where the City of Binghamton proposes to construct a kayak launch and a boat ramp, respectively. One New York state-listed Threatened Species (green floater) and one New York state-listed High Priority Species of Greatest Conservation Need (yellow lampmussel) were observed. This work was conducted through CPL Architecture Engineering and Planning on behalf of the City of Binghamton. Project Manager, New York/USFWS Qualified Surveyor.

Freshwater Mussel Surveys and Impact Avoidance Plan Coordination Services Kaighn Avenue, Cooper River, Camden County New Jersey (2022-Present). In coordination with the project consultant and NJDOT team, Mr. Snively lead all survey plan development, collection permit acquisition, and mussel survey field work for this

bridge replacement project. In addition, Mr. Snively led the completion of an Impact Avoidance Plan, relocation recipient site identification, and Mussel Relocation Plan to be completed in 2023. Multiple species were observed at this location including the tidewater mucket (*Leptodea ochracea*) and eastern pondmussel (*Ligumia recta*). Project Manager, New Jersey/USFWS Qualified Surveyor.

Freshwater Mussel Surveys and Impact Avoidance Plan Coordination Services Interstate 676 Bridge and Outfalls, South Branch Newton Creek, Camden County New Jersey (2022-Present). In coordination with the project consultant and NJDOT team, Mr. Snively lead all survey plan development, collection permit acquisition, and mussel survey field work for this two-phase bridge replacement project. In addition, Mr. Snively led the completion of an Impact Avoidance Plan, relocation recipient site identification, and Mussel Relocation Plan to be completed in 2023. Multiple species were observed including the tidewater mucket (*Leptodea ochracea*) and eastern pondmussel (*Ligumia recta*). Project Manager, New Jersey/USFWS Qualified Surveyor.

Freshwater Mussel Surveys and Impact Avoidance Plan Coordination Services Interstate 76 Bridge and Outfalls, Newton Creek, Camden County New Jersey (2022-Present). In coordination with the project consultant and NJDOT team, Mr. Snively lead all survey plan development, collection permit acquisition, and mussel survey field work for this two-phase bridge replacement project. In addition, Mr. Snively led the completion of an Impact Avoidance Plan, relocation recipient site identification and Mussel Relocation Plan. Nearly 1,000 individuals were relocated as part of this project including the tidewater mucket (*Leptodea ochracea*) and eastern pondmussel (*Ligumia recta*). Project Manager, NJDEP and USFWS Qualified Surveyor.

Freshwater Mussel Surveys and Impact Avoidance Plan Coordination Services Camden County Department of Parks, Kayak Launch Cooper River Camden County, New Jersey (2022-Present). In coordination with the project consultant and NJDOT team, Mr. Snively lead all survey plan development, collection permit acquisition, and mussel survey field work for this project. In addition, Mr. Snively led the completion of an Impact Avoidance Plan, relocation recipient site identification, and Mussel Relocation Plan to be completed in 2023. Multiple species were observed including the tidewater mucket (*Leptodea ochracea*) and eastern pondmussel (*Ligumia recta*). Project Manager, NJDEP and USFWS Qualified Surveyor.

Freshwater Mussel Surveys and Impact Avoidance Plan Coordination Services Camden County Department of Parks, Link Trail Pedestrian Bridge Cooper River Camden County, New Jersey (2022-Present). In coordination with the project consultant and NJDOT team, Mr. Snively lead all survey plan development, collection permit acquisition, and mussel survey field work for this two-phase bridge project for geotechnical drilling and construction support. In addition, Mr. Snively led the completion of an Impact Avoidance Plan, relocation recipient site identification, and Mussel Relocation Plan to be completed in 2023. Multiple species were observed including the tidewater mucket (*Leptodea ochracea*) and eastern pondmussel (*Ligumia recta*). Project Manager, NJDEP and USFWS Qualified Surveyor.

Freshwater Mussel Surveys and Impact Avoidance Plan Coordination Services Camden County Department of Parks Wiggins Marina Rehabilitation Project Delaware River Camden County, New Jersey (2022-Present). In coordination with the project consultant and NJDOT team, Mr. Snively lead all survey plan development, collection permit acquisition, and mussel survey field work for this bridge replacement project. In addition, Mr. Snively led the completion of an Impact Avoidance Plan, relocation recipient site identification. Mr. Snively successfully coordinated with NJDEP to allow the project to move forward without mussel relocation requirements. Multiple species were observed including the tidewater mucket (*Leptodea ochracea*) and eastern pondmussel (*Ligumia recta*). Project Manager, NJDEP and USFWS Qualified Surveyor.

Freshwater Mussel Surveys and Impact Avoidance Plan Coordination Services Route 29 Riverwall Reconstruction Delaware River Trenton, New Jersey (2022-Present). In coordination with the project consultant and NJDOT team, Mr. Snively lead all survey plan development, collection permit acquisition, and mussel survey field work for this bridge replacement project. In addition, Mr. Snively led the completion of an Impact Avoidance

Plan, relocation recipient site identification. Multiple species were observed including the tidewater mucket (*Leptodea ochracea*) and eastern pondmussel (*Ligumia recta*). Project Manager, NJDEP and USFWS Qualified Surveyor.

Wetland and Stream Identification Services, Multiple Sites, New York State (2020-Present). Mr. Snavelly led the wetland and stream presence absence field work and reporting for multiple sites for natural gas recycling at commercial agricultural properties. Site reviews were completed to identify terrestrial aquatic resource conflicts with the placement of as recycling facilities. This included the desktop review for potential conflicts with rare, threatened and endangered species for project planning and permitting purposes. Project Manager

Great River Hydro Dwarf Wedgemussel FERC Relicensing Project, Section 7 Consultation, Connecticut River, Multiple Counties, NH (2019-Present). In coordination with the project team, Mr. Snavelly served as the qualified malacologist for the preparation of a biological assessment for potential effects to the Dwarf Wedgemussel at three hydropower operations on the Connecticut River. The biological assessment covers 120 miles of the Connecticut River that encompass two discrete populations of Dwarf Wedgemussel. Project activities included review of the FERC study plans and documents, habitat and population impact assessments and agency negotiation support for the development of a Biological Opinion. Presently, Normandeau is supporting additional agency coordination for the project. Project Manager, USFWS Qualified Surveyor.

Headquarters Road Bridge over Tinicum Creek, River Condition Assessment, PADOT District 6, Bucks County, PA (2020-Present). In coordination with the project team, Mr. Snavelly oversaw the evaluation of existing aquatic habitat conditions from Tinicum Creek. Completion of the Pennsylvania Riverine Condition Level 2 Rapid Assessment was required in support of the project Joint Permit Application and mitigation coordination. Project activities included review of the Categorical Exclusion Evaluation, project area assessment and riparian and floodway habitat evaluations. Mr. Snavelly was responsible technical reporting and project and agency coordination. Project Manager.

French Creek Mussel Community Assessment, French Creek, Venango County, PA (2019). Mr. Snavelly served as the natural resource coordinator and qualified malacologist for a mussel survey in French Creek, Pennsylvania. As part of field crew training on several regional project, Mr. Snavelly led species surveys for identification training of field staff. Over 20 species of mussels were observed including five federal endangered species: Rayed Bean (*Villosa fabilis*), Northern Riffleshell (*Epioblasma t. rangiana*), Clubshell (*Pluerobema clava*), Rabbitsfoot (*Theliderma cylindrica*) and Snuffbox (*Epioblasma triquetra*). Lead Malacologist, USFWS Qualified Surveyor.

Freshwater Mussel, Macroinvertebrate Survey and Mitigation Support, Allegheny County Sanitary Authority (ALCOSAN) Outfall and Riverwall Project, Allegheny County, PA (2017-Present). Mr. Snavelly coordinated and led freshwater mussel survey, macroinvertebrate, and fish evaluation efforts in support of Environmental Assessments associated with a Joint Permit Application submission for riverwall and outfall construction in the Ohio River. ALCOSAN combines over 50 municipalities from the greater Pittsburgh, Pennsylvania area into a one million gallons per day discharge. Mr. Snavelly participated in agency negotiation efforts with PADEP, USACE, PFBC, and USFWS associated with the proposed impacts to aquatic communities from the proposed riverwall and outfalls. He also assisted with the proposed conceptual mitigation package for the Joint Permit Application. Project Manager, USFWS Qualified Mussel Surveyor.

Allegheny Riverfront Development Project, Allegheny River (RM 1.9), Allegheny County, PA (2018-2020). Mr. Snavelly served as the natural resource coordinator and qualified malacologist for mussel survey in Pool 4 of the Allegheny River, Pennsylvania. Activities included mussel survey and survey plan negotiation, visual and tactile searches (Smith et. al 2000, 2001, and 2006 and West Virginia protocols), timed searches, habitat assess, quadrat excavations and species distribution. Project activities involved the survey targeting Rayed Bean (*Villosa fabilis*). A total of five live species were observed during this survey. Normandeau was successful in obtaining agency clearance from the PFBC and USFWS in support of this project. Project Manager, USFWS Qualified Surveyor.

Electra Pipeline Intake Project, Allegheny River Pool 4 (RM 17.0), Allegheny County, PA (2018-2020). Mr. Snively served as the natural resource coordinator and qualified malacologist for mussel survey in Pool 4 of the Allegheny River, Pennsylvania. Activities included mussel survey and survey plan negotiation, visual and tactile searches (Smith et. al 2000, 2001, and 2006 and West Virginia protocols), timed searches, habitat assessment, quadrat excavations and species distribution. Project activities involved the survey targeting Rayed Bean (*Villosa fabilis*). A total of four live species were observed during this survey. Normandeau was successful in obtaining agency clearance from the PFBC and USFWS in support of this project. Project Manager, USFWS Qualified Surveyor.

Kanawha River Capping Project, Kanawha River (RM 30 to 42), Putnam County, WV (2018-2020). Mr. Snively served as the natural resource coordinator and qualified malacologist for mussel survey across a large portion of the Kanawha River. Activities included mussel survey and survey plan negotiation, visual and tactile searches (Smith et. al 2000, 2001, and 2006 and West Virginia protocols), timed searches, habitat assessment, and species distribution. Over 170 transects were surveyed across five separate capping sites comprising nearly 15 acres of direct impact area. This project involved multiple dive crews and operations teams. A total of 23 species were observed during this survey including the first record of the federal endangered Pink Mucket (*Lampsilis abrupta*) in this section of the Kanawha River. Normandeau supported the completion of the biological assessment and agency negotiations. Project Manager, WV/USFWS Qualified Surveyor.

Confidential FERC Pipeline Project, Multiple Sites Allegheny River Watershed, McKean and Potter Counties, PA (2018-Present). Mr. Snively served as the qualified malacologist for mussel survey operations at multiple pipeline crossing locations in McKean and Potter Counties in Pennsylvania. Activities included mussel survey and survey plan negotiation, visual and tactile searches (Smith et. al 2000, 2001, and 2006 and West Virginia protocols), timed searches, assessment of available habitat, and species distribution. Target species included the salamander mussel (*Simposonias ambigua*) and the Rayed Bean (*Villosa fabilis*). Nearly 20 mussel species were observed including seven PA listed species of concern. Presently, Normandeau is supporting additional PFBC and USFWS coordination for the project. Project Manager, USFWS Qualified Surveyor.

Conneaut Lake Shoreline Development Project, Conneaut Lake, Crawford County, PA (2019-Present). Mr. Snively served as the natural resource coordinator and qualified malacologist for mussel survey and salvage for the project. Activities included mussel survey and survey plan negotiation, visual and tactile searches (Smith et. al 2000, 2001, and 2006 and West Virginia protocols), timed searches, assessment of available habitat, and species distribution. Normandeau successfully obtained clearance from PFBC in support of this project. Project Manager, USFWS Qualified Surveyor.

Wolf Bridge Replacement Project, PennDOT District 8-0, Conodoguinet Creek, Cumberland County, PA (2016-2019). Mr. Snively served as the natural resource coordinator and qualified malacologist for mussel survey and salvage operations on the Conodoguinet Creek in Cumberland County, Pennsylvania. Activities included mussel survey and salvage plan negotiation, visual and tactile searches (Smith et. al 2000, 2001, and 2006 and West Virginia protocols), timed searches, assessment of available habitat, and species distribution. Project activities involved the relocation of over 200 live mussels (multiple species) to a PFBC approved location. Presently, Normandeau is supporting additional PFBC coordination for the project. Project Manager, USFWS Qualified Surveyor.

AECOM – PQS, NTC Pipeyard Freshwater Mussel Survey and Section 7 Consultation Oil Creek, Venango County, PA (2017-Present). In coordination with the project consultant team, AECOM and Shell, Mr. Snively prepared and submitted a mussel survey plan, developed salvage strategies, and conducted agency negotiations for the survey of the federally endangered Northern Riffleshell (*E. torulosa rangiana*) and the state rare Wavy-rayed Lampmussel (*L. fasciola*). A total of nine mussel species were identified within the study area, including the Northern Riffleshell and Wavy-rayed Lampmussel. Formal Section 7 consultation and subsequent Biological

Assessment has been initiated to address the effect of the proposed shoreline improvements to federal endangered mussel species. Project Manager, USFWS Qualified Surveyor Region 5.

AECOM – Pennzoil Quaker State Refinery, Plant II Freshwater Mussel Survey and Section 7 Consultation Oil Creek, Venango County, PA (2017-Present). In coordination with the project consultant team, AECOM and Shell, Mr. Snively prepared and submitted a mussel survey plan, developed salvage strategies, and conducted agency negotiations for the survey of the federally endangered Northern Riffleshell (*E. torulosa rangiana*) and the state rare Wavy-rayed Lampmussel (*L. fasciola*). A total of eight mussel species were identified within the study area including, the Northern Riffleshell and Wavy-rayed Lampmussel. Formal Section 7 consultation and subsequent Biological Assessment has been initiated to address the effect of the proposed shoreline improvements to federal endangered mussel species. Project Manager, USFWS Qualified Surveyor Region 5.

Allegheny River Discharge Reporting Review, Confidential Client, Venango County, PA (2017). Mr. Snively provided an independent technical review of PA DEP water quality and species survey reporting for potential effects of an existing outfall to federal endangered mussel species located in proximity to the existing outfall. The desktop review include reviews for the federal endangered Norther Riffleshell (*E. torulosa rangiana*) and Clubshell (*P. clava*) among other species. Task Manager.

Shell Northeast Ethane Pipeline (Falcon Pipeline) OH and PA (2015 and 2016). Mr. Snively served as the task lead for mussel survey efforts across numerous drainages throughout the proposed pipeline. This project involved agency coordination and habitat assessments for numerous crossing locations along eastern Ohio and western Pennsylvania. Survey efforts were designed and reported using the Ohio Mussel Survey Protocol for presence/absence surveys and habitat assessments. USFWS Qualified Surveyor Region 3 and Ohio DNR Approved Surveyor.

Shell Proposed Petrochemical Facility, Beaver County, PA (2013-2016). Mr. Snively oversaw all wetland delineations, aquatic assessments, mitigation evaluations, and coordinated Section 404 and Chapter 105 permitting for all natural resources associated with the proposed Gas to Liquids facility in Beaver County, PA. Project activities for the 750-acre site included wetland and watercourse delineations (approximately five acres of jurisdictional wetlands and approximately 40,000 feet of jurisdictional watercourse), benthic evaluations, freshwater mussel surveys, T&E species evaluation, multi-agency coordination, mitigation site planning, impact assessments as part of the feasibility study. A preliminary jurisdictional determination of the identified aquatic resources was completed for the project with representatives of the U.S. Army Corps of Engineers, Pittsburgh District, PADEP, and U.S. EPA. Permitting and Natural Resource Lead.

Shell Petrochemical Facility Marine Services, Beaver County, PA (2013). Mr. Snively served as the site safety officer, natural resource lead and co-taxonomist for a mussel survey operation on the Ohio River in Pennsylvania. Mr. Snively prepared and submitted mussel survey plans for approval by the PFBC and USFWS and led the project survey efforts as designed by the approved survey plan requirements. Mr. Snively served as the lead agency coordinator for the mussel survey effort to present survey designs and results. This project involved visual and tactile searches using the West Virginia Mussel Sample (Clayton 2013) and Smith et. al 2000, 2001, and 2006 protocols. Both transect and timed searches were employed along with an assessment of river substrate, available habitat, and species distribution. Project activities involved the translocation of several mussel species to a USFWS and PFBC approved location. A total of 190 live mussels, including 8 live species, were encountered including Pink Heelsplitter (*P. alatus*), Mapleleaf (*Q. quadrula*), Threehorn Wartyback (*O. reflexa*), White Heelsplitter (*L. complanata*), Flat Floater (*A. suborbiculata*), Fat Mucket (*L. siliquioidea*), and Black Sandshell (*L. recta*). Mr. Snively was responsible for daily safety briefings, daily site checks, coordination with lock and dams, float plans, and project safety reporting. Site Safety Officer and Natural Resource Lead.

Cornish-Windsor Covered Bridge 25067, Dwarf Wedgemussel Survey, Connecticut River, Sullivan County, NH (2017-2019). In coordination with the project consultant team, NHDOT, and FHWA, Mr. Snively prepared

and submitted a mussel survey plan, developed salvage strategies, and conducted agency negotiations for the development of a Biological Opinion to complete a survey for federally endangered Dwarf Wedgemussel (*A. heterodon*). As designed, this survey effort required diving and the use of fixed area timed cell survey strategies. Over 1,500 live unionids were observed representing three live species including Dwarf Wedgemussel. Task Manager, USFWS Qualified Surveyor Region 5.

Cresson Covered Bridge 23737 Replacement Project, Dwarf Wedgemussel Section 7 Consultation, Ashuelot River, Cheshire County, NH (2016-2019). In coordination with the project consultant team, NHDOT, and FHWA, Mr. Snavelly prepared and submitted a mussel survey plan, developed salvage strategies, and conducted agency negotiations for the development of a Biological Assessment and Biological Opinion to collect and relocate federally endangered Dwarf Wedgemussel (*A. heterodon*) from the area of direct impact prior to construction activities. In total, over 8,000 live mussels were relocated including seven species. A total of 68 federal endangered Dwarf Wedgemussels were captured, tagged, and relocated to a USFWS approved location. One-month survivorship and monitoring studies were conducted relocated Dwarf Wedgemussels and reported to the USFWS. Task Manager, USFWS Qualified Surveyor Region 5.

National Park Service Chesapeake and Ohio Canal National Historic Park, McMaho's Mill Towpath Reconstruction and River Wall Restoration Freshwater Mussel and SAV Survey (2016-2020). The National Park Service (NPS) plans to rehabilitate an existing historic stone retaining wall and re-establish the historic towpath along an approximate 0.9-mile stretch in the Chesapeake and Ohio Canal National Historical Park between McMahon's Mill and Lock 42 in Washington County Maryland, bounded by Chesapeake and Ohio Canal (Canal) mileposts 88.0 and 89.0.

NPS also requested that Normandeau conduct a freshwater mussel presence and submerged aquatic vegetation (SAV) survey along the Potomac River littoral zone proposed for construction. Normandeau evaluated the presence and distribution of species with special protection status in proximity to the existing towpath wall and incorporate these sensitive areas into the preliminary design alternatives to develop appropriate avoidance and minimization measures.

A total of 863 live individuals representing five (5) species was observed within the survey area. The state rare Atlantic spike (*Elliptio producta*) represented nearly 98 percent of the total catch. The state endangered green floater (*Lasmigona subviridis*) was the next abundant comprising nearly one (1) percent of the total catch. The remaining approximate one (1) percent of the total catch comprised the eastern elliptio (*Elliptio complanata*, 0.5%), pocketbook (*Lampsilis cardium*, 0.3%), and paper pondshell (*Utterbackia imbecillis*, 0.3%).

Longview Property Aquatic Resource Characterization, Confidential Client, Chester County, PA (2016-Present). In coordination with the property owner and project counsel on behalf of its client, Mr. Snavelly evaluated existing aquatic habitat conditions from three drainages. Physical habitat, biological and water quality data were used to determine points of first use and determine boundaries between ephemeral, intermittent and perennial stream channels within the subject property. Macroinvertebrate samples were collected using the PA Index of Biotic Integrity (IBI) protocols and analyzed as part of this evaluation. Mr. Snavelly was responsible for survey design, sample analysis, technical reporting and project and agency coordination. Project Manager.

Pennsylvania Fish and Boat Commission Federal Endangered Mussel PIT Tagging Pilot Study, Allegheny River and Conowingo Creek, Warren County, PA (2014). Mr. Snavelly assisted the PFBC with the PIT tagging, processing, and relocation of the federal endangered Clubshell (*Pleurobema clava*) and Northern Riffleshell (*Epioblasma torulosa rangiana*). A total of 90 individuals from each species were PIT tagged and translocated to the Conowingo Creek to assess mark recapture efficiency and species survivorship.

Chemours Shoreline Access Mussel Relocation, Ohio River Parkersburg, WV (2015). Mr. Snavelly served as the project manager associated with the required mussel relocation efforts associated with temporary barge spudding and shoreline improvement projects. West Virginia Department of Natural Resources required that all

live mussels be relocated from the direct impact area prior to construction. Species were relocated to an approved location on Blennerhasset Island. Project Manager - USFWS Qualified Surveyor and West Virginia Approved Surveyor.

Freshwater Mussel Survey, Matrix Realty Outfall Project, Delaware River, Burlington County, NJ (2016-2017). Mr. Snively performed freshwater mussel survey efforts as previously designed, assisted with Impact Avoidance Plans, and conducted agency coordination efforts. Over 2,300 live mussels including four live species were encountered: Eastern elliptio (*E. complanata*), Eastern Floater (*P. cataracta*), Tidewater Mucket (*L. ochracea*), and Eastern Pondmussel (*L. nasuta*). Mr. Snively led agency negotiation efforts for reduction in relocation efforts and assisted with the Impact Avoidance Plan for submittal to the NJDEP. USFWS Qualified Dwarf Wedgemussel Surveyor.

FERC Relicensing Project, Attean Pond Freshwater Mussel Survey, Brookfield Energy, Somerset County, ME (2016-2019). Mr. Snively performed freshwater mussel survey efforts as previously designed. Over 14,000 live mussels including three live species were encountered: Eastern Elliptio (*E. complanata*), Eastern Floater (*P. cataracta*), and Triangle Floater (*A. undulata*). Mr. Snively provided agency negotiation support and prepared the final report documents for submittal to the state agency. Project Manager - USFWS Qualified Dwarf Wedgemussel Surveyor.

Route 94 Bridge Repair Project, New Jersey Department of Transportation, Paulins Kill River, Warren County, NJ (2017-2019). Mr. Snively prepared and submitted a mussel survey plan and led agency negotiations for freshwater mussel survey services targeting the federally endangered Dwarf Wedgemussel (*A. heterodon*). Survey work was completed in the 2017 survey season. Over 2,000 live mussels were identified during the Phase 1 survey activities including the state threatened Eastern Lampmussel (*Lampsillis radiata*). Evaluations of the direct and indirect project impacts were summarized to determine applicable avoidance and minimization measures for the bridge repair project. Project Manager - USFWS Qualified Dwarf Wedgemussel Surveyor.

Interstate 81 Bridge Improvement Project, MD State Highway Administration, Potomac River, Washington County, MD (2016-2017). Mr. Snively developed and submitted a river wide survey and salvage plan for this bridge project. The salvage plan was approved and implemented by Maryland DNR and the consultant team for the detection and relocation of inhabitant mussel species. Project Manager, USFWS Qualified Surveyor.

Dwarf Wedge Mussel Survey, Delaware River, City of Port Jervis Whitewater Park, Pike County, PA and Sullivan County, NY (2014-2017). Mr. Snively prepared and submitted a mussel survey plan and led the project survey efforts as designed. Over 1,000 live mussels of five live species were encountered: Eastern elliptio (*E. complanata*), Alewife Floater (*A. implicata*), Eastern Floater (*P. cataracta*), Creep (*S. undulatus*), and Yellow Lampmussel (*L. cariosa*). Project Manager - USFWS Qualified Dwarf Wedgemussel Surveyor.

Schoharie Creek Freshwater Mussel Survey, Schoharie Creek, NY (2014). Mr. Snively prepared and submitted a mussel survey plan and led the project survey efforts as designed. This project included the survey and relocation of State listed species associated with the placement of a temporary water intake structure. Five live species were encountered: Giant Floater (*P. grandis*), Creeper (*S. undulatus*), Fluted Shell (*L. costata*), Elktoe (*A. marginata*) and Yellow Lampmussel (*L. cariosa*). Project Manager - USFWS Qualified Dwarf Wedgemussel Surveyor.

Delaware River Pipeline Repair Project, Warren County, NJ (2014-2015). Mr. Snively served as the project manager and natural resource coordinator for a mussel survey operation on the Delaware River in New Jersey. As the USFWS Qualified Surveyor Mr. Snively prepared and submitted a mussel survey plan for approval by the NJDEP and USFWS and led the project survey efforts as designed by the approved survey plan requirements. This project involved visual and tactile searches using the Smith et. al 2000, 2001, and 2006 protocols. Both transect and timed searches were employed along with an assessment of river substrate, available habitat, and species distribution. Project activities involved the translocation of several mussel species to a USFWS and

NJDEP approved location to facilitate the dig, lift, repair of an existing transmission line. Over 1,500 live mussels including 5 live species were encountered including Eastern Elliptio (*E. complanata*), Alewife Floater (*A. implicata*), Eastern Floater (*P. cataracta*), Triangle Floater (*A. undulata*), and Yellow Lampmussel (*L. cariosa*). Project Manager, Natural Resource Coordinator.

Big Darby Creek, S.R. 245 Bridge Replacement Project, Union County, OH (2014). Mr. Snively assisted in the qualitative survey of freshwater mussels within the Big Darby Creek (West Virginia Mussel Sampling Protocols; Smith, et al. 2000). This project involved surveying approximately 300 meters of Big Darby Creek (250m downstream and 150m upstream) for unionids prior to the replacement of an existing bridge structure. This project involved midden searches, visual and tactile surveys, viewing buckets, SCUBA, and periodic excavation. Several species of live mussels were encountered including the Fat Mucket (*L. siliquioidea*), Cylindrical Papershell (*A. ferussacianus*), Spike (*E. dilatata*), Wabash Pigtoe (*F. flava*), Creek Heelsplitter (*L. compressa*), and Giant Floater (*P. grandis*). Qualified Surveyor.

Conodoguinet Creek Aquatic Characterization S.R. 4021 Bridge Replacement Project, Cumberland County, PA (2002). Mr. Snively assisted in the qualitative survey of freshwater mussels within the Conodoguinet Creek (Smith, et al. 2000). This project involved surveying 500 meters of Conodoguinet Creek (300m downstream and 200m upstream) for the historically documented Green Floater (*L. subviridis*) prior to the replacement of an existing bridge structure. This project involved midden searches, visual and tactile surveys, viewing buckets, and periodic excavation. A total of 1,102 live mussels were encountered including two unionid species; the Atlantic Spike (*E. complanata*) and Creeper (*S. undulatus*). Senior Biologist.

North Branch Susquehanna River – Mifflinville Sewer Force Main Project, Columbia County, PA (2003). This project involved a survey for the Yellow Lampmussel (*L. cariosa*) and the Green Floater (*L. subviridis*) for the placement of a sewer force main across the North Branch Susquehanna River. Survey protocols were coordinated with the Pennsylvania Fish and Boat Commission (Smith, et al. 2000; Strayer and Smith, 2003). The project involved surveying 300 meters of the North Branch (200m downstream and 100m upstream) including midden searches, visual and tactile searches, snorkeling, SCUBA, viewing buckets, and periodic excavation. A total of 60 live mussels were encountered including six unionid species; the Yellow Lampmussel (*L. cariosa*), Green Floater (*L. subviridis*), Elktoe (*A. marginata*), Creeper (*S. undulatus*), Eastern Floater (*P. cataracta*), and Triangle Floater (*A. undulata*) within the zone of direct and indirect effects of the proposed project. Task Manager.

S.R. 0035 Juniata River Bridge Replacement Project, Juniata County, PA (2004). Mr. Snively assisted the Pennsylvania Fish and Boat Commission (Jeff Schmid) in the collection and relocation of freshwater mussels located within the zone of direct and indirect effects of the proposed bridge structure and causeway. A total of 45 live mussels were encountered including three unionid species; the Eastern Spike (*E. complanata*), Yellow Lampmussel (*L. cariosa*), and Rainbow (*V. iris*). In addition, two other relict unionid species were also detected, the Triangle Floater (*A. undulata*) and Elktoe (*A. marginata*). Captured live individuals were relocated upstream of the existing vehicular bridge in a suitable substrate habitat where live individuals were previously detected. Task Manager.

Maryland Route 5 Roadway Improvement Project, St. Mary's County, MD (2008). This project involved coordination with the Maryland Department of Natural Resources (MD DNR) for potential effects on the Dwarf Wedgemussel (*A. heterodon*) from proposed MD 5 roadway improvements within the McIntosh Run watershed. The project area is located in the lower reaches of McIntosh Run (Leonardtwn) and the zone of tidal influence and therefore, detail mussel surveys were not required by MD DNR. Project Manager.

Natural Gas Pipeline Wetland and Watercourse Delineations, Williams Midstream, LLC., PA (2011-2015). Responsible for coordinating and conducting delineation efforts on approximately seven miles of new natural gas transmission pipeline in Susquehanna County, PA. Efforts included coordination with project land agents, GPS (Trimble Geo- XH) survey, and the project team. Responsible for effective communication project conditions for

the purposes of submitting necessary reporting and permitting requirements. Senior Biologist – Field Crew Leader.

Natural Gas Pipeline Post-Construction Impact Assessment, Williams Midstream, LLC., PA (2014). Responsible for post-construction evaluation and delineation of existing, new, and/or impacted wetlands and watercourses over approximately 44 miles of constructed pipeline for after-the-fact permit negotiations with regulatory agencies. Efforts included the evaluation of all resources along the constructed pipeline and a determination between existing permitted, newly created, and recently impacted wetland and watercourse features under disturbed conditions. Senior Biologist – Field Crew Leader.

Kinder Morgan Saw Palmetto Pipeline, Sumter National Forest, Long Cane District (2014). Interstate environmental assessment and 404 permitting project. AECOM. FL, GA, SC RTE Project lead, including websters salamander, federally endangered Carolina heel splitter, Georgia aster, Oglethorpe oak, relict trillium, and other plant and tree species within the Sumter National Forest. Project activities included agency negotiation, field surveys with multiple protocols and multiple seasons. Threatened and Endangered Species Lead/Task Manager.

Seneca Owls Nest Seismic Testing, Forest and Elk Counties, PA (2011). Responsible for natural resource surveys regarding wetlands, watercourses, threatened and endangered species, invasive species avoidances, and sensitive areas for seismic testing for a 51-square mile tract in the Allegheny National Forest, Pennsylvania. Sensitive species surveys included birds, raptor nesting areas, rattlesnakes, and sensitive plant communities. Senior Biologist/Field Leader.

Southwestern Energy, PA (2011-2013). Responsible for wetland delineation, GPS survey, T&E species evaluation, permitting coordination, and project scheduling for nine miles of water supply and gathering line rights-of-way, impoundment locations, well pads, and water in-take structures. Conducted sensitive plant species surveys for soft-leaved sedge and marsh bedstraw. Responsible for effective communication project conditions for the purposes of submitting necessary reporting and permitting requirements. Senior Biologist – Task Manager/Field Crew Leader.

Chesapeake Energy Corporation, PA (2011-2014). Responsible for conducting aquatic surveys of macroinvertebrate and fish communities within watersheds in proximity to existing well pad locations. Responsible for evaluating temporal and community effects on biological communities following the placement of well pad structures within the Towanda Creek watershed. Principal taxonomist responsible for the identification of macroinvertebrates and laboratory quality control procedures. Evaluations included community metric calculations and Index of Biotic Integrity (IBI) as outlined in the Pennsylvania Department of Environmental Protection (PADEP) protocols. Senior Aquatic Biologist – Project Manager.

El Paso Northeast Passage Natural Gas Transmission Line Project, Pennsylvania Section. Coordinated and conducted wetland delineations and aquatic assessments of surface water resources associated with the proposed natural gas transmission line of approximately 130 miles throughout south-central and northeastern Pennsylvania. Senior Biologist.

Specialty Granules Inc., Adams County, PA (2011-2015). Mr. Snavely conducted wetland delineations, aquatic assessments, natural resource assessments associated with the proposed expansion of a greenstone quarry in Adams County, PA. Project activities included wetland and watercourse delineations, benthic evaluations, watershed assessments, and multi T&E species evaluation as part of the feasibility study. Rare plant surveys were conducted for Nodding Trillium and Northeastern Bulrush. Coordination with site construction personnel to avoid rare plant populations was performed in conjunction with the PA Department of Conservation of Natural Resources. Natural Resource Lead.

Crystal Springs Land Development Project, Fulton County, PA (2006). Mr. Snavely led wetland delineations and aquatic assessments of all surface water resources associated with the proposed residential development of

approximately 550 acres in Crystal Springs, Fulton County, PA. The wetland and watercourse investigations for the proposed project resulted in the identification and delineation of approximately 15 acres of jurisdictional wetland and approximately 15,000 feet of jurisdictional watercourse. A preliminary jurisdictional determination of the identified aquatic resources was completed for the project with representatives of the U.S. Army Corps of Engineers, Baltimore District. Section 404 and Chapter 105 permit authorizations were successfully acquired for the project. Project Biologist.

Vulcan Quarries Planning Project, Loudon County, VA (2005-2007). Mr. Snively conducted wetland delineations, aquatic assessments, assisted with sensitive plant species surveys associated with the proposed siting of a new quarry location in Loudon County, VA. Project activities included wetland and watercourse delineations, benthic evaluations, headwater stream evaluations, and rare plant species/community evaluations as part of the feasibility study. Rare plant surveys were conducted for Narrowed-Leaved Mountain-Mint, Stiff Goldenrod and the Piedmont Prairie community. Natural Resource Lead.

Liberty Land Development Project, Adams County, PA (2007). Assisted with the coordination of wetland delineations and aquatic assessments of all surface water resources associated with the proposed residential development of approximately 744 acres in Liberty Township, Adams County. The wetland and watercourse investigations for the proposed project resulted in the identification and delineation of approximately 124 acres of jurisdictional wetland and approximately 21,500 feet of jurisdictional watercourse. A preliminary jurisdictional determination of the identified aquatic resources was completed for the project with representatives of the U.S. Army Corps of Engineers, Baltimore District. Staff Biologist.

Aquatic Resource Monitor and Wetland Delineator – US 220 Roadway Improvement Project, Blair and Center Counties, PA (2001-2011). Principal aquatic biologist responsible for permanent surface water monitoring throughout the South Bald Eagle Creek, North Bald Eagle Creek, and Buffalo Run watersheds. Monitoring includes evaluations of stream flow, ambient water quality, aquatic biota, and fluvial geomorphologic conditions in place for over ten years. Mr. Snively is currently responsible for the collection and evaluation of physiochemical, biological, and physical habitat data throughout the project for compliance with the state issued CWA 401 Water Quality Certification. He is the principal biologist responsible for the identification and evaluation of the benthologic communities throughout the project watersheds. Senior Biologist.

Wetland Delineator, and Water Quality/Aquatic Resources Assistant, Route 322-B02, Corridor O Project, Centre and Clearfield County, PA (2002-2004). Responsible for the identification and delineation of wetlands and the evaluation of aquatic resources throughout the approximate 12,000-acre project area. Mr. Snively was also responsible for the identification and classification of aquatic communities based on their inhabitant benthologic and finfish communities. Staff Biologist.

Wetland Delineator, and Water Quality/Aquatic Resources – Keyser's Ridge NPDES Treatment Systems, Garrett County, MD (2001-2011). Responsible for the delineation of wetlands and watercourses for upgrades and improvements to an active groundwater treatment system in Garrett County, Maryland. This project involved weekly water quality monitoring and calibration within the treatment system and quarterly monitoring along two unnamed tributaries to Lake Louise. This treatment system and long-term monitoring program was designed and retrofitted to transition from passive to active treatment and to re-establish trout communities within Lake Louise and its larger tributaries. This project involved ensuring compliance with permitted NPDES discharge requirement and reporting. Senior Biologist – Task Manager.

Wetland Delineator, Aquatic Resources, and Forest Stand Professional – MD 5 Leonardtown Roadway Improvements Project, St. Mary's County, MD (2008). Responsible for the delineation of wetlands and watercourses along a 1.8 mile stretch of Maryland Route 5 from Maryland Route 243 to Hollywood Drive north of Leonardtown, Maryland. This project also involved assessment of Nontidal Wetlands of Special State Concern along with the land cover within the project study corridor for impacts to adjacent forest stand and roadside trees

within the jurisdiction Roadside Tree and Reforestation Laws of Maryland as well as the Forest Conservation Laws of St. Mary's County. Assessment of seven watercourses, including McIntosh Run, using MD DNR MBSS protocols was conducted as part of this project. Senior Biologist – Task Manager.

Water Quality and Aquatic Resources Professional – Intercounty Connector Project Contract C, Montgomery and Prince Georges County, MD (2009-2011). Responsible for the deployment of solar powered continuous water quality stations for pre-, active, and post- construction monitoring in the Little Paint Branch and Indian Creek Watersheds. The project involved management of routine water quality station maintenance and calibration. Responsible for collection, identification, and relocation of freshwater fish during channel dewatering and relocation efforts. This effort required a MD DNR collectors permit. Also assisted with Box Turtle translocation efforts using visual, tactile, and canine detection methods. Senior Biologist – Task Manager.

Interstate 81 Widening Mitigation Site Evaluation, Washington County, MD (2005-2008). Project manager responsible for the identification of potential wetland and stream mitigation sites within the Conococheague watershed for inclusion in the Maryland State Highway Administration's Conceptual Mitigation Design Package. This project involved the coordination and over-site of field staff, land owner consultation, and coordination with the US Army Corps of Engineers, US Fish and Wildlife Service, Maryland State Highway Administration, and Maryland Department of the Environment. Successfully attained interagency approval for the mitigation alternatives. Senior Biologist.

Wetland Delineator and Forest Stand Professional – Boyer's Mill Road, Frederick County, MD (2009). Project manager responsible for the delineation of wetlands and watercourses along 4.4 miles of Boyer's Mill Road from Gas House Pike to Old National Pike. This project also involved assessment of the land cover within the project study corridor for impacts to adjacent forest stand and roadside trees within the jurisdiction Roadside Tree and Reforestation Laws of Maryland as well as the Forest Conservation Laws of Frederick County. Detailed agency coordination with the ACOE, MDE, and Frederick County was required to address future mitigation strategies. Senior Biologist – Project Manager.

Wetland Delineator and Forest Stand Professional – Maryland State Highway Administration (MDSHA) (2007-2011). Project manager responsible for the delineation of wetlands and watercourses on numerous MD SHA projects in Districts 3, 4, 5, 6, and 7. These projects involved completion of delineation reports for inclusion in Maryland Joint Permit application. Agency coordination with the ACOE and MDE was conducted to present resource boundaries and conduct impact assessments. Senior Biologist – Project Manager.

Broadneck Road Stream Restoration Project, Anne Arundel County, MD (2009-2010). Task manager responsible for the coordination and completion of wetland and watercourse delineations and forest stand delineations. This inventory was conducted for the completion of an Environmental Assessment and associated permitting requisites for stream restoration. The delineation of the approximate 1.6-mile project area was conducted to facilitate the planning and design of stream restoration efforts on behalf of the Anne Arundel County Department of Public Works. Senior Biologist – Task Manager.

SPECIAL TRAINING

Detailed species experience from 2013 to present is extensive available upon request

West Virginia Freshwater Mussel Taxonomy Class, Janet Clayton (WVDNR) 2020

Ohio Freshwater Mussel Taxonomy Class Tom Watters, FMCS 2017

North Carolina Freshwater Mussel Taxonomy North Carolina Tim Savidge, American Fisheries Society 2017

Freshwater Mussel Taxonomy Workshop, Art Bogan, Mid- Atlantic Water Pollution Biologists Workshop (2008)



Attachment 2
MassDOT Plans

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION

HIGHWAY DIVISION

PLAN AND PROFILE OF CREAMERY ROAD BRIDGE REPLACEMENT OVER WARE RIVER (BRIDGE NO. H-08-003=N-07-002 (C7G))

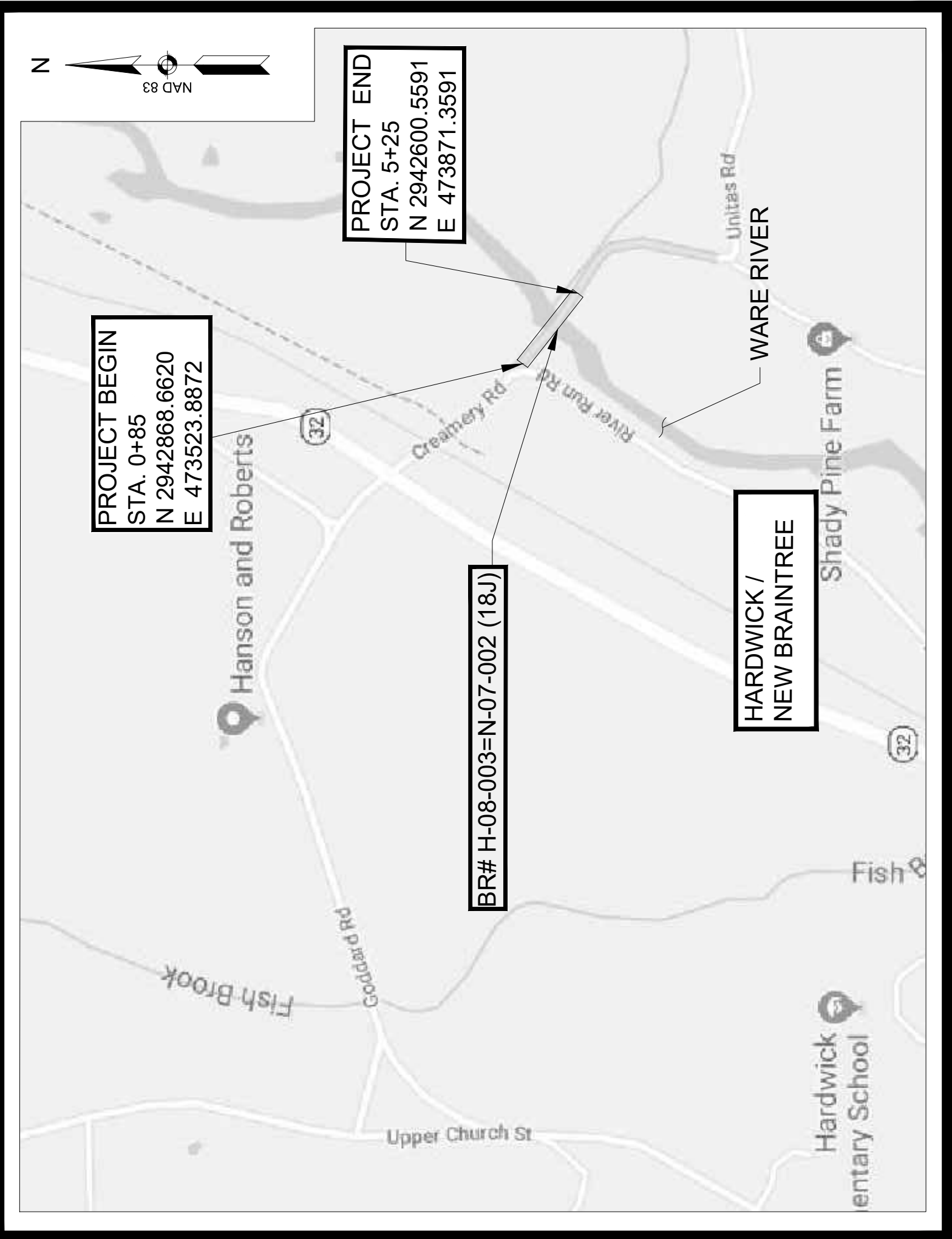
IN THE CITY/TOWN OF HARDWICK/NEW BRAINTREE WORCESTER

FEDERAL AID PROJECT NO. 608851

100% SUBMITTAL

SHEET NO.	DESCRIPTION
1	TITLE SHEET & INDEX
2	LEGEND & ABBREVIATIONS
3	TYPICAL SECTIONS
4	RETAINING WALL DETAILS
5	CONSTRUCTION PLANS
6	PROFILE
7	GRADING PLAN
8-9	WETLAND REPLICATION PLAN
10	TRAFFIC SIGN SUMMARY SHEET
11-12	TEMPORARY TRAFFIC CONTROL PLANS
13-30	BRIDGE PLANS
31-34	CROSS SECTIONS

INDEX



0 500 1000 1500 2000

SCALE: 1" = 500'

LENGTH OF PROJECT = 490.85 FEET = 0.09 MILES

HARDWICK/NEW BRAINTREE
CREAMERY ROAD

STATE	FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	1	34
PROJECT FILE NO.		608851	



TITLE SHEET & INDEX

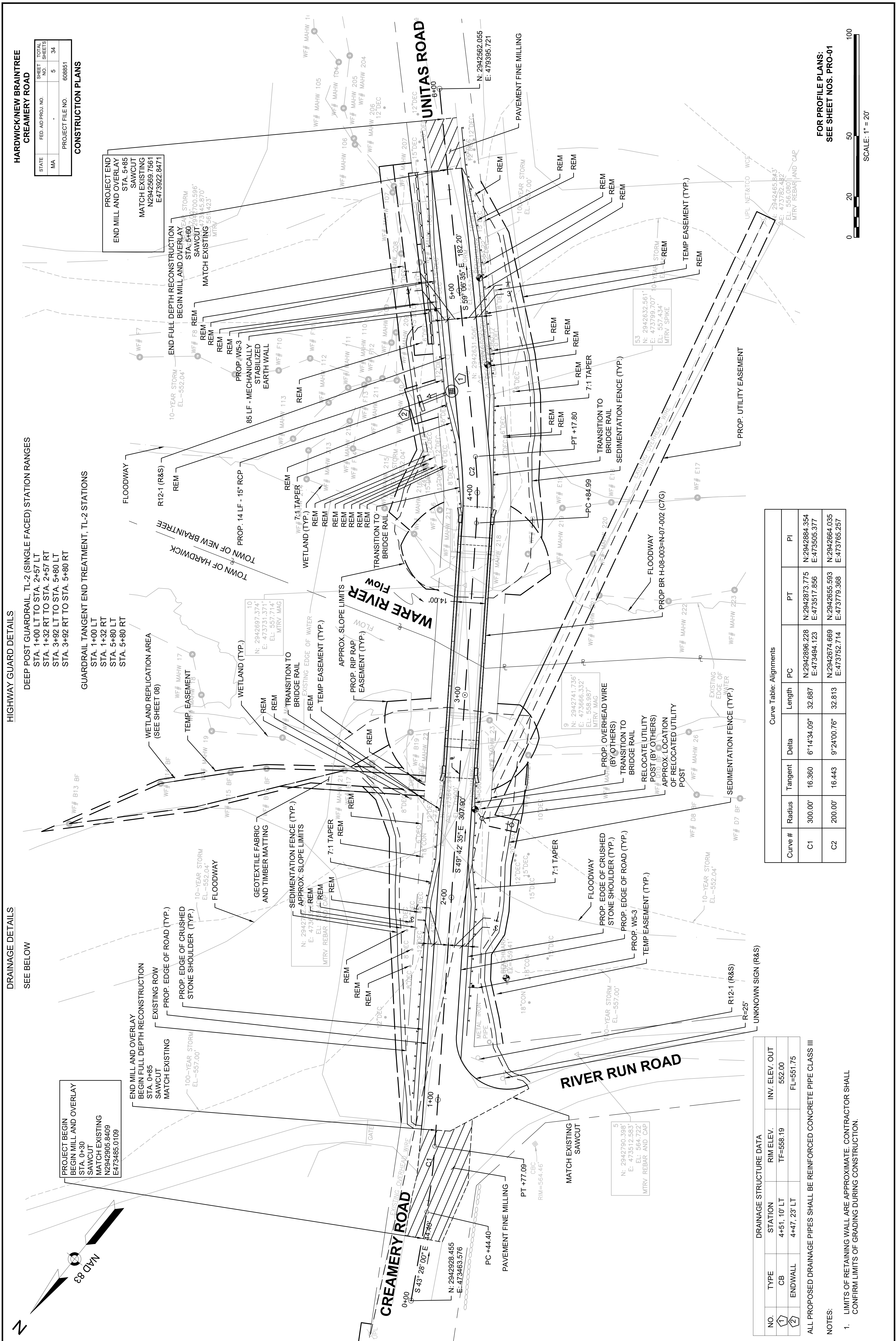
THE MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES DATED 2022, AS AMENDED, THE SUPPLEMENTAL SPECIFICATIONS DATED JUNE 30, 2022, THE OCTOBER 2017 CONSTRUCTION STANDARD DETAILS, THE 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, THE LATEST MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS WITH MASSACHUSETTS AMENDMENTS, THE 1980 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS, THE 1966 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING, AND THE LATEST EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK, WILL GOVERN.

DESIGN DESIGNATION (CREAMERY ROAD)

DESIGN SPEED 25 MPH
ADT 109

MO-DD-YYYY	PRELIMINARY ROW
DATE	DESCRIPTION
	REV #

 BL Companies 345 Shawsheen Parkway Middletown, CT 06457 (203) 934-3515 Fax (203) 934-3516 Fax	 massDOT Massachusetts Department of Transportation Highway Division
RECOMMENDED FOR APPROVAL	RECOMMENDED FOR APPROVAL
CHIEF ENGINEER	DATE
DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION APPROVED:	APPROVED
DIVISION ADMINISTRATOR	DATE
HIGHWAY ADMINISTRATOR	DATE



HARDWICK/NEW BRAINTREE
CREAMERY ROAD

STATE
MA

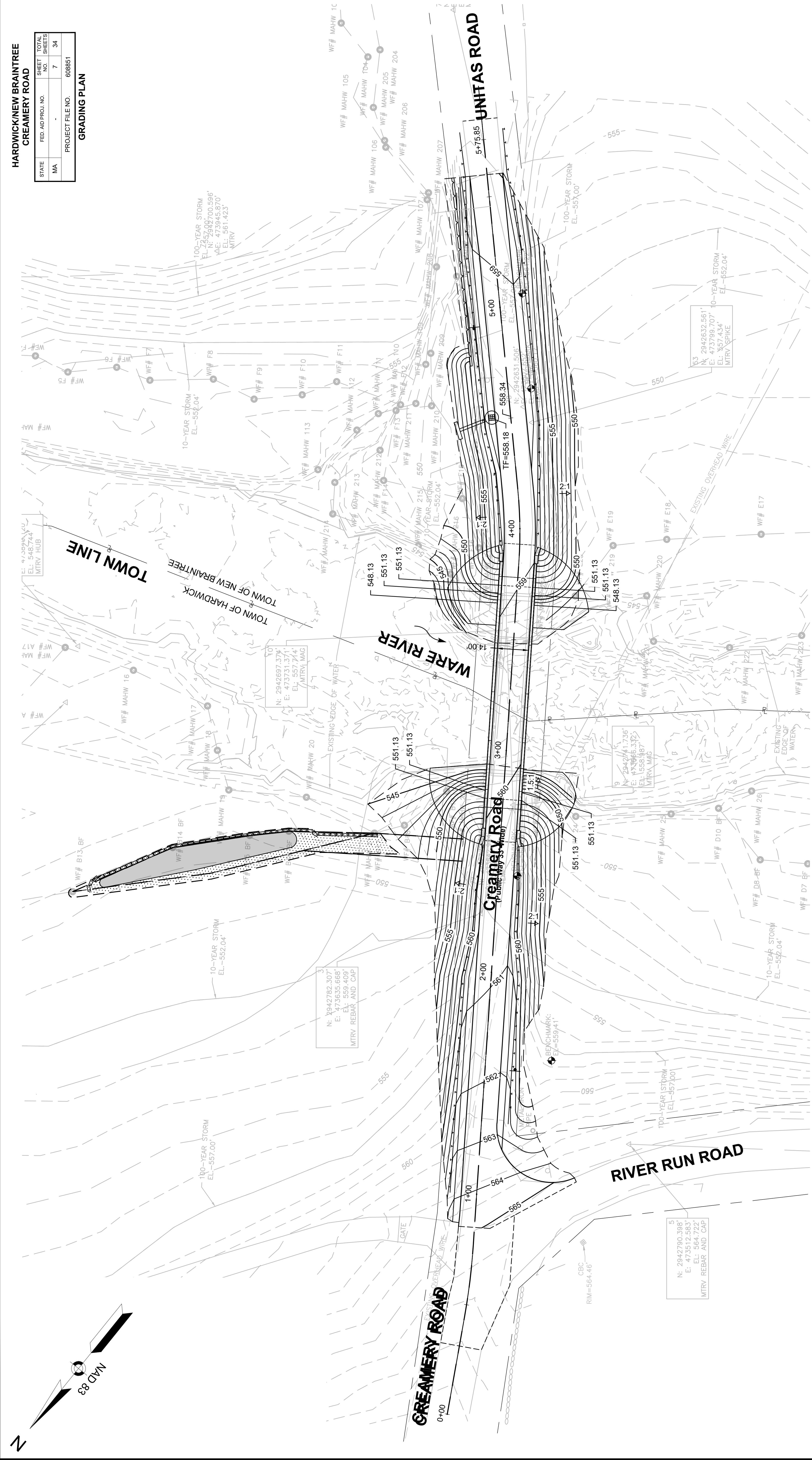
FED. AID PROJ. NO.
-

SHEET NO.
7

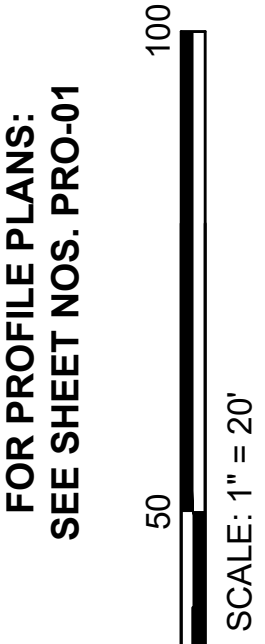
TOTAL SHEETS
34

PROJECT FILE NO.
608851

GRADING PLAN

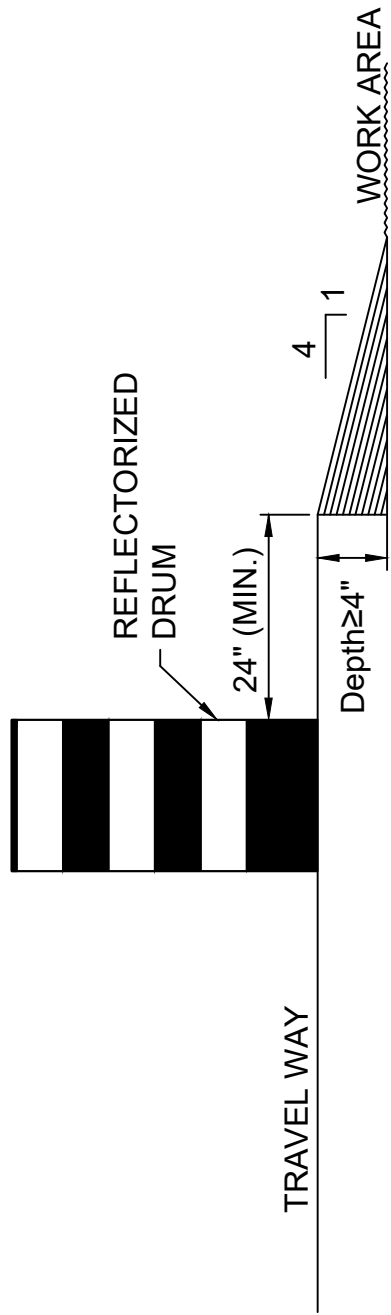
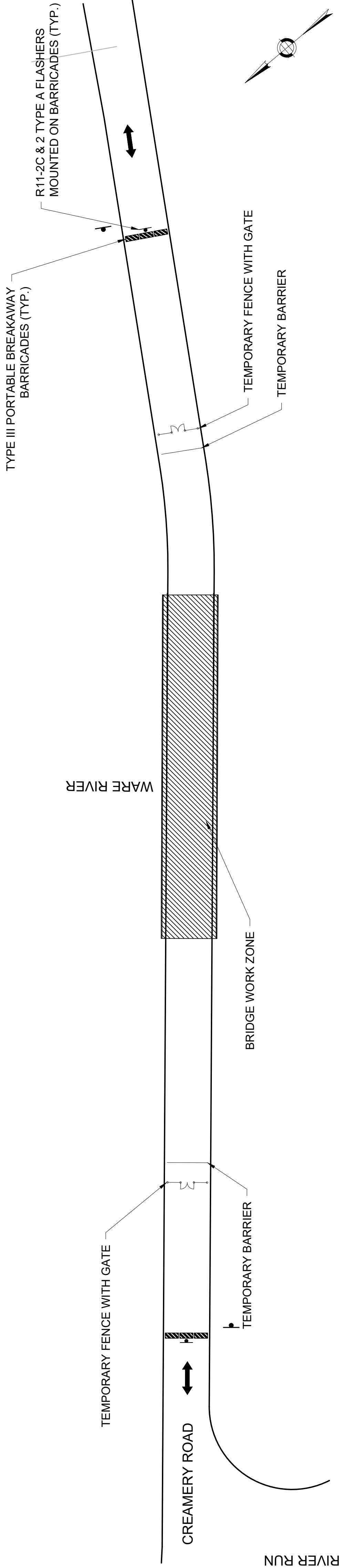


- NOTES:
- LIMITS OF RETAINING WALL ARE APPROXIMATE. CONTRACTOR SHALL CONFIRM LIMITS OF GRADING DURING CONSTRUCTION.



BRIDGE CLOSURE

1" = 20'



LATERAL DROP-OFF DETAIL

NOT TO SCALE

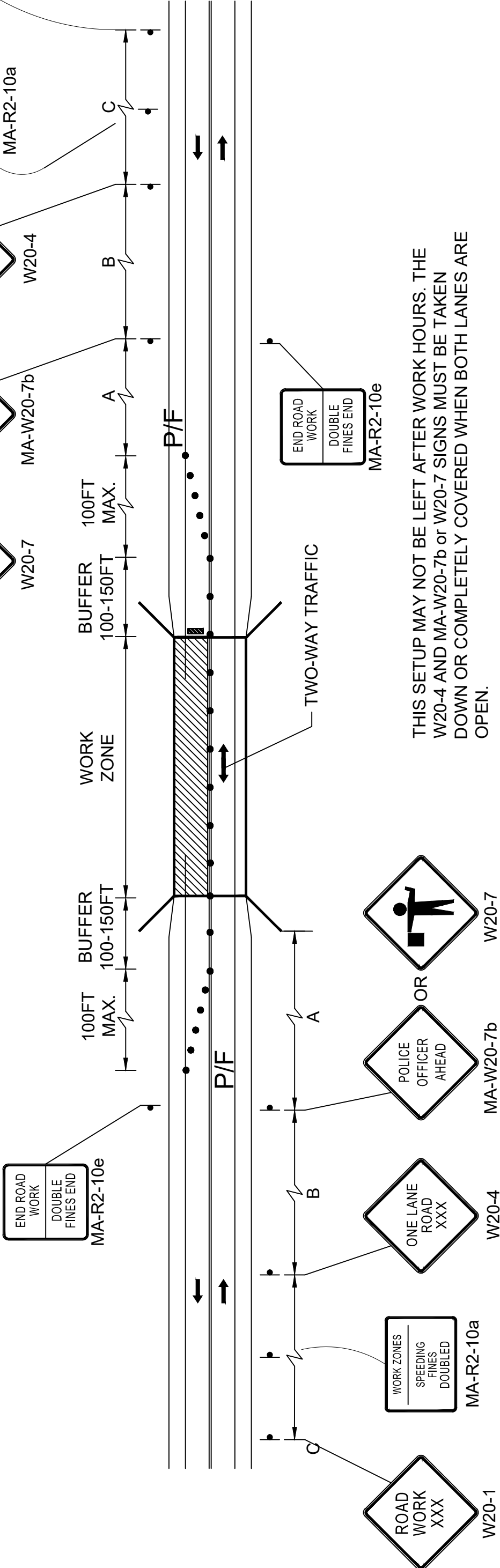
THE IDEAL CAPACITY OF A MAJOR HIGHWAY IS GENERALLY CONSIDERED TO BE 1900 PASSENGER CARS PER HOUR PER LANE (PCPHPL). IN WORK ZONES ON A MULTI-LANE DIVIDED HIGHWAY, THE FOLLOWING VOLUME GUIDELINES HAVE BEEN SUGGESTED:

MEASURED AVERAGE WORK ZONE CAPACITIES

NUMBER OF LANES NORMAL (EXISTING)	NUMBER OF STUDIES (TO TRAFFIC)	AVERAGE CAPACITY	
		VPH	VP/PL
3	1	1,170	1,170
2	1	1,340	1,340
5	8	2,740	1,370
4	2	1,480	1,480
3	9	2,980	1,580
4	3	4,560	1,520

Source: Dudek, C., *Notes on Work Zone Capacity and Level of Service*, Texas Transportation Institute, Texas A&M University, College Station, Texas (1984)

BY OBTAINING HOURLY TRAFFIC COUNTS FOR A PARTICULAR ROADWAY (WITH A MINIMUM OF A 48-HOUR AUTOMATIC TRAFFIC RECORDER (ATR) COUNT), THIS WILL HELP TO DETERMINE AT WHAT TIMES OF THE DAY OR NIGHT A CERTAIN NUMBER OF LANES MAY BE CLOSED.



ONE LANE ALTERNATING TRAFFIC DETAIL (IF REQUIRED)

NOT TO SCALE

HARDWICK/BRAINTREE
CREAMERY ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	12	34
PROJECT FILE NO.		608851	

TEMPORARY TRAFFIC CONTROL PLANS - 02

NOTES:

- ALL DISTANCES MAY BE ADJUSTED TO FIT FIELD CONDITIONS, AS DIRECTED BY THE ENGINEER. HOWEVER, MINIMUM DISTANCES, WHERE INDICATED, SHOULD BE MAINTAINED.
- ALL SIGNS SHALL BE BLACK LEGEND ON A REFLECTIVE ORANGE BACKGROUND, UNLESS OTHERWISE NOTED, AND IN ACCORDANCE WITH MUTCD & MASSDOT STANDARDS. ALL CONSTRUCTION SIGNS SHALL BE ATTACHED TO THEIR OWN INDEPENDENT SUPPORTS, UNLESS OTHERWISE NOTED.
- THE CONTRACTOR MUST MAINTAIN ACCESS AND EGRESS AT ALL TIMES TO ALL PROPERTIES AND ROADWAYS ABUTTING THE WORK ZONE.
- SIGNS AND SIGN SUPPORTS LOCATED ON OR NEAR THE TRAVELED WAY MUST PASS THE CRITERIA SET FORTH IN THE NCHRP 350 REPORT.
- ALL SIGNS NOT APPLICABLE TO VARIOUS STAGES OF CONSTRUCTION SHALL BE REMOVED OR COVERED AS APPROVED BY THE ENGINEER.
- ALL BARRICADES NEAR THE WORK AREA MUST HAVE TWO TYPE A FLASHERS MOUNTED ON THEM.
- THE CONTRACTOR SHALL SET BARRICADES, WARNING LIGHTS, AND OTHER PROTECTIVE DEVICES THAT ARE NECESSARY IN THE JUDGEMENT OF THE ENGINEER, FOR THE PROTECTION OF THE PUBLIC.

SUGGESTED WORK ZONE WARNING SIGN SPACING

ROAD TYPE	DISTANCE BETWEEN SIGNS **		
	A	B	C
LOCAL OR LOW VOLUME ROADWAYS*	350	350	350
MOST OTHER ROADWAYS*	500	500	500
FREEWAYS AND EXPRESSWAYS*	1,000	1,500	2,640

* ROAD TYPE TO BE DETERMINED BY MASSDOT OFFICE OF TRANSPORTATION PLANNING.

** DISTANCES ARE SHOWN IN FEET. THE COLUMN HEADINGS A, B, AND C ARE THE DIMENSIONS SHOWN IN THE DETAIL/TYPICAL SETUP FIGURES. THE A DIMENSION IS THE DISTANCE FROM THE TRANSITION OR POINT OF RESTRICTION TO THE FIRST SIGN. THE B DIMENSION IS THE DISTANCE BETWEEN THE FIRST AND SECOND SIGNS. THE C DIMENSION IS THE DISTANCE BETWEEN THE SECOND AND THIRD SIGNS. (THE "THIRD" SIGN IS THE FIRST ONE TYPICALLY ENCOUNTERED BY A DRIVER APPROACHING A TEMPORARY TRAFFIC CONTROL (TTC) ZONE.)

THE "THIRD" SIGN ABOVE IS TYPICALLY REFERRED TO AS AN "ADVANCE WARNING" SIGN ON THE TTCP SETUPS. THESE ADVANCE WARNING SIGNS ARE LOCATED PRIOR TO THE PROJECT LIMITS ON ALL APPROACHES (i.e. THE W20-1 SERIES (ROAD WORK XX FT) SIGNS), AND USUALLY REMAIN FOR THE DURATION OF THE PROJECT. ADDITIONAL SIGNS (i.e. "RIGHT LANE CLOSED 1 MILE" AND "LEFT LANE CLOSED 1 MILE") HAVE BEEN SHOWN IN SOME FIGURES AS EXAMPLES OF REINFORCEMENT SIGN PLACEMENT BUT ARE USED IN RARE OCCASIONS.

THE FIRST AND SECOND WARNING SIGNS ABOVE ARE REFERRED TO AS THE OPERATIONAL (DAY-TO-DAY) WORK ZONE SIGNS AND MAY BE MOVED DEPENDING ON WHERE THE SPECIFIC ROADWAY WORK FOR THAT DAY IS LOCATED.

MA-R2-10a SIGNS SHALL BE PLACED BETWEEN THE SECOND AND THIRD SIGNS AS DESCRIBED ABOVE.

MA-R2-10a, MA-R2-10e, AND W20-1 SERIES SIGNS ARE TO BE INCLUDED ON ALL DETAILS/TYPICAL SETUPS.

Based on: Table 6C-1 MUTCD LATEST EDITION

STOPPING SIGHT DISTANCE AS A FUNCTION OF SPEED

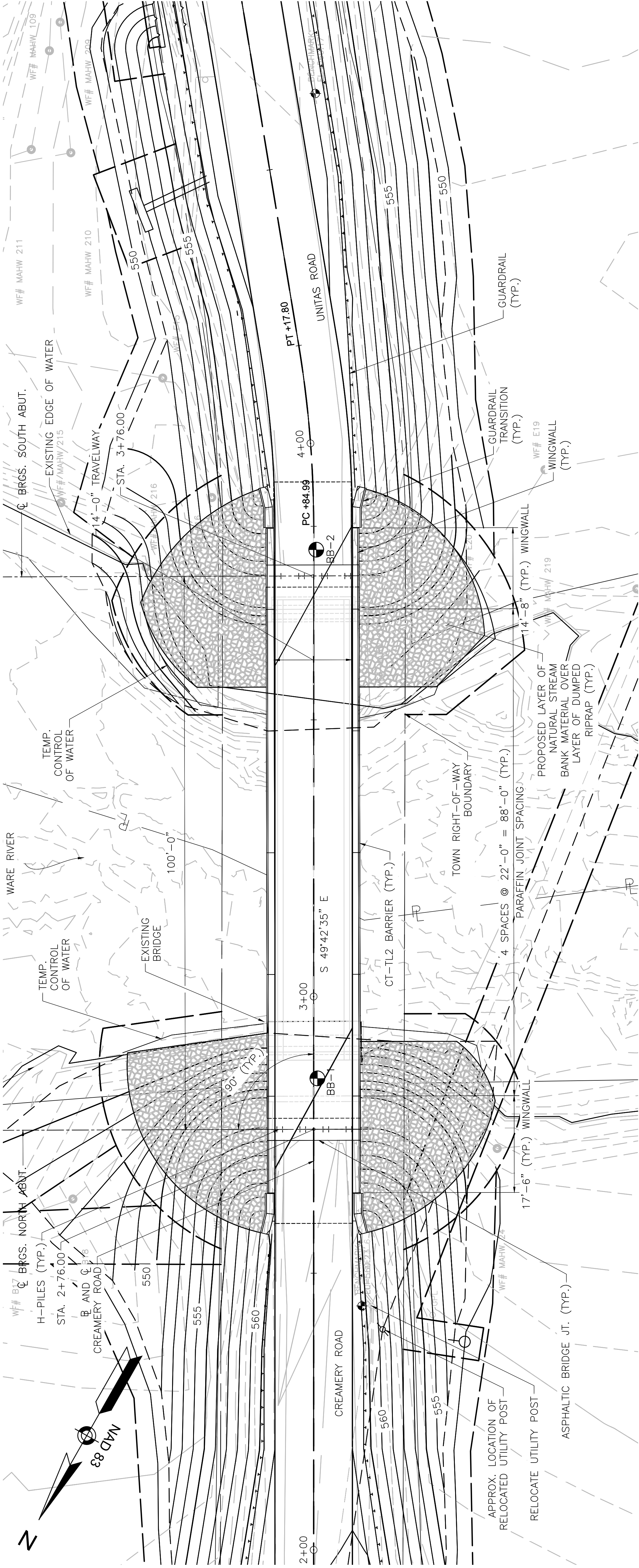
SPEED* (mph)	DISTANCE (ft)
20	115
25	155
30	200
35	250
40	305
45	365
50	425
55	495
60	570
65	645
70	730
75	820

*POSTED SPEED, OFF-PEAK 85TH-PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED

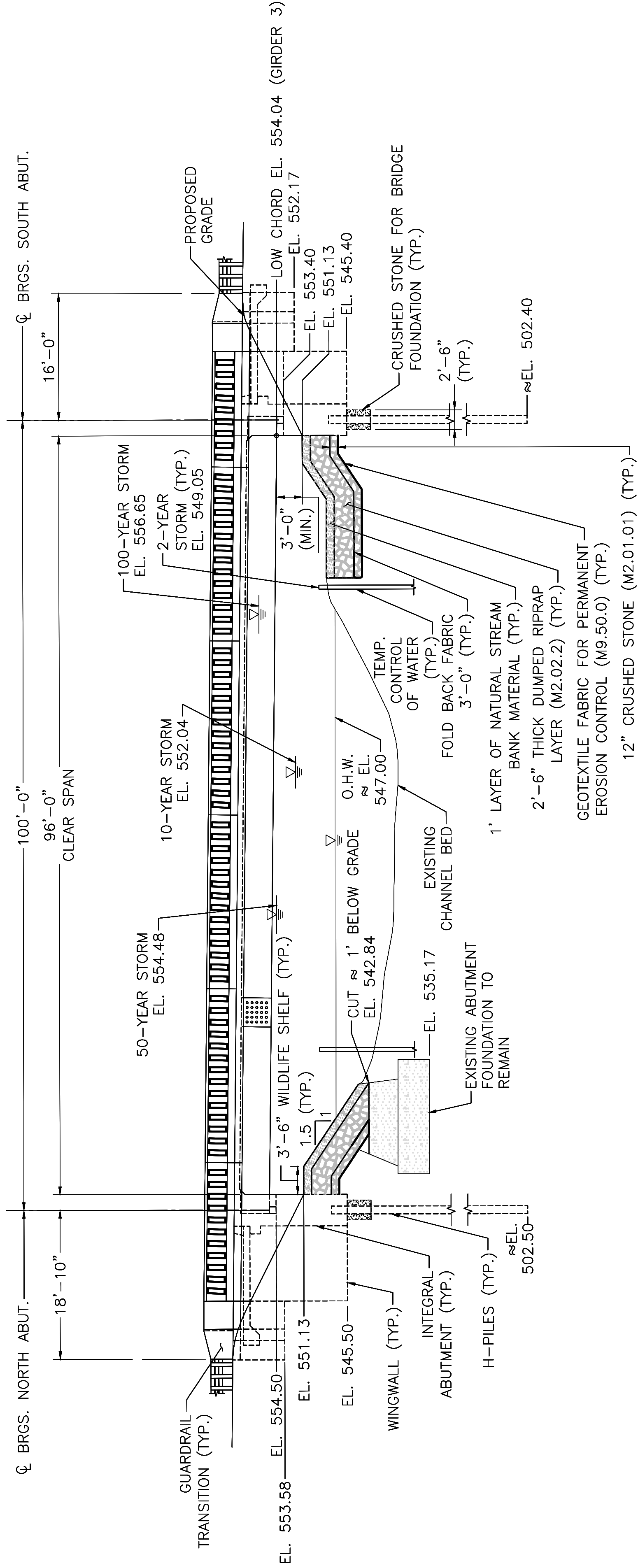
THESE VALUES MAY BE USED TO DETERMINE THE LENGTH OF LONGITUDINAL BUFFER SPACES.

THE DISTANCES IN THE ABOVE CHART REPRESENT THE MINIMAL VALUES FOR BUFFER SPACING.

Source: Table 6C-2 MUTCD LATEST EDITION



GENERAL PLAN
SCALE: 1" = 10'



WEST ELEVATION
SCALE: 1" = 10'

HARDWICK-NEW BRAINTREE
CREAMERY ROAD

STATE	FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#	16	34
PROJECT FILE NO. 608851		608851	

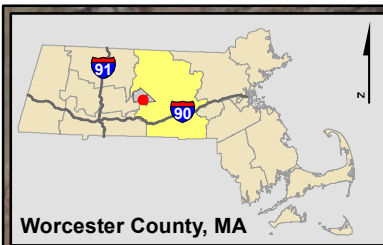
GENERAL PLAN & ELEVATION

9/16/2022	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT AUTHORIZED SIGNATORY: _____	
STATE BRIDGE ENGINEER	
USE ONLY PRINTS OF LATEST DATE	



Attachment 3

Proposed Survey Plan Mapping



Massachusetts 2019 USGS Color Ortho Imagery



- Area of Direct Impact (ADI) - 507 sq m
- Downstream Buffer - 3,029 sq m
- Upstream Buffer - 1,777 sq m

0 10 20 40 Meters

0 30 60 120 Feet

**Proposed Survey Area
Bridge over the Ware River
Hardwick- New Braintree
Worcester County, MA**



Date:
3/16/2023

APPENDIX B

Scientific Collector's Permit



DIVISION OF FISHERIES & WILDLIFE

1 Rabbit Hill Road, Westborough, MA 01581

p: (508) 389-6300 | f: (508) 389-7890

MASS.GOV/MASSWILDLIFE

Scientific Collection Permit INVERTEBRATES

**VALID
2023**

Normandeau Associates
Joseph Snavelly
156 Echo Drive
Chambersburg, PA 17202

Date: 9/29/2023
NHESP Tracking #: 23-8704
Permit #: 950.23WI

Subpermittees: Joe Battaglia, Richard Bistline, Claire Leedy, John Miller, Cassidy Manzonelli, Dan Geiger, Jason Gagnon

is (are) hereby authorized, in accordance with the provisions of Section 4, Chapter 131 and 131A of the Massachusetts General Laws, to remove from the wild within the Commonwealth, subject to conditions set forth below, the following species and numbers:

May hand capture all species of freshwater mussels as part of presence/absence survey. Must follow the NHESP endangered species survey guidelines for freshwater mussels and/or approved scope of work. NHESP species observation forms must be submitted for all state-listed rare species encountered via the Division's online data portal. Within 10 days of the first observation of a given state-listed species, a NHESP species observation form must be submitted to the NHESP. All other NHESP species observation forms reporting subsequent observations of a given species shall be submitted by December 31.

The following method(s) of taking is (are) hereby authorized:

Hand Capture

Collection activities under this permit shall be restricted to the following locations, subject to the approval of private landowners

Creamery Road over Ware River, Hardwick, New Braintree

All specimens secured under this permit shall be donated to the following institutions:

All live specimens shall be released. A representative collection of spent shells may be collected and submitted as voucher specimen to NHESP; others may be donated to a university or research institution.

No specimen taken under the authority of this permit may be sold. No specimen may be transferred to another not duly licensed.

This permit of a copy thereof shall be carried at all times by the permittee and subpermittee(s) while engaged in the activities authorized herein.

This permit does not absolve the permittee from compliance in full with any and all other applicable federal, state and local requirements, including the acquisition of a federal endangered species permit if required.

Upon expiration of this permit, a complete report detailing all collection activities shall be filed with this office and must include a listing of all species taken, numbers of specimens, and the disposition of same.

This permit, unless sooner revoked for cause, shall expire on December 31 of the year of issue.

Mark S. Tisa, Director

APPENDIX C

Field Data Sheets

Date 26 Sept 2023

Freshwater Mussel Data Sheet

Page 1 of 2

Project Name/No.: 24055.004 Mass DOT Creamery Rd.

Crew: ALB, JEE, CML, JCM

River/Stream Name Ware

State Mass

County Worcester

County

River Mile

Location/Town Andover - New Braintree

Weather

Cloudy to partly Sunny Drizzle AM
Rain PM 24

Air Temp: 45-63°F

Water Quality (T, pH, Flow, Cond, DO)

Water 58-60°F

Survey Type (Semi-quant/Qual/Quant/Reconn):

Comments

Time DSB 1, 2, 5, 6, 9 + ADI 3 @ 27min x 4 = 104 min

Visibility 1.0 + m

Dispersal/Type 1.04M

Rep			Unionid Data										Habit/Substrate (%)						
T/Q/Size	X	Y	Species	L	AJ	Age	LHW	FD	WD	SF	Depth	Br	Bo	Cb	Gr	Sd	St	Cl	Other
1	ADIF	3	ELCO	0	A						3						100	100	SAV
2	Partial		NoLive/shell	0															
3																			
4	USB	1	ELCO	2	A						3						100	100	SAV
5																			
6																			
7	USB	2	ELCO	1	A						4						100	100	SAV
8																			
9																			
10	USB	5	NoLive/shell	0							3						100	100	SAV
11																			
12																			
13	USB	6	ELCO	1	A						3						100	100	SAV
14																			
15																			
16	USB	9	NoLive/shell	0							3						100	100	SAV
17																			
18			Large Emergent veg pocket w/ Arrow Weed soft stem																
19			Buttish. Silt w/ High organic content.																
20																			
21	ADI	1	ELCO	32	M	3012					8	10	15	75			50%	100	SAV
22			STUN	1	A	49x27x170													
23																			
24	ADI	3	ELCO	7	A						8	10	15	75			50%	100	SAV
25																			
26																			
27	ADI	2	ELCO	3	A						8								
28		30	M. marginifera	30	A														
29																			
30																			

Time 1432-1449 x2
90 55 37mm
2070

Large Emergent veg pocket w/ Arrow Weed soft stem
Bulrush. Silt w/ High organic content.

Time 1405-1416 x2

Time 1417-1428 x2

Time 1432-1449 x2
90 5 5 37min

Photo Log Notes

ADI 2 Combined Adj Abutment Area

GPS Log Notes

Date 26 Sept 2023

Project Name/No.:

Freshwater Mussel Data Sheet

Page 2 of 2

Crew:

24055.004 Mass DOT Creamery Rd.

JCS, ALB, CML, JZM

River/Stream Name Ware

State Mass

County Worcester

County

River Mile

Location/Town Hemlock - New Braintree

Weather

Air Temp:

Water Quality (T, pH, Flow, Cond, DO)

Survey Type (Semi-quant/Qual/Quant/Reconn):

Comments

Rep*			Unionid Data										Habit/Substrate (%)									
TQ/SL*	X	Y	Species	L	AJ	Age	LH/W	FD	WD	SF	Depth	Br	Bo	Cb	Gr	Id	St	Cl	Other			
1	ADI	4	ELCO	38	A/S	30/8	—	—	4	8												
2			Mr. marginifera	26	A		—	—	1													
3																						
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
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21																						
22																						
23																						
24																						
25																						
26																						
27																						
28																						
29																						
30																						

Time 1449-1506 x 2
90 5 5 34 min
5 20 70

Photo Log Notes

GPS Log Notes

Date 9/27/23

Project Name/No.: _____

Freshwater Mussel Data Sheet

Page _____ of 7Crew: Emily JCS, PLS, JCMRiver/Stream Name creamery road Ware RiverCounty WareState MACounty Worcester

River Mile _____

Location/Town Hardwick - New Braintree

Weather _____

Air Temp: 42-65°FWater Quality (T, pH, Flow, Cond, DO) Sunny No Rain Past 24hrsWater 58-59°F

Survey Type (Semi-quant/Qual/Quant/Reconn): _____

Comments visibility @ 1.5 + meters - IdealUSB 3, 7, 10, 12 1044-1117 x 2 = 33 min10:42-11:35 35x2USB 4, 8, 11, 14, 16 1125-1210 x 1 = 45 min

Rep: _____

10:47-11:17

Unionid Data

Habit/substrate (%)

TQ/Site	X	Y	Species	L	AJ	Age	LAHW	FD	WD	BF	Depth	Br	Bo	Cb	Gr	Id	It	Cl	Other
1	3, 7, 10, 12		Elco	17	—			0	3	0	5				20	80			10 LVD (35% SAV) 25 UPPER SV LVD
2	10, 12		Elco	9	—			0	1	0	4			10	10	80			
3																			
4	4		NO L/S	11:25-12:10							5			10	20	70			
5																			
6	8		Elco	3	—			0	—	5				10	20	70			
7																			
8	11		Elco	3	—			0	—	5				10	20	70			
9																			
10	13		MA marg.					0	—	5				10	20	70			
11																			
12	15		Elco	3	—			0	—	5				10	20	70			
13																			
14	4, 8, 11, 15, 17		- split w/ center channel																includes USB 14, 16
15																			
16	USB 14		ELCO	3	A			0	0	1	4				80	10	10		X2 20% SAV 20% SAV
17																			
18																			
19	USB 16		ELCO	2	A			0	—	4				10	70	10	10		
20																			
21																			
22	USB 11*		ELCO	3	A			0	—										
23																			
24																			
25	USB 8*		ELCO	5	A	4/1		0	—										
26																			
27																			
28	USB 4*		No live shell	0	—			0	—										
29																			
30																			

Photo Log Notes

GPS Log Notes

* 2nd pass on left descending side of the lane due to flows

Date 9/27/23

Project Name/No.:

Freshwater Mussel Data Sheet

Page 2 of 8
Crew: CM, JCS, JCM, RB

River/Stream Name Creamery Road Ware River
County Ware State MA County Worcester
Weather _____ Location/Town Hardwick - New Braintree
Water Quality (T, pH, Flow, Cond, DO) _____ Air Temp: _____
Survey Type (Semi-quant/Qual/Quant/Reconn): _____
Comments _____

Rep*			Unionid Data										Habit/Substrate (%)									
T/Q/Site*	X	Y	Species	L	AJ	Age	LHW	FD	WD	SF	Depth	Br	Bo	Cb	Gr	Sd	St	Cl	Other			
1	USB	13*																				
2			Nolivel/shell	0	—			0	—													
3																						
4	USB	15*																				
5			Nolivel/shell	0	—			0	—													
6																						
7																						
8	DSB	17																				
9			A. undulata	1	A	TETA	35x23x17	0	—	4												
10			ELCO	92	A	5	84/8	0	55													
11																						
12	DSB	19																				
13			ELCO	19	A			0	01													
14																						
15																						
16	DSB	21																				
17			ELCO	14	A	5	13/1	0	—	5												
18																						
19																						
20																						
21																						
22																						
23																						
24																						
25																						
26																						
27																						
28																						
29																						
30																						

DSB 17, 19, 21
Time 1448-1520

Flows in center channel elevated but surveyable.

DSB 17, 19, 21

Time 8:44-15:22x2

Flows in center channel elevated but surveyable.

Photo Log Notes

GPS Log Notes

Date 9/28/2023
Project Name/No.: CREWING RD Freshwater Mussel Data Sheet

Page 1 of 3
Crew: RUB JCS CML JCM

River/Stream Name WARE State MASS. County _____
County _____ River Mile _____ Location/Town _____
Weather 50°F OVERCAST Air Temp: 50°F - 68°F
Water Quality (T, pH, Flow, Cond, DO) _____
Survey Type (Semi-quant/Qual/Quant/Reconn): _____
Comments Visibility Ideal @ 1.5 + m
Water 58-69°F

Rep			Unionid Data										Habit/Substrate (%)									
TQ/Site ^a	X	Y	Species	L	AJ	Age	LHW	FD	WD	SF	Depth	Br	Bo	Cs	Cr	Sd	St	Cl	Other			
DSB CELL 5			1011-1021	x3							5			20	50	30						
			ELCO	3				0	—													
DSB CELL 7			Time 1021-1138	x2							5			20	50	30						
-CELL 22			ALUN	1	A		31x18x120															
			ELCO	3	A			0	—													
DSB CELL 9			ELCO	14	A			0	—		5			20	50	30						
			ELCO	4	A ₁₅			0	—													
			ELCO	14	A			0	—		5			20	50	30						
DSB 11																						
			ELCO	3	A			0	—													
			ELCO	14	A			0	—													
DSB 13											5			20	50	30						
			ELCO	4	A			0	—													
			ELCO	14	A ₁₅	191		0	—													
DSB 15											5		30	20	30	20						
			ELCO	4	A			0	1	0												
			ELCO	17	A ₁₅	192		0	2	0												
DSB 18											8		30	20	30	20						
			No live/shell	—				0	—													
DSB 20											8		30	20	30	20						
			No live/shell	—				0	—													
DSB 22											8		30	20	30	20						
			No live/shell	—				0	—													
DSB 6											5			20	50	30						
			ELCO	14	A			0	—													

Photo Log Notes

GPS Log Notes

Date 28 Sept 2023

Project Name/No.: _____

Freshwater Mussel Data Sheet

Page 2 of 3

Crew: _____

IC, KLB, Jem, emc

River/Stream Name

Ware

State

Mass

County

Worcester

Weather

River Mile

Location/Town

Air Temp: _____

Water Quality (T, pH, Flow, Cond, DO)

Survey Type (Semi-quant/Qual/Quant/Reconn):

Comments

Time 8, 10, 12, 14, 16, 18, 20, 22 13:13 - 1523 X 2 = 140 min

Rep*		Unionid Data										Habit/Substrate (%)							
TQ/Site*	X	Y	Species	L	AJ	Age	LHW	FD	WD	SF	Depth	Br	Bo	Cb	Gr	Sd	St	Cl	Other
DSB 143			ELCO	17	A			0	-	4			10	10	20	60			70 SCLD 20 LWD 10 SAV
DSB 2			ELCO	1	A			0	-	5				10	15				75 - shoreline
									</										

Note DSB Cell 4 and center channel portions of 1, 2, + 3 Not surveyed due to High flows
Coarse substrate and similarly sparse mussel community as observed in 7, 9, 13, 15, 18 upstream, this area of the river does not support dense mussel community

Photo Log Notes

GPS Log Notes

Date 28 Sept 2023

Freshwater Mussel Data Sheet

Page 3 of 3

Project Name/No.: _____

Craneys Rd

Crew:

JES, ALB, JEM, CML

River/Stream Name Ware

State Mass

County

Worcester

County

River Mile

Location/Town

Weather

Air Temp: _____

Water Quality (T, pH, Flow, Cond, DO)

Survey Type (Semi-quant/Qual/Quant/Reconn): _____

Comments

TQ/Size ⁴	Rep ³		Species	Unionid Data										Habit/substrate (%)									
	X	Y		L	AU	Age	LHW	FD	WD	SF	Depth	Br	Bo	Ch	Gr	Sl	St	Cl	Other				
1	DSB	16	ELCO	10	A			—	0	4					10	20	70						
2																							
3																							
4	DSB	18	ELCO	10	A			—	2	4					10	20	70						
5																							
6																							
7																							
8	DSB	20	ELCO	9	A			—	4	5					10	20	70						
9																							
10																							
11																							
12	DSB	22	ELCO	9	A			—	4	7					10	10	80						
13			MAMA	18	A			0	—														
14																							
15																							
16																							
17																							
18																							
19																							
20																							
21																							
22																							
23																							
24																							
25																							
26																							
27																							
28																							
29																							
30																							

Photo Log Notes

GPS Log Notes

APPENDIX D

Photopages



Photo # 1 Date: 26 September 2023

Creamery Road bridge crossing over the Ware River, Hardwick-New Braintree, MA



Photo # 2 Date: 26 September 2023

Downstream portion of the ADI depicted from the right descending bank.



Photo # 3 Date: 26 September 2023
Survey area upstream of the Creamery Road bridge.



Photo # 4 Date: 26 September 2023
Survey area downstream of the Creamery Road bridge.



Photo # 5 Date: 26 September 2023
Emergent vegetation located within the upstream buffer.



Photo # 6 Date: 26 September 2023
A backwater eddy with emergent vegetation located directly downstream of the bridge in the downstream buffer.



Photo # 7 Date: 26 September 2023
Wetland area located in the lower cells of the downstream buffer.

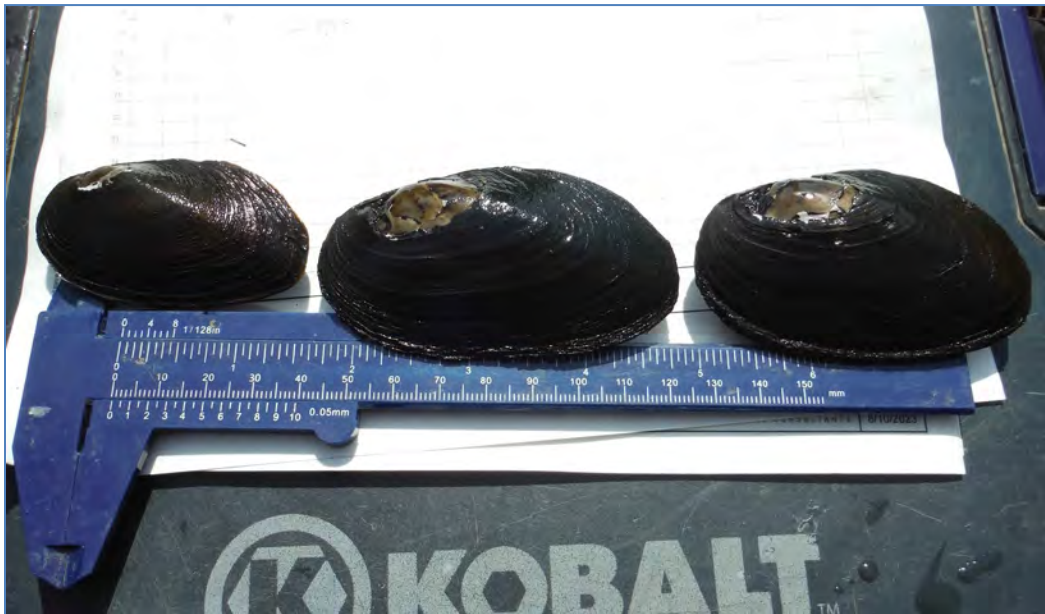


Photo # 8 Date: 26 September 2023
Representative photograph of live eastern elliptio (*Elliptio complanata*) age classes- lateral view.



Photo # 9 Date: 26 September 2023

Representative photograph of a live eastern elliptio (*Elilptio complanata*) - dorsal view.



Photo # 10 Date: 26 September 2023

Representative photograph of a live eastern pearlshell (*Margaritifera margaritifera*) - dorsal view.



Photo # 11 Date: 26 September 2023

Representative photograph of a live eastern pearlshell (*Margaritifera margaritifera*) - lateral view.



Photo # 12 Date: 26 September 2023

Representative photograph of a live eastern pearlshell (*Margaritifera margaritifera*) collected from the back water eddy in the DSB.



Photo # 13 Date: 26 September 2023

Representative photograph of a live creeper (*Strophitus undulatas*) - lateral view.



Photo # 14 Date: 26 September 2023

Representative photograph of a live creeper (*Strophitus undulatas*) - dorsal view.

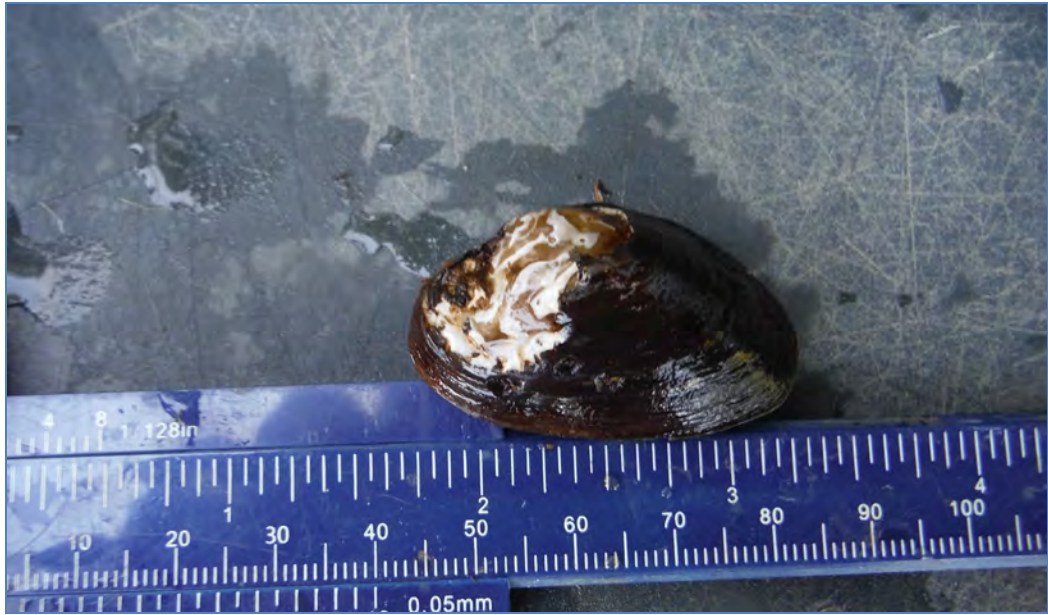


Photo # 15 Date: 26 September 2023

Representative photograph of a live triangle floater (*Alasmidonta undulata*) - lateral view.



Photo # 16 Date: 26 September 2023

Representative photograph of a live triangle floater (*Alasmidonta undulata*) - dorsal view

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DOCUMENT A00846

**MASSACHUSETTS DIVISION OF FISHERIES
& WILDLIFE**

**NATURAL HERITAGE AND ENDANGERED SPECIES
PROGRAM (NHESP)**

NHESP Determination Letter

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MASSWILDLIFE

DIVISION OF FISHERIES & WILDLIFE

1 Rabbit Hill Road, Westborough, MA 01581

p: (508) 389-6300 | f: (508) 389-7890

MASS.GOV/MASSWILDLIFE

November 16, 2023

Julia Hooageboom

10 park plaza

Boston, MA 02116

RE: Applicant: Julia Hooageboom
 Project Location: Creamery Road Bridge (H-08-003=N-07-002) over Ware River
 Project Description: 608851 - HARDWICK- NEW BRAINTREE- BRIDGE REPLACEMENT, H-08-003=N-07-002,
 CREAMERY ROAD OVER WARE RIV
 NHESP File No.: 23-8704

Dear Applicant:

The Natural Heritage & Endangered Species Program of the Massachusetts Division of Fisheries & Wildlife (the "Division") received the MESA Project Review Checklist and supporting documentation for review pursuant to the Massachusetts Endangered Species Act (MESA) (MGL c.131A) and its implementing regulations (321 CMR 10.00).

The MESA is administered by the Division, and prohibits the Take of state-listed species. The Take of state-listed species is defined as "in reference to animals...harm...kill...disrupt the nesting, breeding, feeding or migratory activity...and in reference to plants...collect, pick, kill, transplant, cut or process...Disruption of nesting, breeding, feeding, or migratory activity may result from, but is not limited to, the modification, degradation, or destruction of Habitat" of state-listed species (321 CMR 10.02).

The Division has determined that this Project, as currently proposed, will occur **within** the actual habitat of the following species:

<u>Scientific Name</u>	<u>Common Name</u>	<u>Taxonomic Group</u>	<u>State Status</u>
<i>Glyptemys insculpta</i>	Wood Turtle	Reptile	Special Concern
<i>Strophitus undulatus</i>	Creeper	Mussel	Special Concern

These species and their habitats are protected in accordance with the MESA.

Based on the information provided and the information contained in our database, the Division finds that a portion of this project, as currently proposed, **must be conditioned to avoid a prohibited Take of state-listed**

MASSWILDLIFE

species (321 CMR 10.18(2)(a)). To avoid a prohibited Take of state-listed species, the conditions attached to this letter must be met.

Provided the attached conditions are fully implemented and there are no changes to the project plans, this project will not result in a Take of state-listed species. We note that all work is subject to the anti-segmentation provisions (321 CMR 10.16) of the MESA. This determination is a final decision of the Division of Fisheries and Wildlife pursuant to 321 CMR 10.18. Any changes to the proposed project or any additional work beyond that shown on the site plans may require an additional filing with the Division pursuant to the MESA. This project may be subject to further review if no physical work is commenced within five years from the date of issuance of this determination, or if there is a change to the project.

Please note that this determination addresses only the matter of state-listed species and their habitats. If you have any questions regarding this letter please contact Melany Cheeseman, Endangered Species Review Assistant, at Melany.Cheeseman@mass.gov, (508) 389-6357.

Sincerely,



Everose Schlüter, Ph.D.
Assistant Director

cc: david paulson, Massachusetts Department of Transportation
Julia Hoozeboom, Massachusetts Department of Transportation
New Braintree Conservation Commission

Attachment: List of Conditions

List of Conditions

Applicant: Julia Hoogeboom
Project Location: Creamery Road Bridge (H-08-003=N-07-002) over Ware River
Project Description: 608851 - HARDWICK- NEW BRAINTREE- BRIDGE REPLACEMENT, H-08-003=N-07-002, CREAMERY ROAD OVER WARE RIV
NHESP File No.: 23-8704
Heritage Hub Form ID: RC-74162
Approved Plan: Creamery Road Bridge Replacement Over Ware River
Plan date: 9/22/23 Revised Date: N/A

To avoid a prohibited Take of state-listed species, the following condition(s) must be met:

1. **Mussel Protection:** A one-time mussel sweep shall be conducted immediately prior to the work. The purpose of the sweep is for a qualified biologist to search the work area and vicinity for mussels and translocate them outside of area subject to alteration.
 - a. State Listed Mussel Sweep: Mussels shall be located, identified, and moved to suitable habitat away from impacts associated with the project immediately prior to work within habitat.
 - b. Pre-Approval: The Division must pre-approve the candidate biologist(s) prior to any Work subject to this condition. The ability to locate and identify state-listed mussels requires significant experience with the target mussel species. The resume/curriculum vitae of the candidate biologist, demonstrating extensive experience locating state-listed mussels, shall be sent to the Division for written pre-approval.
 - c. Collection Permit: The biologist must obtain a Commercial Scientific Collection Permit for this project site prior to conducting mussel sweeps. Commercial Scientific Collection Permit Application & filing fee information can be found at: <https://www.mass.gov/doc/commercial-scientific-collection-permit-application/download>.
 - d. Survey Timing: Survey and relocation of mussels shall only occur between June 1 and October 1.
 - e. Reporting: The survey report, reporting positive or negative finding (aka 'fail to find') shall be submitted to the Division as outlined in the survey guidelines reporting all state-listed and watch-listed species. Please note that survey data must be submitted via the Heritage Hub (www.mass.gov/heritagehub) within 10 days of the completion of the survey.
2. **Turtle Protection Plan:** The applicant shall implement the Wood Turtle Protection Plan included as part of this submittal prior to the start of work (including vegetation clearing or soil disturbance). The Division-approved Plan shall be implemented as written; any proposed changes to the Plan must be submitted to the Division for review and written approval prior to implementation of said changes. By December 31st of any year in which work occurs, the qualified biologist shall submit: a) a summary report to the Division detailing project status and compliance with the Plan; and b) any observations of state-listed turtles at <https://www.mass.gov/how-to/report-rare-species-vernal-pool-observations>.

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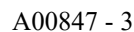
DOCUMENT A00847

**MASSACHUSETTS DIVISION OF FISHERIES
& WILDLIFE**

**NATURAL HERITAGE AND ENDANGERED SPECIES
PROGRAM (NHESP)**

Turtle Protection Sketch

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DOCUMENT A00875

**POLICY DIRECTIVE P-22-001
AND
POLICY DIRECTIVE P-22-002**

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Number: P-22-001
Date: 9/23/22

POLICY DIRECTIVE

Jonathan Gulliver (signature on original)

HIGHWAY ADMINISTRATOR

Off-Site Stockpiling of Soil from MassDOT Construction Projects

Purpose

The purpose of this Policy Directive is to formally establish a policy and procedures for managing and stockpiling soil generated and transported from MassDOT construction projects. This Policy Directive does not supersede any Federal, State, or Local regulations.

Date of Effect

This Policy Directive is effective immediately for all projects, including active construction projects.

For active construction projects and for other projects advertised prior to October 15, 2022, changes to the contract documents needed to implement the requirements of this Policy Directive will be considered on a case-by-case basis and shall be approved by the District Highway Director, as necessary.

For projects advertised on or after October 15, 2022, MassDOT will include the requirements and implementation procedures of this Policy Directive in the construction contract documents.

Policy Requirements

This policy is intended to prevent the off-site relocation of excavated soil generated from MassDOT projects to areas near residential receptors and to control potential fugitive dusts and/or contaminants. To that end, excavated soil may not be moved from the project site without knowledge of the content of the material. Knowledge may include visual field observations for presence of staining, odor, and/or debris, screening with a photoionization detector (PID), laboratory analysis, and/or site history. Pavement millings and other non-soil materials are not subject to the requirements of this Policy Directive.

Moving soil from a MassDOT project site to a temporary off-site storage location must be approved in writing by the District Highway Director.

The Contractor must select a storage location that is at least 500 feet away from residential receptors, as defined herein to include, but not be limited to, residential dwellings, residentially

zoned property, schools, daycare facilities, playgrounds, parks, recreational areas, hospitals, elderly housing and convalescent facilities.

Temporary off-site storage of excavated soil from a MassDOT project is only permissible at a location approved and permitted by MassDOT. The temporary storage location should be located within the same municipality where the soil was excavated, where possible. Stockpiled soil must be securely covered, and appropriate measures must be taken to minimize fugitive dust and erosion.

Signs indicating the source of the soil, the date the soil was generated, and contact information must be erected and maintained until the stockpiled soils are transported to a disposal facility or reused on the project site.

Implementation Procedures

To ensure that off-site storage of excavated soils is managed properly on MassDOT projects, this policy requires the following:

1. Off-Site Stockpile Storage Locations

- a. The Contractor shall provide proposed off-site storage locations to the Engineer for approval at least 30 days prior to transporting soil off site. Off-site storage locations should be in the same municipality as the work site.
- b. The Contractor shall keep excavated soil on site until adequately characterized to the satisfaction of the Engineer.
- c. The Contractor shall provide notification of the approved off-site storage location to the local Board of Health and the Town Manager's/Mayor's Office at least 7-days prior to transporting soil off site.
- d. The Contractor shall provide the Engineer with at least 3-days' notice prior to transporting soil off site.
- e. For off-site storage locations on MassDOT property, the Contractor is required to obtain an Access Permit through the District Permits Office prior to storage of soil or other materials. MassDOT will issue these permits at no cost to the Contractor. Information to be submitted by the Contractor as part of the permit application shall include:
 - i. A description of material to be stored off-site, including available analytical data;
 - ii. A figure of the location with distances to residences and residential receptors; and
 - iii. Anticipated duration of temporary storage.
- f. Stockpile locations should not be within 500 feet of residential receptors (e.g., residential dwellings, residentially zoned property, schools, daycare facilities, playgrounds, parks, recreational areas, hospitals, elderly housing and convalescent facilities).
 - i. If the stockpile location must be within 500 feet of residential receptors, then soil must be less than RCS-1 (per 310 CMR 40.1600) and free of potentially hazardous or regulated items.

- g. For off-site storage locations on non-MassDOT property, the Contractor must notify the property owner(s) at least 7 days prior to transporting material.
- h. Exceptions to these rules will be reviewed by MassDOT and may be approved by the District Highway Director on a case-by-case basis.

2. Off-Site Stockpile Management

- a. The Contractor shall keep soil stockpiles on impermeable surfaces (e.g., asphalt or concrete) or on 10-mil polyethylene sheeting.
- b. The Contractor shall cover soil stockpiles with 10-mil polyethylene sheeting and surround with a berm made of hay bales, straw wattles, or similar.
 - i. Piles that are actively being worked on must be covered and re-secured at the end of the work shift.
- c. The Contractor shall label stockpiles with signs, including:
 - i. Location of origin (including any Release Tracking Numbers)
 - ii. Stockpile ID number (including MassDOT District office-assigned tracking ID, if different)
 - iii. Date of initial accumulation
 - iv. Applicable telephone numbers for the Contractor and MassDOT.
- d. The Contractor shall mitigate fugitive dust at storage locations under the direction of an appropriately trained/certified environmental professional.
- e. The Contractor shall remedy noncompliance with this policy within 48 hours.
- f. The Contractor shall remedy noncompliance with this policy on the SAME DAY for potentially hazardous material, as determined by the Engineer.
- g. The Contractor shall handle excavated soil according to federal, state, and local regulations.
- h. The Contractor shall use appropriate shipping documents for all movements of excavated soil on public roadways (e.g., Bill of Lading, Material Shipping Record, Manifest, Asbestos Waste Shipment Record, etc.).

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Number: P-22-002Date: 9/23/22

POLICY DIRECTIVE

Jonathan Gulliver (signature on original)

HIGHWAY ADMINISTRATOR

Use of MassDOT Property for Staging and other Construction-Related Operations

Purpose

This Policy Directive is intended to address the use of MassDOT property by MassDOT Contractors for construction staging and other construction-related operations that are not specifically defined in the construction contract. Such use of MassDOT property will only be allowed if permitted by the District Office in accordance with 700 CMR 13.00, Approval of Access to MassDOT Highways and Other Property. This includes the use of MassDOT property for staging, laydown, and storage of equipment and materials, including soil excavated from a project site.

This Policy Directive requires the Contractor/applicant to obtain a Non-Vehicular Access Permit from MassDOT to use MassDOT property for these purposes.

This Policy Directive is effective immediately and applies to all MassDOT construction projects.

General Permit Considerations and Conditions

In addition to other normal MassDOT Access Permit procedures, MassDOT shall consider the following during the application, review, implementation and monitoring processes of Access Permits required by this Policy Directive:

- Storage and placement of the Contractor's equipment and materials should not be allowed within the clear zone of the roadway.
- Stockpiled soils should not be located within 500 feet of residential receptors, as defined herein to include, but not be limited to, residential dwellings, residentially zoned property, schools, daycare facilities, playgrounds, parks, recreational areas, hospitals, elderly housing and convalescent facilities.
- The Contractor/applicant shall identify the access/egress locations of the proposed storage areas. MassDOT will only approve locations determined to be safe for roadway users, construction workers and the general public.
- The Contractor may be required to submit a Traffic Management Plan and/or Lighting Plan for MassDOT review and approval as part of the permit application, depending on the proposed use of the area.

- The Contractor shall submit the permit application through MassDOT's online State Highway Access Permit System (SHAPS).
- MassDOT will waive the permit application fee for any application received from a MassDOT Contractor for any permit required by this Policy Directive and will waive any subsequent amendment and extension fees that may otherwise be required.
- MassDOT will review the permit application in accordance with applicable standard procedures and will apply standard permit terms and conditions, as necessary.
- The Resident Engineer will verify that the permit is approved before allowing the Contractor to use the affected area for the requested purpose.
- Areas permitted are for use by the approved applicant only and are not to be shared with or used by other vendors. Subcontractors specifically engaged with the applicant working on the specific MassDOT project will be allowed to use the area in accordance with the terms of the permit.
- Permits are issued on an annual basis and will require the Contractor to file for an extension each year to continue use.

Exemptions from Permit Requirements

Equipment and materials being used for active construction operations and located within the work zone of the construction contract are exempt from this permit requirement, provided they do not interfere with the safety or operation of the roadway or the work zone. Examples of these types of exempt uses are:

- Equipment and materials parked or stored within a protected (barriered) work zone.
- Materials placed in the work zone prior to same-day installation or use.
- Soils excavated temporarily and scheduled to be replaced, such as for trenching operations or for installation of drainage structures.

DOCUMENT B00420

PROPOSAL

HARDWICK-NEW BRAINTREE

For: **Bridge Replacement, H-08-003=N-07-002, Creamery Road over Ware River**

COMMONWEALTH OF MASSACHUSETTS

LOCATION

The work referred to herein is in the Towns of HARDWICK and NEW BRAINTREE in Worcester County, in the Commonwealth of Massachusetts, and is shown by the locus map (Document 00331) in the Proposal Pamphlet, the work locations extend as follows:

Creamery Road (Hardwick)

Unitas Road (New Braintree)

Beginning – Station 0+30.00 +/-

Ending –Station 5+85.00 +/-

The contract prices shall include the furnishing of all materials (except as otherwise herein specified), the performing of all the labor requisite or proper, the providing of all necessary machinery, tools, apparatus and other means of construction, the doing of all the abovementioned work in the manner set forth, described and shown in the specifications and on the drawings for the work, and in the form of contract, and the completion thereof within **730 CALENDAR DAYS** upon receipt of a Notice to Proceed, except that if the completion date falls between December 1 and March 15 then the same number of days beyond December 1st will be extended after March 15th.

The Work of this project is described by the following Items and quantities.

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Project # 608851		Contract # 126586		
Location : HARDWICK - NEW BRAINTREE				
Description : Bridge Replacement, H-08-003=N-07-002, Creamery Road over Ware River				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
100.	1	SCHEDULE OF OPERATIONS - FIXED PRICE \$31000 AT Thirty One Thousand Dollars LUMP SUM	\$31,000.00	\$31,000.00
101.	1	CLEARING AND GRUBBING AT _____ PER ACRE		
102.3	20	HERBICIDE TREATMENT OF INVASIVE PLANTS AT _____ PER HOUR		
102.33	12	INVASIVE PLANT MANAGEMENT STRATEGY AT _____ PER HOUR		
115.1	1	DEMOLITION OF BRIDGE NO. H-08-003=N-07-002 AT _____ LUMP SUM		
120.	312	EARTH EXCAVATION AT _____ PER CUBIC YARD		
121.	20	CLASS A ROCK EXCAVATION AT _____ PER CUBIC YARD		
140.	530	BRIDGE EXCAVATION AT _____ PER CUBIC YARD		
141.	18	CLASS A TRENCH EXCAVATION AT _____ PER CUBIC YARD		

Project # 608851		Contract # 126586		
Location : HARDWICK - NEW BRAINTREE				
Description : Bridge Replacement, H-08-003=N-07-002, Creamery Road over Ware River				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
144.	110	CLASS B ROCK EXCAVATION AT _____ PER CUBIC YARD		
150.	326	ORDINARY BORROW AT _____ PER CUBIC YARD		
151.	400	GRAVEL BORROW AT _____ PER CUBIC YARD		
151.1	150	GRAVEL BORROW FOR BRIDGE FOUNDATION AT _____ PER CUBIC YARD		
156.	170	CRUSHED STONE AT _____ PER TON		
156.1	20	CRUSHED STONE FOR BRIDGE FOUNDATIONS AT _____ PER TON		
170.	590	FINE GRADING AND COMPACTING - SUBGRADE AREA AT _____ PER SQUARE YARD		
184.1	3	DISPOSAL OF TREATED WOOD PRODUCTS AT _____ PER TON		
201.	1	CATCH BASIN AT _____ EACH		

Project # 608851		Contract # 126586		
Location : HARDWICK - NEW BRAINTREE				
Description : Bridge Replacement, H-08-003=N-07-002, Creamery Road over Ware River				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
222.1	1	FRAME AND GRATE - MASSDOT CASCADE TYPE AT _____ EACH		
224.12	1	12 INCH HOOD AT _____ EACH		
230.212	17	12 INCH CORRUGATED METAL PIPE 14 GAGE AT _____ PER FOOT		
258.	5	STONE FOR PIPE ENDS AT _____ PER SQUARE YARD		
402.	66	DENSE GRADED CRUSHED STONE FOR SUB-BASE AT _____ PER CUBIC YARD		
402.12	16	DENSE GRADED CRUSHED STONE FOR SHOULDERS AT _____ PER CUBIC YARD		
415.2	188	PAVEMENT FINE MILLING AT _____ PER SQUARE YARD		
440.	1,295	CALCIUM CHLORIDE FOR ROADWAY DUST CONTROL AT _____ PER POUND		
443.	1	WATER FOR ROADWAY DUST CONTROL AT _____ PER 1000 GALLONS		

Project # 608851		Contract # 126586		
Location : HARDWICK - NEW BRAINTREE				
Description : Bridge Replacement, H-08-003=N-07-002, Creamery Road over Ware River				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
450.22	66	SUPERPAVE SURFACE COURSE – 9.5 (SSC – 9.5) AT _____ PER TON		
450.31	67	SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC -12.5) AT _____ PER TON		
450.42	133	SUPERPAVE BASE COURSE - 37.5 (SBC - 37.5) AT _____ PER TON		
450.60	60	SUPERPAVE BRIDGE SURFACE COURSE - 9.5 (SSC-B - 9.5) AT _____ PER TON		
450.70	20	SUPERPAVE BRIDGE PROTECTIVE COURSE - 9.5 (SPC-B - 9.5) AT _____ PER TON		
452.	125	ASPHALT EMULSION FOR TACK COAT AT _____ PER GALLON		
620.12	501	GUARDRAIL, TL-2 (SINGLE FACED) AT _____ PER FOOT		
627.82	4	GUARDRAIL TANGENT END TREATMENT, TL-2 AT _____ EACH		
628.24	4	TRANSITION TO BRIDGE RAIL AT _____ EACH		

Project # 608851		Contract # 126586		
Location : HARDWICK - NEW BRAINTREE				
Description : Bridge Replacement, H-08-003=N-07-002, Creamery Road over Ware River				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
630.2	120	HIGHWAY GUARD REMOVED AND DISCARDED AT _____ PER FOOT		
645.160	90	60 INCH CHAIN LINK FENCE (PIPE TOP RAIL) VINYL COATED (LINE POST OPTION) AT _____ PER FOOT		
657.	110	TEMPORARY FENCE AT _____ PER FOOT		
657.5	110	TEMPORARY FENCE REMOVED AND RESET AT _____ PER FOOT		
697.	592	SEDIMENTATION FENCE AT _____ PER FOOT		
698.31	70	GEOTEXTILE FABRIC FOR TEMPORY SOIL PROTECTION AT _____ PER SQUARE YARD		
698.4	530	GEOTEXTILE FABRIC FOR PERMANENT EROSION CONTROL AT _____ PER SQUARE YARD		
711.	6	BOUND REMOVED AND RESET AT _____ EACH		
734.52	3	SIGN POST REMOVED AND STACKED AT _____ EACH		

Project # 608851		Contract # 126586		
Location : HARDWICK - NEW BRAINTREE				
Description : Bridge Replacement, H-08-003=N-07-002, Creamery Road over Ware River				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
740.	24	ENGINEERS FIELD OFFICE AND EQUIPMENT (TYPE A) AT _____ PER MONTH		
748.	1	MOBILIZATION AT _____ LUMP SUM		
751.73	52	COMPOST BLANKET AT _____ PER CUBIC YARD		
755.35	1	INLAND WETLAND REPLICATION AREA AT _____ LUMP SUM		
755.45	70	WETLAND RESTORATION AT _____ PER SQUARE YARD		
755.75	40	WETLAND SPECIALIST AT _____ PER HOUR		
755.76	1	WETLANDS MONITORING REPORTS AT _____ LUMP SUM		
765.	1,663	SEEDING AT _____ PER SQUARE YARD		
765.21	1	ANNUAL COVER CROP FOR NATIVE SEEDING AT _____ PER POUND		

Project # 608851		Contract # 126586		
Location : HARDWICK - NEW BRAINTREE				
Description : Bridge Replacement, H-08-003=N-07-002, Creamery Road over Ware River				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
765.421	1	NATIVE SEEDING MIX MID- HEIGHT GRASSLAND MIX AT _____ PER POUND		
765.635	110	NATIVE SEEDING AND ESTABLISHMENT AT _____ PER SQUARE YARD		
767.12	1,424	SEDIMENT BARRIER - COIR LOG AT _____ PER FOOT		
767.121	732	SEDIMENT CONTROL BARRIER AT _____ PER FOOT		
767.9	20	JUTE MESH AT _____ PER SQUARE YARD		
767.91	70	TIMBER MATTING AT _____ PER SQUARE YARD		
824.20	1	FLASHING WARNING BEACON TYPE A AT _____ LUMP SUM		
832.	6	WARNING-REGULATORY AND ROUTE MARKER - ALUMINUM PANEL (TYPE A) AT _____ PER SQUARE FOOT		
833.7	8	DELINEATION FOR GUARD RAIL TERMINI AT _____ EACH		

Project # 608851		Contract # 126586		
Location : HARDWICK - NEW BRAINTREE				
Description : Bridge Replacement, H-08-003=N-07-002, Creamery Road over Ware River				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
847.1	2	SIGN SUP (N/GUIDE)+RTE MKR W/1 BRKWAY POST ASSEMBLY - STEEL AT _____ EACH		
850.41	160	ROADWAY FLAGGER AT _____ PER HOUR		
851.1	20	TRAFFIC CONES FOR TRAFFIC MANAGEMENT AT _____ PER DAY		
852.	408	SAFETY SIGNING FOR TRAFFIC MANAGEMENT AT _____ PER SQUARE FOOT		
853.1	6	PORTABLE BREAKAWAY BARRICADE TYPE III AT _____ EACH		
853.2	40	TEMPORARY BARRIER (TL-2) AT _____ PER FOOT		
859.	20	REFLECTORIZED DRUM AT _____ PER DAY		
859.1	10	REFLECTORIZED DRUMS WITH SEQUENTIAL FLASHING WARNING LIGHTS AT _____ PER DAY		
874.4	3	TRAFFIC SIGN REMOVED AND STACKED AT _____ EACH		

Project # 608851		Contract # 126586		
Location : HARDWICK - NEW BRAINTREE				
Description : Bridge Replacement, H-08-003=N-07-002, Creamery Road over Ware River				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
904.	2	4000 PSI, 3/4 INCH, 610 CEMENT CONCRETE AT _____ PER CUBIC YARD		
910.	36	STEEL REINFORCEMENT FOR STRUCTURES AT _____ PER POUND		
942.124	380	STEEL PILE HP 12 X 84 AT _____ PER FOOT		
944.2	210	PRE-DRILLING FOR PILES AT _____ PER FOOT		
944.3	23	DRILLING FOR PILE OBSTRUCTIONS AT _____ PER FOOT		
948.41	4	DYNAMIC LOAD TEST BY CONTRACTOR AT _____ EACH		
948.5	8	PILE SHOES AT _____ EACH		
983.	490	DUMPED RIPRAP AT _____ PER TON		
983.5	390	STREAMBED/BANK RESTORATION AT _____ PER TON		

Project # 608851					Contract # 126586						
Location : HARDWICK - NEW BRAINTREE											
Description : Bridge Replacement, H-08-003=N-07-002, Creamery Road over Ware River											
ITEM #		QUANTITY		ITEM WITH UNIT BID PRICE WRITTEN IN WORDS			UNIT PRICE		AMOUNT		
991.1		1		CONTROL OF WATER - STRUCTURE NO. H-08-003=N-07-002 AT _____ LUMP SUM							
995.01		1		BRIDGE STRUCTURE, BRIDGE NO. H-08-003=N-07-002 AT _____ LUMP SUM							
996.31		75		MECHANICALLY STABILIZED EARTH WALL AT _____ PER SQUARE YARD							
Total Qty:		13,400									

DOCUMENT B00853

SCHEDULE OF PARTICIPATION BY DISADVANTAGED BUSINESS ENTERPRISES (DBES)

PRIME BIDDER: _____

DATE OF BID OPENING: _____ PROJECT NO.: 608851FEDERAL AID PROJECT NO. BES(BR-OFF)-003S(750)XPROJECT LOCATION: HARDWICK-NEW BRAINTREE

Name, Address, and Phone Number(s) of DBE	Name of Activity	(a) [†] DBE Contractor Activity Amount <i>Construction Work</i>	(b) DBE Other Business Amount <i>Services, Supplies, Material</i>	(c) Total amount eligible for credit under rules in Section 6 of Document 00719 - DBE Special Provisions
Total Bid Amount	TOTALS:	\$	\$	\$
\$	DBE Percentage of Total Bid:	%	%	%

[†]Column (a) must be at least one-half of the DBE participation goal. Attach additional sheets as necessary.Is MassDOT Document B00855 (Joint Check Approval) being submitted for any of the above? ☐ Yes ☐ No☐ Not Known at This TimeWill any of the contractors listed above be using a third party (i.e. manufacturer) to deliver materials or perform any portion of work by a third party? ☐ Yes ☐ No

CERTIFICATION: I HEREBY DECLARE, TO THE BEST OF MY KNOWLEDGE, THAT **I HAVE READ THE SPECIAL PROVISIONS FOR PARTICIPATION BY DISADVANTAGED BUSINESS ENTERPRISES - DOCUMENT 00719.** BOTH THIS SCHEDULE AND THE RELEVANT AND ACCOMPANYING LETTER(S) OF INTENT ARE IN FULL COMPLIANCE WITH THE PROVISIONS OF, AND IN ACCORDANCE WITH, TITLE 49 CODE OF FEDERAL REGULATIONS, PART 26 (49 CFR Part 26).

SIGNATURE: _____ DATE _____

NAME AND TITLE (*PRINT*): _____

EMAIL ADDRESS: _____ TEL NO.: _____

*** END OF DOCUMENT ***

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DOCUMENT B00854

DISADVANTAGED BUSINESS ENTERPRISES (DBE) PARTICIPATION
LETTER OF INTENT

(To be completed by the DBE – Page 1 of 2)

TO: _____ (Prime Bidder)

FROM: _____ (DBE Firm)

RE: PROJECT NO.: 608851 FEDERAL AID PROJECT NO.: BFS(BR-OFF)-003S(750)XPROJECT LOCATION: HARDWICK-NEW BRAINTREE

DATE OF BID OPENING: _____

I, _____, *Print Name* authorized signatory of the above-referenced DBE firm hereby declare:

1. My company is currently certified as a Disadvantaged Business Enterprise (DBE) by the Massachusetts Supplier Diversity Office (“SDO”), formerly known as the State Office of Minority and Women Business Assistance (SOMWBA), as a: (check all applicable, see Section 1 of the Special Provisions For Participation By Disadvantaged Business Enterprises, MassDOT Document 00719 additional guidance is available at Title 49, Code of Federal Regulations, Part 26.55 (49 CFR Part 26.55)):
☐ CONTRACTOR ☐ REGULAR DEALER ☐ BROKER
☐ MANUFACTURER ☐ TRUCKING OPERATIONS ☐ PROFESSIONAL SERVICES
2. My firm has the ability to manage, supervise and perform the activity described on page 2 of this Letter of Intent. If you are awarded the contract, my company intends to enter into a contract with your firm to perform the items of work or other activity described on the following sheet for the prices indicated.
3. There have been no changes affecting the ownership, control or independence of my company since my last certification review on _____, 20____. If any such change is planned or occurs prior to my company's completion of this proposed work, I will give prior written notification to your firm and to the Massachusetts Department of Transportation (“MassDOT”) Office of Civil Rights and SDO.
4. I have read the MassDOT proposal for the Project which may be entitled “Project Contract Documents and Special Provisions” or the draft “Contract” which includes MassDOT Document 00719, and acknowledge that my company will comply with that document and the requirements of 49 CFR Part 26.
5. For the purpose of obtaining subcontractor approval from MassDOT, my firm will provide to you:
 - A. **The following construction work:**
 - (i) a resume, stating the qualifications and experience, of the superintendent or foreperson who will supervise on site-work;
 - (ii) a list of equipment owned or leased by my firm for use on this project; and
 - (iii) a list of all projects (public or private) upon which my firm is currently performing, is committed to perform, or intends to make a commitment to perform. I shall also include, for each project: the name and telephone number of a contact person for the contracting authority, person, or organization; the dollar value of the work; a description of the work; and my firm's work schedule for the project.
 - B. **The following services, materials or supplies:**
 - (i) a written agreement and invoices for the materials or supplies, and any other documents evidencing the terms of providing such items;
 - (ii) information concerning brokers fees and commissions for providing services or materials; and
 - (iii) a statement concerning whether my firm intends or will be required to use a joint check arrangement; and any other documents that may be required by MassDOT.

DBE Company Authorized Signature

Date _____

DISADVANTAGED BUSINESS ENTERPRISES (DBE) PARTICIPATION
LETTER OF INTENT
(To be completed by the DBE – Page 2 of 2)

DATE OF BID OPENING: _____

PROJECT NUMBER: 608851FEDERAL AID PROJECT NUMBER: BFS(BR-OFF)-003S(750)XPROJECT LOCATION: HARDWICK-NEW BRAINTREE

PRIME BIDDER: _____

DBE COMPANY NAME: _____

<u>Item number</u> if applicable	<u>NAICS</u> <u>Code</u>	<u>Description of Activity</u> with notations such as Services, or Brokerage, Installation Only, Material Only, or Complete	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
				TOTAL AMOUNT:	

Please give full explanations, attach additional sheets if necessary.

I HEREBY VERIFY THAT _____ WILL SOLELY
(DBE company name)
PERFORM THE WORK, OR PROVIDE THE SERVICES OR MATERIALS, AS DESCRIBED ABOVE.

DBE AUTHORIZED SIGNATURE: _____

NAME AND TITLE (PRINT): _____

TELEPHONE NUMBER: _____ FAX NUMBER: _____

EMAIL ADDRESS: _____

*** END OF DOCUMENT ***

Rev'd 9/20/19

DOCUMENT B00855

DBE JOINT CHECK ARRANGEMENT APPROVAL FORM

(to be submitted by Prime Contractor)

Contract No: 126586 Project No. 608851 Federal Aid No.: BFS(BR-OFF)-003S(750)XLocation: HARDWICK-NEW BRAINTREE Bid Opening Date: _____Project Description: Bridge Replacement, H-08-003=N-07-002, Creamery Road over Ware River

We have received the attached request for the use of a joint check arrangement from _____, a DBE on the above- referenced Contract and _____, a Material Supplier/Vendor for the subject Contract. The DBE has complied with the requirements of 49 CFR Part 26.55(c)(1). In particular, the DBE has:

- a written agreement with the material supplier/vendor;
- applied for credit with the subject material supplier and has supplied the vendor's response;
- shown that it will place all orders to the subject material supplier/vendor;
- made and retains all decision-making responsibilities concerning the materials; and
- provided a Joint Check Agreement that is acceptable to MassDOT;

As the Contractor for the Project, we agree to issue joint checks (made payable to the Material Supplier/Vendor and the DBE) for payment of sums due pursuant to invoices from the Supplier/Vendor and DBE.

Contractor:_____
Company Name_____
Signature
Duly Authorized_____
Printed Name_____
Date_____
Title**SubContractor:**_____
Company Name_____
Signature –
Duly Authorized_____
Printed Name_____
Date_____
Title

*** END OF DOCUMENT ***

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DOCUMENT B00856

JOINT VENTURE AFFIDAVIT

(All Firms)

- All Information Requested By This Schedule Must Be Answered. Additional Sheets May Be Attached.
- If, there is any change in the information submitted, the Joint Venture parties must inform MassDOT Pre-Qualifications Office (and, if one of the companies is a DBE, the Director of Contract Compliance, Office of Civil Rights) *prior* to such change, in writing, either directly or through the Prime Contractor if the Joint Venture is a subcontractor.
- If the Joint Venture Entity will be the bidder on a prime Contract, it must bid and submit all required documents (insurance, worker's compensation, bonds, etc.) in the name of the Joint Venture Entity.

I. Name of Joint Venture: _____

Type of Entity if applicable (Corp., LLC): _____ Filing State _____

Address of joint venture: _____

Phone No(s) for JV Entity: _____ E-mail: _____

Contact Person(s) _____

Tax ID/EIN of Joint Venture: _____ Vendor Code: _____

II. Identify each firm or party to the Joint Venture:

Name of Firm: _____

Address: _____

Phone : _____ E-mail: _____

Contact person(s) _____

Name of Firm: _____

Address: _____

Phone: _____ E-mail: _____

Contact Person(s) _____

III. Describe the role(s) of the each party to the Joint Venture:_____

- IV. Attach a copy of the Joint Venture Agreement.** The proposed Joint Venture Agreement should include specific details including, but not limited to: (1) the contributions of capital and equipment; (2) work items to be performed by each company's forces, (3) work items to be performed under the supervision of any DBE Venturer; (4) the commitment of management, supervisory and operative personnel employed by the DBE to be dedicated to the performance of the Project; and (5) warranty, guaranty, and indemnification clauses.

V. Attach any applicable Corporate or LLC Votes, Authorizations, etc.

VI. Ownership of the Joint Venture:

A. What is the percentage(s) of each company's ownership in the Joint Venture?

ownership percentage(s): _____

ownership percentage(s): _____

B. Specify percentages for each of the following (provide narrative descriptions and other detail as applicable):

1. Sharing of profit and loss: _____

2. Capital contributions:

(a) Dollar amounts of initial contribution: _____

(b) Dollar amounts of anticipated on-going contributions: _____

(c) Contributions of equipment (specify types, quality and quantities of equipment to be provided by each firm): _____

4. Other applicable ownership interests, including ownership options or other agreements, which restrict or limit ownership and/or control:

5. Provide copies of all other written agreements between firms concerning bidding and operation of this Project or projects or contracts.

6. Identify all current contracts and contracts completed during the past two (2) years by either of the Joint Venture partners to this Joint Venture:

VII. Control of and Participation in the Joint Venture. Identify by name and firm those individuals who are, or will be, responsible for and have the authority to engage in the following management functions and policy decisions. (Indicate any limitations to their authority such as dollar limits and co-signatory requirements.):

A. Joint Venture check signing:

B. Authority to enter Contracts on behalf of the Joint Venture:

C. Signing, co-signing and/or collateralizing loans:

D. Acquisition of lines of credit:

E. Acquisition and indemnification of payment and performance bonds:

F. Negotiating and signing labor agreements:

G. Management of contract performance. (*Identify by name and firm only*):

1. Supervision of field operations: _____
2. Major purchases: _____
3. Estimating: _____
4. Engineering: _____

VIII. Financial Controls of Joint Venture:

A. Which firm and/or individual will be responsible for keeping the books of account?

B. Identify the "Managing Partner," if any, and describe the means and measure of their compensation:

C. What authority does each firm have to commit or obligate the other to insurance and bonding companies, financing institutions, suppliers, subcontractors, and/or other parties participating in the performance of this Contract or the work of this Project?

IX. Personnel of Joint Venture: State the approximate number of personnel (by trade) needed to perform the Joint Venture's work under this Contract. Indicate whether they will be employees of the majority firm, DBE firm, or the Joint Venture.

	Firm 1 (number)	Firm 2 (number)	Joint Venture (number)
Trade			
Professional			
Administrative/Clerical			
Unskilled Labor			

Will any personnel proposed for this Project be employees of the Joint Venture?: _____

If so, who: _____

A. Are any proposed Joint Venture employees currently employed by either firm?

Employed by Firm 1: _____ Employed by firm 2 _____

B. Identify by name and firm the individual who will be responsible for Joint Venture hiring: _____

X. Additional Information. Please state any material facts and additional information pertinent to the control and structure of this Joint Venture.

XI. AFFIDAVIT OF JOINT VENTURE PARTIES. The undersigned affirm that the foregoing statements and attached documents are correct and include all material information necessary to identify and explain the terms and operations of our Joint Venture and the intended participation of each firm in the undertaking. Further, the undersigned covenant and agree to provide to MassDOT current, complete and accurate information regarding actual Joint Venture work, payments, and any proposed changes to any provisions of the Joint Venture, or the nature, character of each party to the Joint Venture. We understand that any material misrepresentation will be grounds for terminating any Contract awarded and for initiating action under Federal or State laws concerning false statements.

Firm 1

Firm 2

Signature
Duly Authorized

Signature
Duly Authorized

Printed Name and Title

Printed Name and Title

Date

Date

*** END OF DOCUMENT ***